BROADCAST engineering®

March, 1975/75 cents

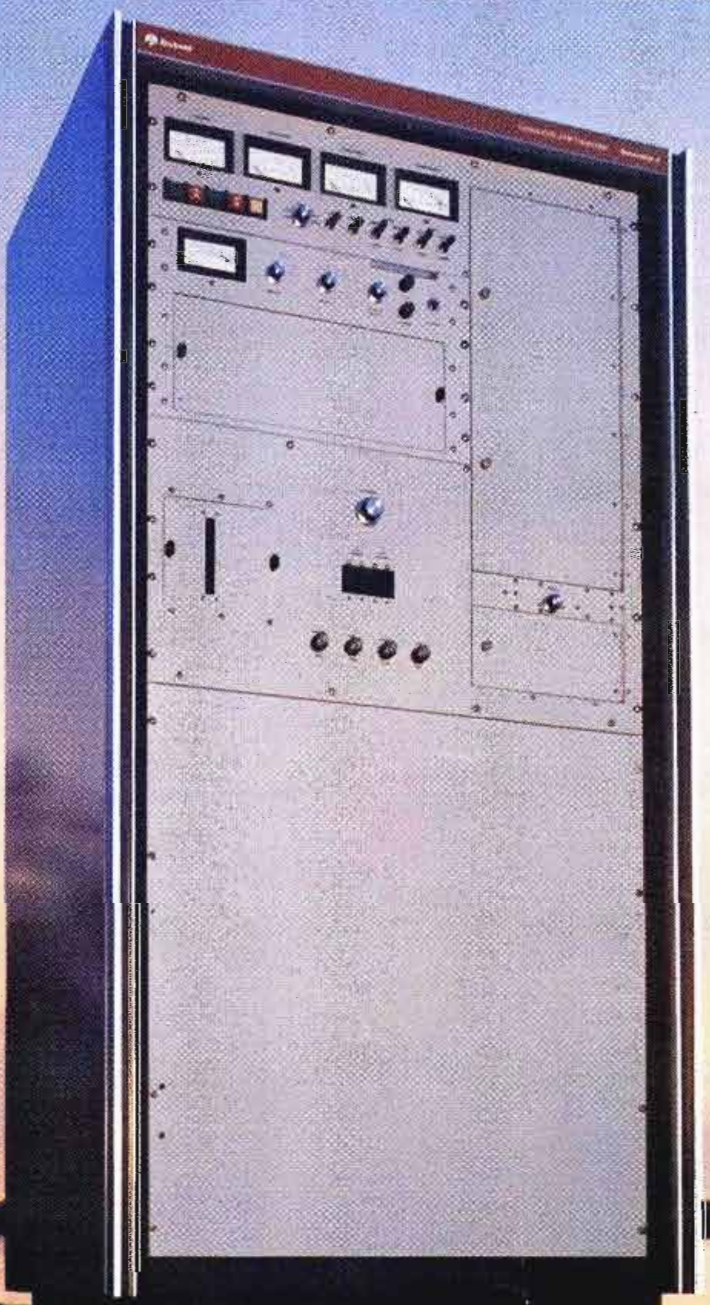
NAB Convention Issue

NAB Locator Guide

Pre-convention Roundup

Special Product Section

Collins announces the next generation of FM transmitters. The Generation 4 line.



They're here now. Nine new FM transmitters from Collins. Named Generation 4™ because they're a full generation ahead of anything else on the market. And because every feature is the product of 4 decades of Collins broadcast experience.

At the heart of everything is Collins' new, field-proven Phase 4™ Exciter. The best FM exciter available today at any price. Just one part of a system designed to meet the requirements of today's new generation of radio audiophiles . . . with discrete quad compatibility and stringent specifications on all the things that count, like intermod distortion.

Choices? Everything from the big 40-KW 831H-2, the 22½-KW 831G-2B, and 2½-KW 831D-2, to the 10-watt 831A-2. And five more models in between. And they're available right now at prices that are going to be a pleasant surprise. With the same superior Collins quality you've come to expect. Backed with the same unexcelled 24-hour parts and field service.

Act now, while we're still able to hold our current pricing. Contact your local Collins Broadcast salesman. Or Broadcast Marketing, Collins Radio Group, Rockwell International, Dallas, Texas 75207. Phone 214-690-5574 or 214-690-5219.

Rockwell International

For More Details Circle (1) on Reply Card

Any editor, film or video, can master our EA-5 helical VTR editing system in less than 15 minutes. That's a fact!

Furthermore, we will install the EA-5 system in less than an hour. And that's a fact.

How does it work?

In some respects, TRI's film approach to video tape editing will remind you of a film editing table. You edit, in a "hands on" technique, picture by picture. The electronics? 12 fool-proof buttons run the whole show. No time code. No tones. Just normal off-the-shelf tapes.

Availability? Well, we've already delivered more than 200 systems around the world and, we can deliver your EA-5 system in 30 days.

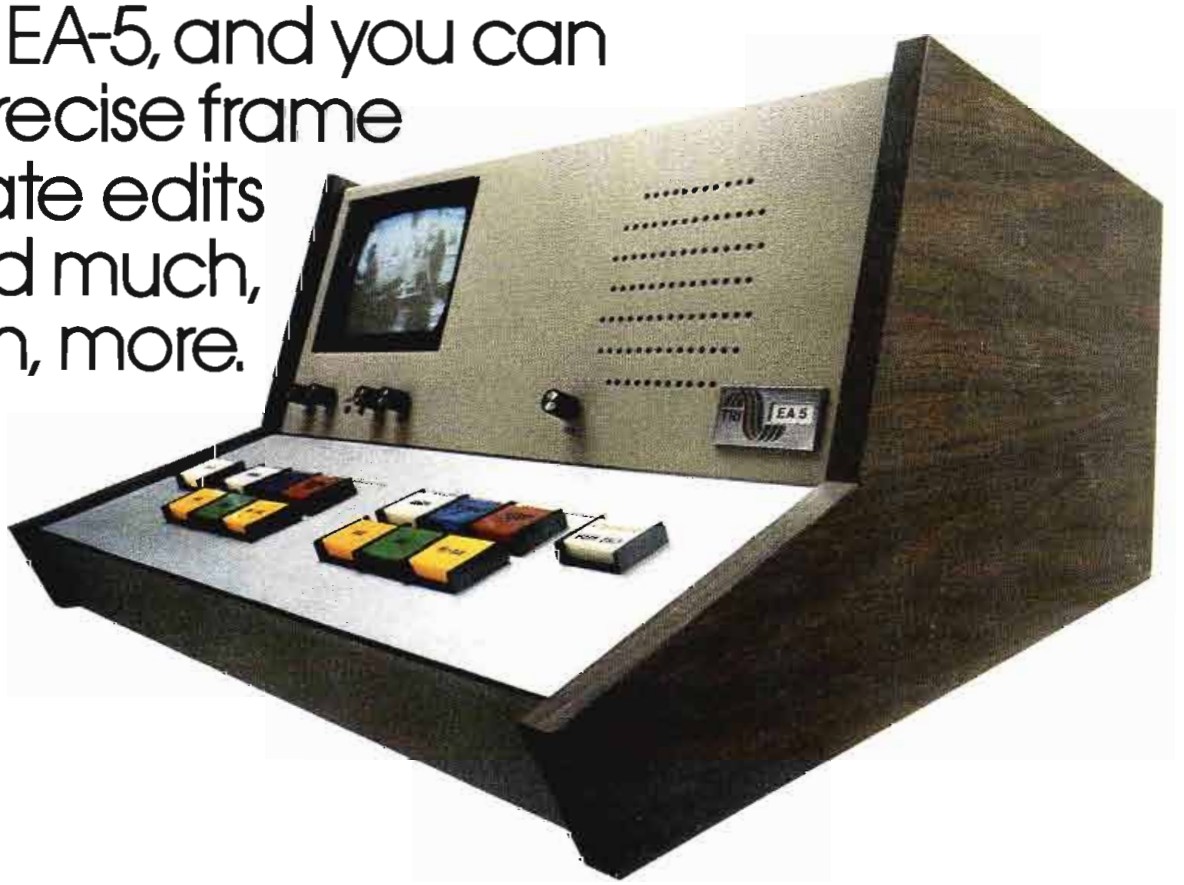
The price? $4,900.00. Complete. Total. No add-ons. Period. Seems fair to us.

Want more information? Contact us or the best video systems distributor in your area. Chances are he's our distributor.

TELEVISION RESEARCH INTERNATIONAL, INC.

"Manufacturers and distributors of Creative Freedom."

Take two helical VTR's, add our EA-5, and you can make precise frame accurate edits and much, much, more.



See you at the NAB.
Booth 1019, South Hall.

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BROADCASTengineering®

The journal of the broadcast-communications industry *March, 1975* *Volume 17, No. 3*

About the cover

BE introduces the first all solid state transmitter to hit 1 kW. It's covered on page 40 and will be on display at NAB. Photo courtesy of Harris (Gates).

Departments

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Robert E. Hertel, *Publisher*

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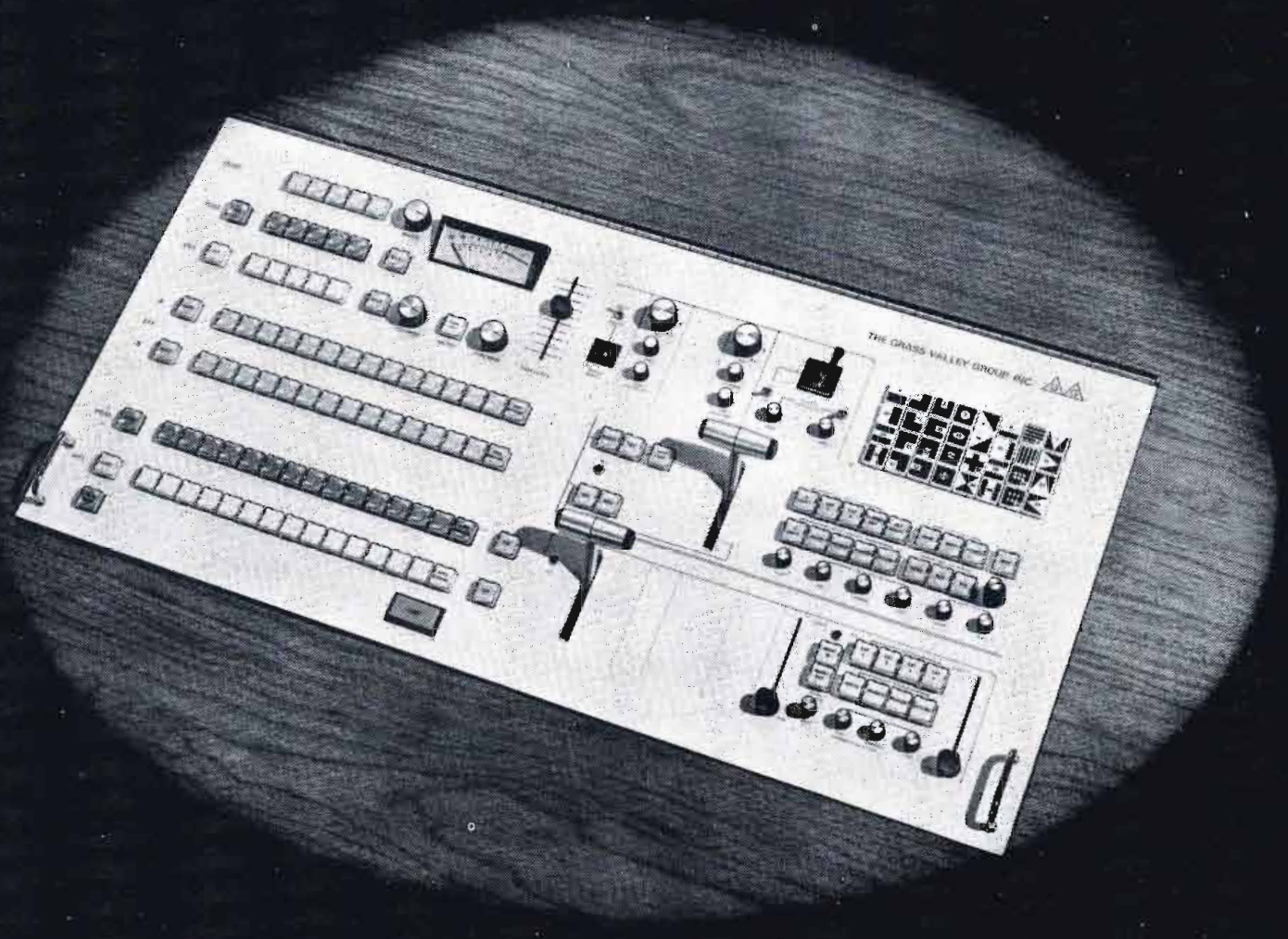
Introducing the 1600 2B

An audio-follow-video switcher expressly designed for use in master control rooms and post-production studios. The system provides 16 AFV inputs, plus 5 audio-only inputs.

The 2B is another addition to the ever-increasing range of GVG's 1600 Series switchers, of which over 100 are already in service throughout the world.



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DIRECT CURRENT FROM D.C.

March, 1975/by Howard T. Head and Harold L. Kassens

Beginning with this issue, we are joined in Direct Current from D.C. by Harold L. Kassens, former Assistant of the FCC Broadcast Bureau and now in private consulting engineering practice (see story in Industry News). And...Harold joins us at that time of the year when we indulge in our annual Pompous Predictions wherein we predict what the FCC and other Washington agencies may or may not do during the coming year. And so here are our 1975...

POMPOUS PREDICTIONS

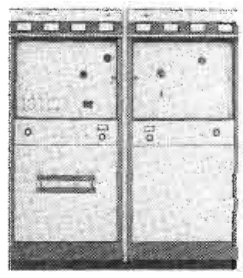
FCC Backlog--In certain areas, FCC broadcast application processing will come to a virtual standstill because of a loss of key operating personnel. One critical area is that of TV auxiliaries, where the staff has been inundated by a deluge of TV microwave applications for electronic journalism. Vacancies in the Broadcast Bureau will eventually be filled by competent subordinates, but government hiring and promotion processes are slow.

World-wide--The FCC will go all out in its preparation for the 1979 World Administrative Radio Conference (WARC). At stake is possible re-allocation of all frequencies presently allotted to the various services, including both radio and television broadcasting. Competition between government and non-government users as well as service against service (TV vs land-mobile, common-carrier, CATV auxiliaries, etc.), not to mention the competition among governments, will be devastating. The Public Broadcasting System (PBS) and the Department of Health, Education and Welfare (HEW) will continue to press for the reservation of frequencies for direct satellite broadcasting. And if the FCC doesn't step in and do the treaty job, the White House Office of Telecommunications Policy (OTP) will.

AM Power Increases--The Commission will relax its AM processing rules to permit existing stations to increase power to the maximum for their class, provided no interference is caused. This will include a relaxation of the present prohibition against delivery by suburban stations of primary service to central cities of metropolitan areas. The Commission will also continue to search for a way to permit daytime-only stations to get some limited nighttime operation -- but without much success.

(*Continued on page 6*)

Can't see the forest for the trees?



If the few proverbial trees bearing certain names are hiding the many broadcast equipment possibilities from you, we urge you to step out and examine the whole forest. These days none of us can afford to buy by maker's name alone. The woods are full of brand names, old and new, and we again invite you to glance through a few published features of high powered FM transmitters bearing popular names . . .

Manufacturer & Model	GATES FM20H3	CCA FM25000D/DS	COLLINS 831G-1B	RCA BTF20E1	**SPARTA 625A**
Power Output	21.5Kw	27.5Kw	22.5Kw	20Kw	**25Kw**
Driver as Auxiliary Capability	No	Yes	No	No	**Yes**
Automatic Power Control	No	No	No	No	**Yes**
VSWR Protection	No	No	No	No	**Yes**
Size of Largest Cabinet	42" W 78" H 32¾" D	38" W 76" H 34" D	71½" W 68-15/16" H 27½" D	48½" W 77" H 32½" D	**34" W 75" H 25½" D**

Note the considerations that even a quick comparison can reveal. For instance the Sparta 25 kw FM transmitter, due to its modular construction in smaller cabinets, is easier to transport and install in any location, yet through thoughtful design it offers far superior accessibility. APC and VSWR protection may be available at extra cost on some models listed, but on our 625A they are standard.

Making equipment decisions today can be more difficult than ever, with such a thicket of names and claims to choose among. Only careful, detailed comparison should guide your choice, and surely our brief chart above gives reason for you to inquire further of all manufacturers. Evaluation of claims in depth will best serve your interests. And ours.

Start now by getting full, exact specifications on Sparta FM transmitters, AM transmitters, audio equipment and Spartamation systems and components. We want you to write or call us collect, today, for the Sparta equipment information you need.

We're in the business of You.

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DIRECT CURRENT
FROM D.C.

(*Continued from page 4*)

VHF TV Drop-ins--The FCC will continue to debate the question of whether or not it is possible to drop in additional VHF TV channels in the larger markets. A public inquiry will be instituted and at least some specific drops-ins will be proposed. This will attract educators, public officials, minority groups, UHF broadcasters, and many others, and the docket will become thick with position papers. But the lack of available manpower within the halls of the FCC to sift through the chaff will prolong the eventual conclusion.

Automatic Transmitters--The FCC will issue a Notice of Proposed Rule Making on the subject of automatic transmitters for AM, FM, and TV stations. The unanimity of support for the proposal will be so overwhelming that the proposal may be adopted rather promptly.

TV Vertical Interval--With the rapid progress in England in the use of the TV vertical interval lines for the transmission of news and other consumer oriented information, a number of new proposals will come forward, including one by the rating services for a program identification code to activate attachments to home receivers.

Four-Channel FM Sound--The National Quadraphonic Committee (NQRC) will submit its final report on four-channel discrete FM systems to the FCC, where it will gather dust - again due to a lack of manpower.

TV Circular Polarization--ABC will complete the tests of circular polarization for TV in Chicago and will petition the Commission to permit this mode of operation on a voluntary, regular basis. The proposal will be generally supported by both the TV broadcasting and manufacturing industries, but the Commission is not likely to act with any speed because of its preoccupation with other problems.

UHF TV Tuner Performance--In the wake of a study commissioned by PBS of U.S. and European UHF TV tuner performance, PBS will petition the FCC to reduce the permissible tuner noise figure at UHF - presently set in Section 15.67 of the FCC Rules at 18 dB - to a substantially lower value. The Commission will respond by proposing such a reduction, which in turn will encounter united opposition from the receiver industry, largely on the grounds at the added cost of an RF amplifier stage at UHF.

CATV Technical Standards--The Industry-Government Cable Television Advisory Committee (CTAC) will report to the Commission this spring and the CTAC report will contain a wealth of information suitable for the formulation of additional and revised cable technical standards.

ADC

the TECHNOLOGY Company

In 1974 we brought you the first "DEVELOPED FOR TELEVISION" I.C. Crosspoint. Since then over 15,000 crosspoints, used in the ADC 900 Switching Systems, have been placed in service by some of the most demanding customers in the country, with a reliability rate second to none.

We also brought you the "OBQS" (One Bus Quad Split) which now are in service as primary mobile switchers, "add-on's" to existing systems and as integrated segments in ADC switching systems.

In 1975 we have gone even further! Video amplifiers are now available in an integrated TO-8 package. The Audio/Video/Tally crosspoint I.C. has been further condensed into a monolithic 16 pin DIP configuration. Both will soon be available as components from ADC.

Also we will introduce for the first time, a revolutionary new production system which comes the closest ever to duplicating film techniques in video production. The ADC 558 features a new generation of special effects which is all "soft", capable of multiple keys on each mix/effects amplifier, features spiral-rotary-inverting-clock face and parallel bar wipes in two independent effects amplifiers, includes more capabilities than are available from anyone, for a price tag of less than $25,000.

Our display will include the full line of smaller production systems, the ultimate in expandable distribution switching equipment, sync. systems, test equipment, and "add-on" hardware for existing systems.

Look for us at the Las Vegas Convention Center, booth 329 - North Hall. Hospitality Headquarters in the Landmark Hotel.

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INDUSTRY NEWS

CVS lands TBC patent

Anyone with an eye on the industry knows that the key to electronic journalism and the enthusiasm associated with it is highly dependent upon the time base corrector. Those who attended the NAB convention last year were treated to an array of variations off the theme by a number of exhibitors. The latest development may put the brakes on some manufacturers.

Consolidated Video Systems has been issued a basic patent covering the general technique of correcting certain video signal errors by means of a time base corrector. The issue date of the patent is January 14, 1975 and is US Patent #3860592.

"This patent covers the concept of time base correcting a video signal by sampling means, analogue or digital, storing that signal in a memory and clocking that signal out at a corrected rate" said Daniel J. Yomine, President of Consolidated Video Systems.

CVS also has corresponding patent applications pending in foreign countries including Great Britain and Canada. Early acceptance of these applications is expected in both countries.

Kassens joins A.D. Ring & Assoc.

Harold L. Kassens, former Assistant Chief of the FCC Broadcast Bureau, has become a partner in the consulting engineering firm of A. D. Ring & Associates, Washington, D.C. The firm specializes in the engineering representation of radio and television broadcast stations. Other partners include A. D. Ring, who established the firm in 1941, Dr. Frank G. Kear, Howard T. Head, Marvin Blumberg, and Ogden Prestholdt.

Kassens has been a U.S. delegate to numerous meetings of the International Radio Consultative Committee (C.C.I.R.) which deals with international standardization in radio matters and is presently Chairman of Study Group Ten (Sound Broadcasting) and Study Group Eleven (Television) of the U.S. C.C.I.R. National Organization. He has also been active in negotiating several international broadcasting treaties and agreements.

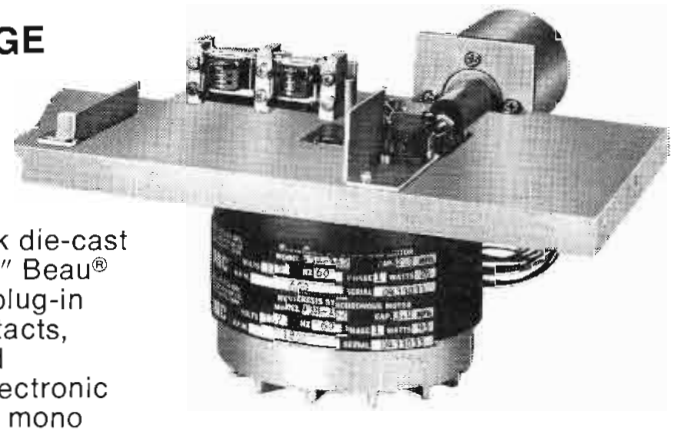
Harold Kassens is well known in the broadcast industry because of his activity in FM stereophonic and quadraphonic broadcasting, as well as his work in broadcast re-regulation and broadcast allocations. He has published several technical articles and addressed numerous engineering assemblies including NAB Broadcast Engineering Conferences and IEEE Symposia. He has held offices in the Institute of Electrical and Electronic Engineers and the Audio Engineering Society, and has also been active in the Society of Broadcast Engineers. He has been an amateur radio operator since 1932.

AMST meeting set for April 6

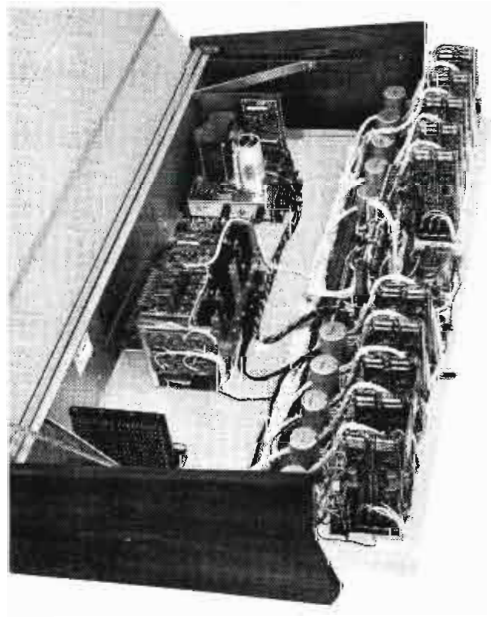
The Nineteenth Annual Membership Meeting of the Association of Maximum Service Telecasters, Inc., will be held at 2:00 pm, Sunday, April 6, 1975, in the Bijou/Century Rooms at the MGM Grand Hotel, Las Vegas, Nevada. Arch L. Madsen, Bonneville International Corporation, Salt Lake City, Utah, President of the Association, will preside at the session during which Association members will elect a new Board of Directors, and hear reports from Lester W. Lindow, the Association's Executive Director, and from the Association's legal and engineering counselors, dealing with current and future activities of the Association.

Ampro makes them better. And we've got the guts to prove it.

Take our AUTOMATIC TAPE CARTRIDGE RECORDER/REPRODUCERS.

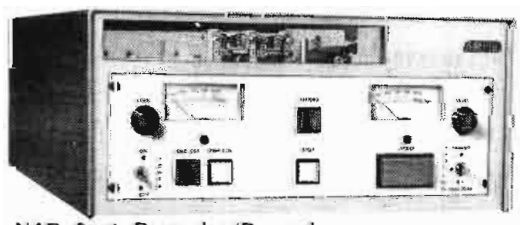


Look inside and see the self-aligning pinch roller for superior stereo phase tracking and heavy duty 3/8" thick machined aluminum head assembly mounted on a precision ground 5/8" thick die-cast transport structure. Plus a high torque 4" Beau® Motor, precision air-damped solenoid, plug-in fully shielded electronics with gold contacts, differential amplifier balanced input and transformer outputs . . . AND NEW all electronic built-in splice finder option available on mono and stereo recorder models. Just some of the features enabling you to originate the finest possible audio quality! Low prices. Available from stock for immediate delivery.

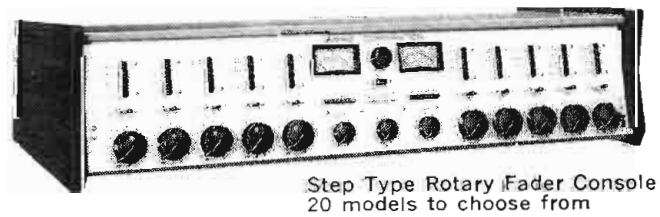


Match them with a rugged AMPRO AUDIO CONSOLE.

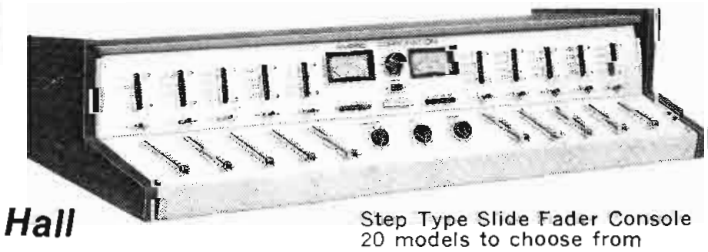
You'll see all modular plug-in circuitry, each channel equipped with triple shielded transformer coupled preamps and step type faders with cue, remote start capability on all high level inputs, shielded PC board mixing bus, telephone grade lever keys, 4 selectable inputs to each channel, built-in regulated power supply, transformer output program amplifiers and an electronically protected monitor amplifier. Available in 6, 8, 10 and 12 channel mono, dual, stereo, dual stereo and simulcast models, rotary or slide fader versions . . . all for immediate delivery from stock.



NAB Cart Recorder/Reproducer
34 models to choose from
(50 Hz and Mike Preamp options available)



Step Type Rotary Fader Console
20 models to choose from



Step Type Slide Fader Console
20 models to choose from

See how AMPRO makes them better at NAB BOOTH #910, South Hall

AMPRO CORPORATION

2220 Maplewood Avenue, Willow Grove, Pa. 19090 • (215) 657-3100

Professional Equipment for Broadcasting Professionals.

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ITVA Schedules Vegas meeting

The awards to be made by the 1975 Annual International Videotape Program Competition will be a major event of the Conference of the International Industrial Television Association (ITVA) meeting April 6-9, 1975, Sahara Hotel, Las Vegas, Nevada.

The Videotape Competition is now regularly regarded by non-broadcast producers and users of videotape materials as the most important opportunity available to display the very latest in communication, training, promotion, instruction, and information techniques. Regional and international winners are viewed by ITVA chapters and members throughout the year. The Competition is open to all non-broadcast industrial, educational, governmental and similar organizational user-producers of videotape presentations recorded in the current or last calendar year.

Competition International Chairman is Al Bond, Texas Instruments Learning Center, Dallas, Tx. Bond, who is also an ITVA 2nd VP, said, "In response to the almost overwhelming interest last year, we have opened up new classes and categories at the regional and international levels to provide for greater participation." Videotape programs produced by non-broadcast users for their own use either through their own in-house facilities or by out-of-house means are eligible.

Interference manual available now

Signal Leakage and Interference Control, a field-tested manual presenting information on good engineering practices, is now available from the National Cable Television Association.

The 39-page booklet, edited by NCTA Vice President for Engineering Delmer Ports, is designed for the CATV technician and gives step-by-step procedures for control of signal leakage. The handy booklet treats three important problem areas: measurements, installation and maintenance.

In addition to presenting an explication of the FCC regulations pertaining to signal leakage, the "how to" manual features diagrams, graphs and other aids for the technician. **Signal Leakage** also contains a list of equipment, manufacturers and measurement tables. A sample test record form acceptable by the FCC is included in the appendix.

Signal Leakage and Interference Control is available from the NCTA Engineering Dept. Cost is $5.00 for members, $8.00 for others.

Collin Chamberlain to Telemation

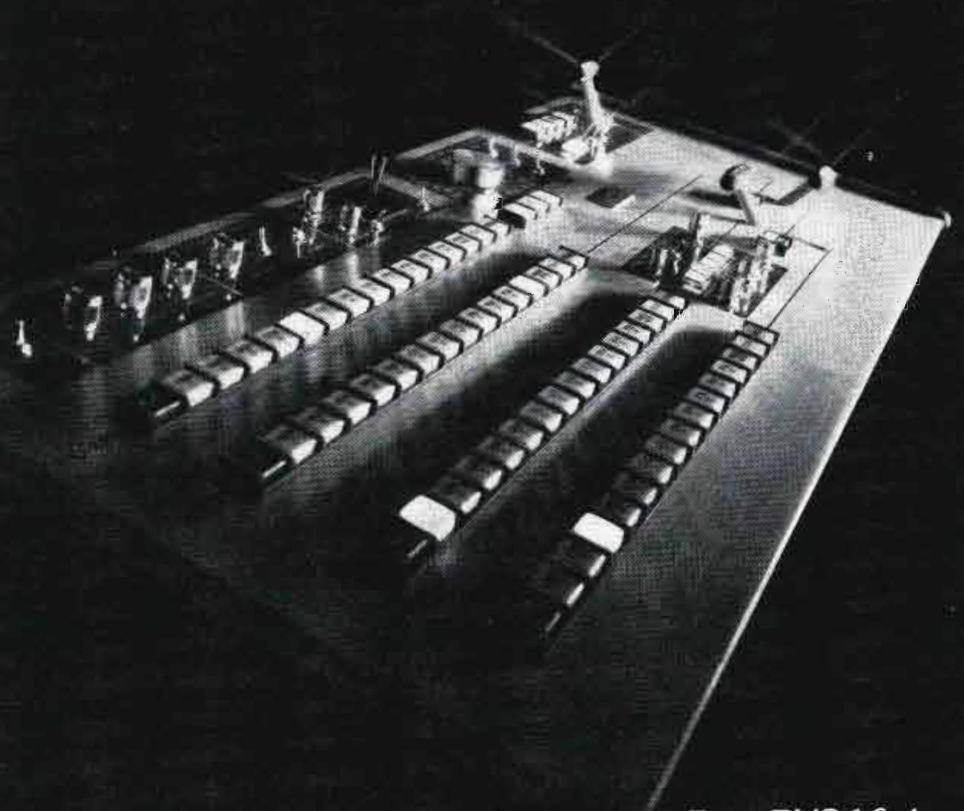
Collin Chamberlain has been named Advertising/Public Relations Manager at Telemation. Chamberlain was formerly Ad Supervisor and Corporate Trade Show/Exhibits Manager at Ampex.

Fidelipac moving

Fidelipac, a Division of TelePro Industries Incorporated, announces its move into expanded quarters at 109 Gaither Drive, Mt. Laurel., New Jersey 08057. The move of Fidelipac was required because of an increase in sales and product development necessitating larger facilities. The new quarters include complete sales, manufacturing, engineering, research and development and shipping areas. Fidelipac's new telephone number is 609-235-3511.

Fidelipac is manufacturer of Fidelipac® Broadcast Tape Cartridges. Additional products for the broadcasting and related industries include test tapes and gages, Cart-A-round Tape Racks, Cart-E-rase Tape Erasers, cartridge labels, tape head cleaner and Fidelipac's new on-air light.

Suddenly
It's a Whole New Ballgame



Ross RVS 16-4
16 input, 4 bus Video Production Switcher. Approximately $18,000 U.S.

State of the art features, compact construction, reliability and a price about 25% less than you'd expect to pay. Impossible? Read on.
The Ross RVS 16-4 pioneers a new design concept to achieve a full featured video production switcher of ultra reliable high quality performance in a super-compact package. Ingenious and innovative, yet proven —several systems have been in service for months with flawless performance. And to top it off delivery is 4 to 6 weeks.

Find out more about the most advanced switcher in the field. Our detailed brochure is available from:

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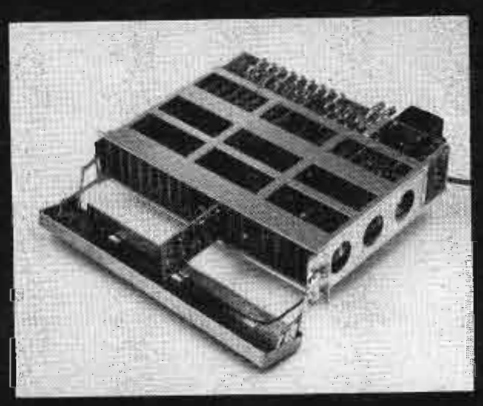


Electronics Package
3½" Rack Space (including power supply)
Power Consumption: 50 VA.

For More Details Circle (8) on Reply Card

FM Broadcasters petition for equal treatment

The National Association of FM Broadcasters has filed a Petition for Rulemaking before the Federal Communications Commission requesting a change in the definition of a "standard broadcasting station" to "AM broadcasting station".

In the current FCC Rules and FCC Application forms, AM radio is always designated as "standard broadcasting". James Gabbert, President of the NAFMB contends that this definition of AM stations is derogatory and discriminatory to FM, as well as misleading and confusing to the public.

It is the NAFMB's position that in view of the proliferating types of broadcasting now permitted by the Rules and Regulations, there is no such thing as "standard broadcasting". Not only are there commercial AM and FM stations, but educational FM, commercial UHF-TV, commercial VHF-TV, educational UHF-TV, and educational VHF-TV. The NAFMB maintains that in view of the tremendous growth which FM has experienced that it must be treated as a full and viable partner of AM radio.

In the petition, the NAFMB has asked the Commission to treat FM as an equal partner of AM.

Review board amends code

The Television Code Review Board of the National Association of Broadcasters has amended the Television Code to deal with programs inappropriate for a general family audience during early evening time periods and to provide for advisories for certain programs.

The new language, effective September 1975, must be approved by NAB's Television Board of Directors. The Board will meet during the Association's convention April 6-9 in Las Vegas.

The new language under the Code's Program Standards, Section I reads:

"Additionally, entertainment programming inappropriate for viewing by a general family audience should not be broadcast during the first hour of network entertainment programming in prime time and in the immediately preceding hour. In the occasional case when an entertainment program in this time period is deemed to be inappropriate for such an audience, advisories should be used to alert viewers. Advisories should also be used when programs in later prime time periods contain material that might be disturbing to significant segments of the audience.

"These advisories should be presented in audio and video form at the beginning of the program and when deemed appropriate at a later point in the program. Advisories should also be used responsibly in promotional material in advance of the program. When using an advisory, the broadcasters should attempt to notify publishers of television program listings."

NAB elects directors

The National Association of Broadcasters announced today the election of 19 prominent broadcasters to its 48-member Board of Directors—13 to the Radio Board and six to the Television Board.

Elected by mail ballot, all will serve two-year terms starting Wednesday, April 9, the concluding day of NAB's 53rd annual convention in Las Vegas, Nev.

Elected to the Radio Board:

District 1—(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont). Donald A. Thurston, WMNB AM-FM, North Adams, Mass.

District 3—(Delaware, District of Columbia, Maryland, Pennsylvania and West Virginia). Victor C. Diehm, WAZL/WVCD, Hazleton, Pa.

District 5—(Alabama, Florida, Georgia, Puerto Rico and the Virgin Islands). Paul E. Reid, WBHB, Fitzgerald, Ga.

District 7—(Kentucky and Ohio). Walter E. May, WPKE-WDHR, Pikesville, Ky.

District 9—(Illinois and Wisconsin). Donald G. Jones, KFIZ, Fond du Lac, Wis.

District 11—(Minnesota, North Dakota and South Dakota). George L. Brooks, KCUE AM-FM, Red Wing, Minn.

District 13—(Texas). Stan Wilson, KFJZ/KWXI, Fort Worth, Tex.

District 15—(California—excluding counties of San Luis Obispo, Kern, San Bernardino, Santa Barbara, Ventura, Los Angeles, Orange, Riverside, San Diego, & Imperial—and Nevada, Hawaii and Guam). Frank M. McLaurin, KSRO, Santa Rosa, Calif.

District 17—(Alaska, Oregon and Washington). Wally Nelskog, KIXI AM-FM, Seattle, Wash.

Class A Market—(Population of 500,000 or more). Virginia Pate Wetter, WASA/WHDG, Havre de Grace, Md.

Class B Market—(Population of 100,000 to 500,000). Ben A. Laird, WDUZ AM-FM, Green Bay, Wis.

Class C Market—(Population of 25,000 to 100,000). Bill Sims, KOJO/KIOZ, Laramie, Wyo.

Class D Market—(Population of 25,000 or less). Edward D. Allen, Jr., WDOR AM-FM, Sturgeon Bay, Wis.

Szegda new group president

Richard L. Bloch, President and Chairman of the Board of Filmways, Inc., announces the establishment of the Broadcast and Sound Services Group.

This action brings together under one executive group head two Filmways subsidiaries: Broadcast Electronics, Inc. of Silver Spring, Maryland and the Wally Heider Recording Studios of Hollywood and San Francisco, California. Andrew Szegda, President of Broadcast Electronics, Inc., becomes the group president of this new Filmways division.

Broadcast Electronics manufactures and distributes the Spotmaster® line of tape cartridge machines, Modtec video monitors and related equipment for the broadcast industry.

National meeting in Las Vegas

Special SBE workshop

At the NAB convention, the SBE will conduct an earlybird workshop. It'll be a presentation of our engineering certification program, a program that the certification has worked on for several months now. The workshop will be held at 8 AM, Tuesday, April 8. Check your sessions program for the meeting place. It was not available as we went to press.

After the SBE panel makes its presentation, they will accept questions and comments from the floor.

The Society will soon have a bi-monthly newsletter underway, and it'll be coming out of a newly established editorial office. The address will be: SBE Editorial Offices, Suite 210, Embassy Square, 2000 N Street, N.W., Washington, D.C. 20036.

In other recent actions, the Society has changed the name of the conventions it is sponsoring. They'll now be called regional conventions. As you can see from the pictures included here, SBE conventions have been doing quite well.

The pictures that are included in the Journal this month reflect the continuing interest of the SBE in regional conventions. Prospects are good for even better results in 1975.

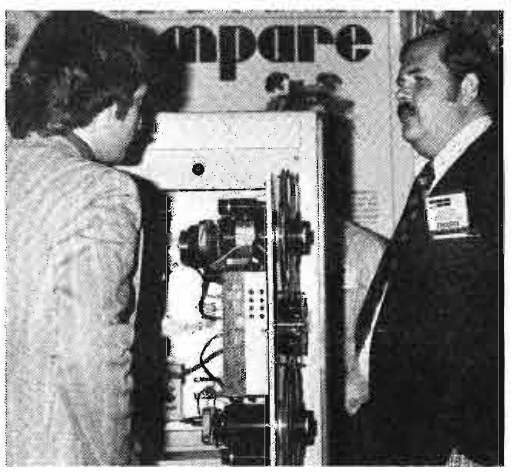
The national meeting will precede the heavy NAB schedule April 6 at 12:00 noon when the Board convenes to lay the groundwork for 1975 activities. The annual membership meeting will be from 3:00 to 5:00 pm, and that includes an open bar. The place of these meetings has not yet been set. Watch for special last minute announcements in BE.

For those of you who have never attended the national meeting, this offers a great opportunity to meet other Society engineers and begin friendships that last a life time.

SBE fellow

In the short, 10-year history of the Society of Broadcast Engineers, Inc., a number of members have been advanced to the grade of Fellow. The Fellow Grade is conferred on those who have rendered conspicuous service or who have given signal service to the Society. A member cannot apply for the Fellow grade, but must be nominated by other members and be approved by the SBE Board of Directors.

In each of the previous eight issues of **Broadcast Engineering,** thanks to the **BE** publisher, we featured a recipient of the SBE Fellow award. So far, we have



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Digital Antenna Monitoring

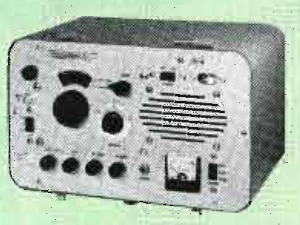
DAM-1 DIGITAL ANTENNA MONITOR – FCC type approved. Provides digital readout of amplitude, ratio and phase. Also available: DAMA-1 Base Current Adapter for remote digital readout of antenna base currents; DAMA-2 Analog Converter to Interface DAMA-1 Monitor with existing analog remote control systems; DAMX-1 to extend capacity of DAM-1 to arrays up to 12 towers.

Transmitter/Antenna Remote Control

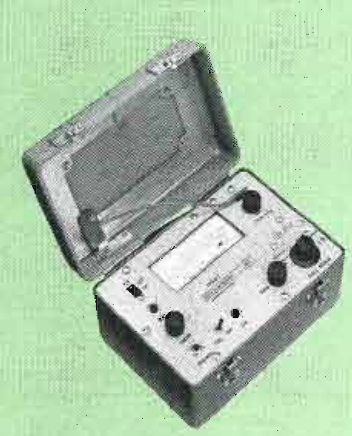
TMCS-1 TRANSMITTER/ANTENNA REMOTE CONTROL SYSTEM – Provides digital readout and control of the DAM-1 and transmitter over a single voice channel. Other systems available: DAMR-1/DAML-1 for digital readout and control of the DAM-1 only; DAMH-1 for use where the remote control point is close enough to the monitor to permit hardwired inter-connection.

Measurement/Test Instruments

OIB-1 OPERATING IMPEDANCE BRIDGE – For antenna system measurements under transmitter power. May also be used as a conventional bridge.



RG-1 RECEIVER/GENERATOR – Two-watt signal generator with a tracking detector. Built-in rechargeable battery power supply for full portability in making low power impedance measurements. For use with OIB-1 or other RF bridges.



CPB-1 COMMON POINT IMPEDANCE BRIDGE – Monitors common point impedance continuously. Designed for permanent installation.

FSM-1 FIELD STRENGTH METER – Single frequency meter for simple, error-free, economical field strength measurements. Plug in modules for multi-frequency and harmonic measurements.

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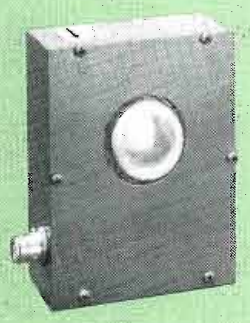

TCT-( ) TOROIDAL CURRENT TRANSFORMER – Provides accurate, stable R. F. samples for phase and amplitude measurements. Available in three sensitivities. Also available: TCTR-1 Compensated Rectifier Circuit to provide DC voltage for remote current measurement when used with TCT-( ).

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For More Details Circle (11) on Reply Card

honored Robert Flanders, Charles Hallinan, Harold E. Ennes, Albert H. Chismark, Benjamin Wolfe, Leo Reetz, Orville J. Sather and Martin R. Williams. In this issue we have selected Lewis D. Wetzel.

Lewis D. Wetzel served two terms as president of the SBE, was also an Executive Vice President, and the first Chairman of the Philadelphia Chapter. He was instrumental in encouraging the formation of a number of other SBE chapters in various parts of the country.

He is presently associated with Dielectric Communications; previously he was Assistant Director of Engineering for the Broadcasting Division of Triangle Publications. He joined Triangle in 1960. During his association with Triangle, he initiated experimental work which lead to the reduction of aural power for VHF transmitters, the use of dual polarized antennas for FM, and also did experimental work on circular polarization for television.

In April 1968 he was a State Department representative to an International meeting of the Broadcast Study Groups of CCIR in Palma de Majorica. From 1957 to 1960 he was a Senior Staff Engineer for Kear and Kennedy, Broadcast Consultants. During the years 1952 through 1957 he was associated with RCA as a research and development engineer on broadcast transmitters; he was also associated with Picatinney Arsenal, working on the development of electronic fuses for artillery ammunition.

Wetzel received his BS degree in Electrical Engineering from Lehigh University and did graduate work at the University of Pennsylvania and the RCA Advanced Training Center. He is a member of a number of other organizations including the SMPTE, IEEE, AES and is an associate member of the Association of Federal Communications Commission Engineers.

Chapter reports

Chapter 1: Binghamton, N.Y.
Chairman: Bill Sitzman, Jr.
Tyrone, N.Y. 14887

On January 14th members and guests met at the Sheraton Motor Inn, Ithaca, N.Y. for a business session followed by a tour of the new WHCU transmitter. Bill Bingham and Bob Denimon were in charge of the tour.

(*Continued on page 134*)

Attention SBE Members
Annual Membership Meeting
Sunday, April 6
2:30 pm
Conference Rooms 2 & 3
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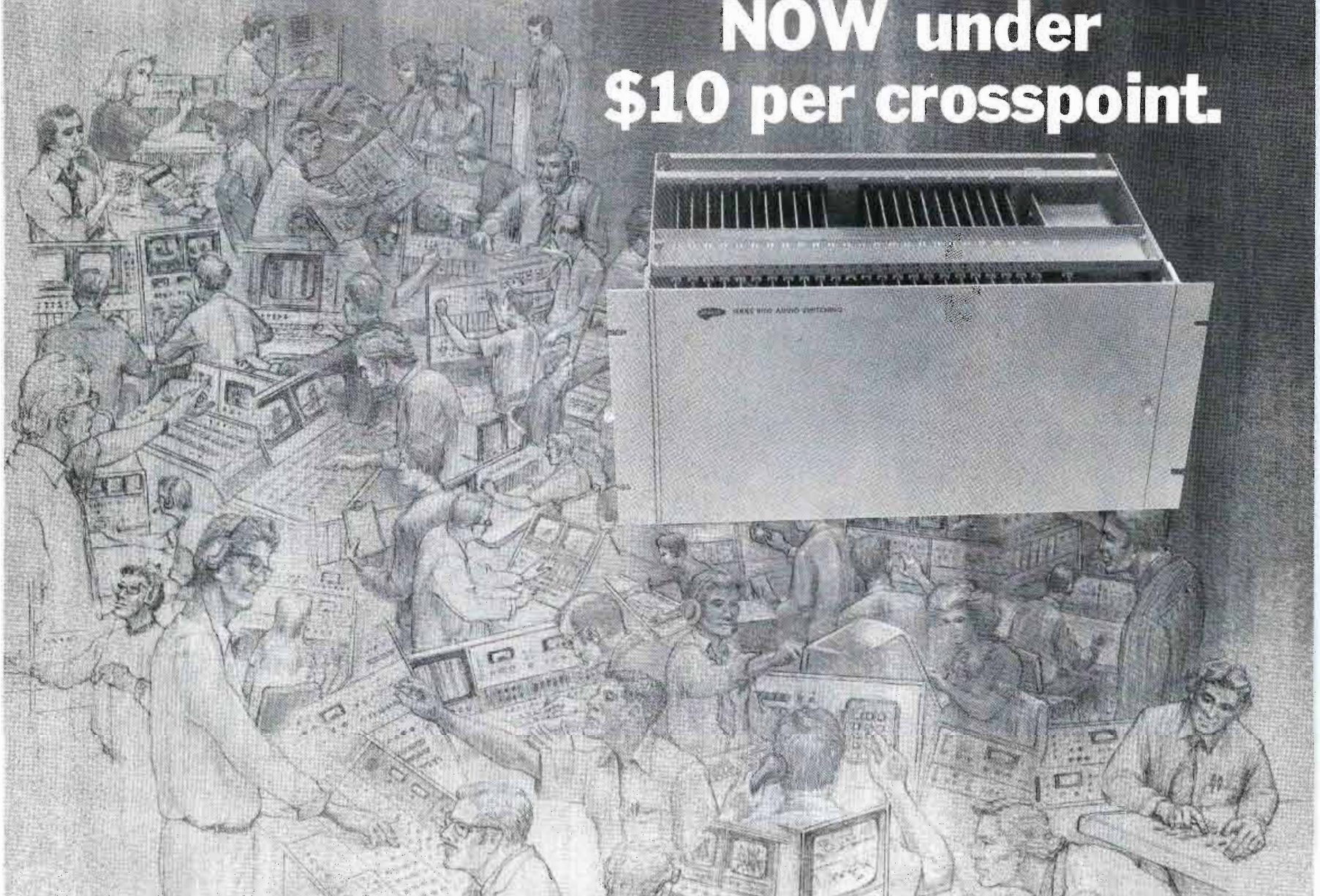
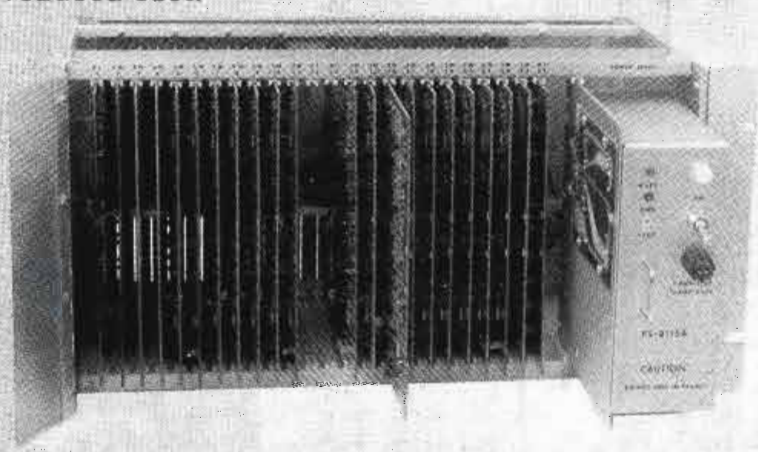


Input-output configurations are virtually unlimited with this modular, building-block, solid-state, audio switch. And . . . this flexibility comes at reduced cost.



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DYNAIR

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The odds are good...

NAB SHOW will be a hit

NAB president Vince Wasilewski will stay on target in battles on fairness, renewals, and cable, but how will he react to the programming pressures of the FCC?

By Ron Merrell

Last year was a good year for the broadcast industry. And if you can believe the predictions, 1975 will be an even better year. As you will see in the NAB roundup section, there are a number of industry roadblocks. Even so, the outlook is good, and the equipment manufacturers are betting on it. That makes Las Vegas on ideal site for the 1975 version of the annual convention.

If you watch conventions throughout the year, you'll see that the belt-tightening (which isn't relevant to many aspects of the industry and its suppliers) will have a far greater effect on other association conventions than it will on NAB.

The appearance at NAB usually is considered a must. At times it even shapes up as the world series of broadcasting. But there is an added facet this year, because a number of exhibitors attending will not be present at other conventions. Of course it didn't help when the NCTA bumped its convention dates to within days of the NAB show. Still the odds are that this will be one of the best shows NAB has had in recent years.

One of the show-biz and exciting aspects of the exhibits will be to follow the competition of those committed to electronic journalism and special effects. But equally important - and not nearly so obvious - will be the innovations of digital technology, power in solid state, and manufacturers testing the water in whole new product lines.

Our exasperating national economy and the "what are we short of now" evening news would lead you to believe that the broadcast industry is probably as vulnerable as any other industry today. We can't deny that the dollar isn't going as far and that unemployment is high. But somehow the industry - for all its fairness and renewal problems - finds itself on solid ground. And, it can take comfort in the fact that it is likely to remain that way throughout 1975.

If you believe that we have nothing to fear but fear itself, you can recall that the industry is not facing the same death-defying problems that were so ominous the last time the economy took a dive.

You'll recall that cigarette advertising was curiously prohibited. And that, along with other industry hangups, was enough to stifle growth regardless of what the national economy was doing.

One thing is certain, you can't afford to pull in your horns when NAB time comes 'round.

Last time around, NAB was a video show. While there will be plenty of video happenings to see, radio will have its share of interest. One of the most talked about items will have to be the first all solid state 1 kW AM transmitter. Although there probably will be little information available immediately, RCA has demonstrated two tubeless black-and-white TV cameras. The RCA "eye" is the first solid state image sensor to be fully compatible with present TV monitors and accessories, eliminating the need for equipment modification.

At this writing, there were 173 booths scheduled and sold in a display area that will cover over 72,000 square feet.

Space Scientist To Address Engineer

Dr. Hans M. Mark, whose Pioneer space probes sent back to earth the first pictures of Jupiter, has been named as the luncheon speaker at the NAB's 29th annual Broadcast Engineering Conference.

As director of the National Aeronautics and Space Administration's Ames Research Center at Moffett Field, Calif., Dr. Mark is in overall charge of the Pioneer 11 space probe that photographed Jupiter from a distance of 25,000 miles last fall and is now enroute to a 1979 rendezvous with Saturn. He also directed the Pioneer 10 probe that earlier photographed Jupiter from 80,000 miles on a course that will carry it to outer space.

He will address a Monday, April 7, luncheon at the Las Vegas Hilton Hotel — a featured event of the Engineering Conference being held in conjunction with the 53rd annual Convention of the National Association of Broadcasters, April 6-9.

The 45-year old German-born space scientist who came to this country at age 19 and was naturalized a U.S. citizen in 1945, is also a teaching professor at Stanford University.

Chairman Of The Board

Andrew M. Ockershausen was born in Washington, D.C., in 1929. He attended public schools in the District of Columbia, The University of Maryland and American University.

In 1949, Ockershausen joined the staff of WMAL (The Evening Star Broadcasting Company), as a page. He later moved on to positions in Radio Traffic, Television Sales and TV Sports. In 1956, he was named National Sales Manager for WMAL-TV; in 1960, Station Manager for WMAL-AM, and in 1965, he became General Manager for both WMAL-AM and WMAL-FM.

In 1970, Ockershausen was appointed Assistant General Manager (and Secretary) and elected to the Board of Directors of The Evening Star Broadcasting Company. In 1972, he became Vice-President of The Washington Star Station Group, which owns WLVA-AM & TV in Lynchburg, Va., and WCIV-TV in Charleston, S.C., as well as the three WMAL stations. Ockershausen is responsible for the operations of all six stations.

In June of this year, Ockershausen was elected Joint Chairman of the National Association of Broadcasters. He was originally appointed to the NAB Radio Code Board in 1965. In 1969, he was elected as Class A Station Member to the Radio Board. In subsequent years, he was elected as Vice-Chairman of the Radio Board (1970) and Chairman of the Radio Board (1971 and 1972).

Wiley To Address General Assembly

Richard E. Wiley, chairman of the Federal Communications Commission, will be a featured speaker at the 53rd annual convention.

He will address the joint management-engineering luncheon Tuesday (April 8) at the Las Vegas Hilton Hotel.

At Wedensday morning's general assembly, Wiley and four FCC commissioners will discuss current issues before the Commission and answer questions from the audience.

Appearing with the chairman will be Benjamin L. Hooks, Robert E. Lee, James H. Quello and Abbott M. Washburn.

Two of broadcasting's true pioneers — George B. Storer of the Storer Broadcasting Co. and the late Jack Benny — will be honored by the NAB in April during its 53rd annual convention in Las Vegas.

Storer, a 46-year veteran of commercial broadcasting who founded and is now Executive Committee Chairman of the company bearing his name, was named to receive NAB's 1975 Distinguished Service Award, the industry's highest honor.

A special award will be presented posthumously to Benny, the masterful comedian-showman whose fuss-budget mannerism and pregnant pauses fractured radio and television audiences over a span of 42 years.

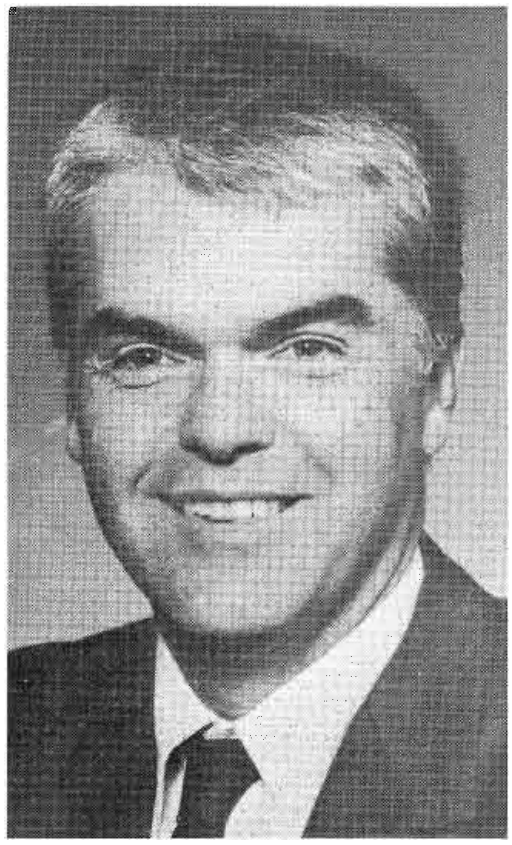
The presentations will be made at the opening General Assembly on Monday, April 7.

NAB's Distinguished Service Award, established in 1953, is presented to individuals who make "a significant and lasting contribution to the American system of broadcasting by virtue of singular achievement or continuing service for or in behalf of the industry in any or all phases."

Storer's infatuation with broadcasting was evident early in life. In 1912, at age 13, he built his own ham radio station at the family's fashionable home in Toledo, Ohio. As a youngster in high school, he provided news to the Associated Press via his station on the famous Dayton flood.

His first brush with commercial broadcasting was as a buyer of advertising on station WTAL, Toledo, for his newly-formed Fort Industry Oil Co. He decided in 1928 that he might as well buy the station as finance it, changed its call letters to WSPD—and has been actively engaged in the business ever since.

He plunged into television in post-war 1949 and was the only independent radio broadcaster to launch three major TV stations in eight months. The three are WSPD-TV, Toledo; WJBK-TV, Detroit; and WAGA-TV, Atlanta.



Space scientist Dr. Hans Mark will address the engineering luncheon. Dr. Mark was in charge of the Pioneer 11 space probe that sent back pictures of Jupiter.

The company bearing his name, now headquartered in Miami Beach, Fla., owns and operates six radio and six television stations—KGBS-AM/FM, Los Angeles; WJW, Cleveland; WGBS, Miami; WHN, New York and WSPD, Toledo, and WAGA-TV, Atlanta; WSBK-TV, Boston; WJW-TV, Cleveland; WJBK-TV, Detroit; WITI-TV, Milwaukee, and WSPD-TV, Toledo.

An active industry leader, Storer has served NAB in a number of capacities, including past membership on its Television Code Review Board. Proof that he gives more than lip service to this phase of broadcasting is the fact that Storer maintains a Quality Control and Broadcast Standards Division which constantly monitors its radio and TV stations to assure that each is complying with industry standards.

Previous recipients of NAB's DSA award are David Sarnoff (1953), William S. Paley (1954), Mark Ethridge (1955), Robert E. Kintner (1956), Herbert Hoover (1957), Frank Stanton (1958), Robert W. Sarnoff (1959), Clair R. McCollough (1960), Justin Miller (1961), Edward R. Murrow (1962), Bob Hope (1963), Donald H. McGannon (1964), Leonard H. Goldenson (1965), Sol Taishoff (1966), Chet Huntley and David Brinkley (1967), Lowell Thomas (1968), John Fetzer (1969), Rosel Hyde (1970), Neville Miller (1971), Billy Graham (1972), Ward L. Quaal (1973), and Richard W. Chapin (1974).

Thanks A Lot, But No Thanks

The NAB has commended the Federal Communications Commission for proposing to streamline some of its rules on broadcasting's remote operations and has urged it to move ahead to simplify the rest.

At the same time, it objected to efforts by the American Petroleum Institute and other land mobile services to share in frequencies now allocated exclusively to broadcasting for such essential services as remote coverage of local news, sports events and public service programming.

In comments filed with the FCC, the Association said the Commission's proposal for simpler regulations for remote station pickups was a "first step in...streamlining the rules" and recommended that similar action be taken on inter-city relays, auxiliary TV and other types of remote broadcasts.

The marked expansion of news, sports and public service programming, coupled with mobile, handheld cameras, it said, has resulted in increased on-the-scene coverage requiring high-quality interconnections between remote sites and the main studio.

Endorsing FCC's goal of simplifying the "patchwork of requirements" that have grown with new operating practices and techniques, NAB said the Commission "must not languish in this overall objective by merely concerning itself with the remote pickup broadcast service but should expeditiously continue to effect the changes deemed necessary as they relate to aural broadcast STL and inter-city relay stations and television auxiliary broadcast stations."

Long Overdue Changes

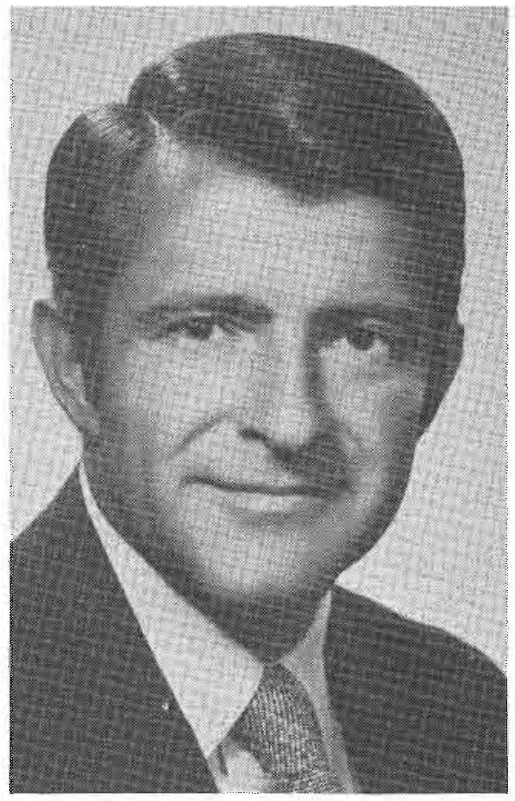
NAB commended FCC for modifying its pickup rules, including elimination of a requirement that remote pickups be under the supervision of a licensed operator, saying such changes were "long overdue."

It's major objection was that the Commission had retained an "archaic" requirement for logging all remote pickup operations. It said such requirements have "long outlived their useful lives" and a record of maintenance, tower lighting and similar information should suffice.

Turning to land mobile demands for joint use of frequencies now allocated to broadcasting, NAB said "channel sharing has never been satisfactory" since remote broadcasts require instant transmission and must be free of interference.

"The broadcasting industry," it said, "has long endured these continuing attacks from the land mobile service for the use or reallocation of existing broadcasting or broadcast-related frequencies. For over 35 years the broadcaster has borne the brunt of various proposals introduced by the land mobile services to restructure broadcast-related frequencies to their every whim."

(*Continued on page 22*)



Andrew M. Ockershausen, Chairman of the Board.

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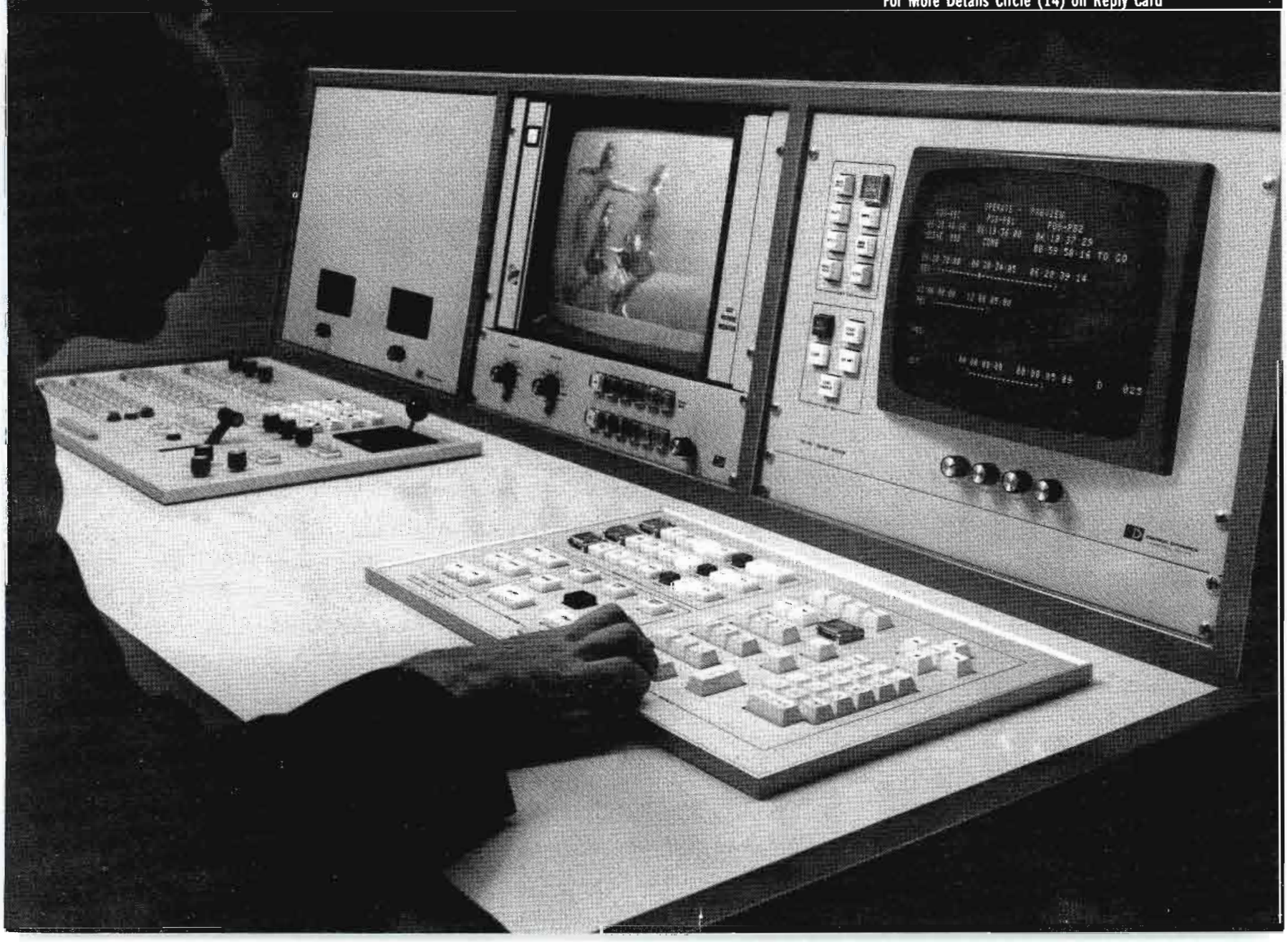

George B. Storer will receive the NAB's Distinguished Service Award.

(*Continued from page 20*)

It noted that land mobile has been alloted higher frequencies where, at a not unreasonable cost, surplus military equipment could be used in meeting its needs.

"The Association feels," it added, "that the Commission has... taken extraordinary steps to accommodate the land mobile services' long-term needs and has now reached the point where these needs have been amply and adequately satisfied....Let the land mobile services look toward the efficient use of frequencies presently allocated to that service instead of eroding spectrum space assigned to other services...."

Another Petition On Fairness Rule

In other recent action, the NAB has urged the U.S. Court of Appeals here to reaffirm its ruling that the Federal Communications Commission must give broadcast journalists wide latitude in determining for themselves the fairness of their investigative reporting.

NAB's friend of the court brief was filed in a rehearing by the full nine-member court of a 2-1 panel decision of last Sept. 27 that overturned FCC's finding that the National Broadcasting Co. violated the fairness doctrine in its news documentary, "Pensions: The Broken Promise."

The rehearing was granted at the request of Accuracy in Media, the organization that filed the original complaint against NBC.

NAB's brief argued that the court, in its earlier decision, correctly held that FCC "failed to limit its function to adjudging the good faith and reasonableness of NBC's determination...(and) substituted its judgment for NBC's judgment as to the controversiality of the program."

Furthermore, it said, the court "concluded that NBC's determination as to the controversiality of the program was made in good faith and was neither arbitrary nor unreasonable."

NAB said that "the prior decisions of this and other courts reflect the Supreme Court's altogether appropriate apprehensions that rigid, bureaucratic determinations of fairness would stifle broadcast journalism."

"NAB submits," it said, "that this court...has viewed the fairness doctrine the way it must be viewed to insure that the people of this nation will continue to receive the benefits of broadcast journalism unencumbered by unwarranted government interference..."

"The National Association of Broadcasters respectfully urges this court to reaffirm its earlier decision that NBC's determination as to the controversiality of the program, 'Pensions: The Broken Promise,' was made in a reasonable and good faith manner and that the FCC erred by substituting its judgment for NBC's judgment as to whether the program constituted a discussion of one side of a controversial issue of public importance."

The Proposed Agenda

Saturday, April 5
Registration and non-agenda events.

Sunday, April 6
Registration, opening of exhibits, and non-agenda events.

Monday, April 7

Morning	Workshops, Opening General Assembly for Management and Engineers.
Luncheon	Separate Management and Engineering Luncheons.
Afternoon	Television Conference, Small Market Radio Session, Radio-Television Engineering Conference.

Tuesday, April 8

Morning	Workshops, Radio Conference, Secondary Market Television Session, Separate Radio and Television Engineering Assemblies.
Luncheon	Separate Management and Engineering Luncheons.
Afternoon	(No programming scheduled for this period to permit delegates to visit the exhibits and hospitality quarters).

Wednesday, April 9

Morning	Workshops, Radio-TV Engineering Conference, Joint Management-Engineering Assembly.
Luncheon	Joint luncheon for Management and Engineering delegates.

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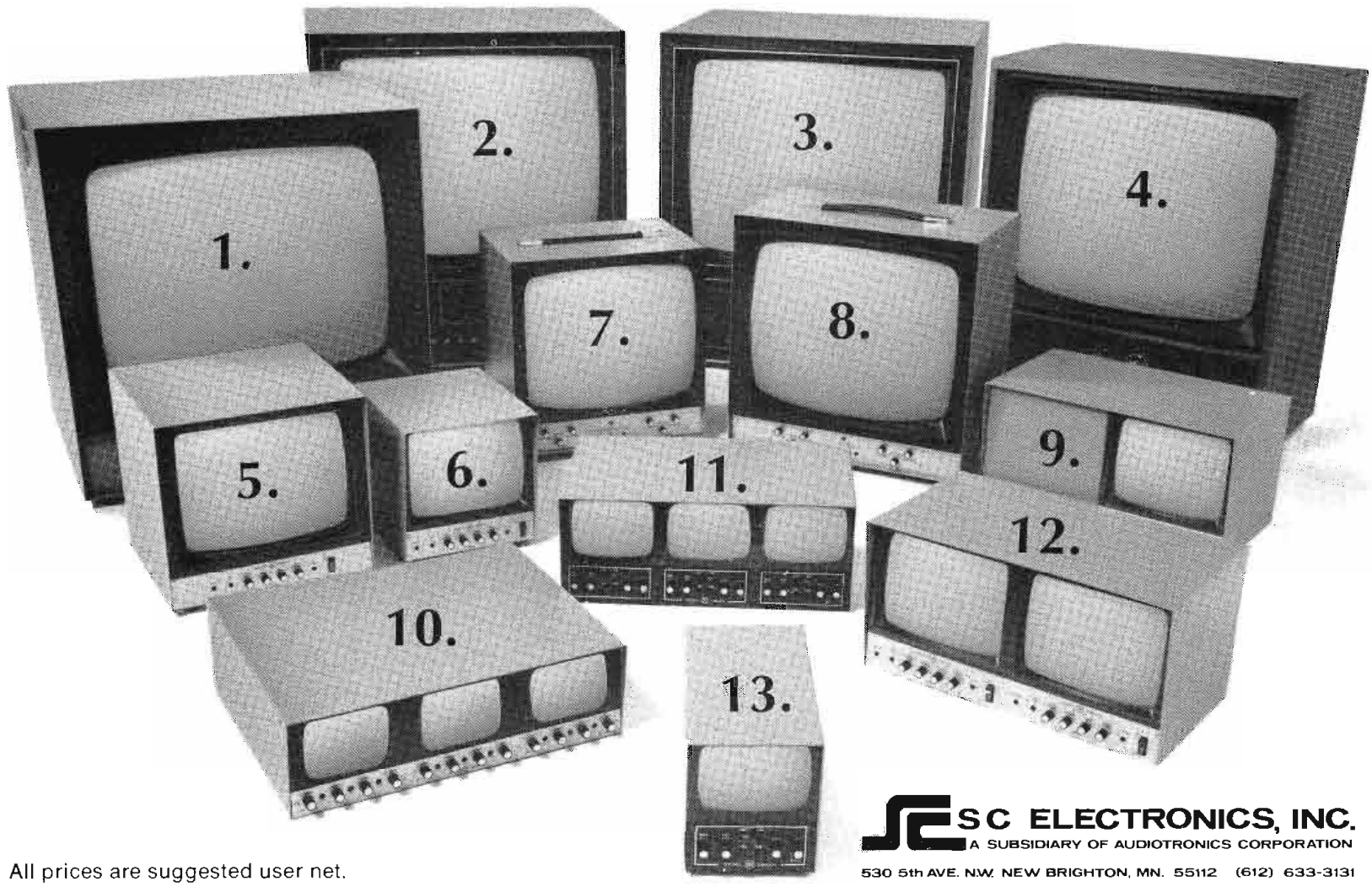

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5. 12" MONITOR	Ideal "single party viewing" display. Large 74 square inch screen. Fast AFC for VTR use. UNIT-IZED® plug-in circuit modules. Solid State. 640 lines horizontal resolution. Only $275.
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8. 19" MONITOR	Small group display. Rugged and portable. Convenient controls. UNIT-IZED® plug-in circuit modules. Solid State. 640 lines horizontal resolution. Only $300. Rack-mount version, only $300.
9. 10" MONITOR WITH BLANK LEFT PANEL	Large 44 square inch screen. Increased "corner area". UNIT-IZED® plug-in circuit modules. Solid State. 640 lines horizontal resolution. Rack-mount adaptors. Occupies 8¾" vertical rack space. Blank space reserved for custom auxiliary equipment. Only $250.
10. TRIPLE 5" MONITOR	Three "Mini-space" screens. Occupies only 5¼" vertical rack space. No Crosstalk, UNIT-IZED® plug-in circuit modules. Solid State. 540 lines horizontal resolution. Rack-mount adaptors. Only $735.
11. TRIPLE 6" MONITOR	Three 16 square inch screens. Occupies only 7" vertical rack space. No Crosstalk. Unique single module chassis. Solid State. 600 lines horizontal resolution. Adjustable underscan. Rack-mount adaptors. Only $660.
12. DUAL 10" MONITOR	Two large 44 square inch screens. Increased "corner area". UNIT-IZED® plug-in circuit modules. Solid State. 640 lines horizontal resolution. Rack-mount adaptors. Occupies only 8¾" vertical rack space. Only $465.
13. SINGLE 6" MONITOR	Ultra compact and portable. Unique single module chassis. Solid State. Adjustable underscan. 600 lines horizontal resolution. Only $235.

For More Details Circle (16) on Reply Card

NAB exhibit locator

Exhibitors and booth numbers

Acrodyne Industries, South 711
Akai, East 1223, 1224
Alford Manufacturing, North 119
Allied Tower, South 1008
Amco Engineering, South 813
American Data, North 329
American Electronic Laboratories, North 404
American Electronics, South 905
Ampex, North 207
Ampro, South 910
Andrew, North 323
Angenieux, North 321
Asaca Corporation of America, South 600
Audio Designs and Manufacturing, North 205
Audio Services, South 915
Auditronics, South 1014
Autogram, South 1015
Automated Processes, South 810

Ball Brothers Research, North 213
BASF Systems, East 1208
Belar Electronics Laboratory, North 307
Berkey-ColorTran, North 416
Bird Electronics, North 110
Robert Bosch-Fernseh Group, North 211
Boston Insulated Wire & Cable, North 414
Broadcast Computer Services, North 313
Broadcast Electronics, South 235
Burwen Laboratories Division, South 1018

Cablewave Systems, South 611
Canon U.S.A., North 114
Capitol Magnetic Products, North 112
CBS Laboratories, North 103
CCA Electronics, North 319
Central Dynamics, North 204
Cinema Products, South 617
CMX, North 107
Cohu/Electronics Division, North 219
Collins Radio Group, Rockwell International, North 300
Commercial Electronics, North 105
Compu/Net, South 511
Computer Image, South 1106
Computer Magnetics, South 1009
Comrex, South 1013
Conrac, North 108
Consolidated Video Systems, North 109
Continental Electronics Manufacturing, North 302
Control Design, South 1006
Cooke Engineering, South 709
Corning Glass Works, East 1209
Cox Data Systems, South 815

Data Communications, South 909
Datatek, South 715
Datatron, South 602
Datavision, South 706
Delta Electronics, North 217
Dielectric Communications, South 1016
Dipol Electronics, South 1001
Duncan Electronics, South 1104
DYMA Engineering, South 1002
Dynair Electronics, North 303
Dynasciences, South 619

Eastman Kodak, North 206
Editel Productions, South 806
Electro Sound, South 1007
Electro-Voice, East 1221, 1222
Electrophome (USA), South 1110
Electronics, Missiles & Communications, North 410
ELPA Marketing Industries, South 917
Emcor-Ingersoll Products, South 802
ESE, East 1210

Farinon Electric, South 1005
Fidelipac, See Telepro Industries
Imero Fiorentino Associates, South 606
Flash Technology, East 1206
Fuji Photo Film USA, South 607
Fujinon Optical, South 603

General Camera, East 1212
Gotham Audio North 122
Grass Valley Group, North 209
GTE Sylvania, North 325

Harris Corporation, North 201
Hitachi Shibaden, North 225

Ikegami Electronics, South 808
Industrial Sciences, South 1011
Innovative Television Equipment, North 412
International Tapetronics, South 900
International Video, North 101

Jamieson Film, South 803
Jefferson Data Systems, South 913

Kallman Associates, North 308
Kansas State Network, South 912
King's Electronics, East 1211
Kliegl Bros. Universal Electric Stage, North 104

Laird Telemedia, East 1204
Lenco Electronics, South 613
Lighting Elimination, East 1213
Listec Television Equipment, North 218
LPB, South 809

Marconi Electronics, North 212
Marti Electronics, North 309
McCurdy Radio, North 408
McMartin Industries, North 301
Memorex, North 118
Merlin Engineering, East 1226
MICMIX, East 1207
Micro Communications, South 906
Microwave Associates, North 216
Minnesota Mining & Manufacturing, North 208
Mohawk Wire & Cable, South 704
Mole-Richardson, North 223
Moseley Associates, North 305

Nagra Magnetic Recorders, South 1004
Rupert Neve, South 1010
North American Philips, North 215
Northwestern Technology, South 804
Nortronics, North 402
Nurad, East 1225

Orrox, North 107
Otari, South 1112

Pacific Recorders & Engineering, South 1012
Paperwork Systems, South 509
Paulmar, South 615
Pentagon Industries, South 901
Phelps Dodge Communications, South 609
Philips Broadcast Equipment, North 202
Potomac Instruments, South 807
Power-Optics, North 106

Q-TV/Telesync, North 327
Quick-Set, North 335

RCA/Commercial Communications Systems Div., North 200
RCA/Electronic Components, North 102
Recortec, South 907
Revox, South 713
Robins/Fairchild, South 911
Rodelco Electronics, South 1108
Rohde & Schwarz Sales (USA), North 310
Rosco, East 1227
Russco Electronics Manufacturing, South 1017

Sarkes Tarzian/IDC, North 203
Schafer Electronics, North 306
Scully/Metrotech Recording Div., South 908
Shintron, East 1220
Shure Brothers, North 317
Sintronic, South 1003
Skirpan Lighting Control, South 707
Soll, South 904
Sonex International, South 827
Sony Corporation of America, South 601
Sparta Electronic, North 312
Stanton Magnetics, South 811
Storeel, South 507
Strand Century, South 605
Willi Studer America, South 702
Systems Marketing, South 817
Systems Resources, South 703

Taber Manufacturing & Engineering, South 705
Tapecaster TCM, North 400
Tektronix, North 209
Tele-Cine, South 801
Telecommunications Industries, East 1215
Teledyne Camera Systems, North 210A
TeleMation, North 214
Telemet, North 304
TelePro Industries-Fidelipac Div., North 221
Television Equipment Associates, South 701
Television Microtime, South 700
Television Research International, South 1019
Telex Communications, North 124
Thomson-CSF, North 314
Time and Frequency Technology, South 902

Unidyne, East 1217, 1218
United Press International, South 503
United Research Laboratory, South 1000
U.S. Pioneer Electronics, South 1116
Utility Tower, North 406

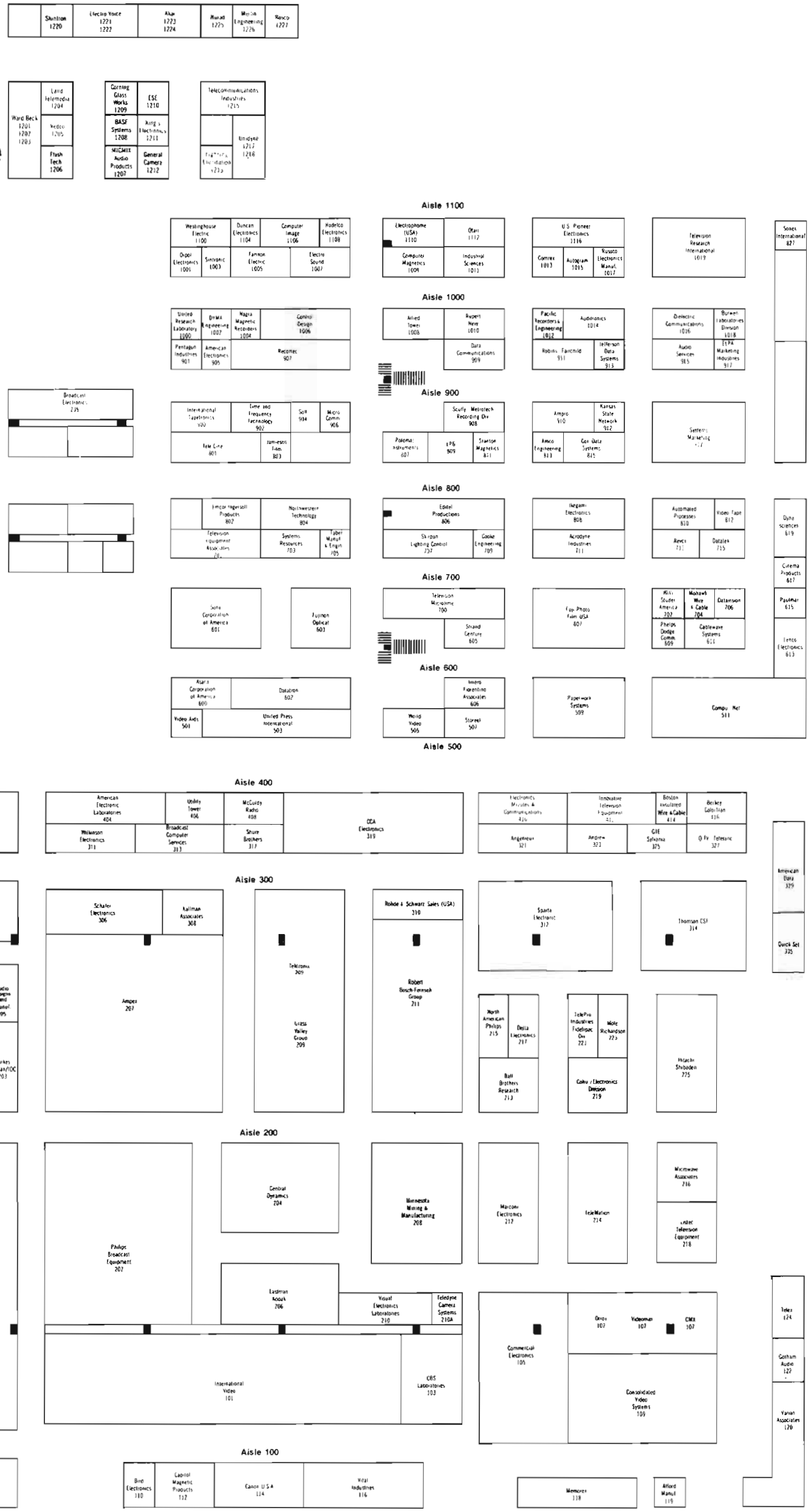
Varian Associates, North 120
Vedco, East 1205
Video Aids, South 501
Videomax, North 107
Video Tape, South 812
VIF International, North 401A
Visual Electronics Laboratories, North 210
Vital Industries, North 116

Ward-Beck, East 1201, 1202, 1203
Westinghouse Electric, South 1100
Wilkinson Electronics, North 311
World Video, South 505

East Concourse

South Hall

North Hall



New Sony U-matic news team... from action to broadcast in 30 minutes.

Or even less time. With less equipment. And at less total cost than you're probably paying now for news-gathering and teleproduction.

The major networks, ABC, CBS, and NBC, and many stations nationally are using the new Sony U-matic VO-3800/2850 Videocassette System.

All your work is done on economical, reusable videocassettes. After location taping, either microwave the signals or send the cassette to the studio for quick and accurate editing. Or go right on the air with the use of a time base corrector.

You eliminate film cost and processing time, especially when important events break close to air-time deadlines.

You start with the Sony VO-3800 portable VideoRanger™ recorder and a color camera, such as the Sony hand-held DXC-1600. The VO-3800 can record three 20-minute cassettes on a single battery charge. It has NTSC color and EIA monochrome standard signals, remote control, two separate audio tracks, automatic power shut-off, and on-the-scene playback capability.

Accurate electronic editing is achieved with two Sony VO-2850 mastering recorder/editors and the Sony RM-400 Remote Automatic Editing Controller. The RM-400 provides search, pause, and automatic back-spacing. The VO-2850 has a signal-to-noise ratio in excess of 45 dB for video and audio, also separate editing capability for video and two audio tracks.

Of course, the VO-3800 portable VideoRanger™ or the VO-2850 editor can be used independently of each other. In addition to electronic news gathering, these versatile new videocassette units can add new capability and economy in production of documentaries, on-site retail spots, and general studio use.

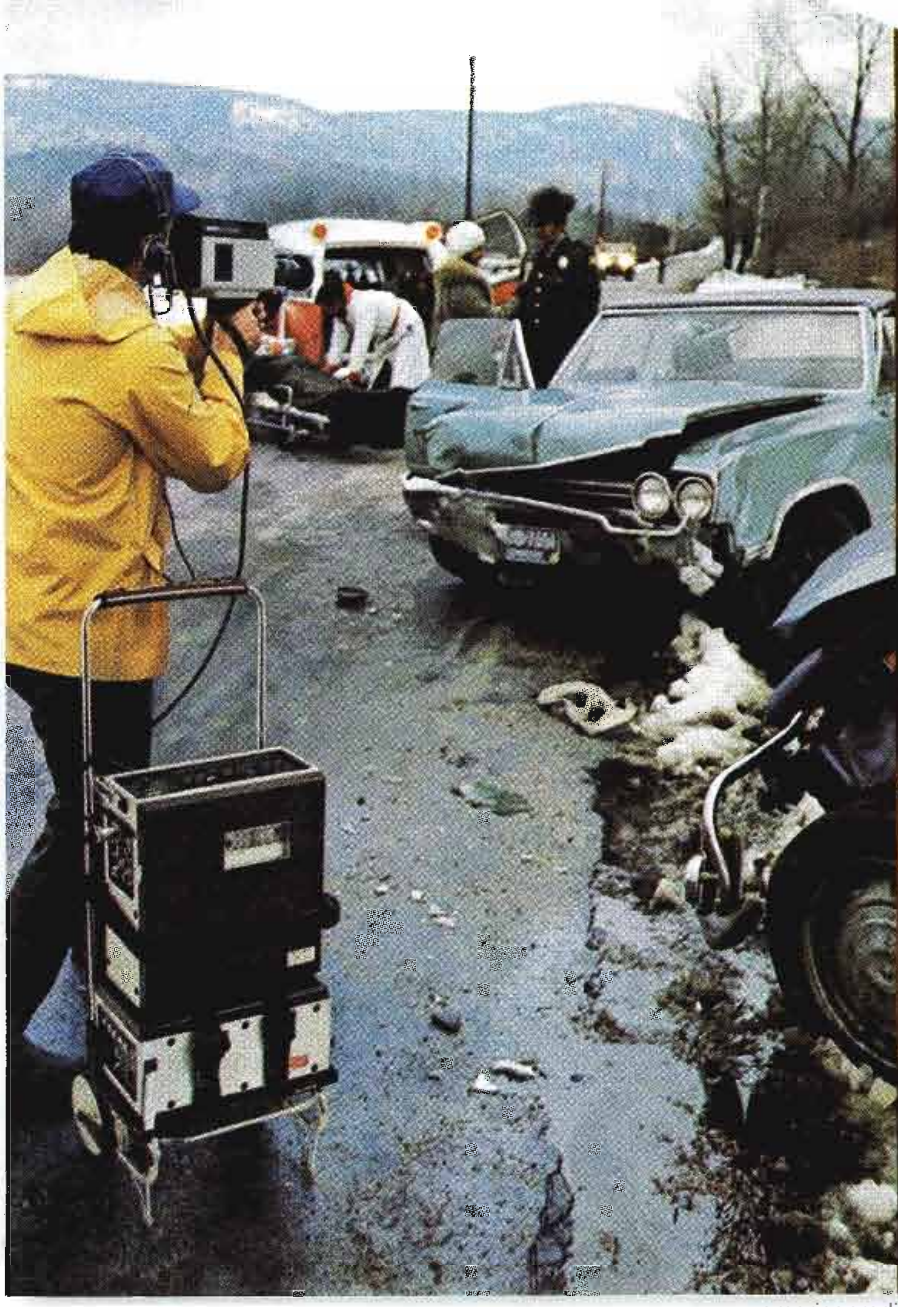
For complete information and/or a demonstration write us today.
Sony Corporation of America
Video Products Dept. BE-035-210
9 West 57th Street
New York, New York 10019

Sony. The proven one!

Sony® U-matic® Color Videocassette System

TV reception simulated.

"See us at the April NAB Show in Las Vegas"



NAB Product Review

Each year at NAB show time, BE brings you a last minute report of products that will be on display in the exhibits. In this way, you don't have to attend to know what was interesting in the way of new equipment. To accommodate those who don't go, we suggest you use the reader service circle number under the items that interest you.

This year, 1975, is bound to be one of those years when manufacturers pour out some really new and inviting equipment. You knew someone would eventually come out with an all solid state transmitter at the 1 kW level. That's been done, and it'll be operating at NAB. But that's not all.

There will be new audio cart machines, new versions of color hand-held cameras, improvements in TBC's, all sorts of special effects equipment and a number of companies with familiar names expanding their product lines.

Because some companies prefer to unveil their "hit of the show" at the convention, product coverage of the convention will continue in April and May. That's right, it takes at least that long to report new products thoroughly. As this section of the magazine goes to press, there are 173 booth spaces already sold to manufacturers.

All-Solid State 1KW AM Transmitter

Harris, formerly called Gates, will have one of the hits of the show in their MW-1 solid state transmitter, the first one in this power range with a solid state final. This rig is covered in a regular article in this issue.

This magazine does not normally tab anything as a hit of the show, but we feel this one everyone will agree with. The transmitter was designed for easy maintenance, and it includes a unique modulation system.

This transmitter has been field tested and on the air, making it one of the few well kept industry secrets. It will be operational at NAB.

For More Details Circle (147) on Reply Card

Broadcast Limiter

Pacific Recorders and Engineering Corporation, San Diego, has announced the MULTI limiter, an all new, multi-purpose limiter with selectable pre-emphasis for FM, FM Dolby, or Television; automatic polarity correlation and adjustable asymmetry for AM; and independant adjustment of RMS and peak limiting.

The new limiter, to be unveiled at the NAB show in Las Vegas (Booth 1012, South Hall), is completely modular allowing the user to "buy only what he needs".

For More Details Circle (148) on Reply Card

Audio Console

A dramatic entry in the audio console field will be shown by **Sparta Electronic Corporation** at the 1975 NAB Convention.

The first all-new model of the series to be shown will be the dual-channel mono version, boasting 28 inputs into ten mixers. The inputs comprise ten microphone and 18 line level. Noiseless optically-coupled audio switching, built-in cue speaker and intercom, 12 Watt monitor amplifier and amplified headphone output for low z phones are all standard features.

Functionally, the console offers extreme flexibility for any audio handling assignment. Five bridging inputs for mixing audio from several cartridge playbacks without interaction are provided for Mixer 8. Ten switch-selected remote lines in Mixers 9 and 10 can be used either to send or receive audio. And all mixers can be turned on and off by remote control, such as a video switcher, or by a studio announcer or newsman.

Maintenance ease is assured by optimum access to the interior through a double-hinged front panel. Only three types of amplifiers are used in the console.

For More Details Circle (149) on Reply Card

Attention SBE Members
Annual Membership Meeting
Sunday, April 6
2:30 pm
Conference Rooms 2 & 3
Las Vegas Hilton

Video Switching System

A new cost-effective broadcast quality solid-state video switching system for multiple input/output applications is being introduced at NAB by **Dynair Electronics, Inc.** of San Diego, California. The Series-1400 system provides a wide range of units for efficient remotely-controlled color and monochrome video switching, designed to replace large patch boards or mechanical switching systems.

Individual building blocks provide matrices of up to 20 x 20 and the system is readily expandable to an almost unlimited number of crosspoints. Remote control may be effected by manual pushbutton or direct encoded logic levels. This series can be used with Dynair's Series-8100 Solid-State Audio Distribution Switcher for audio/video switching.

The basic design approach of the Series-1400 equipment makes video switching for as low as $30.00 per crosspoint a reality. Performance characteristics - frequency response: 8 MHz ±0.1 dB, 12 MHz ±0.5 dB; isolation between output (crosstalk worst case): 60 dB at 4.2 MHz; differential phase: 0.1° with 1VPP output, 10%, 50%, 90% APL; differential gain: 0.1% with 1VPP output, 10%, 50%, 90% APL.

For More Details Circle (150) on Reply Card

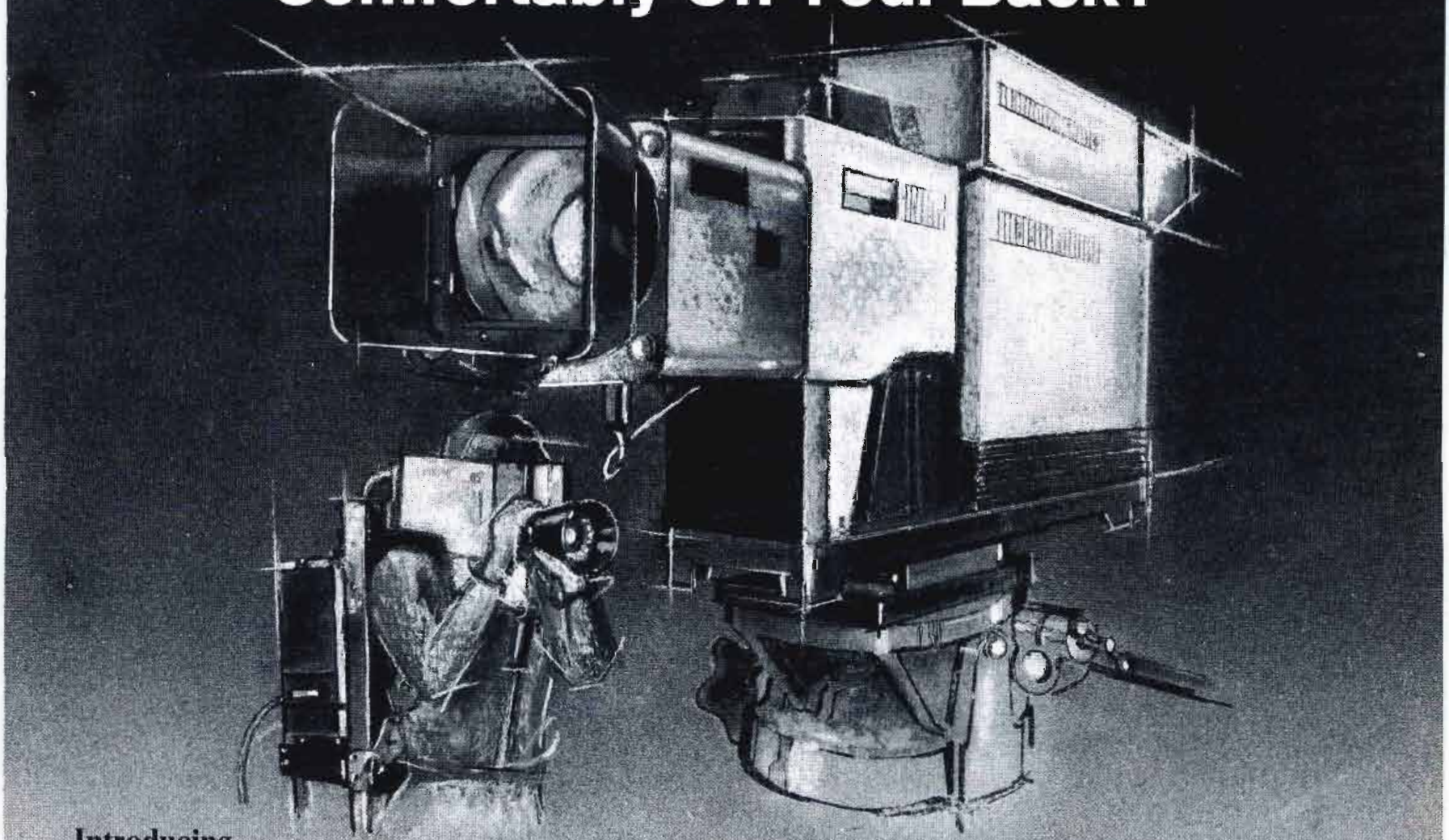
Portable TV Camera

A new back-pack color TV camera has been developed and manufactured by **CEI** of Mountain View, California.

(*Continued on page 32*)

Who but HITACHI...

Could Put This Broadcast Studio Camera Comfortably On Your Back?



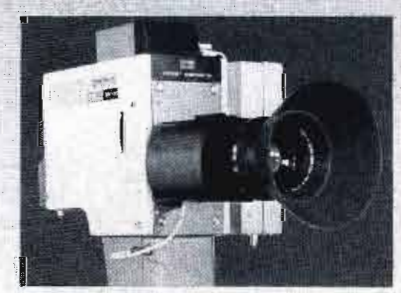
Introducing...
The Hitachi SK-70. A superb 2/3" Saticon three-tube studio camera *and* portable/remote color camera in one modular package.

FOR THE STUDIO: The 13-pound camera head accepts the following add-on modules to make up a full N.T.S.C. studio camera: process pack, AC Power Pack, 5" viewfinder, and studio lens on a unified base plate.

FOR MOBILITY: The same camera head mounts onto a shoulder harness with a 1-1/2" electronic viewfinder and a 10:1 zoom lens; the process pack with DC power pack rests comfortably on operator's back.

DIGITAL COMMAND CONTROL: Audio, video, and digital command signal share low cost *coaxial* cable.

The picture quality of the new SK-70 is truly exceptional. Now the enterprising broadcaster has an opportunity to fill the four most important camera requirements of his station (self-contained, studio, remote, and portable) with one reasonably-priced purchase.



SEE THE REMARKABLE SK-70 AT OUR BOOTH (#225N) AT THE NAB SHOW. Or write to us for more details.

HITACHI SHIBADEN
Corporation of America

Exec. offices: 58-25 Brooklyn-Queens Expressway, Woodside, N.Y. 11377
Offices in Chicago, Los Angeles, Dallas, Toronto, Atlanta

For More Details Circle (17) on Reply Card

COMPARE FM ANTENNAS BEFORE YOU BUY!

Compare all elliptically or circularly polarized FM antennas and you'll find JAMPRO'S PENETRATOR leads the others in 19 important categories. It has more outstanding performance features than any other comparable FM antenna on the market today. The PENETRATOR has the widest VSWR bandwidth for best stereo now, and quadraphonic sound when you are ready! It is unique, it has a patent for five features not found in any other FM antenna. Only the PENETRATOR made by JAMPRO insures maximum power gain by using internal transformers together with phase and amplitude tests. It has the lowest windload, with and without deicers! It comes with a 2 year warranty, a first for the industry. Compare these six bay high power antennas offered for 50 KW and 100 KW ERP stations, taken from printed company literature in February, 1975.

	SUPPLIER	JAMPRO	RCA	GATES	COLLINS	SHIVELY	PHELPS DODGE	CCA
1.	Antenna Type Number	JSCP-6	BFG 6A	FMS-6	37CP6	6810-6	CFM HP-6	FMC-HP-6
2.	Safe input power rating	40 KW	36 KW	40 KW	40 KW	40 KW	30 KW	40 KW
3.	Power gain ratio DB	5.05	5.06	5.05	5.00	5.18	5.2	5.2
4.	Trimmed 1.1/1 VSWR bandwidth	±200KHz	±100KHz	±100KHz	±110KHz	±150KHz	±100 KHz	NS
5.	Axial ratio-polarization	2DB	NS	NS	NS	NS	NS	NS
6.	Impedance match at each bay?	Yes	No	No	No	No	No	No
7.	Factory VSWR plot in I.B.	Yes	No	No	No	No	No	No
8.	Factory phase/amplitude checks.	Yes	No	No	No	No	No	No
9.	Tuned on customer tower?	Yes	No	No	No	No	No	No
10.	Antenna factory pre-tuned?	Yes	Yes	Yes	Yes	Yes	No	No
11.	Quadraphonic capability?*	Yes	No	No	No	No	No	No
12.	Manufactured by seller?	Yes	No	No	No	Yes	Yes	Yes
13.	Dual Deicer wattage?	Yes	No	No	No	No	No	No
14.	Antenna shop painted?	Yes	Yes	No	No	No	No	No
15.	Weight with mtg. bckts.	498.5#	381#	496#	512#	NS	404#	404#
16.	Wind load 50/33 PSF, EIA	673#	920#	883#	1301#	727#	780#	780#
17.	Deicer wind load, 50/33 PSF	770#	1040#	NS	NS	NS	NS	NS
18.	Warranty - guarantee	2 Yr.	1 Yr.	1 Yr.	1 Yr.	1 Yr.	1 Yr.	1 Yr.
19.	Antenna List Price	$7,250	$7,642	$7,245	$6,900	$5,505	$5,000	$6,545
20.	Antenna price with deicers	$8,750	$11,421	$8,820	$8,400	$6,303	$5,660	$7,670

*Quad Sound requirements proposed by NQRC NS = Not Stated

Other exclusive reasons for choosing a PENETRATOR include dual wattage deicers for energy conservation, FAA color painting for longer antenna life, and a 15 page complete instruction booklet with measured factory VSWR!

JAMPRO ANTENNA COMPANY

A DIVISION OF COMPUTER EQUIPMENT CORPORATION

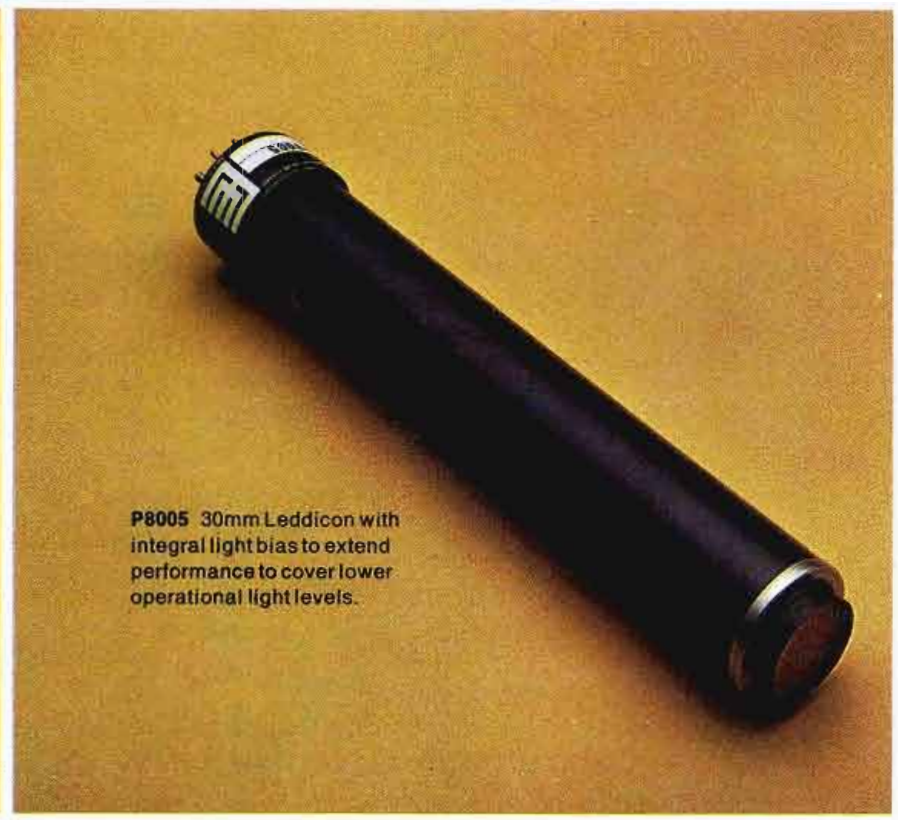
(916) 383-1177

6939 POWER INN ROAD
SACRAMENTO, CALIF.
95828

For More Details Circle (18) on Reply Card

Clean up your image with EEV camera tubes.

P8001 30mm separate mesh Leddicon for high definition pickup in color and monochrome broadcast cameras.



P8005 30mm Leddicon with integral light bias to extend performance to cover lower operational light levels.

P858 4½-inch Image Orthicon for use as the luminance tube in color cameras.

8134V1 1-inch electrostatic focus Vidicon for color telecine broadcast applications.

Clean, precise, consistent – EEV Leddicon® camera tubes are made to last. They can be used as replacements for Plumbicon and Vistacon tubes.

Hundreds of stations in the U.S.A. and throughout the world use Leddicons to down costs and up quality.

From the same one-stop source you can also specify EEV image orthicons – we're the world's biggest makers – and vidicons.

All EEV tubes are on immediate delivery, with fast service backup. Contact us now for type lists and prices.

English Electric Valve North America Ltd.,
1 America Drive, Cheektowaga, New York 14225.
Tel: (716) 632 5871. TWX: 710 523 1862.

24 Ronson Drive, Rexdale, Ontario M9W 1B4.
Tel: 416 249 8548. Telex: 06 965864

NAB Convention. We'll be there. Come and meet us. Booth **212**

For More Details Circle (19) on Reply Card

NAB Products

(*Continued from page 28*)

The CEI-290 camera is ideal for mobile video taping and live TV broadcast production applications. The system includes four discrete units: (1) camera head with standard 10:1 Angenieux f2.8 lens; (2) back-pack electronics; (3) detachable view finder and Bell hip-pack mounting adapters; and (4) camera control unit with NTSC encoder and operating control panel.

The CEI-290 back-pack system weighs only 40-pounds. It will operate up to 600-feet from the control unit. The camera head can be operated up to 30-feet from the back-pack electronics unit. For studio use, it has a tripod mounting and quick-connect 7" view finder. The system is priced from $43,000 and includes the only 2-year warranty in the industry.

For More Details Circle (151) on Reply Card

Professional Recorder

There are so many really new products being shown at NAB this year, if you take the time to look them all over, you'll never leave the exhibit area. **Elpa Marketing Industries** is an example of the variety of what's new. They will be showing the Ferrograph Studio 8 professional recorder.

Features include: rugged tape transport with all controls and the interlocking between them fully electronic with remote control capability; lapsed tape running time indicated in minutes and seconds on LED's (they count both up and down); "zero recognition" to stop recorder automatically in record, playback or fast rewind; interchangeable head blocks make exchange of track configuration fast and simple for full track, single half track or half track stereo.

For More Details Circle (152) on Reply Card

Headsets

Television Equipment Associates will show their Amplivox line of headsets. They include a dynamic noise cancelling type microphone for talk-back, with a solid state encapsulated amplifier package.

These are light weight, yet durable, and they are comfortable.

For More Details Circle (153) on Reply Card

Cross Pulse Generator

Video Aids Corporation of Colorado will show their newly developed model CPG-1 Cross Pulse Generator.

Designed for use in diagnosing video problems, the unit also helps in predetermining timing for instant glitch-free gen-lock and VTR lockup. In addition, it is useful in checking edits before dubbing and distribution.

The CPG-1 features BNC loop-thru that connects in any video line. It operates externally with any monitor without modification.

For More Details Circle (154) on Reply Card

Special Effects Video Compressor

We mentioned earlier that some interesting new things would be happening in video. Here's one of them. **Consolidated Video** will show their CVS 600 video compressor. The unique unit will allow you to shrink a picture and place it where you want it on the screen.

Video compression is a capability optionally available with the CVS 600 Digital Video Synchronizer. It can lock an incoming asynchronous signal to station sync automatically and reduce that video signal to one-fourth size and then locate it in any one of six positions on the CRT.

The output of the video compressor is keyed for mixing with other signals.

For More Details Circle (155) on Reply Card

Plug-in Amp System

Automated Processes has taken a unique approach to the lineup of typical station amps and preamps. They employ rack card frames that will fit into either 10-inch or 19-inch racks. They also make available a wide range of amplifiers on plug-in cards. For example, the 19-inch model will take cards holding their power supply and 10 other amplifiers on cards.

The amps include: mic preamp; special purpose amps; distribution amps; 10-watt power amp; line amp. They also manufacture faders, compressors, equalizers, consoles, and synchronizers.

For More Details Circle (156) on Reply Card

Audio Consoles

This year at the NAB, **Neve** will be displaying 3 new consoles in their

(*Continued on page 36*)

TeleMation vs. SMPTE

TeleMation's TCF-3000 Color Film Camera takes on the tough SMPTE color test series.

Slide No. 9, SMPTE subjective color reference slide series, courtesy of the Society of Motion Picture and Television Engineers.

Broadcasters are accustomed to seeing beautiful pictures at NAB telecine demonstrations — all from carefully selected "safe" film and slides.

For our 1975 NAB demonstration we will use the toughest source material of all — the SMPTE series designed to test critical performance parameters . . . . gamma range, gamma tracking, colorimetry, white shading, black shading, noise, enhancement, auto white and black level control.

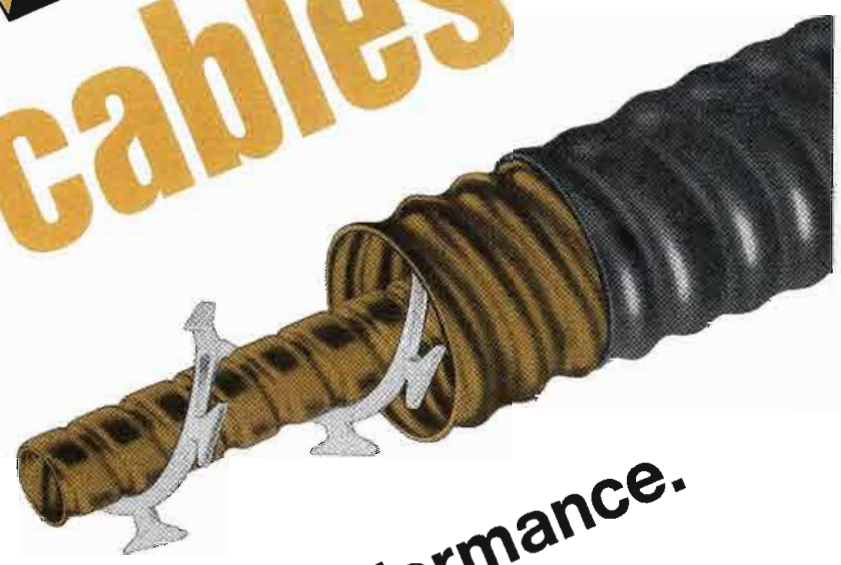
See for yourself at NAB booth 214.

TeleMation®

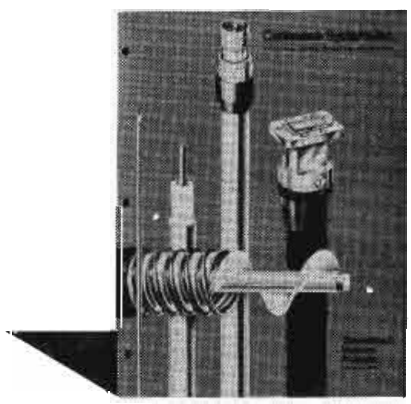
P. O. BOX 15068, SALT LAKE CITY, UTAH 84115, (801) 487-5399

For More Details Circle (22) on Reply Card

INNOVATIONS
in coaxial cables



guarantees mechanical and electrical performance.



The choice is yours at Cablewave Systems . . . 0.180" to 3⅛" outer conductors of smooth wall aluminum or corrugated copper; dielectric insulators of air (extruded spiral polyethylene or special helix designs), foam polyethylene center conductors of copper or copper clad aluminum . . . each engineered to excel in its area of application whether it be phasing lines for broadcasting, microwave antenna feeders, or delay line applications and each with a full range of connectors and accessories.

By giving you the widest selection of cable types, connectors, sizes and lengths through new and patented manufacturing techniques, plus a complete selection of compatible connectors, you are assured of getting the ideal cable assembly for your specific application — there's no compromising. Cablewave Systems Inc., 60 Dodge Avenue, North Haven, Conn. 06473, 203-239-3311.

Call or write for catalog 401A and get all the details on our complete line of Coaxial Cables and accessories.

***now, that's* INNOVATION**

"See us at NAB SHOW-BOOTH #611S."

Cablewave Systems Inc.

A Corporation owned by Phelps Dodge & Kabelmetal

For More Details Circle (23) on Reply Card

NAB Products

(*Continued from page 33*)

production and broadcast range.

The compactness of the Kelso and Melbourn consoles makes them suited for remote broadcasts, giving complete facilities for equalization, mixing, and monitoring.

The 5303 studio consoles will be attractive to the discriminating broadcaster with a variety of sources from which to select material to be broadcast.

For More Details Circle (157) on Reply Card

Synthesizer-Detector

For RF bridge measurement of AM antenna impedance, a high-output signal generator of precisely known frequency and a sensitive, selective detector are essential. The **Potomac** SD-31 Synthesizer-Detector provides these elements in a single lightweight battery-powered unit, designed to work with bridges such as the GR 1606 or 916.

A frequency synthesizer determines the generator frequency, which can be adjusted to 0.5 kHz steps by means of a front-panel switch from 100.0 kHz to 1999.5 kHz. Frequency accuracy is the same as that of the internal crystal reference oscillator. A front panel fine frequency control varies the frequency up to ± .01 percent. The generator can drive a wide range of load impedance at levels up to 20 Volts RMS. It also has a variable low-level output suitable for driving a counter or for receiver frequency calibration.

For detection, the SD-31 uses a coherent detection system which rejects interfering signals picked up by the antenna. In this system, the generator is modulated at a low frequency, and the SD-31 detector circuit responds only to a signal having that particular modulation. A sensitive and selective receiver connected to the bridge detector output is required; this may be the RX-31 Receiver, supplied as an option in the SD-31 package, or an external receiver such as the Potomac FIM-21 Field Strength Meter.

The optional RX-31 receiver is designed to work with the SD-31 and is automatically tuned to the SD-31 generator frequency.

For More Details Circle (158) on Reply Card

Eight-Track Pro Recorder

Otari Corporation has announced the introduction of a new one-inch eight-track professional recorder.

Designated the MX-7300-8, the recorder incorporates entirely new electronics and transport. Key features are:

- Compatible eight-track one-inch tape format that matches the track configuration found on the great majority of eight track recorders in use today.
- Completely redesigned electronics offer greater compactness and operator/service conveniences. Two complete amplifiers are contained in a single 5¼-inch rack panel with the two meters stacked one above the other for faster reading and interpertation. The electronics cards are plug-in front accessible for ease of set-up and maintenance. A standard reference level calibrate position and two-frequency test oscillators are also provided for convenient alignment. Master bias oscillator, power supply, and test oscillator are located in the transport console to save space and provide electrical isolation from the signal electronics. Outputs are professional 600 Ohm +4dB. Input and output signal connectors are XL type.
- Transport features include newly designed control logic with motion sensing. This allows you to switch from any mode to any other mode

without unnecessary delays or damage to tape. For example, you can go directly into drive from either fast forward or rewind without pressing the stop button and with no delay or danger of throwing tape loops or stretching tape. Tape is driven by a direct drive hysteresis capstan motor which requires no belts, pulleys, linkages, or other flutter producing elements. A DC capstan servo speed control system is optionally available. Tape speeds are 15 and 7½ or optionally 30 and 15 ips.

For More Details Circle (159) on Reply Card

WWVB Synchronized Time System

Chronotron Systems, Inc. announces a unique system for time synchronization of ± 2 ms for every important clock system located in the United States.

The Chronotron system consists of a time-synchronized master clock and impulse slave clocks. The system provides precise time of day anywhere in the United States, and is synchronized with the National Bureau of Standards.

The Chronotron master clock consists of a WWVB receiver, code demodulator, synchronized digital clock time code generator, and a crystal-controlled oscillator which is phase-locked to the NBS broadcast signal. The Chronotron master clock eliminates basic problems in synchronizing remote clocks by providing the following features: automatically sets the local master digital clock to NBS time; frequency phase locks the internal oscillator to the NBS carrier frequency (60 KHz); automatically stops and advances for standard time changes; phase locks the internal 1 PPS signal to the 1 PPS signal from NBS; and automatically corrects for drift in the internal time base oscillator.

For More Details Circle (160) on Reply Card

Recorder-Reproducer

The PD-II Series is the new line of economy cartridge machines from **International Tapetronics.** Both the reproducer and recorder/reproducer provide an excellent combination of features, including: direct-drive motor, air-damped solenoid, ½-inch thick aluminum deck, plug-in circuit cards, adjustable tape guides, micro-adjustable head assembly, and lubrication-free operation.

The trim design allows three units to be placed side-by-side in a 19-inch rack. The PD-II is designed for continuous use, long life, and minimum maintenance.

For More Details Circle (161) on Reply Card

Modular Memory Lighting System

Two new lighting products will be shown by **Strand Century Inc.** during the convention.

For the first time ever, a lighting system designated MMS (Modular Memory System) will be available for inspection by U.S. audiences. The solid-state modular lighting control console is capable of holding up to 320 lighting channels and up to 400 lighting cues. Pre-programmed solid state memory circuits allow complete freedom to the operator—including unlimited and instantaneous manual access to the controls if circumstances demand a manual takeover, for on-set changes in timing or cues.

Strand Century's second major feature for the show will be its introduction of the revolutionary new Ianiro HMI metal halide Fresnels capable of duplicating the wave length of ordinary sunlight without the need for gels. The units are available in 575 Watt, 1200 Watt and 2500 Watt ratings. Each unit is powered by a 120-Volt, 60-cycle ballast.

Efficiency of the Ianiro HMI fixtures is very high—85 lumens per Watt compared to 20 lumens per Watt for incandescent fixtures. This means that at 5600°K each Ianiro unit delivers as much light as four or more incandescent fixtures of comparable wattage.

Strand Century, a leading supplier of lighting for television, motion picture, theatrical and architectural uses, will be headquartered at booth Number 605 during the NAB Show. In charge of the exhibit will be Edward Gallagher, Director of Television and Motion Picture Sales.

For More Details Circle (162) on Reply Card

Portable Camera

RCA Broadcast Systems will demonstrate a new battery-operated portable color TV camera system, especially designed for electronic news-gathering, as a feature of its exhibit.

Designated the TK-76, the new addition to RCA's portable camera line will join the TKP-45, a multiple-purpose portable camera capable of producing studio-quality color pictures in the studio or on location. The TKP-45 is in factory production and deliveries have begun.

The TK-76 portable uses three ⅔-inch pickup tubes and features a shock-mounted optical system with a prism efficiency four times that of standard field lens system. The camera weighs only 17 pounds, including camera head, 10-to-1 zoom lens and electronic viewfinder. A separate power pack weighs approximately 10 pounds, including batteries.

Introduced at last year's NAB convention, the TKP-45 camera will be shown at Las Vegas with a newly-developed lightweight control unit for backpack or hand-carried use. The battery-operated unit makes it possible for the cameraman to range up to 5,000 feet from a video taping point or microwave station and to capture pictures comparable in quality with those made in the studio.

For studio use the TKP-45 can be fitted with a special lens adapter to accommodate large lenses normally used in studio production, including a 30-to-1 zoom.

For More Details Circle (163) on Reply Card

Tape Cartridge

Fidelipac will feature a new tape cartridge that uses natural flow patterns to eliminate erratic tape behavior and to assure record and reproduce repeatability from cartridge to cartridge. This cartridge will be available in all standard "A" type lengths.

For More Details Circle (164) on Reply Card

(Continued on page 119)

m'CURDY

The McCurdy approach
to engineering and construction
of a packaged system
allows the user to easily locate
his new equipment without the added
burden of wiring to auxiliary equipment.

All aspects of the broadcast function,
from news booth to music production
center, can be assembled into
a unique and functional package.

Each system is fully pretested
as a total functional unit
and will meet or exceed
all broadcast specifications.

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For More Details Circle (27) on Reply Card

The first all solid state 1 KW AM transmitter

By Jim Briscoe and Brian Cox
Harris Corporation, Quincy, Ill.

The world's first all solid state FCC type accepted one-kilowatt AM broadcast transmitter, the MW-1, was introduced by the Broadcast Equipment Division of Harris Corporation at a special showing February 19, 1975, in Quincy, Illinois. In addition to being all solid state design, the MW-1 introduces another first—the Progressive Series Modulator (Patent Pending).

In designing the MW-1 transmitter, Harris decided to incorporate these two "firsts" for several reasons. The technology was available for the all-transistor design, using it would mean reliability and long life inherent in solid state circuitry to be carried throughout the transmitter.

The solid state power amplifier used in the MW-1 has been field proven, operating as an RF driver in an MW-5 transmitter, which has been on the air for over a year. Also, it has been field proven in the MW-1 itself at a broadcast station in Missouri.

Since transistors have now become competitive with tubes, costwise, in a one-kilowatt transmitter, this was no drawback.

The Progressive Series Modulator (PSM) answered the need for a DC coupled modulator which would give DC feedback for automatic power stability and carrier shift correction, and also would provide excellent transient response.

Design Criteria

The approach to designing the MW-1 was to first establish certain important criteria that must be met. These were recognized before work was even begun on the MW-1, and were, briefly:

1. The transmitter must provide a louder, cleaner signal.
2. The transmitter must provide superior transient response, equal to or better than that discussed last year in our NAB paper entitled "Enhancing AM Signal Coverage Through Improved Modulation Techniques."
3. The power amplifier/modulator transistorized modules must be paralleled in such a fashion as to provide as much redundancy as possible in the transmitter.
4. The distortion, response and intermodulation must be better than that presently available.
5. The transmitter must have built-in protection against brownouts and lightning.
6. The transmitter must be easy to maintain—which means trouble-shooting devices and indicators must be more than just adequate, and the transmitter design should be as modular as possible for easy repair or replacement. Also, access to components must be quick and easy.
7. Simplicity and high efficiency must be combined in one high level modulation method.
8. Reliability is of prime importance.
9. The value per dollar will be maximized through each step of the design stage.

Solid State Power Amplifier

In the MW-1, twelve transistorized power amplifier modules (which also include modulators) are operated in parallel, through 90° networks, to provide 1100 Watts output at 125 percent modulation. Because of the 90° networks, the loss of a module, or modules,

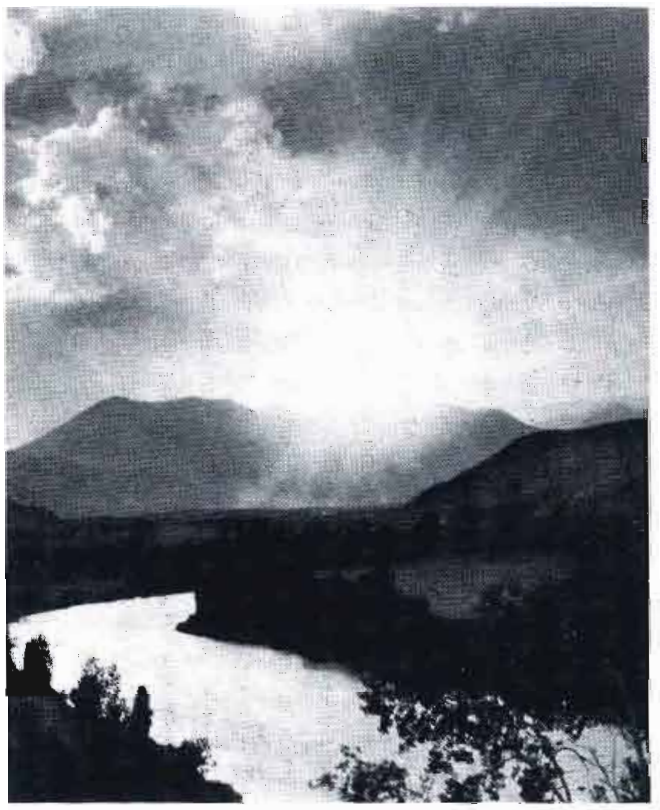
(*Continued on page 44*)

Management Highlights

The all solid state transmitter at 1 kW has been a design goal we all knew was possible at some time in the future. Well, the Harris version —which is the first in the market place—is being introduced now. Rather than cover it in a typical new product release, we thought broadcasters would be interested in seeing how Harris put their efforts into nudging the technology forward.

Since at this writing **BE** consultants have not compared the specs with its actual operation, we have limited the scope of this article to design factors. The MW-1 will be operational at the NAB, and we suggest you stop by to make your own evaluation.

For sheer reliability, few things can beat our RE15 microphone:



And we're conceding only the slightest of edges to the sun.

Because the RE15 is one mike you can always count on to give you the same reliable response at any distance, any angle. It's a continuously Variable-D® cardioid microphone—an exclusive E-V design.* Once you've set your equalization, all that varies is the level.

Unwanted noise is no problem, either. Not with a super cardioid pattern that provides maximum rejection at 150° off axis. So when the mike is tilted in its most natural position—30° from horizontal—you'll be sure of getting maximum rejection in the horizontal plane. And there's a 100-Hz cutoff "bass tilt" switch for boom use and other long reach situations.

Other features abound. Like a "hum buck" coil to supply an extra 25 dB of hum rejection. And a rugged design that stands up to shock and mechanical abuse.

The Electro-Voice RE15. So you can work with confidence in the most demanding professional applications.

RE15...$180.00. RE16...(with blast filter) $190.20. And for slightly less demanding situations, RE10... $110.10. RE11 (with blast filter)...$120.00. Suggested Resale Net Prices. Slightly higher in Western States.

*U.S. Patent Number 3,115,207. Trade mark registered.

Electro-Voice INC
a gulton company

Electro-Voice, Inc., Dept. 351V
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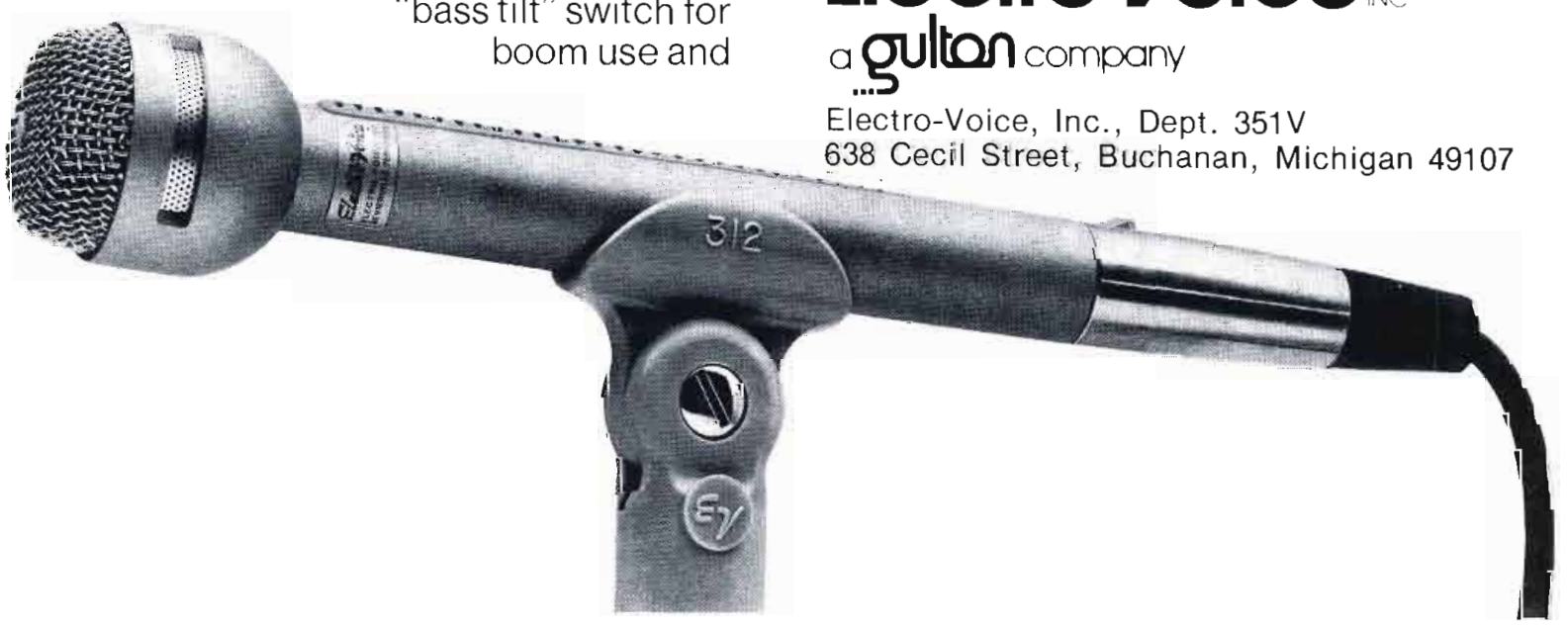

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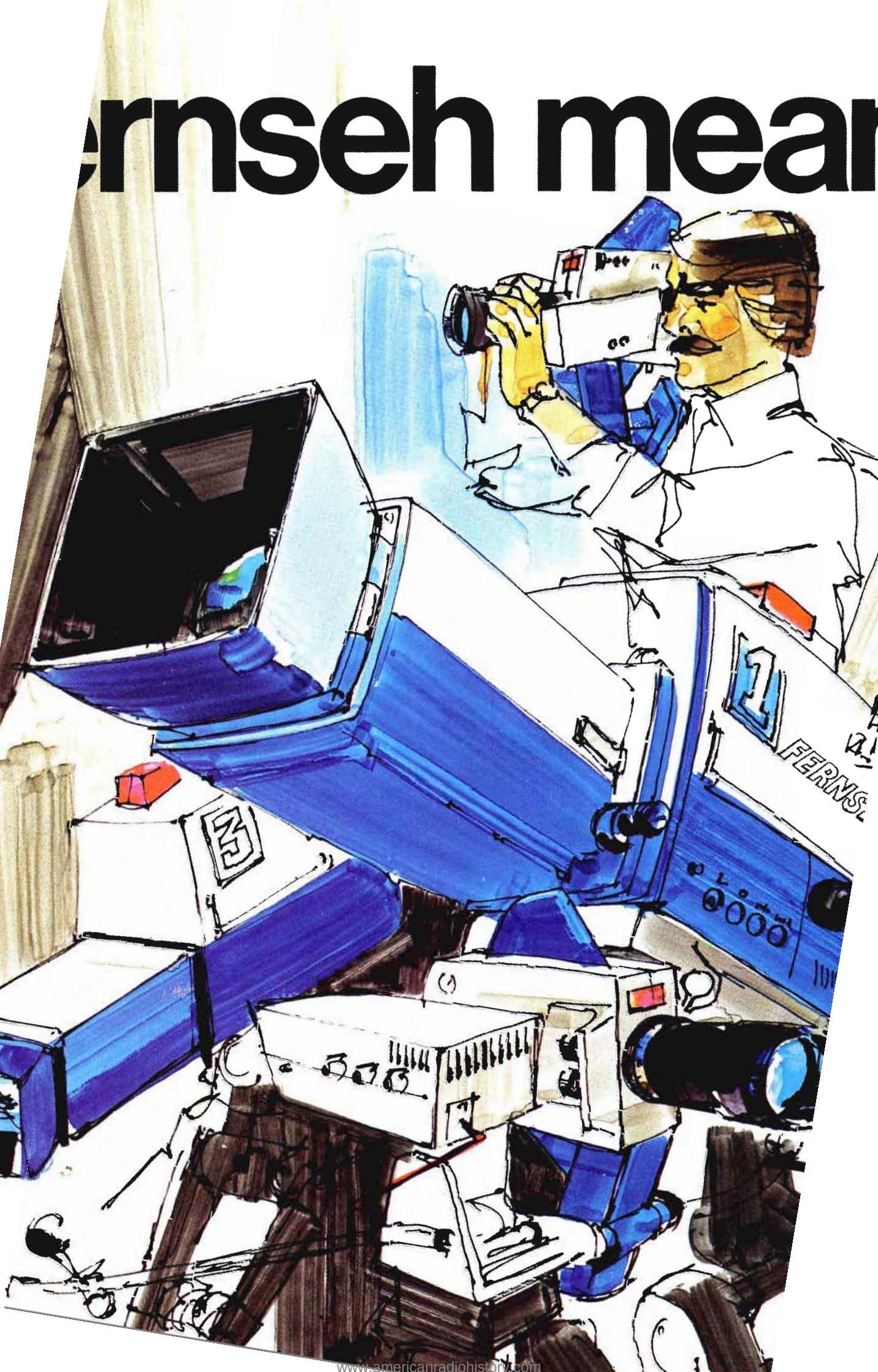


television.

KCN Electronic Journalism Camera Selected by NBC!

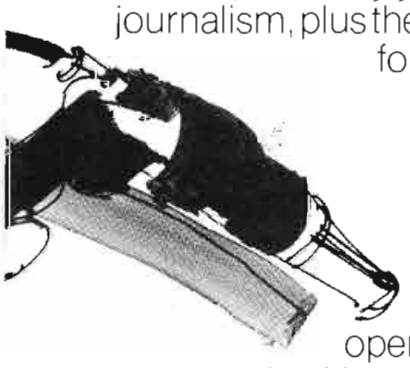
And television means some good news, and some bad news. All of which means being there.

So you've got to be flexible.

You've got to be portable.

And you've got to be ready-to-go.

Fernseh handheld camera systems are lightweight and offer the speed and portability you need for electronic journalism, plus the video quality required for television production excellence.



The KCR-40 (shown front and center) is completely compatible with our standard KCU-40 and will operate from that system's electronics. You can roam 325 feet on a quarter-inch cable, 2600 on a half. With an additional 50 feet between the head and back pack.

And if you're a real independent, the battery operated KCN (shown with the cameraman) is completely self-contained and can be used in conjunction with a portable VTR.

Both KCR and KCN systems use the same camera head, which is the lightest in its class, weighing as little as a 16mm film camera.

Fernseh means television.

Television good news.

We'd welcome the opportunity to demonstrate the superior capabilities of Fernseh television equipment. A call to your nearest office will bring any further information you require.

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Chicago (312) 681-5000
Houston (713) 688-9171
Los Angeles (213) 649-4330

FERNSEH
Robert Bosch Corporation

For More Details Circle (29) on Reply Card

(*Continued from page 40*)
actually reduces stress on the remaining modules, and failure of one module will not affect the transmitter's rated performance. Even in the unlikely event that several modules should fail, the MW-1 still stays on the air, although at proportionately reduced power levels. This provides redundancy in the high power stages.

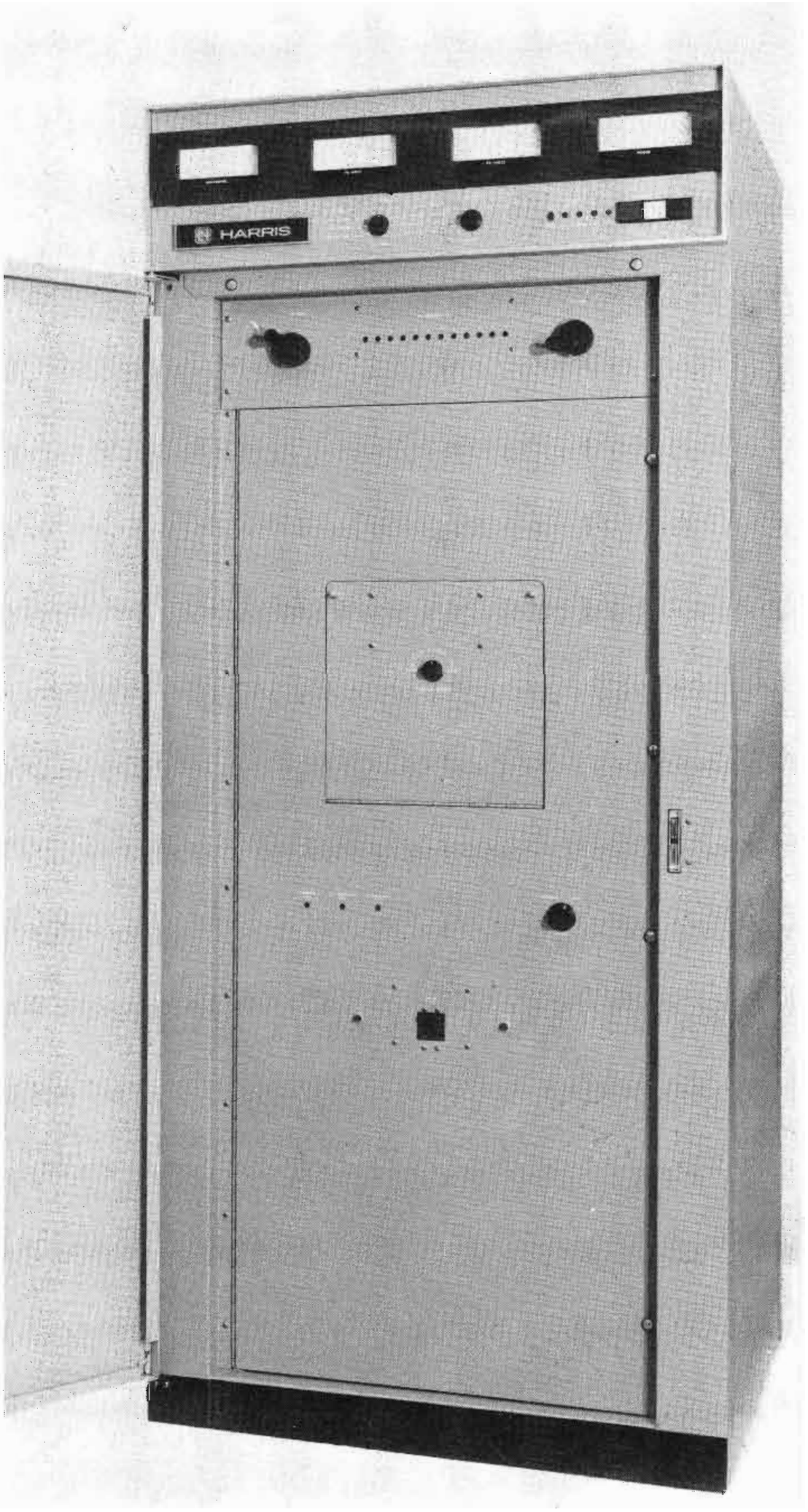
The low level stages, where failures are less likely to occur, were not made redundant, as this could easily have doubled the cost of the transmitter. However, these stages are plug-in for maintenance, or replacement should it become necessary.

The PA of each of the twelve modules consists of two transistors operating Class D push-pull. This method allows an efficiency of close to 90 percent without the use of special shaping circuits used in tube designs. Each of the twelve PA modules is capable of at least 100 Watts carrier and 500 Watts peak.

By operating the PA transistors Class D, which is a square wave switching mode, we actually attain slightly higher efficiency than the single-ended Class C with wave shaping. Also, the PA voltage is always controlled, and even during lightning the power amplifier voltage cannot exceed the supply voltage. Thus, we have lightning protection and only the normal tuning controls. Using this circuit we obtain all the advantages of Class C with third harmonic shaping, plus a little, and have good lightning resistance, with no new tuning controls.

Progressive Series Modulator

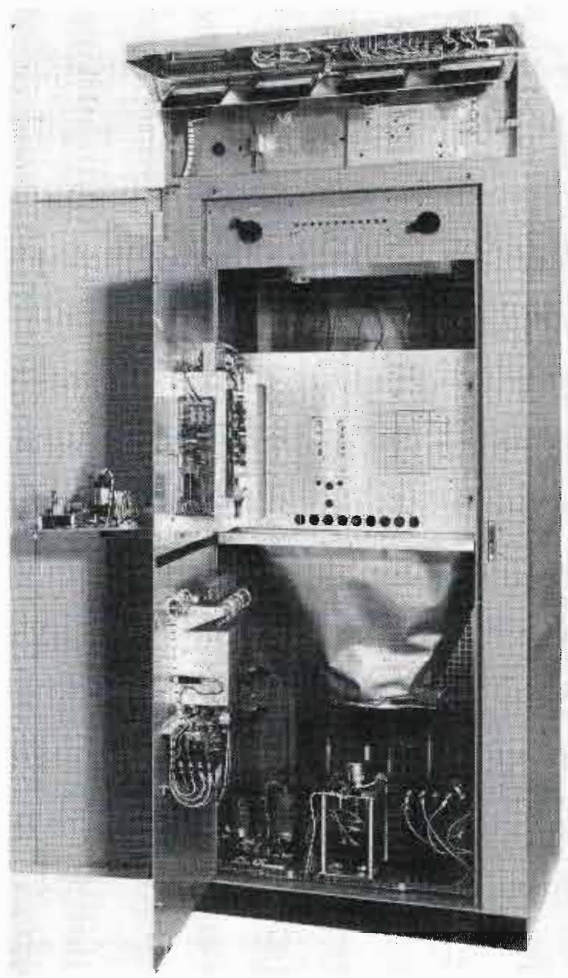
We decided to put the modulator on each power amplifier module to help in troubleshooting, and to provide more redundancy for the MW-1. The Progressive Series Modulator (PSM) used in the MW-1 is a simple series regulator, connected in such a way as to provide efficient high level modulation without the use of a modulation transformer, modulation reactor, power supply choke, or 70

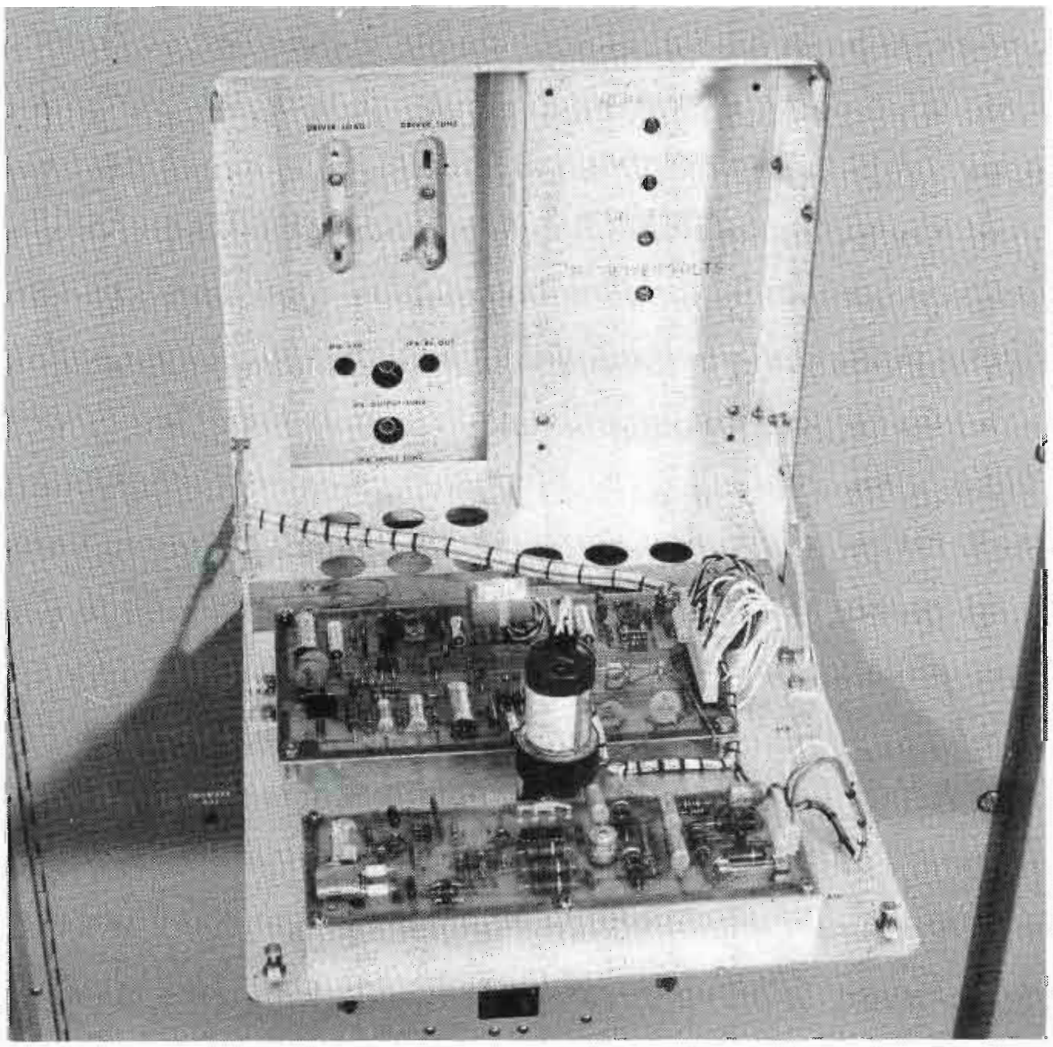


With front door open, the MW-1 (left) shows its PA module fault panel, power control, and PA loading and tuning controls.

Popping about four fasteners (right) will allow front entry to most key MW-1 circuits.

The oscillator module drops down and out from the middle of the front panel.





kHz filter. Control of the transmitter over a wide range is accomplished in a low level stage of the modulator by means of a convenient front panel vernier control. No adjustment is necessary in any high power RF circuit, including the loading coil.

Up to now, series modulators—which have the advantage of operational simplicity—have been too inefficient to be used effectively. Now, with the Progressive Series Modulator, simplicity and efficiency have been combined into one high level series modulation method.

A conventional series modulator is shown in Figure A. It has one active device, Q1 (modulator), which regulates the 100 Volt power supply to provide the proper voltage at carrier and the modulation voltage to the PA. Its only drawback is its inefficiency. Under carrier conditions, only 50 Volts is required at the PA. This means 50 Volts is also across the modulator, Q1. Whatever current is required at the PA must flow through Q1.

Assume 24 amps and 50 Volts is required at the PA to achieve the 1000 Watt carrier. This means 24 amps is also flowing in Q1 and the power lost in Q1 is 1200 Watts (all heat). This is much too inefficient, even for a one-kilowatt transmitter. The PA and output network operate at about 85 percent, so the loss in the PA and output network is only 200 Watts.

If the advantages of a DC coupled series modulator are to be utilized, a more efficient method must be found—hence a Progressive Series Modulator (PSM). PSM is two series modulators, in series, as shown in Figure B. Two power supply voltages are now used. One is a little higher than that required to produce the proper PA voltage at carrier conditions, and the second is high enough to provide the positive peak required.

Now, during carrier, all the PA voltage comes from the 52 Volt supply through CR1 and Q1. Only about 2 Volts is lost across the modulator, so the required 50 Volts, 24 amps is provided the PA.

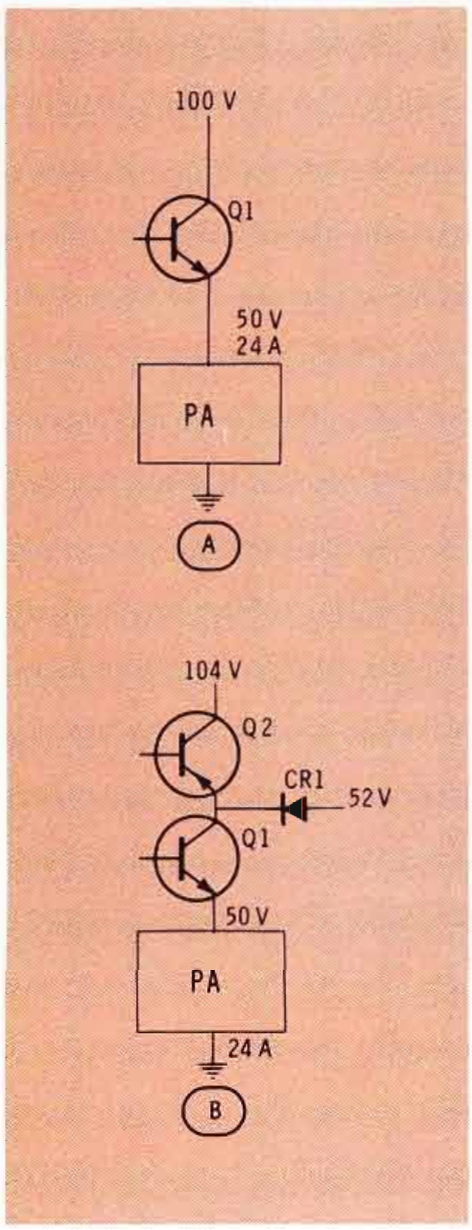


Fig. 1 "A" (below) shows a conventional series modulator. "B" is a progressive series modulator. Voltages used in the MW-1 vary slightly from the example used here to provide 125 percent positive peak modulation capability.

The loss across the modulator at carrier is now 2 x 24, or 48 Watts, and the power to the PA is 50 x 24, or 1200 Watts.

During the positive peak the PA voltage is supplied from the 104 Volt supply through Q2 and Q1 (CR1 disconnects the 52 Volt supply when Q2 turns on). During the negative peak Q2 is open, and the voltage is supplied from the 52 volt supply through CR1 and Q1.

Design Features

The MW-1 is capable of providing the maximum positive modulation peaks allowed by the FCC (125 percent), with plenty of reserve for reliability. This can mean higher average modulation levels for loud, clean signals, with no increase in transmitter carrier power and no increase in distortion.

A maximum carrier power of 1100 Watts is provided, allowing more reserve for driving directional antenna arrays. The transmitter uses DC feedback and a power supply regulator for power output stability, which insures a minimum of RF power output change with a change of the power line voltage. Power reduction to 500 or 250 Watts is provided, and power may be switched with carrier and program on.

In the MW-1, accessibility to all components is quick and easy through the front and rear of the transmitter. The following modules are plug-in design for easy maintenance: PA/modulator (12 modules), RF driver, IPA, oscillator, audio driver, and audio input and overload. The two low voltage power supplies may be lifted out by removing four screws and a few wires. Front and rear doors remove easily, and the entire control circuit panel swings out, allowing quick access to the relays.

The RF chain in the MW-1 consists of a crystal oscillator, divider, amplifier plug-in module, a plug-in IPA module, a plug-in RF driver module and 12 plug-in PA/modulator modules. Fault indicator lamps are located on the oscillator, IPA, and audio input and overload. Fault indicator lamps for the 12 PA modules are located at eye level on the front panel for easy visual troubleshooting.

The RF driver module is identical to the PA modules for redundancy. Should the driver fail, a PA module can be placed in the RF driver location, and the PA allowed to operate with one module short while the failed module is repaired at the engineer's convenience. Incidentally, the MW-1 employs a total of 112 transistors.

In addition to the lightning protection afforded by the power amplifier design, the MW-1 also has more than ample circuit protection in other areas.

- The two power supplies of the MW-1 are protected by circuit breakers, which are reset from the front panel.
- Protection against voltage standing wave ratios of greater than 1.2 to 1.0 is provided. Both forward and reflected power are metered at the front panel.
- In case of momentary RF overloads, the MW-1 will recycle automatically. Should a repeat overload occur within a thirty-second period, the transmitter will remain off until manually reset. However, if the time between overloads is greater than 30 seconds, continuous recycling will occur.
- Resettable status/overload indicators are located on the meter panel. Remote readout and reset of these indicators are also provided to help the engineer determine if a trip to the transmitter site is required when the transmitter has recycled. For example, VSWR recycles (as determined at the remote control point) may be caused by lightning or icing of the transmission line. A switch to low power may be all that is necessary and can be accomplished by remote control.

Naturally, all functions required for remote control are built into the MW-1, including raise/lower power control, and PA voltage and current metering. A local/remote switch is provided on the control panel so the remote control point cannot turn the transmitter on while being operated locally. All electrical connections for remote control are brought out to a single terminal board.

A built-in dummy load is also featured in the MW-1, so that the transmitter may be tested at a full kilowatt output with 100 percent sine wave or full program modulation.

The Harris MW-1 will be shown—in operation—at the 1975 NAB Convention in Las Vegas.

Neve has a baby!

New in the Neve family is little Kelso. Just look at what 24.8 inches of transportable, top quality mixing console gives you:

• 10 fully equalized inputs with conductive plastic faders • 4 buses (2 program and 2 auxiliary) all of the same high performance standard • 2 monitor outputs

Of course the handbook, spares and mating connectors are included. All this for under $10,000.

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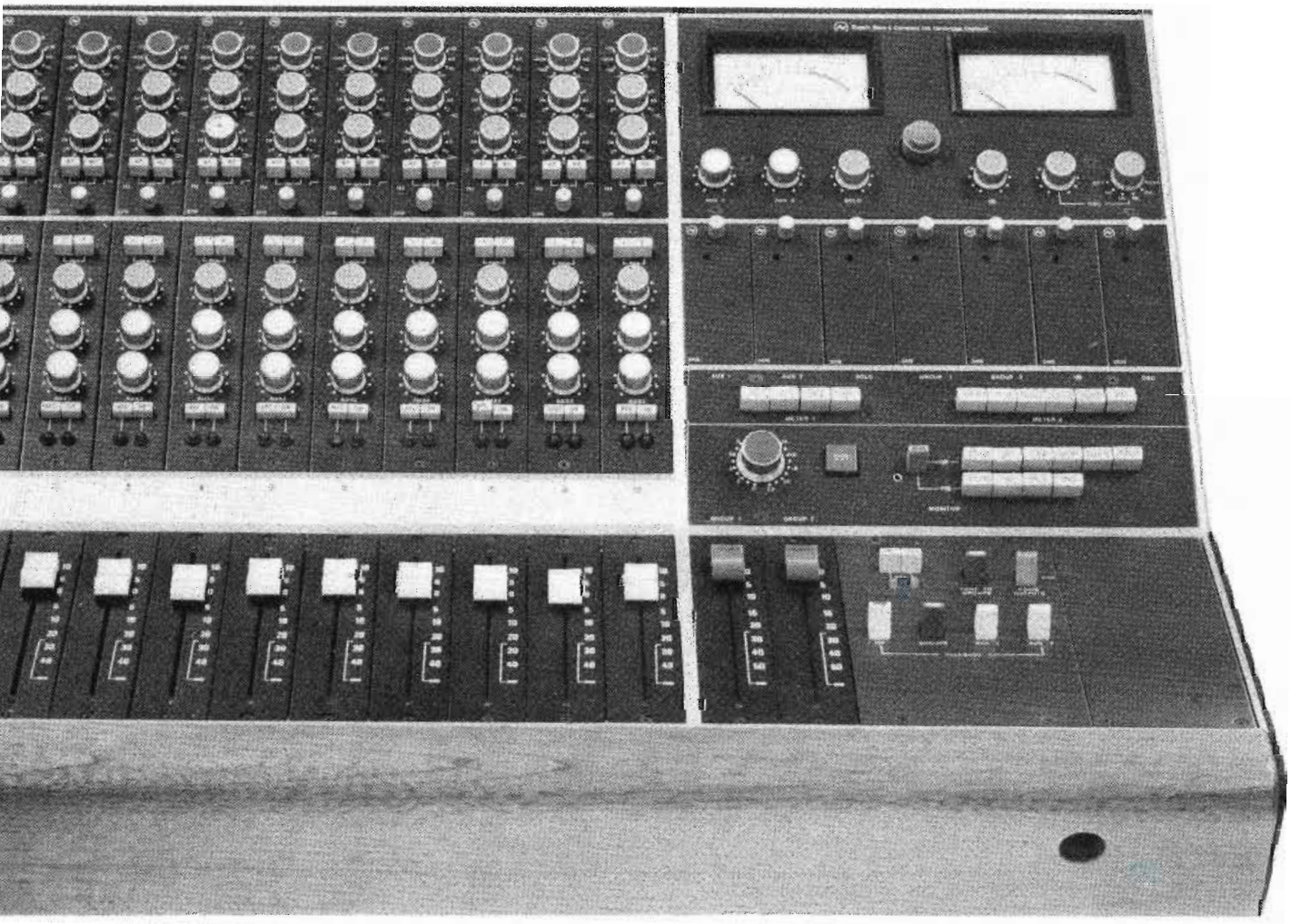

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For More

SMPTE provides forum for electronic journalism

By Joe Roizen / *(Photos by Donna Roizen)*

The SMPTE Winter Conference held in San Francisco on January 24 and 25 proved to be a lively forum for major proponents of new operational techniques in broadcast and closed-circuit television.

The papers started out with the hottest item in the broadcasting field, namely Electronic Journalism. Proponents of this technique such as Joe Flaherty of CBS (one of the early pioneers in this approach) and Ralph Huckaby of WLAC in Nashville described the benefits that have been obtained in their organizations from the use of light weight, portable color cameras and VTR's that are used for news acquisition in place of the traditional film crews generally assigned to such tasks. Not that the proponents of film are about to fold their tripods and silently steal away! There was a lively debate from the floor about the validity of some of the cost reduction claims and other advantages being put forward by the all electronic protagonists.

The film advocates pointed to new rapid processors that are virtually automatic and the development of telecine equipment to simplify film utilization. A. H. Lind of RCA even described a 16 mm film cartridge machine that could provide rapid access to a sequence of film clips that are housed in special plastic containers, but whose reel is standard and can be extracted and run on a normal projector. Film people also pointed to the relatively high capital investment for the Electronic Journalism components, in particular with regard to the approximately 30K figure for the color camera that is generally used for such applications.

Nevertheless, it would appear that the new methods are here to stay and will continue to expand. The reasons were well expressed in the papers describing their own operations and they were categorized as follows:

1. More instant news coverage by direct relaying of the story to the studio center by microwave from a small vehicle in the field.
2. Greater flexibility of the actual news story because the news director back in the studio could call the shot on the nature of the coverage through a talk-back audio link.
3. If the event was beyond a microwave site, then a portable VTR could be used to record the images and the tape returned to the studio for editing and airing. The tape is less costly than film and reusable.
4. The new generation of this type of video equipment is simple and reliable, therefore requires a smaller crew to operate, thus cutting personnel costs.
5. Even energy conservation was quoted. Huckaby indicated that his station spent $10,000 last year on gasoline for conventional film crew vehicles and they expected to cut this figure substantially by despatching the mobile EJ vehicle from site to site by radio and not requiring a return to the studio.

Hal Blakeslee of Consolidated Video demonstrates the CVS digital video synchronizer. At the same meeting, CVS announced it has the patent on digital time base correction techniques, a fact that will concern many manufacturers.

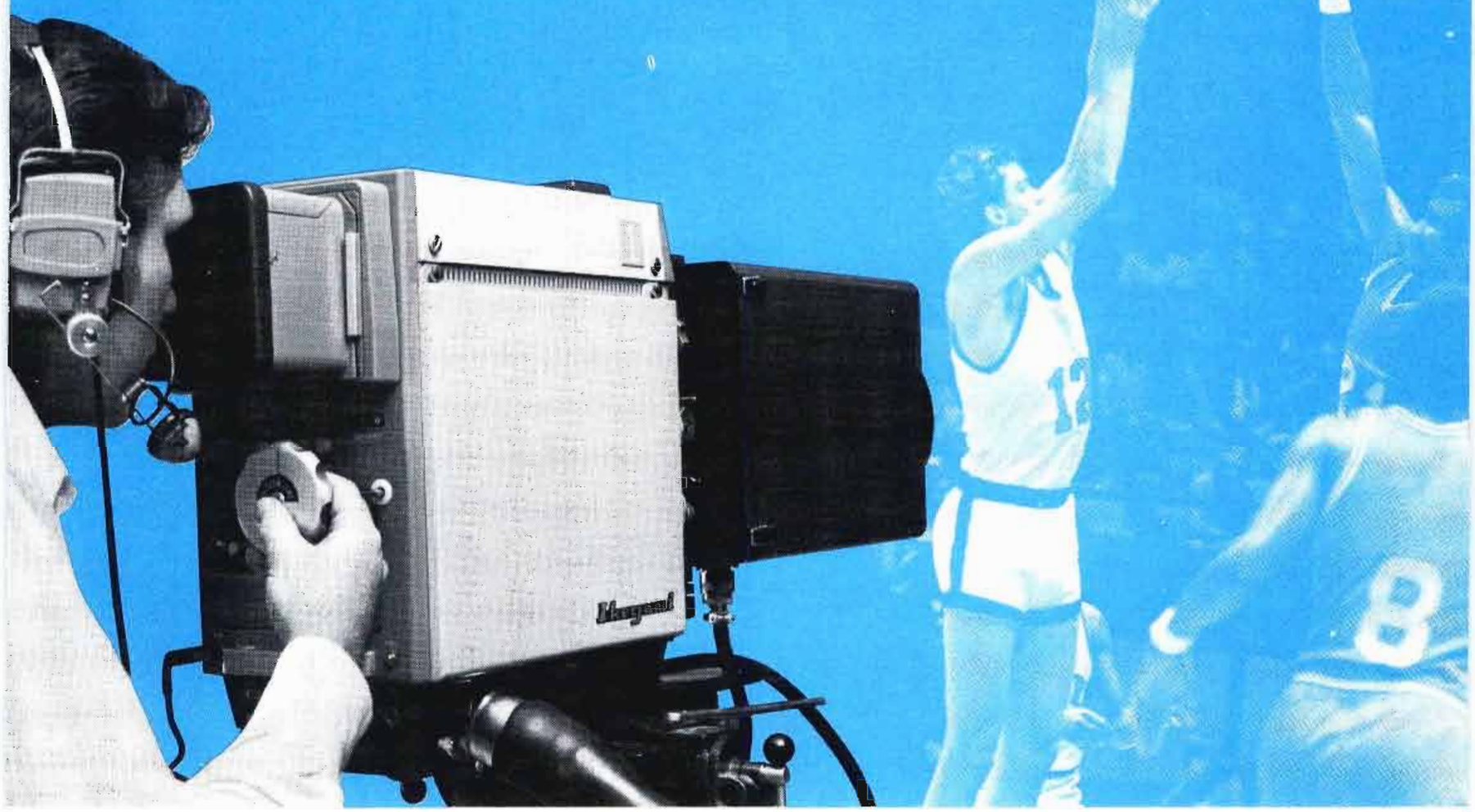
The general consensus by representatives of various levels of television broadcast operations from network news down to the low rate card stations was that Electronic Journalism will expand to meet modern television news needs using whatever hardware is tailored for this application, even if some limitations in picture quality have to be accepted. Their position is that 16 mm news film with rapid processing already imposes a quality limitation which makes even limited bandwidth, color under

(Continued on page 52)

IKEGAMI TK-355

"...super-reliable low-cost color camera"

says Midwest Teleproductions.



"At under 60 lbs., the TK-355 moves to new camera positions with a quarter the manpower and time of our previous studio-type color cameras. And it's fantastically reliable. Our three Ikegami TK-355's cover all events at the new sports and entertainment center in Northwest Ohio, The Coliseum. With these cameras, it's been zero downtime all the way!

There are plenty of little 'extras' which make the TK-355 a pleasure to use, too. Like velvet-smooth zooming with unique push-pull control . . . and the built-in diascope registration chart for instant emergency set-up and alignment.

No other low-cost color camera we've tested is so portable, so reliable, so easy to use, and delivers such great pictures at moderate lighting levels. Ikegami has really put it all together in the TK-355!"

Len Zaller, Operations Manager
Midwest Teleproductions, Inc.

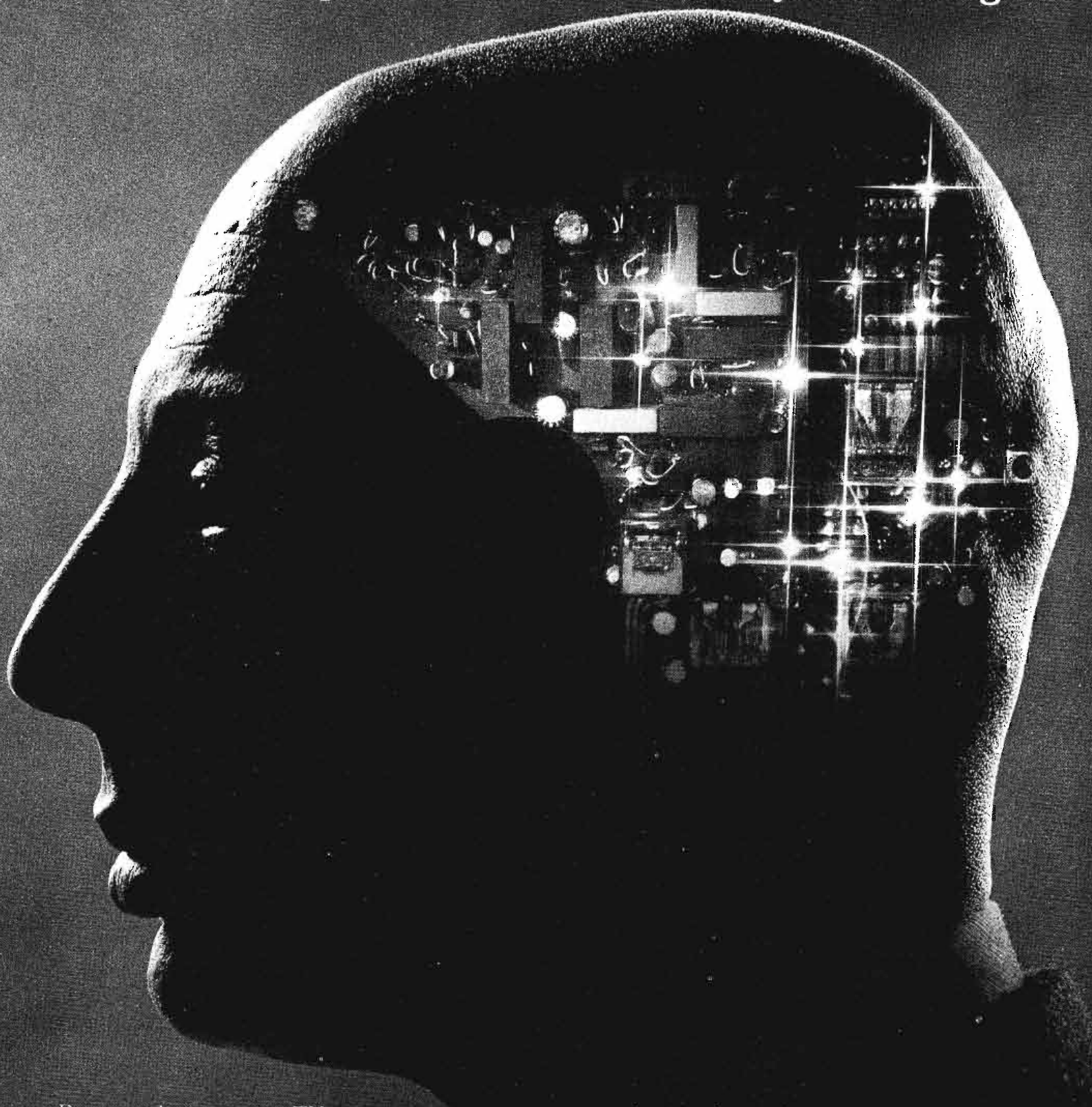
For further information and/or demonstration, call or write:

IKEGAMI ELECTRONICS INDUSTRIES INC. OF NEW YORK

35-27 31st Street, Long Island City, New York 11106/Telephone: (212) 932-2577

For More Details Circle (31) on Reply Card

Can a chief engineer afford to think only like an engineer?



Put a good picture on a TV set.

That's always been the first thing a chief engineer has to think about.

But it doesn't seem to be the only thing anymore.

Today, more and more chief engineers are thinking more and more like station managers.

They have to. They've got staff meetings to go to, they've got equipment to buy, they've got cameramen to keep happy, they've got program directors to keep happy.

Now they've got this whole new thing of electronic journalism to think about.

How can their station adapt.

Most agree the way to do that is with one of those little portable color videotape systems.

But what about the chief engineer who doesn't agree. What is he thinking about.

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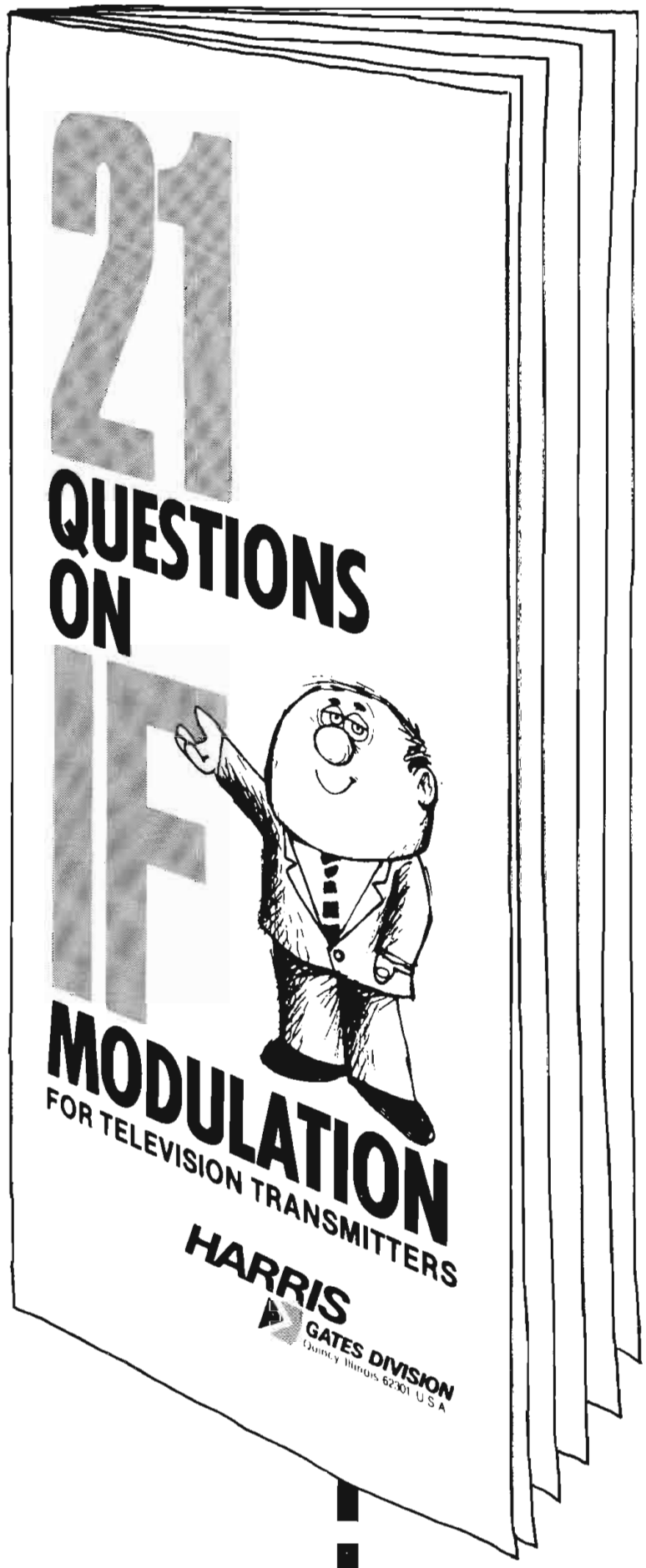

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(*Continued from page 48*)
VTR's competitive as long as time base stability, meeting FCC requirements, is achieved. With the new digital time base correctors, this last requirement is quite easily met.

Digital Video

Electronic Journalism was not the only major subject of discussion at the conference, digital video and in particular digital time base correctors were widely covered by a series of papers and by the luncheon speech of Charles Ginsburg, Vice President of VTR Research for Ampex Corp. Ginsburg's major theme was that the digital VTR is still quite some distance away because digital techniques do not as yet equal the efficiency of analog techniques in recording or reproducing video signals from magnetic tape. He compared the experimental recorder built by the BBC to a present analog VTR and found it to be 8 to 10 times less efficient by today's standards. He also cautioned against the assumption that future analog VTR's would not improve substantially so that when an all digital VTR if indeed available might find itself competing with much better analog machines.

A series of papers related to digital video covered the basics of the subject and some interesting predictions as well as descriptions of actual equipment which was on display. The most intriguing piece of equipment was described by Bill Hendershot of Consolidated Video Systems. This was the CVS 600 synchronizer and is a unit capable of storing a frame of information thereby permitting full synchronous operation between any two video sources, regardless of their origin. If this was not enough, the CVS 600 has an option which permits video compression of the television signal to one quarter size and the placement of the minified image almost anywhere in a full picture. The VCS 600 synchronizer is a progressive development from their 504 digital time base corrector.

More startling was the announcement by the author on behalf of CVS that the company had been granted an all inclusive patent of digital time base correction techniques which may very well put them in a commanding position with regard to other manufacturers who are using these methods in equipment they are now fabricating.

Ampex TBC 800 was described by Mark Sanders and John Lowry (of Image Transform fame) showed his unit made by Digital Video Labs of Willowdale, Ontario, Canada. The paper presented by Lowry, however, was not simply a description of his digital TBC, but was a proposal that the industry adopt a standard for digital video processing at four times the color subcarrier so as to not limit future development in the digital field as far as high quality video signals are concerned. Lowry painted an interesting picture of future television studios which somewhat amplified the remarks made in his paper by Frank Davidoff of the CBS television network. The overall image depicts a studio of the future where all origination signals from television cameras are digitized and distributed or manipulated through the system in digital form. Conversion to analog is performed only at the transmitter prior to broadcasting in order to meet FCC signal specifications for radiation. It would seem that the only piece of equipment that does not lend itself to full digitizing at the present time is the VTR.

Joseph Flaherty, VP for Television Affairs, and Charles Anderson, Papers Chairperson for SMPTE relax at the Society luncheon. The success of the conference was greatly due to their efforts in organizing the papers sessions.

VTR Formats

The third subject of considerable importance was the continuing battle between the broadcast VTR formats. Papers by both Ampex and RCA continued to expound the advantages of newer quad recorders, such as the TR60 and the AVR-2, in their less than maximal applications for studio or mobile work. Ampex had an AVR-2 on display in a very compact enclosure. In competition with this well entrenched standard, IVC presented two papers pointing out the specific advantages of their segmented helical 9000 recorder and its application to some highly specialized television origination. Bert Dann of

Recortec president Dr. Lester Lee is shown here with a VR1100 fitted with constant tension transport modifications and a digital readout timer manufactured by his company. Dr. Lee delivered a paper on updating quad VTR's.

IVC described the 9000 in an expanded bandwidth form for maximizing tape to film transfer quality. Fitted with special filters and using its super highband carrier and deviation frequencies (9 to 12 MHz), the machine is capable of an 8 MHz video band pass. In order to demonstrate visually the quality of such an image, IVC employed a pair of high definition Conrac color monitors with a special shadow mask tube, with a super fine aperture mask structure and higher definition faceplate.

The Conrac monitor was displaying 750 lines of resolution at the center of a standard test pattern being reproduced from a prerecorded tape on the 9000. The monitor which is in RGB form was fed by a CBS Model 805 comb filter decoder from the composite NTSC signal. The resultant picture quality on specially made tapes generated from live cameras was superb.

In a subsequent paper, Keith Reynolds of IVC further described several 9000 installations at production centers where wideband origination is desired so that the multi-generation quad copy of the distributed program tape still retains what IVC claims to be "master" quad quality.

Several papers were devoted to new equipment in the television measurement field, one of which was a rather detailed and straightforward description of the new Tektronix 1480 waveform monitor by Steve Kerman. Kerman reviewed the design philosophy behind this improved studio instrument and some of the constraints placed upon the manufacturer when new and more stringent requirements in the measurement aspect have to be housed in a body that meets certain physical requirements, such as rack space and operator knob familiarity.

CCTV

A paper by Walt Robson of Hewlett-Packard of Palo Alto described the creative use of television for corporate training, communication, and sales programs. Robson surprised his audience by explaining that in-house industrial television has come a long way from the days when a corporate CCTV installation consisted of a displaced industrial photographer with a half inch EIAJ black and white recorder and a vidicon camera who was given an almost zero budget to play with the new medium. By contrast, H-P's color TV studio at the headquarters in Palo Alto uses three Norelco color cameras, a Grass Valley switcher with full effects, an Ampex 1200 with full editing facilities, and a yearly budget of $1 million for production. His examples of in-house productions for a variety of applications were excellent and were shown over a u-matic format machine distributed to a group of Unimedia color monitors in the lecture hall.

Summary

The SMPTE Winter Television Conference attracted over 400 participants from most of the western states, with a few coming in from as far away as New York and New Jersey. The high calibre of the technical sessions was evidenced not only by the good quality and topical timeliness of the papers presented, but also by the consistently large attendance in the lecture hall. This in spite of the fact that almost perfect sunny weather in a city with endless other blandishments could have easily diminished attendance if the subject matter had been less interesting.

Major credit for this successful venture should go to Charles Anderson of Ampex Corp. who is presently Section Chairman for the SMPTE in San Francisco, and who worked for months to attract the papers that were given at the conference. In addition, other local officers and members of the SMPTE, including Joseph Semmelmayer, Werner Ruhl, Donald Lincoln, Carlos Kennedy, Kay Kibby, and John Streets served as session chairpersons and helped organize the technical sessions, as well as the Friday luncheon and the wine and cheese tasting party which was hosted by Kodak, with provisions of California wines provided by KGO, KPIX, KRON, KTVU, and CBS.

Audio recordings of all sessions which will be available in cassette form from the Society were made by William Palmer of Palmer Films. Projectionists were Walter Kisner and Sue Blumenberg, and the short films program was supervised by Winston Silers. Registration and other administrative details were handled by George Shoemaker, Helen Shoemaker, and Maryliz Ruhl.

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ADM is a leading producer of highest quality professional audio consoles. Our key people have had impressive studio broadcast experience, and all of their expertise has been applied to our consoles.

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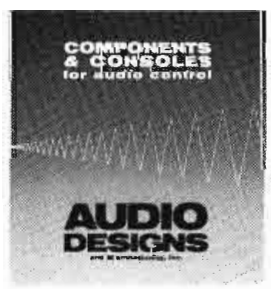

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The internal velocity compensator continuously adjusts the error correction LINE-BY-LINE to prevent color streaking and significantly reduces velocity error across the entire horizontal line. This is not an added cost option - velocity compensation is built into every TBC-110.

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Like other good proc amps ours strips old sync and adds new noise-free stable sync and burst ... but ours gives you a little something extra. Two sets of adjustments to provide front panel control for video gain, set-up, chroma gain and chroma phase and internal calibrated adjustments for the same controls so you can always return to a calibrated status with the push of a button.

SEE THE TBC 110 AT NAB IN APRIL

SYNC GENERATOR

The internal sync generator is the heart of the TBC-110's versatility. It can be slave locked to studio sync and burst as some production requirements dictate or be used as the sole studio sync generator. (Dual outputs on sync, blanking, Burst Flag, H Drive, V Drive, & Subcarrier make it ideal as a studio sync generator.) The third mode of producing following sync, when used with line locked recorders, makes the TBC-110 truly universal for all helical VTR's.

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Are you ready for an OSHA inspector?

By Dennis Ciapura

Broadcasters most often ask two questions about OSHA: how does the OSHA structure relate to broadcast station operation and what should the broadcaster do to insure compliance? Pat Finnegan's article **OSHA: Handle With Care,** in the Dec. '74 issue of **BE** answered the first question very well and is a good piece to keep on file at the station for future reference.

This month we'll talk about the compliance part of the game and tailor our investigation to zero in on the areas that apply to broadcast station operation. We have prepared an OSHA check list for broadcast stations, so, let's take a look at the list and then discuss the requirements so that you can determine what areas of your operation need attention.

Our check list is divided into three sections: office, studio and transmitter. The items printed in heavy black type are the OSHA hot spots, areas that have historically drawn the most citations. All of the health and safety checks on the list are important and we don't recommend that you consider the most frequently cited areas as the only ones worthy of attention, but be aware of the fact that these are proven problem areas.

Although people working at broadcast stations are not working in the same kind of environment as factory or construction workers, safety must still be a high priority. As you can see from our check list, there is a lot of emphasis on getting people out of the offices and studios in the event of an emergency and maintaining operable fire protection equipment. After all, it does little good to have a clearly marked exit that cannot be used because flames have the exit blocked and no extinguisher is on hand to clear the way! Most of the regulations are common sense but some are less obviously inspired than others. Let's go down the list and try to answer some of the questions that may arise.

Getting Out In An Emergency

One of the most frequently violated areas is that of general egress—being able to get out in an emergency. A desk blocking the rear exit from the studios is a no-no, as is a large decorator plant that prevents an exit door from fully opening. Exit signs should consist of 6-inch high lettering, ¾-inch thick. If the exit cannot be easily seen, signs showing the closest route to an exit should be posted. Closets, storage rooms and wash rooms should be clearly marked, so that an emergency won't result in a visitor trapped in a closet with the U.P.I. machine. Exit areas should also be well lighted and the lighted type of exit sign is preferred.

Fire extinguisher violations are also quite common, despite the fact that this is an easy situation to keep tabs on, it's just a matter of getting around to doing it. Each unit should have a tag on which you can indicate the date of the monthly inspections and yearly thorough examination and recharging, if required. The main purpose of the monthly inspections is to catch any damage or tampering that may have rendered the extinguisher unserviceable since it was last checked. If the extinguisher is not in plain view, a sign pointing to its location must be posted. Units under 40 pounds should be mounted so that the top is not more than 5-feet above the floor and units over 40 pounds (except if on wheels) should be mounted no higher than 3½-feet high. Obviously, the point of the regulation is that the fire extinguishers must be easy to pick up. Extinguishers left sitting around in corners are not acceptable.

First Aid

The contents of the first-aid kits should be selected to suit the anticipated needs. A radio station kit would certainly contain components for treating electrical burns. It's also a good idea to see that the kit is kept current. It is unlikely that an OSHA inspector will be positively impressed by a first-aid kit with contents yellowed from age and leaking! The rest room requirements are also based on common sense: where there are people working, there must be rest rooms.

Management Highlights

OSHA regulations are having an effect on the industry, and we hope that through continued attention to interpretations, the results won't be traumatic. We certainly don't want to over-react, but we were drawn into the act when we heard about a West Coast station that had to make several modifications to a new facility....and the added expense came to nearly $50,000.

We suggest reviewing the Finnegan article on OSHA in our December '74 issue, then use the check list included here so you can be reasonably certain you can pass an inspection.

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Output Amplitude:	Pulse — 4.0 Volts P. P. Sub-carriers 2 Volts P. P.
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Vertical Ø Control	± 3 lines
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Size:	1¾" x 12¼" x 19" rack mounting
Temperature Range:	0-50 degrees C

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Figure two, three and four, illustrate what the current forms 100, 101 and 102 look like in case you have stuffed them away someplace and would like to know what they look like so you can find and use them.

The 100 and 101 can be filed in the public file but the 102 must be posted in a prominent place for the employees to see.

Station Wiring

Studio audio and remote control wiring comes under the National Electrical Code Article 725 covering Remote Control, Low Energy Power, Low Voltage Power and Signal Circuits. The circuitry commonly in use at broadcast stations falls within the class 2 voltage and current limits which means that these circuits are not subject to the same overcurrent protection requirements as power and lighting circuits, due to the fact that signal circuits are inherently current limited. It is of primary importance, however, that care is taken to keep the signal circuits separated from power and lighting circuits. An inadvertant short from a power to a signal circuit could prove fatal to maintenance personnel troubleshooting the fault or operating personnel accidentally contacting the signal circuit.

Another danger area exists where equipment is stacked atop relay racks and not secured to prevent it from falling on operating personnel. Equipment placement that impedes studio egress could also be a violation, depending upon the circumstances. Cables across a walkway are just plain poor practice, and a possible citation generator as well.

At The Transmitter

At the transmitter location, things are a bit simpler if the system is remote controlled, since the transmitter room would not be a work area. Certain safeguards must be maintained, however, for the safety of maintenance personnel. These include the fire fighting and electrical fire prevention considerations contained in the OSHA standards and National Electrical Code. These items are particularly important when the transmitter room is in the same building as the offices and/or studios, for it is one thing if the transmitter shack burns down in the middle of the antenna field, and quite another if a transmitter room fire endangers the lives of all station workers.

Even the remote transmitter building must be a safe place to walk though. Nitrogen cylinders should be chained to the wall to prevent them from tipping over. Aside from being a hazard to the feet, a toppled compressed gas cylinder can take off like a rocket if the neck is damaged in the fall—a horrifying sight that must be seen to be believed. For the same reason, any compessed gas cylinder that has been damaged should be replaced immediately.

At TV and FM stations, the OSHA RF limit of 10 mw/cm^2 between 10 MHz and 100 GHz may restrict the areas in which personnel may work while the system(s) are on the air. Levels this high are almost never found in transmitter rooms and usually only very close to master antenna systems being fed simultaneously by several stations. The National Bureau of Standards has a flat response wideband meter capable of determining the actual levels, but an inexpensive meter for use by broadcasters has not yet been devised, although we know of at least one group that is working on the project. In the meantime, if you calculate or suspect a level equal to or greater than 10 mw/cm^2 near your antenna, post the radio radiation warning sign shown in Figure 1.

If not already on hand at the station, we urge all broadcasters to obtain a copy of Volume 37, Number 202, Part 2 of the Federal Register, which contains the OSHA standards, and also the National Electrical Code, printed by the National Fire Prevention Associa-

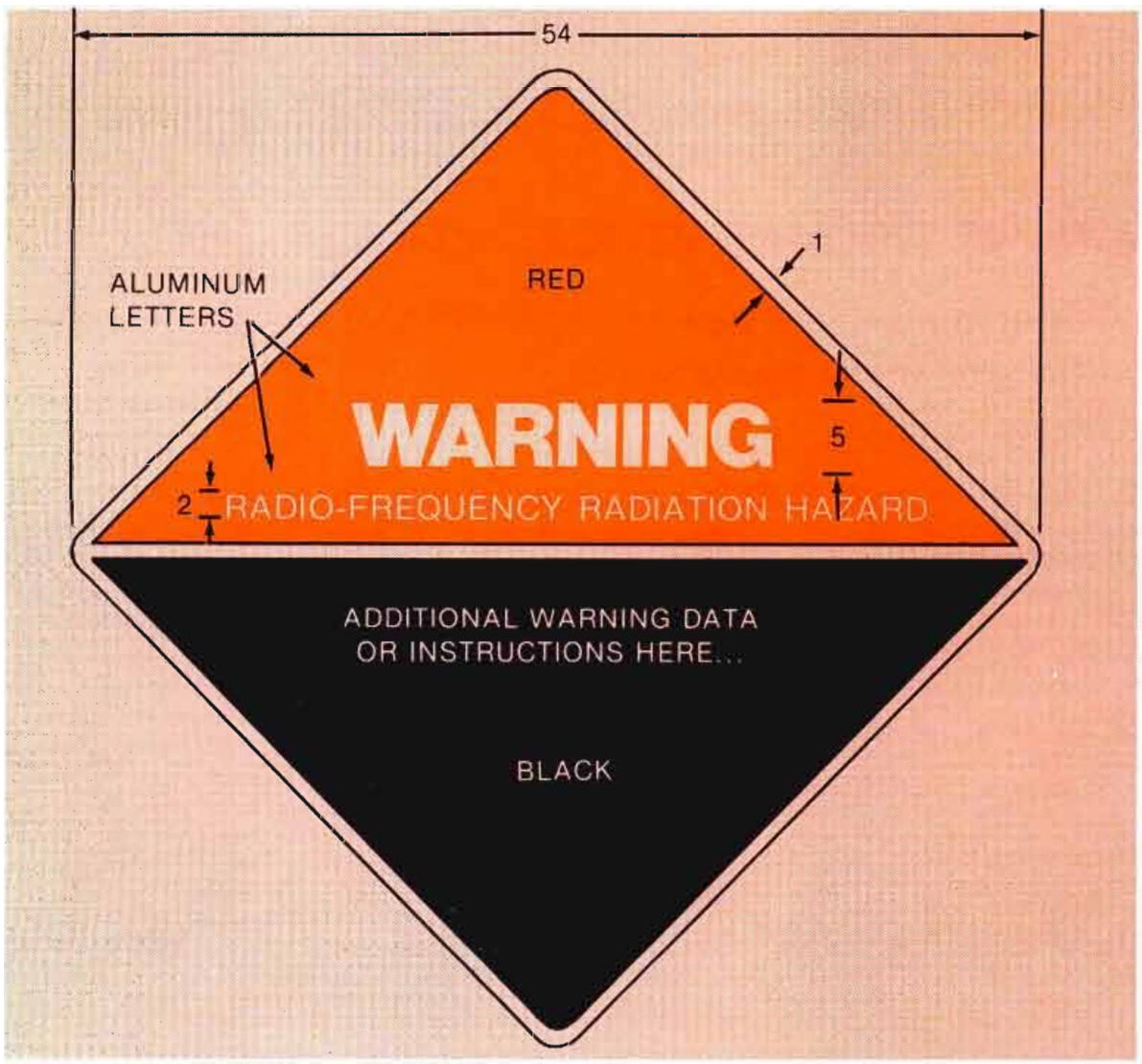
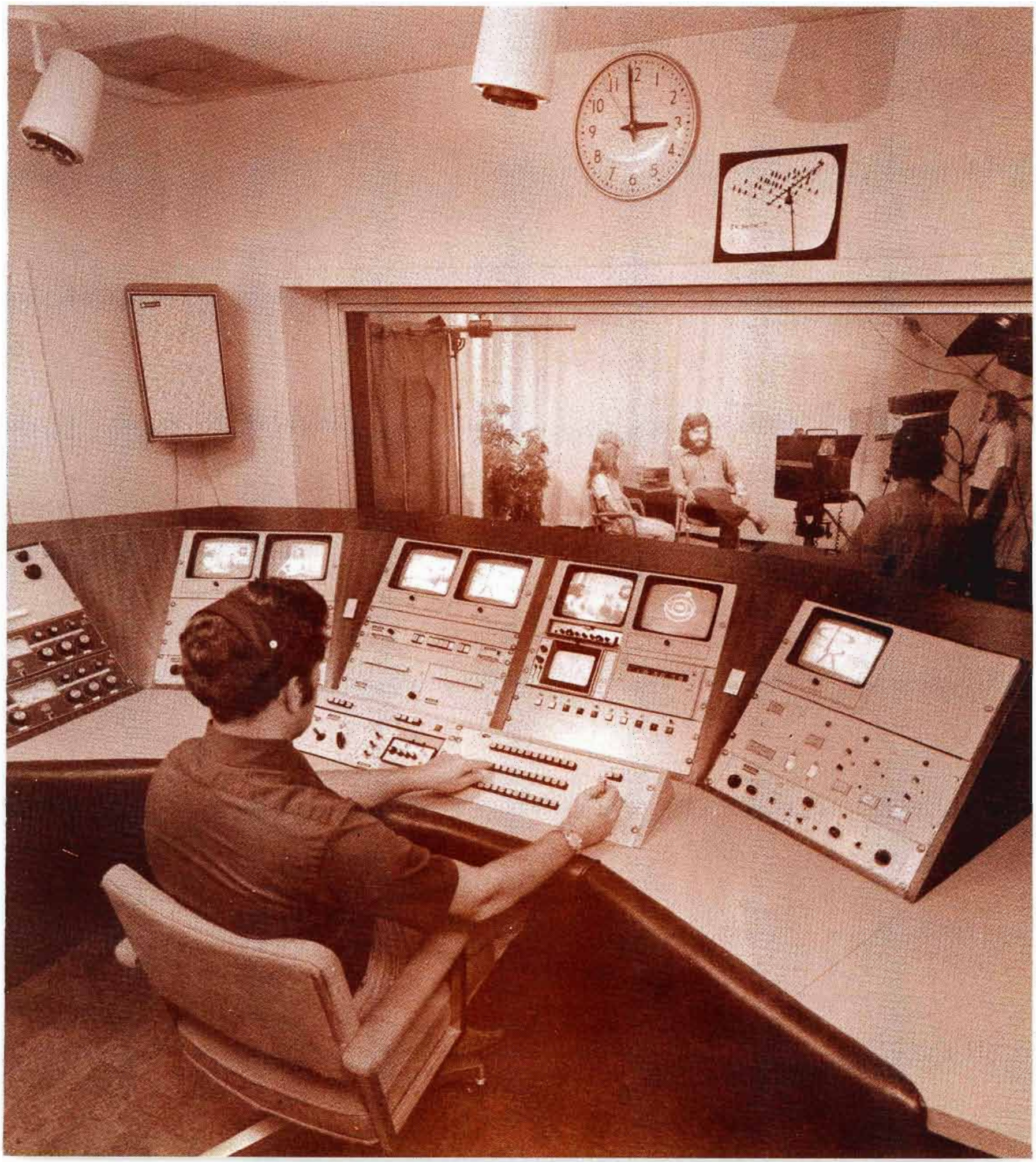


Fig. 1 An RF radiation warning sign for posting in areas where RF levels at or above 10 mw/cm^2 could be encountered. The sign should be large enough to be seen at a distance where safe RF levels exist. The dimensions given here are relative units used to establish standard proportions for the sign.

MARCH, 1975

CABLE ENGINEERING

In this issue....



Gin? Poker, anyone?

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Once the Signal Master is hooked up, there's not much else to do. Oh, you can fiddle around with the video gain and delay centering controls, if you want. But that's about it.

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So when you've grown used to your beautifully clear picture, you've but one choice left. Gin? Poker, anyone?

KSN

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Pre-Convention perspectives

You have to get the feeling these days that when the National Cable Television Association convenes their national convention in New Orleans that it will be a time for soul-searching and direction-seeking.

To a great many small system operators, the past several years have brought on many headaches they didn't bargain for and surely didn't need. With the FCC saying that systems at 3,500 subscribers or above must originate, a real hesitance to expand became apparent. While this magazine encourages entries into local origination, we realize that it was not reasonable to insist on it. In fact, some systems have done quite well with originations. Others have not. The point is, too many neither wanted it nor could afford the investment.

If you got into the business thinking only of bringing in hard-to-get signals or signals where there were none before, you see only a service that is basic and needed by the subscriber.

Copyright Split

If you're a larger system, you're probably in a more highly populated area where, in fact, signals do exist.

In the areas where signals are available, there is a need to offer more. And this is where the two types of systems depart. The smaller systems are unwilling to go along with copyright fees legislation, because they see themselves only as providing an extension of the original signal into areas where they were unavailable. In that sense, they are extending the service of the broadcast television station and its advertisers....a fact which has not escaped the stations or the advertisers.

But, when systems are set up where signals already are in existence, they begin to represent competition to the TV stations. Not for money from advertisers. Competition for the viewers time. That's fractionalizing the market.

So local origination was a political ball thrown at cable, and in some places it made good sense. In others, it didn't.

For the larger systems, it could - if handled and promoted properly - be an incentive to hook on. But meanwhile, instead of using what could have been the uniqueness and strengths of cable, the trend went to importing signals. So when the competition thickened, copyright became the iceberg that the NCTA found impossible to avoid.

For the small systems and their economics (to say nothing of the national economics), it didn't make sense. For the larger systems in a tough competitive battle and in the need to persuade legislators, it is meaningful.

The NCTA board of directors knew this difference. So did NCTA president David Foster. In fact, as a result of this conflict of interests, a number of small systems have withdrawn from the NCTA, a fact that was to weigh on Foster.

By this time, the industry knows that David Foster has resigned, effective May 31. If you start looking back, you'll see a line of presidents who guided the NCTA for short periods. And each time these presidents were introduced as "the" man to do the job.

So the major business and headliner for discussions at the New Orleans convention will be the airing of these differences and the lending of support to a new president.

At The Convention

For years, the annual convention was held months after the National Association of Broadcasters' convention. Now we find it within days of the NAB dates. What will that mean to the industry? For one thing, it will mean fewer exhibitors.

It takes several days for exhibitors to set up booths before the exhibits are open to the attendees. But, days before, a number of the usual NCTA exhibitors will be faced with a nearly impossible situation. How will they tear down their NAB exhibit, ship it from Las Vegas to New Orleans and have it ready in time? They have four days to do that. And if you've ever attended a convention, you have an idea of how weary those exhibitors would be if they could manage to get to New Orleans in time.

The system operators will be the ones to pay for that decision. Perhaps the current problems that beset the industry will preoccupy those who do attend. So it's time now to reconcile differences...or divide and lose the strength of the association. Until there is that renewed and unified voice, any new president will be hard put to accomplish any current NCTA goals.

About the cover

This month's cover picture was taken at the University of California - San Diego. Installation of the CCTV system was accomplished by Roy Phillips of Perspective Measurements, a San Diego-based marketing and engineering firm. Photo courtesy of Dynair Electronics.

The National Cable Television Association has characterized Federal Communications Commission operations as fraught with "procedural delays" which work against the cable industry and the public interest. NCTA also encouraged the FCC to bring more of its deliberations out from behind closed doors.

In a filing which urged the FCC to adopt new "openness and fairness" in its procedures, NCTA charged that many rule making projects have faced "undue delay," at the Commission.

"Delay almost always works to the advantage of those who seek to maintain the status quo," NCTA said in its comments on suggested revisions of FCC procedures. The proposals were filed last month by Henry Geller, former FCC General Counsel and now a Rand Corporation official.

NCTA cited several FCC proceedings—most notably the recent FCC deliberations about pay cable TV—in which private deliberations caused "procedural delay" and worked to the disadvantage of the public interest."

In calling for new openness in informal rule making matters, NCTA said "the public's business should be done in plain view of the public and not behind closed doors."

NCTA said that the slowness of FCC procedures has enabled "the established communications market controlled by the broadcaster" to hinder the development of CATV.

"At every turn the broadcaster has used regulatory delay to prevent the cable operator's entrance into the marketplace," NCTA said. "The history of cable regulation is replete with delay which stifled cable's growth and froze cable's development."

The Board of Directors of the National Cable Television Association has voted to reaffirm its support for the passage in Congress of reasonable copyright legislation. The Board held an extensive discussion and review of its copyright policy, which included presentations by a wide variety of cable television industry representatives. After the discussion, the Board adopted the following resolution:

"The NCTA Board reaffirms its support for the principle of reasonable copyright legislation in the form of a perfected S.1361 which fits the realities of the cable television industry today."

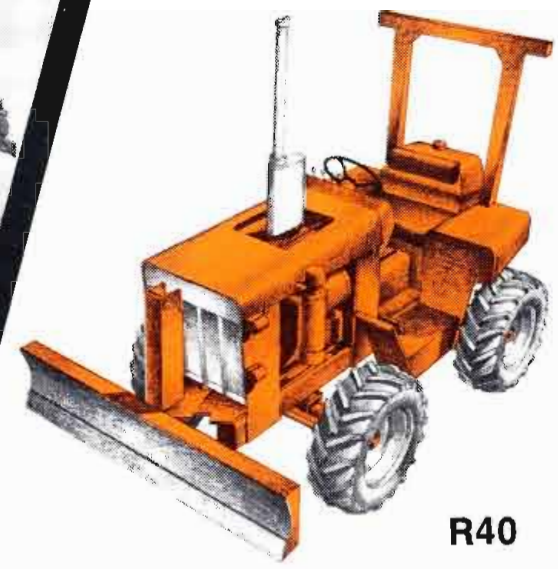
In other actions, the Board:

• Voted to establish a Task Force within NCTA to study and make recommendations to the Board on the possibility of establishing an industry technical certification program;

• Heard a report from the Educational and Community Services Committees and voted to recommend to the membership a by-laws amendment combining the two committees as a single standing committee of NCTA known as the Educational and Community Services Committee.

• Voted to recommend to the membership a by-laws revision which would change the NCTA budgetary fiscal year from June 1-May 31 to Feb. 1-Jan. 31;

R30

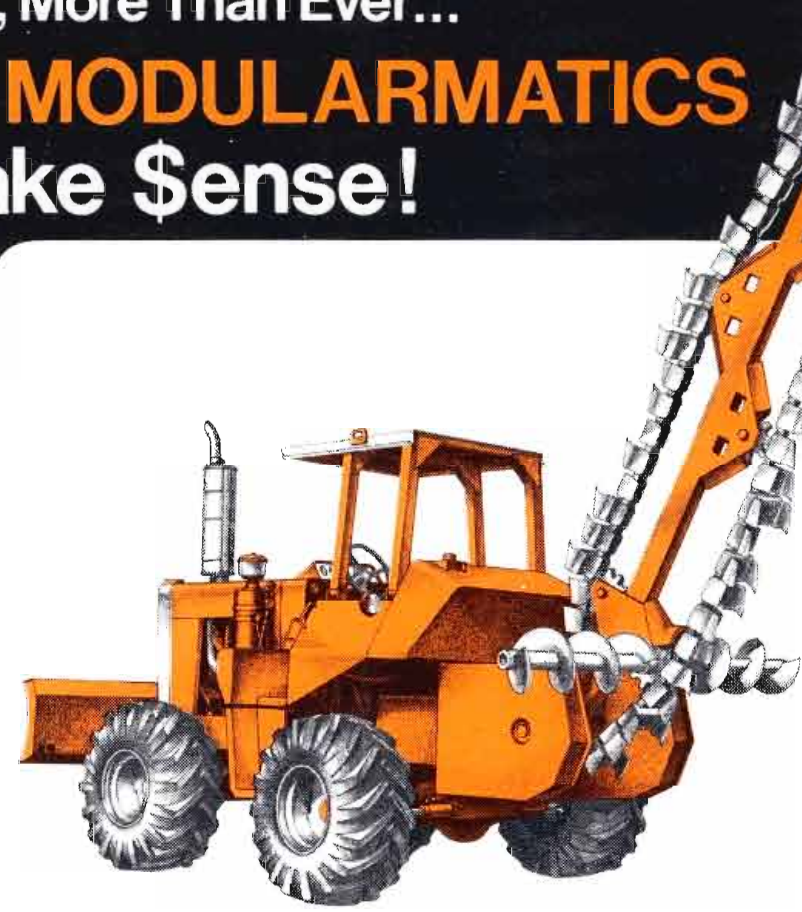


R40

Today, More Than Ever...

DITCH WITCH MODULARMATICS Make $ense!

R65



R100

One piece of equipment for a variety of underground job requirements — that's what the Ditch Witch Modularmatic concept is all about. Interchangeable modules can equip Modularmatic vehicles to perform up to 11 different underground and related job assignments. And since one machine can do more, overall equipment costs are obviously reduced. You get more for your equipment dollar and you get more equipment potential and flexibility. There are four Modularmatic models to choose from, in power ranges from 30-HP to 100-HP. You also have a choice of power plants — gasoline or diesel. Modules allow you to equip your basic vehicles for selected trenching requirements, restoration, vibratory plowing, combination trenching and plowing capability, backhoe work, loading, horizontal boring and pavement breaking work. Buy the Modularmatic vehicle and modules you need now; add other modules as needed. Today, it's more important than ever to get the most for your money. And, that's why, today, the Modularmatics make more sense than ever!

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

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DITCH WITCH

For More Details Circle (167) on Reply Card

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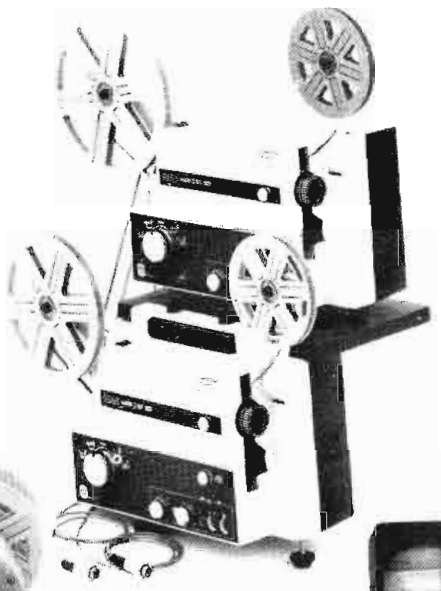
Super 8 is now a professional sync sound film.

It is also the least expensive color video production medium.

Professional Super 8 has been made possible by Super 8 fullcoat magnetic film, fullcoat recorders, and fullcoat editing equipment introduced by **Super8 Sound, Inc.**, of Cambridge, Massachusetts. **Super8 Sound** has designed, manufactured and distributed a full line of location, editing and sync projection equipment for double-system Super 8. **Super8 Sound** is also a retail dealer for all major Super 8 manufacturers, e.g. Braun-Nizo, Beaulieu-Hervic, Bolex, Canon, Eastman Kodak, Elmo, Eumig, Nikon, Pyral and others.

Super8 Sound is your single-contact supplier for everything Super 8.



Location Equipment

The **Super8 Sound** Recorder ($645) records on Super 8 fullcoat magnetic film in sync with all the better Super 8 cameras, with no camera modification.
Location sync sound can also be recorded on a sync cassette recorder or on the sound stripe of a single-system camera such as the new Beaulieu 5008S. The **Super8 Sound** Recorder will "resolve" the location sound to fullcoat magnetic film for professional double-system editing. **Super8 Sound** Crystal Camera Controls ($250) for Beaulieu and Nizo cameras allow cableless sync filming. **Super8 Sound** Silencers ($135) eliminate camera running noise.

Editing Equipment

The heart of an editable film system is the editing equipment. **Super8 Sound**'s Editing Bench ($795) incorporates all the traditional editing techniques of 16mm filmmaking. **Super8 Sound** can also supply horizontal editing tables by MKM Industries and Super 8 Research Associates. This equipment permits the most sophisticated double-system professional editing.

Projection Equipment

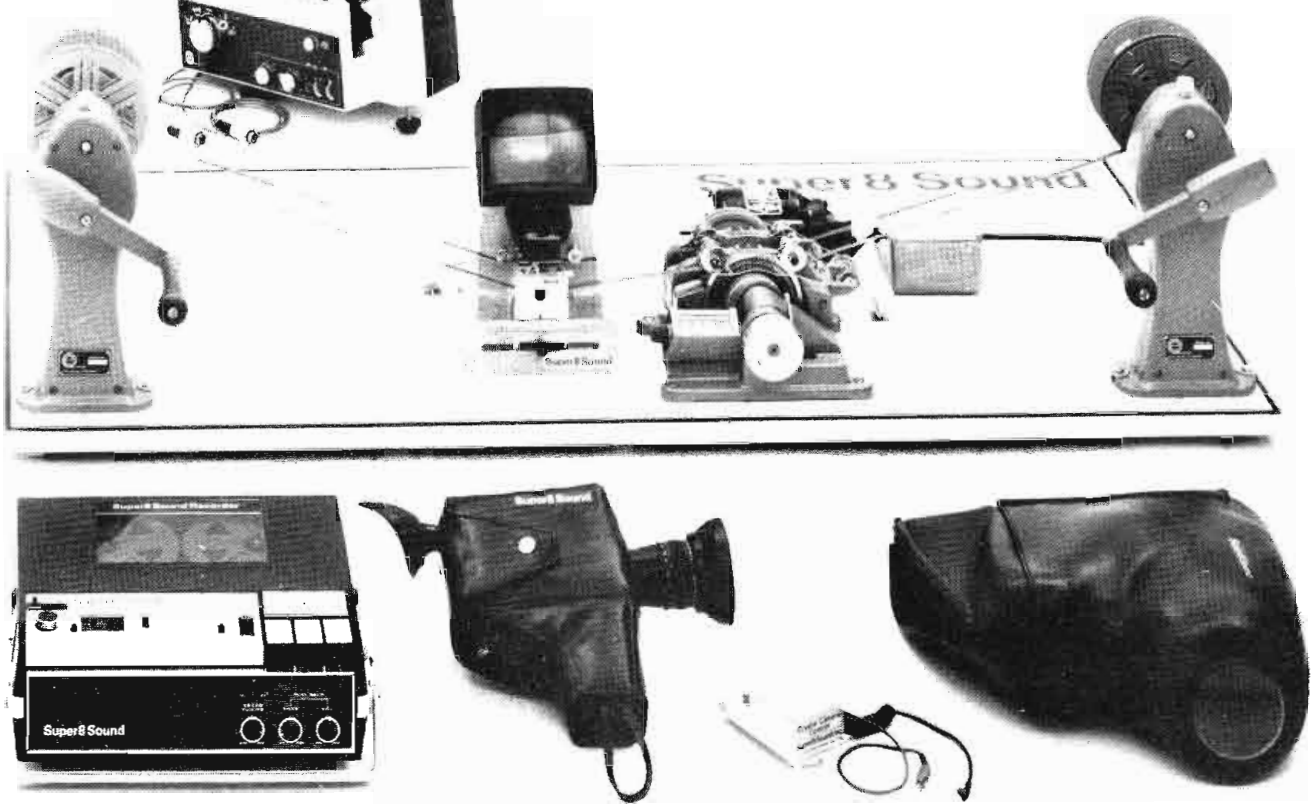
Super8 Sound Sync Projectors are modified to include a 1/F sync contact switch, at prices below projector list. The **Super8 Sound** Double-Band Projector ($900) allows mechanically interlocked screenings of picture film and fullcoat magnetic film with sync rollback. For direct transfers to color video, **Super8 Sound** carries the advanced Kodak Videoplayer VP - 1 ($1095) which provides a full 525-line NTSC color signal suitable for recording on two inch-quad video equipment and subsequent broadcast

Super8 Sound has pioneered in the development of standards for equipment compatibility, without which Super 8 cannot become a truly professional medium.

The **Super8 Sound** Catalog ($1) is the most comprehensive Super 8 equipment listing available.

The **Super8 Sound** Recorder User's Manual ($1) is a 28-page illustrated introduction to all the stages of sync sound film production.

Super8 Sound now has working systems in hundreds of schools and independent production companies in the U.S., Canada, and abroad who are discovering the economies of Super 8.



Isn't it time you got into sync too?

Super8 Sound™, Inc.

95 Harvey Street, Cambridge, Mass. 02140

SUSTAINING SMPTE MEMBER

CE-6

For More Details Circle (168) on Reply Card

BROADCAST ENGINEERING

Who knows it's there?

Management Highlights

For the last several months, people around the communications industry have been saying that cable local originations are a futile effort. Then I recalled that NCTA exhibitors have long told me that cable operators often lack the information to understand the equipment being exhibited at NCTA conventions.

After being exposed to various versions of local originations — most of which were not of much interest to me — I subscribed to a cable company in Overland Park, Kansas. During the summer months I was able to watch local baseball games. Then came football. I learned that many of my friends also were watching these events.

But after football faded in November, I lost interest. I didn't pay much attention until I learned that our cable originations were covering the School Board. Well, that's not so exciting until you consider what happened when sex education was to be covered at a recent meeting. Why, the local papers were full of the news on pro's and con's.

Where do you suppose you could see it? Of course, on local CATV. The coverage of that unique meeting (the school auditorium was packed!) struck me as a really fine piece of journalistic work. It was the talk of the town.

But....for all the local interest, did the local radio, TV and newspapers do anything meaningful with the actual meeting? No.

So you can be sure that there is a single key that unlocks the pocketbook for local origination: understanding what the community is interested in, in terms of local activities.

So, is cable local origination failing? Is it a dead subject? I hope not, for it would mean that a vital part of cable television will have tripped over the lack of discerning the difference between owner ego and interest instead of objectively seeking viewer/subscriber ego and interest.

Unfortunately, the fact that non-subscribers **and** subscribers do not receive a schedule or see schedules printed in local newspapers really distracts from the potential of garnering local interest in local programming. People just don't know it's happening.

The Editor

Notice to Industrial Television users

Industrial Television users are qualified to receive **Broadcast Engineering** free of charge. We invite you to use the Reader Service Cards in the back of this issue to start your subscription and to have further information on products advertised or described in this issue sent to you by the manufacturer. Additionally, **Broadcast Engineering** will be sent to users of CCTV systems in other business special interest areas.

PEOPLE IN THE NEWS

Bert Wolf has been named Vice President and General Manager of Jerrold Electronic Corporation, Distributor Sales Division....**Harold E. Horn** has been named director of field services of the Cable Television Information Center in Washington, D.C. As director of field services, Horn will direct the activities of the center's regional directors, each of whom have responsibility for a specific geographic region of the country....The appointment of **Don Gartzke** as Engineering Manager of Miniature Systems Products, Cablewave Systems Inc., has been announced....Javelin Electronics, Division of Apollo Lasers, Inc., announces the appointment of **R. S. (Bob) Milecki** as Western Regional Sales Manager for CCTV.

William H. Keller, Jr., Executive Vice President of Clearview Cable TV, a unit of Group W, has been named President of Clearview Cable TV....AVA Electronics Corp. has announced the appointment of **Jeffrey B. Rosen** as account representative. Rosen will direct CATV sales activities in the northeastern region....General Cable Corporation has announced that **George Edward Young** has joined as general transportation manager.

OSHA No. 101
Case or File No. _____

Form approved
OMB No. 44R 1453

Supplementary Record of Occupational Injuries and Illnesses

EMPLOYER

1. Name _____
2. Mail address _____
   (No. and street) (City or town) (State)
3. Location, if different from mail address _____

INJURED OR ILL EMPLOYEE

4. Name _____ Social Security No. _____
   (First name) (Middle name) (Last name)
5. Home address _____
   (No. and street) (City or town) (State)
6. Age _____ 7. Sex: Male_____ Female_____ (Check one)
8. Occupation _____
   (Enter regular job title, *not* the specific activity he was performing at time of injury.)
9. Department _____
   (Enter name of department or division in which the injured person is regularly employed, even though he may have been temporarily working in another department at the time of injury.)

THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

10. Place of accident or exposure _____
    (No. and street) (City or town) (State)
    If accident or exposure occurred on employer's premises, give address of plant or establishment in which it occurred. Do not indicate department or division within the plant or establishment. If accident occurred outside employer's premises at an identifiable address, give that address. If it occurred on a public highway or at any other place which cannot be identified by number and street, please provide place references locating the place of injury as accurately as possible.
11. Was place of accident or exposure on employer's premises? _____ (Yes or No)
12. What was the employee doing when injured? _____
    (Be specific. If he was using tools or equipment or handling material,
    _____
    name them and tell what he was doing with them.)
    _____
13. How did the accident occur? _____
    (Describe fully the events which resulted in the injury or occupational illness. Tell what
    _____
    happened and how it happened. Name any objects or substances involved and tell how they were involved. Give
    _____
    full details on all factors which led or contributed to the accident. Use separate sheet for additional space.)

OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS

14. Describe the injury or illness in detail and indicate the part of body affected. _____
    (e.g.: amputation of right index finger
    _____
    at second joint; fracture of ribs; lead poisoning; dermatitis of left hand, etc.)
15. Name the object or substance which directly injured the employee. (For example, the machine or thing he struck against or which struck him; the vapor or poison he inhaled or swallowed; the chemical or radiation which irritated his skin; or in cases of strains, hernias, etc., the thing he was lifting, pulling, etc.)
    _____
    _____
16. Date of injury or initial diagnosis of occupational illness _____
    (Date)
17. Did employee die? _____ (Yes or No)

OTHER

18. Name and address of physician _____
19. If hospitalized, name and address of hospital _____

_____

Date of report _____ Prepared by _____
Official position _____

Fig. 2 FORM 101 that must be kept on file.

tion, which contains the electrical standards endorsed by OSHA. What we have presented here is a general guide to get you started on the right track in a hurry, but familiarization with the regulations will allow you to refine your station's safety program to a point of maximum compliance with the Health and Safety Act.

REFERENCES

1. Volume 37, #202, Part 2 - Federal Register, **Department of Labor Occupational Safety and Health Adm., Occupational Safety and Health Standards.**
2. **National Electrical Code 1971, National Fire Prevention Association.**
3. **Field Operations Manual, Dept. of Labor OSHA,** Commerce Clearing House, Chicago.
4. **Employment Safety and Health.** Commerce Clearing House, Chicago.

Suggested OSHA Check List

OFFICE AREA

1. **Exits unobstructed by furniture or decorations.**
2. Exit areas well lighted.
3. Exits clearly marked.
4. Routes to exits marked (larger buildings).
5. Doors to closets, etc., marked as such so they will not be mistaken as exits in an emergency.
6. **Fire extinguishers installed at proper height.**
7. Fire extinguishers located to be easily seen.
8. **Fire extinguishers inspected for damage and tampering (date on tag) at one month intervals.**
9. Fire extinguishers thoroughly inspected and/or recharged at one year intervals (date on tag).
10. **First-aid kit with contents approved by company doctor available.**
11. Pure drinking water available within 200 feet.
12. Separate toilet facilities provided for each sex within one floor of work area.
13. Toilet paper installed on holder.
14. Covered receptacle available at women's toilet.
15. One couch or bed in ladies rest room if more than 10 women are employed at any one time.
16. At least one washing sink with hand towels available for every 10 employees.
17. Hot and cold water available.
18. Adequate number of waste disposal containers.
19. **Premises clean and sanitary.**
20. **All office electrical wiring in accordance with the National Electrical Code.**
21. Forms 100 and 101 on file and form 102 posted.

STUDIO AREA

1. If the station's studios are not at the same location as the offices, all of the items listed under **Office** will also apply to the studio area. If the studios and offices are at the same location, toilet and wash facilities may be common to both as long as they meet the requirements for the total number of employees in both work areas. **In either case, start the studio check list by** reviewing items 1 to 20 under **Office** to see that studio workers are covered by these general requirements, then proceed with the specialized studio checks listed below.
2. **Fire extinguisher(s) of proper type to handle electrical fires.**
3. All racks and equipment secured so that there is no danger of injury to operating personnel.
4. All equipment cases grounded.
5. All audio and remote control circuits separated from light and power cables by at least 2 inches unless **they are metal clad, sheathed or type UF cable,** unless the circuits can be kept separated by porcelain or flexible insulated tubing.
6. Audio and remote control cable not run in the same raceways as power or lighting cable unless separated by a partition.
7. **All power and lighting circuits in accordance with the National Electrical Code.**

TRANSMITTER

1. If the transmitter is remote controlled, toilet and wash facilities are not required. If, however, the transmitter is manually operated, all of the **Office** requirements prevail in addition to those listed below for protection of maintenance personnel.
2. **All lighting and power circuits comply with National Electrical Code.**
3. **Fire extinguisher(s) properly mounted.**
4. Fire extinguisher of proper type to handle electrical fire.
5. **Fire extinguisher(s) inspected monthly for damage and tampering (date on tag).**
6. Fire extinguisher(s) thoroughly inspected and/or recharged yearly (date on tag).
7. **Nitrogen cylinders secured so as to prevent falling over.**
8. Nitrogen cylinders not dented or gouged.
9. No personnel working in areas with an RF level exceeding $10mw/cm^2$.
10. Radio frequency radiation hazard sign posted in areas where RF exceeds 10 mw/cm^2 10 MHz to 100 GHz.

It is assumed that the safety standards outlined in part 73 of the FCC rules and regulations to prevent a shock hazard to operating and maintenance personnel have been implimented.

This check list is intended to be an aid to OSHA compliance, however, the use of this or any other check list cannot guarantee compliance due to the variation in facilities and situations.

OSHA No. 102

Complete no later than one month after close of calendar year. See back of this form for posting requirements and instructions.

Form Approved
OMB No. 44R 1453

SUMMARY OF OCCUPATIONAL INJURIES AND ILLNESSES FOR CALENDAR YEAR 19__

Use previous edition of this form for summarizing your 1974 cases. This edition is for summarizing your cases for 1975 and subsequent years.

Establishment:
NAME _____
ADDRESS _____

INJURY AND ILLNESS CATEGORY		TOTAL CASES	DEATHS	LOST WORKDAY CASES				NONFATAL CASES WITHOUT LOST WORKDAYS	TERMINATIONS OR PERMANENT TRANSFERS
				Total Lost Workday Cases	Cases Involving Days Away From Work	Days Away From Work	Days of Restricted Work Activity		
CATEGORY	CODE	Number of entries in Col. 7 of the log. (1)	Number of entries in Col. 8 of the log. (2)	Number of checks in Col. 9 of the log. (3)	Number of entries in Col. 9A of the log. (4)	Sum of entries in Col. 9A of the log. (5)	Sum of entries in Col. 9B of the log. (6)	Number of checks in Col. 10 of the log. (7)	Number of checks in Col. 11 of the log. (8)
OCCUPATIONAL INJURIES	10								
OCCUPATIONAL ILLNESSES: Occupational Skin Diseases or Disorders	21								
OCCUPATIONAL ILLNESSES: Dust Diseases of the Lungs	22								
OCCUPATIONAL ILLNESSES: Respiratory Conditions Due to Toxic Agents	23								
OCCUPATIONAL ILLNESSES: Poisoning (Systemic Effects of Toxic Materials)	24								
OCCUPATIONAL ILLNESSES: Disorders Due to Physical Agents	25								
OCCUPATIONAL ILLNESSES: Disorders Associated With Repeated Trauma	26								
OCCUPATIONAL ILLNESSES: All Other Occupational Illnesses	29								
OCCUPATIONAL ILLNESSES: TOTAL–OCCUPATIONAL ILLNESSES (Sum of codes 21 through code 29)	30								
TOTAL–OCCUPATIONAL INJURIES AND ILLNESSES (Sum of code 10 and code 30)	31								

This is NOT a report form. Keep it in the establishment for 5 years.

I certify that this Summary of Occupational Injuries and Illnesses is true and complete, to the best of my knowledge.

Signature _____
Title _____
Date _____

Fig. 3 FORM 102 must be posted at the station.

The eyes of the world are upon us.

Around the world, more people now look to Electrohome for excellence in video equipment than ever before.

We manufacture solid state video monitors in monochrome and color to NTSC and PAL standards for broadcast, educational, industrial, commercial, medical, security and data applications.

The reason for such wide-spread acceptance is two-fold: a standard of quality and a record of service to our customers that have earned our products top rating around the world.

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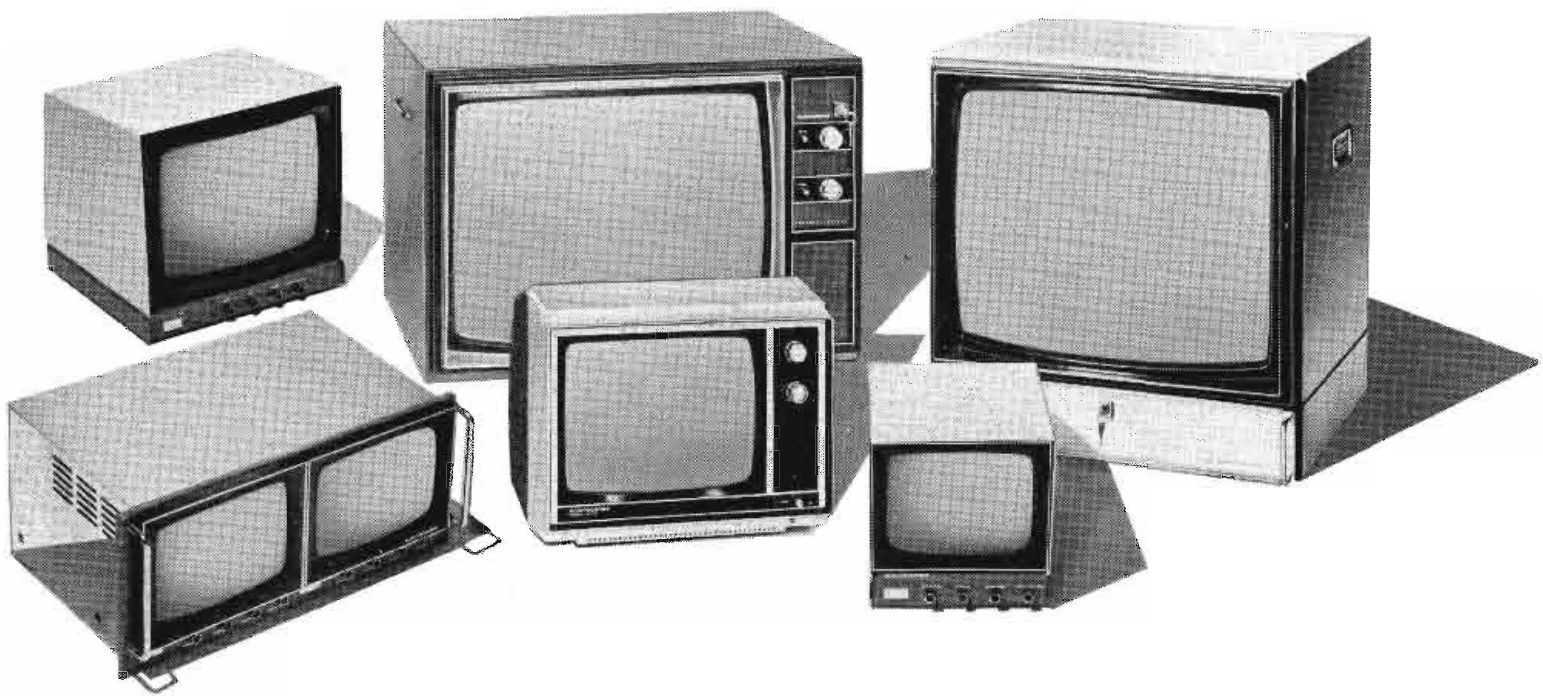
519/744-7111 Telex 069-5449

9314 West 122nd Street, Palos Park, Illinois 60464
312/361-4636

2991 Grace Lane, Costa Mesa, California 92626
714/545-6991



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. . . an extra degree of excellence in video equipment for every application.

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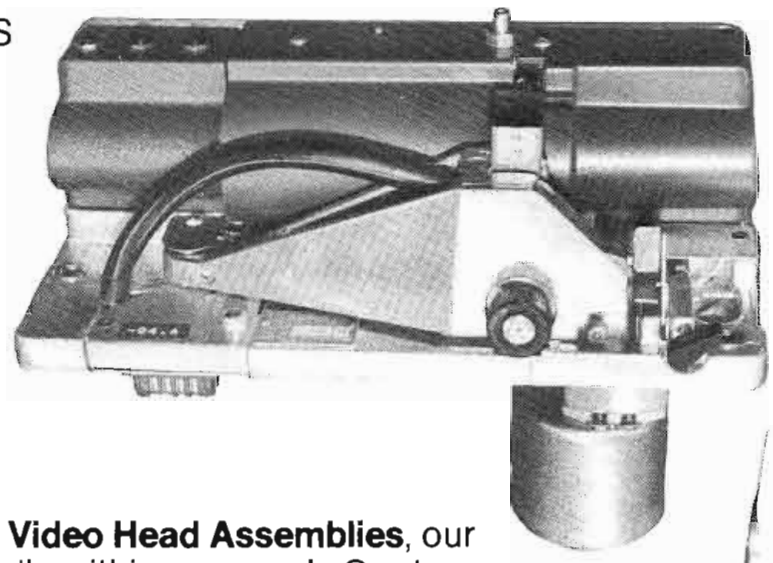
Austria	Denmark	Greece	Malaysia	Norway	Spain	United States
Australia	Eire	Hong Kong	Mexico	Philippines	Sweden	United Kingdom
Belgium	Finland	Italy	Netherlands	Portugal	Switzerland	Venezuela
Canada	France	Japan	New Zealand	South Africa	Thailand	West Germany

For More Details Circle (37) on Reply Card

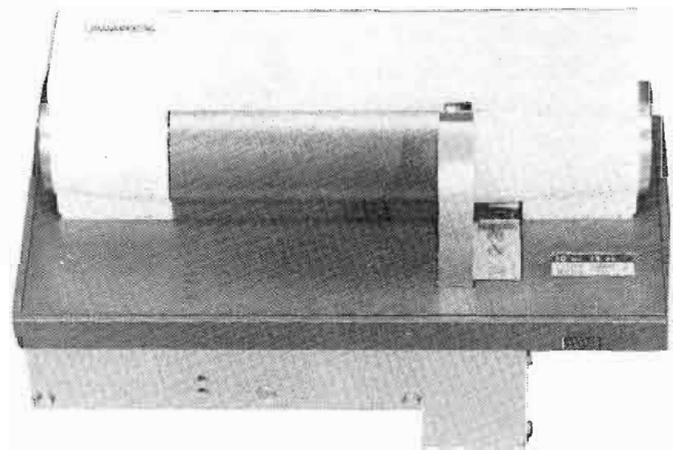
CMC is matching product excellence with the best delivery service in the TV industry.

COMPUTER MAGNETICS CORPORATION has emerged as a major source of quality video tape equipment.

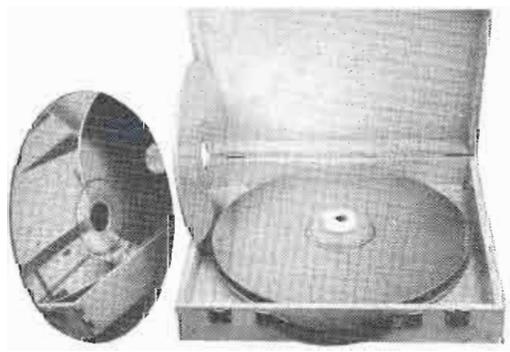
We are a specialty company providing the TV industry with technically superior products, refurbishing capabilities, and very fast delivery.

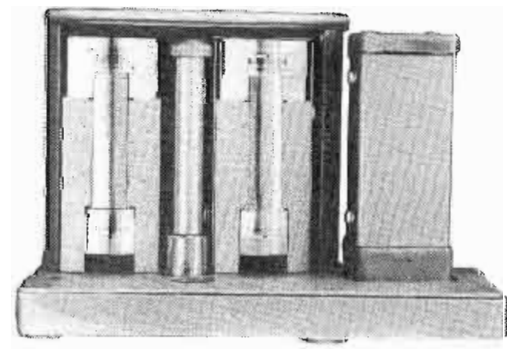


Stations and studios throughout the world have tried CMC when other suppliers failed to produce quality merchandise or to provide speedy delivery. They have not gone back.



For refurbishing **MARK X Video Head Assemblies**, our turn-around time is normally within one week. Our turn-around time for **MARK XX Video Head Assemblies** is two weeks maximum. **VIDEO DISCS** and **HEADS** for Slow-Motion applications are in stock and ready to ship. **AUDIO STACKS** are rebuilt with superior quality heads, and they are in stock for IMMEDIATE delivery. Our **dual track AUDIO** record/playback heads are used for producing stereo sound or bi-lingual tracks on the same tape. We also manufacture special **HEADS** for high speed duplication, and for digital applications.





For more information, please write:

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Burbank, Calif. 91502
(213) 849-2356

Glentronix, Ltd.
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For More Details Circle (38) on Reply Card

Globecasting

People's Republic of China moving into television

By Joe Roizen

The upper floors of the Peking TV Center carry a 30-foot high portrait of Chairman Mao. Those huge Chinese characters above it say "Long Life to Chairman Mao." The cupola supports the TV transmitting antenna and microwave dishes, topped by the Red Star.

(Photos by Donna Roizen)

Among the major communicative media in the People's Republic of China, television still plays a relatively minor role. Newspapers and street posters display and carry the printed (or painted) word while a widespread multi-channel radio service transmits the aural message.

Every area of this huge society is pervaded by broadcasts in AM and FM that can be heard over portable "transistors", regular home receivers or loudspeakers in public places. Visiting a commune or walking down a main street of Peking, one will encounter such speakers mounted on roof tops or on lamp standards. Even railway cars or train compartments have speakers continually carrying radio or recorded messages and music.

By contrast, very few TV receiving antennas are visible anywhere. Except for the rare folded dipole with a single director and reflector on a major building, hotel, or communal meeting center, the roof tops of Chinese cities are still devoid of the metal jungle that has sprouted in most television oriented countries.

Television sets are on sale in a few major department stores, but even a small nine inch monochrome receiver sells for about 450-500 Yuan (225-250 dollars) and with the median wage in the P.R.C. at 60-70 Yuan a month, it is not within the range of most Chinese citizens. In travelling through Peking, or in the country-side, one fails to see the familiar "blue glow" emanating from darkened living rooms that is so prevalent elsewhere. Major hotel lobbies will have a quiet corner in the visitors' club or recreation room where a TV set is available for guests to watch.

Receivers

The sets we saw were built in Shanghai and carried that brand name. Most were 14" to 17" tube type receivers in table top wood cabinets of a design reminiscent of the early fifties in the USA or Europe. We also saw smaller, newer hybrid receivers with nine inch screens, detent tuners, plastic moulded cabinet parts, and more modern esthetic design (see photo) which produced a good monochrome image. No color receivers were either on display or in use in any of the places we visited in Peking although we were told that a few such sets made in the P.R.C. were being experimentally applied at local technical institutes or TV facilities for evaluation of color broadcast that had recently started.

The last estimate of numbers of receivers in the People's Republic of China that was provided by them was in 1965 and indicated there were 300,000 sets in the country. Present estimates made by TV equipment representatives who have visited China regularly is in the order of one million. There seems to be no major importation of foreign built receivers and one Canadian company (Electrohome) who exhibited receivers at a trade fair in the P.R.C. in 1972 reported that no quantity sales were made by them. Indeed, the Chinese ask for diagrams and fabrication information from most manufacturers who display their equipment and usually buy only token or sample quantities of the material shown. Fairly recent articles in foreign language magazines published in Peking for distribution to tourists and Sinologists abroad show pictures of Chinese students or workers at technical institutes and factories producing or testing monochrome and color television receivers.

Large department stores in Peking displayed a variety of TV sets, but there seemed to be little selling activity on the few occasions we were in the store. These retail outlets however have well stocked electronic parts supply departments selling components which can be used to build radio and TV sets and there are plenty of "self help" instruction books in paperback with circuits and fabrication information. While the narrative is in Chinese, most of the technical nomenclature and numerical identification is in English. People are apparently being encouraged to build their own electronic gear, not only make it economically possible but also to spread the technology to a wider base. Technicians and engineers who came to the Peking Exposition grounds to visit the color TV exhibit we were working at generally asked very specific details about the construction of home TV receivers and sub-assemblies, including shadow mask and Trinitron-type picture tubes.

TV Coverage

It was difficult to obtain specific information with regard to the television coverage throughout the People's Republic of China. Two rather lengthy visits to Peking TV and discussions with groups of television engineers failed to uncover any specific facts, however discussions with several television industry representatives in Hong Kong who visit China frequently on business provided some useful information. There are about 15 television centers operating in China with approximately 60 major transmitters. Television channels operate on VHF (as evidenced by the antennas we saw) and is on from approximately 7:00 to 10:30 pm in Peking, and presumably the same in other cities.

Programming starts with a daily news round-up that is mostly local (i.e. P. R. C.) and may be repeated on several successive days. The news leans heavily towards reporting significant internal accomplishments, with emphasis on exceeded quotas at coal mines, oil fields, or agricultural communes. International news is on a few times a week and consists mainly of labor disputes, workers' demonstrations, and other manifestations of what the Chinese consider as class struggle in the western world. As an example, we saw a film report of a major strike in Italy with hordes of

Mary Tyler Moore on Hong Kong TV with Chinese subtitles is acceptable. How about Kung Fu with Chinese subtitles?

sign-carrying marchers going by the ancient Coliseum in Rome. This was given prominent air time and shown on several days.

After the news, there may be local coverage of a basketball game or a ping-pong match at the Sports Palace. On other evenings, they present Chinese movies or the Peking Opera doing classic and modern Chinese dramas. All of the presentations are usually referred to as revolutionary and represent the contemporary views blended in with old artistic form.

Foreign visitors who have been shown television facilities, as recently as a year ago, reported that most of the cameras and telecine units were actual or similar to Soviet built TV cameras using vidicons and orthicons. British sources in Hong Kong report the continuing sale of camera pick-up tubes of this variety in considerable numbers further verifying the use of this type of equipment.

Most of the television programming up to now is on film. We frequently saw local crews from Peking Television shooting news events, such as the French Trade Fair, the official visits to the exhibits, and foreign dignitaries (like Ted Heath of the U.K.) who came to Peking while we were there. Film coverage was done with 16mm Bolex cameras, mostly hand-held and using turret lenses. Portable lighting came from belt battery packs and quad lamp pods carried by separate crew members. One of the three movie photographers we saw frequently was a young woman in her mid-twenties who manipulated her Bolex with obvious skill. Film used was Eastman Ektachrome and processing is done in a unit that was left behind by a CBS film team that did a documentary on China. Foreign films are also used, but they are generally from countries with strong political ties, such as Albania, North Vietnam, North Korea, etc.

The U.S. liaison office in Peking reports that film clips supplied by them which come from USIA or other American Government sources are occasionally put on the air, but the Chinese add their own commentary which often puts a very different connotation to the images. Visits of foreign dignitaries friendly to the P.R.C. are filmed and put on TV the next day. A recent visit by an African head of state was covered live and relayed back to his home country. Solidarity with third world countries is a very popular thing.

The P.R.C.'s link with the outside world through earth satellite stations came about as a result of the visits of President Nixon in 1972 and the Japanese Prime Minister Tanaka. This prompted delivery and installation of two NEC and one RCA satellite earth receiving stations which were purchased by the Chinese and remain in service there.

Video tape recording is just beginning to be used in the P.R.C. Visitors to the Canton Trade Fair have reported seeing pictures supposedly generated by a Chinese built VTR. They have also purchased recently eleven quad video tape recorders which are being installed in Peking, Shanghai, Canton, and Tienstien. There are also at least ten one-inch helical recorders and some cassette units spread throughout the TV centers, technical institutions, and earth satellite stations.

TV And Politics

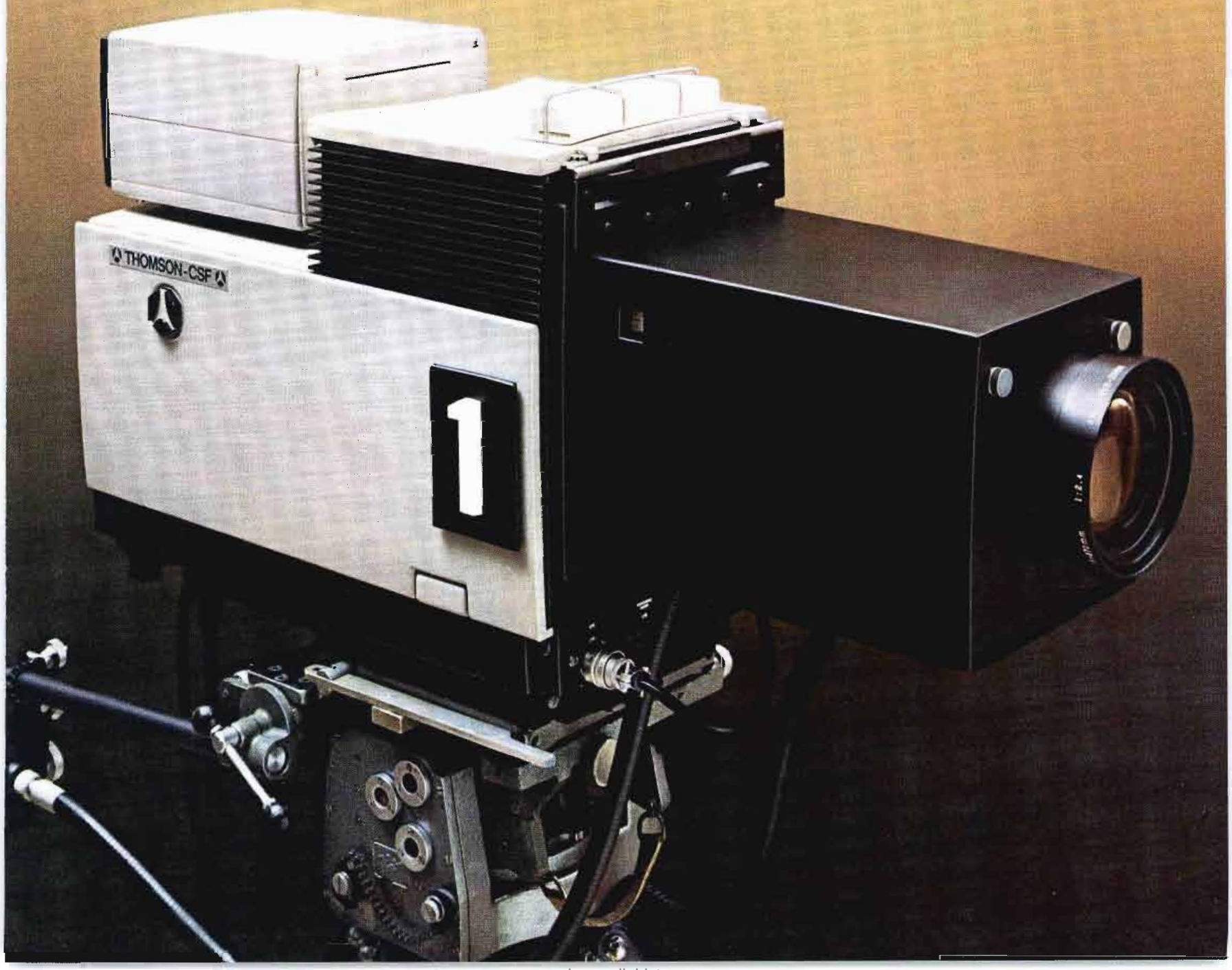
A number of interesting facts about television in and around the P.R.C. were available in Hong Kong. Because there is a continuing and deep dichotomy between the social systems of the P.R.C. and some of its nearest neighbors (and others), there are continuing efforts to record and analyze the political

(Continued on page 71)

Triax Color comes of age

THOMSON-CSF TTV 1515

Now used in the CBS Television mobile units



PROVEN TRIAX

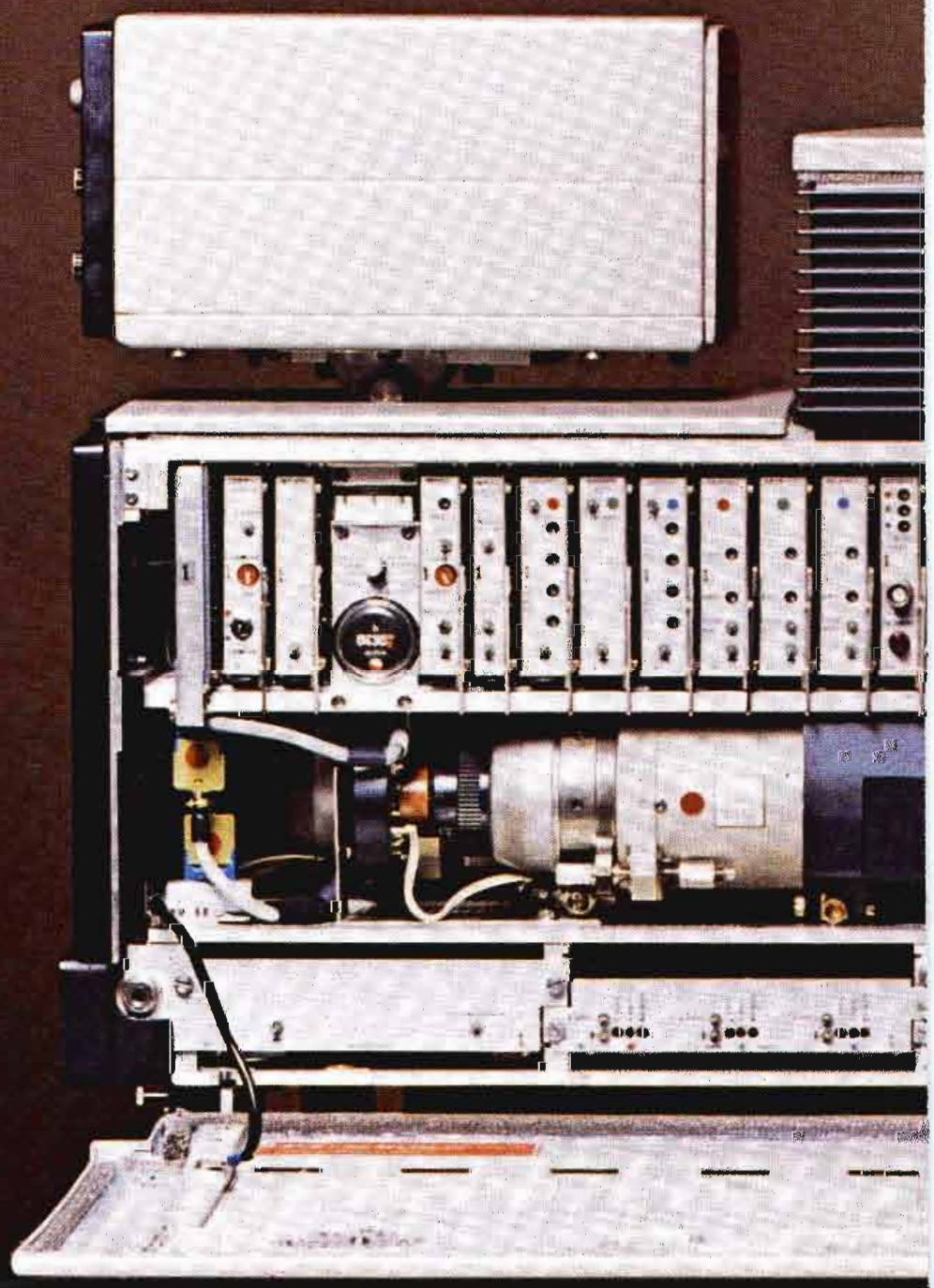
THOMSON-CSF TTV1515

- **Over 3 trouble-free years of field service**
- **Over 300 now in service**
- **Used by CBS to cover field events**

Thomson-CSF has been one of France's major electronics companies since 1893. Today, it's the largest corporation in France for professional electronic equipment, with over 48,000 employees. The parent corporation, Thomson-Brandt, has over 98,000 employees.

Thomson-CSF took a leadership position early in triax color cameras. Its first patents on circuits for this camera were granted in 1964. Before the end of 1971, the TTV 1515 was already the world's most field-proved triax color camera. Today, over 300 are in service.

It all adds up to be the most successful camera in triax color TV. Join the Thomson trend. Win the economy, reliability and picture quality of the true third-generation color camera. The one that works. The TTV 1515 by Thomson-CSF.



Features:

Uses triax cable . . . 1/5 the weight of TV-81. Your mobility zooms. Set up and strike time drops way down. Van space suddenly holds many times more cable footage. You start with dramatic cost cuts on cable and connectors . . . then continue with years of manpower savings.

Converts from triax to ½ inch multiconductor cable with a five minute switch of plug-in circuit boards.

Automatic synchronization. A miniature sync generator built into CCU restores, from mixed sync only, all signals usually derived from external sync . . . blanking, drive, etc.

Three 30 mm. separate mesh tubes, along with dynamic focus correction, provide excellent corner to corner resolution.

Pick-up tubes removable from rear without disturbing deflection yokes.

Head amplifier surrounds target for full shielding. The quietest picture you've ever seen.

Continuous automatic registration. A unique concept: reference windows in the optical path continuously correct vertical and horizontal centering and size.

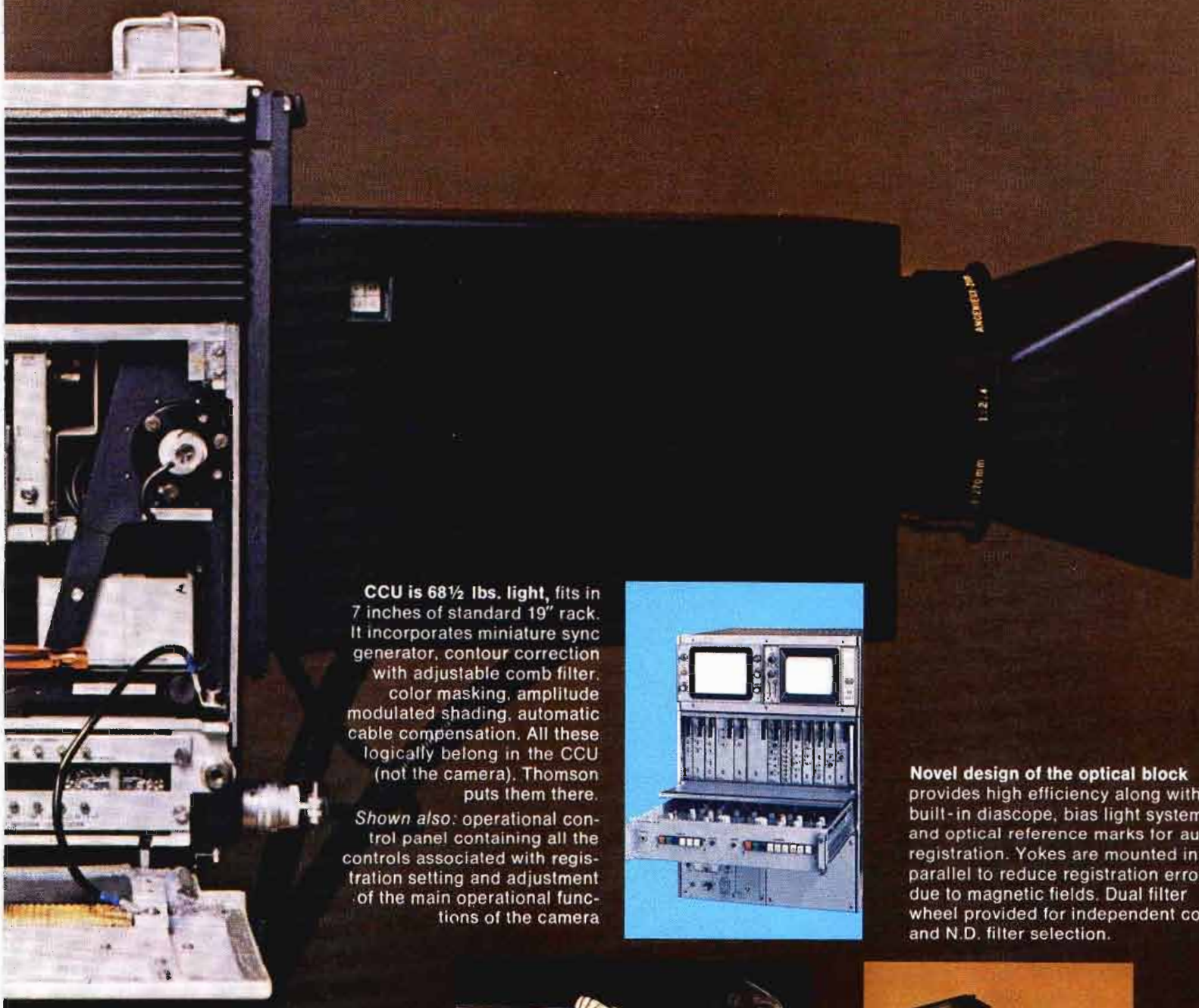
Superb low-light picture capability . . . lighting levels down to 10 foot-candles.

Automatic cable compensation with up to 1¼ miles of triax.

Contour correction with adjustable comb filter.

Separate RGB outputs, enabling color coding in all existing systems: SECAM, PAL,

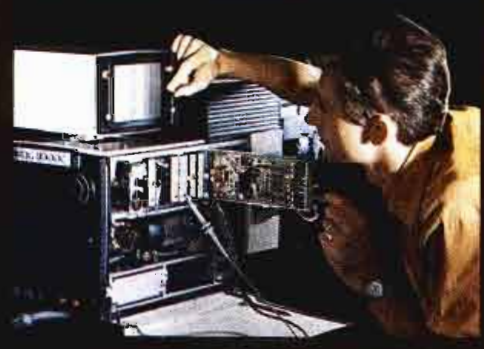
RELIABILITY



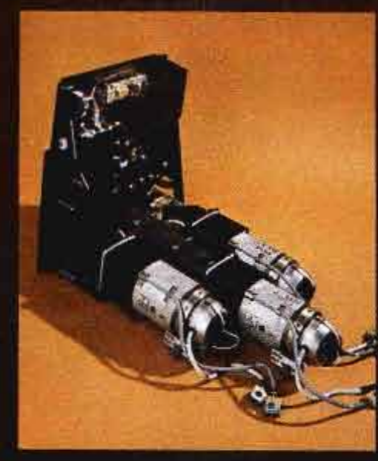
CCU is 68½ lbs. light, fits in 7 inches of standard 19" rack. It incorporates miniature sync generator, contour correction with adjustable comb filter, color masking, amplitude modulated shading, automatic cable compensation. All these logically belong in the CCU (not the camera). Thomson puts them there.

Shown also: operational control panel containing all the controls associated with registration setting and adjustment of the main operational functions of the camera

Novel design of the optical block provides high efficiency along with built-in diascope, bias light system and optical reference marks for auto registration. Yokes are mounted in parallel to reduce registration errors due to magnetic fields. Dual filter wheel provided for independent color and N.D. filter selection.



Downtime virtually eliminated. Instantly-accessible plug-in circuit boards can be changed in seconds. No trouble-prone multi-layer circuit boards.



NTSC . . . or all three simultaneously for world-wide live broadcasts.

Ultra-stable digital and RF multiplexing.

Wide range of zoom lens packages with manual or servo controls.

Unique built-in diascope . . . no add-on "black boxes" in front of lens.

Viewfinder tilts, swivels, locks and operates remotely.

The light one: camera only 77 lbs., viewfinder 11 lbs.

DRAMATIC SAVINGS IN SET-UP AND STRIKE TIME

In just three hours of strike time, a TV crew had their TTV 1515's on the road after covering a professional football game. The next morning they were set up in a city 100 miles away to cover an awards banquet. That's triax mobility and economy in action!

Thomson-built mobile van shows the dramatic compactness possible with TTV 1515. Van carries four cameras, all control equipment, enough triax cable for most events, plus crew!

THOMSON-CSF

THOMSON-CSF, Inc.

Broadcast Products 750 Bloomfield Ave., Clifton, N.J. 07015/(201) 779-0216

Corporate 75 Rockefeller Plaza, New York, N.Y. 10019/(212) 977-2200

Printed in U.

Donna Roizen with Chinese interpretors and operators setting up display panels for the color television exhibit. In the background is some of the terminal equipment used to defuse color television images to monitors placed in the main hall stairways of the exposition building.

(*Continued from page 66*)

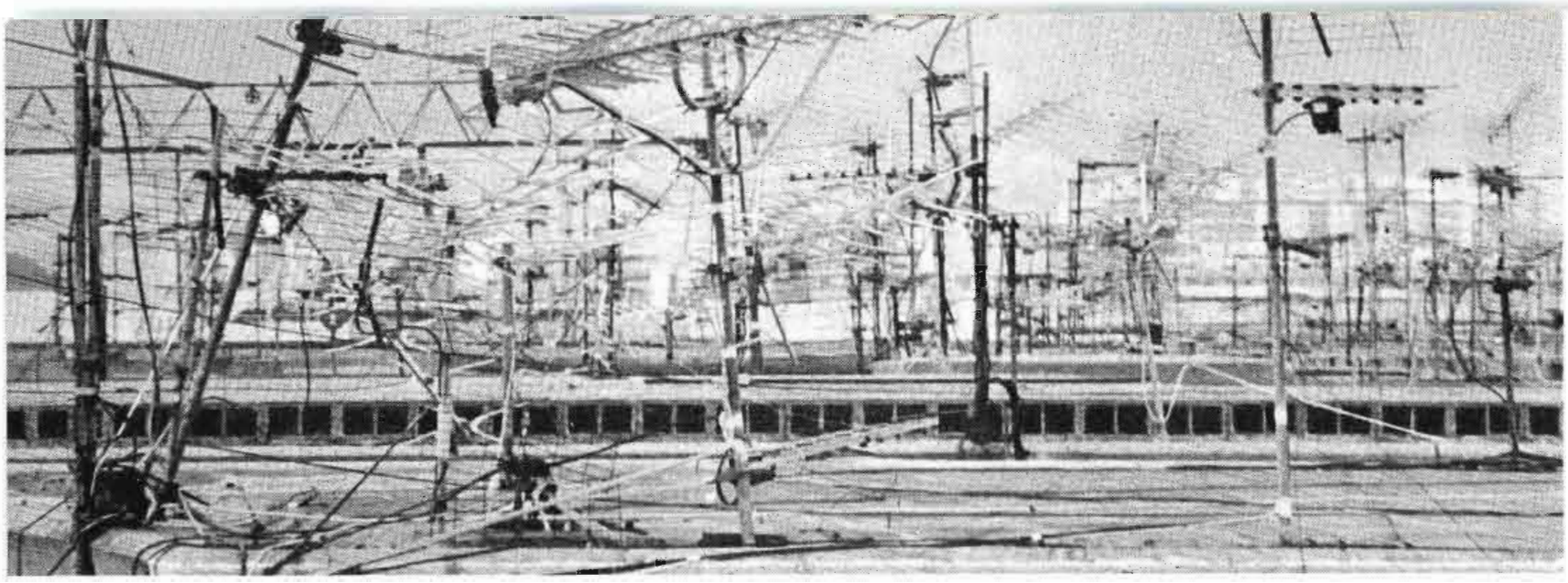
undertones of TV programs on both sides.

A huge antenna on a mountain top near Hong Kong picks up Canton broadcasts and these are recorded on helical VTR's. The tapes are then flown to a U.S. base for review and analysis. Similar activities are carried on in the P.R.C. with regard to TV programs originating in Taiwan. These are also recorded (ironically on the same make of VTR's) located at the coastline, then analyzed in other areas.

The most unusual and unexpected use of television by the P.R.C. is the purchase of commercial time on the two Hong Kong TV stations for the promotion of products manufactured in China and sold through four large department stores located in Kowloon and Victoria. Frequent spots advertise Chinese herbal medicines, furniture, food products, artifacts, souvenirs, antiques and jewellry. The stores themselves have such un-Communist features as summer sales with 10 percent off, acceptance of many varieties of credit cards and highly visible poster ads.

Color Television

Interest in color television by rank and file Chinese was quite evident from the large crowds our color TV exhibit attracted in relation to other technical exhibits at the Peking Exposition. It was necessary occasionally to shut off the programming in order to have groups move away and leave room for new visitors. The technical groups who came to our exhibit were most anxious to sit through slide presentations on color television theory and to ask detailed questions about the color cameras,



The roof-tops of Hong Kong reveal a helter-skelter UHF antenna jungle.

monitors, and VTR's we had on display, as well as other equipment that we did not.

A succession of foreign trade fairs and a variety of visits by heads of state from countries that brought in their own color television equipment has resulted in at least 18 color cameras from major manufacturers being acquired by Chinese television. Since the color television standards in these countries are different, the equipment purchased or left over also covers the three major color TV systems.

The People's Republic of China has not yet officially selected a color television standard, but they are presently conducting tests in Peking on a modified PAL standard with transmission in color for a few hours, three days a week. A European diplomat who brought a PAL receiver to Peking reported seeing Chinese movies in color on his set from time to time. There are also persistent rumors that experimentation with SECAM and NTSC is going on in Shanghai at a color TV research facility. This is being done with encoding and decoding equipment purchased from Thomson-CSF and gear that remained after the Nixon visit. The best guess at present is that the P.R.C. will adopt the PAL standard modified for the transmission channel they used for their regular television.

Television in the People's Republic of China is still in its formative phase and provides a base from which the expansion of services similar to that which has occurred in other countries can be achieved if the national goals require it.

Personal Comments

China is geographically the second largest country in the world with a population of over 750 million people. Spending a little over one month in such a vast and different society is an incredible experience which we are not likely to soon forget. Though it was a short visit, it did give us an opportunity to examine some aspects of the communications field in that country, and to report on what we found.

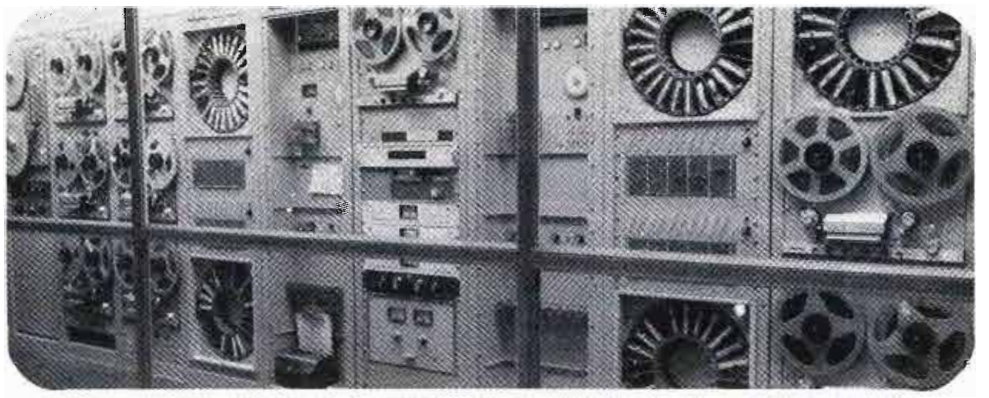
Unfortunately, there is still a strong reticence on the part of officials of the Information Ministry or members of the television industry in the P.R.C. to supply many details regarding local TV services or disclosing technical information about equipment.

Our own mission in the P.R.C. was to equip and operate a small color TV studio typical of closed-circuit installations in medical or educational centers in Europe or the USA. We were using color television equipment operating on the SECAM standard since this was a French exhibition. The gear we had in Peking was a mixture of French, Dutch, American and Japanese manufacture, with prerecorded programming coming from France, the USA, and UNESCO.

For 17 days, we had a steady flow of general visitors who came to see our color television operation and experts who asked detailed questions about the equipment on display and other subjects related to color television. The main interest seemed less in learning how to use what we had, but more towards finding out how to build their own versions of cameras, receivers, and tape recorders. We visited the Peking Television Center on two separate occasions and had lengthy technical discussions with different engineering groups concerned with video tape recorders and other studio equipment.

After leaving the People's Republic, we also visited both commercial TV stations in Hong Kong, where we were able to get a different view of some unusual P.R.C. television activities. Lastly, we talked to various "Old China Hands" who live in Hong Kong and represent a variety of U.K., European, and American manufacturers of broadcast television equipment. These people have made frequent trips to China in the course of doing business with the P.R.C. over the last ten years and could fill in some of the gaps in our knowledge.

From these fragmented inputs, we were able to put together an image of Chinese television in the P.R.C. which is far from what we would have liked. Hopefully, as diplomatic and cultural exchanges grow between China and the western world, there will be a greater interchange of information about television and its role in the People's Republic of China.



Photos of Radio Comerciales S.A., Guadalajara, Jal., Mexico

How to get your share of the Latin American broadcast market.

Right now, there are close to 6,000 radio and television stations in Spanish-speaking areas of the world. Competition among stations is keen. To remain competitive - and keep pace with Latin America's rapidly growing economy - their equipment must be kept in top condition. Clearly, a substantial market exists for all kinds of broadcast equipment and components. New and used.

One publication — RADIO y TELEVISION — serves this vast purchasing potential. It provides saturation coverage among buyers and those who influence purchasing at broadcast facilities throughout Latin America and Spain. Owners, managers, engineers and technicians at commercial and educational radio and TV stations, recording studios, electronic equipment manufacturers and related businesses.

As the Spanish-language counterpart of Broadcast Engineering, RADIO y TELEVISION delivers technically-oriented editorial aimed at helping readers to select, operate and maintain equipment and components for maximum **signal quality.** This unique content provides the precise environment that induces buyer receptivity. It enables advertisers to "sell the broadcaster when his mind is on signal quality."

There's a lot more to the story. And we'd be happy to give you more information about this unique medium and the dynamic market it serves.

Radio y Televisión

The technical journal of the Latin American broadcasting industry.

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Farinon Makes It...

Portable, Tunable and Superior

The new FV Portable Microwave Series for Video Transmission from 1.99 to 13.25 GHz

- **Tunable across the band without narrow-band preselection** — For example, the FV(13)P system for TV broadcasters is tunable from 12.7 to 13.25 GHz, with up to 12 crystal-referenced operating frequencies, with no filter changing.
- **Direct frequency-generation at output frequencies** — No energy-wasting, noise-producing multiplier stages.
- **Plug-in units provide baseband options** — Up to three subcarrier channels, clampers, video monitors, modulators and demodulators.
- **Up to 500-foot cable separation of RF and remote units at each end** — without video roll-off or need for equalization.

and these performance characteristics:

- **±.002% frequency stability**
- **60 dB signal-to-hum ratio from dc to 10 kHz**
- **70 dB signal-to-noise ratio from 10 kHz to 5 MHz**
- **1 watt RF output from 6.875 to 13.25 GHz;** 5 watts output from 1.990 to 2.110 GHz

See Farinon's new portable microwave in Booth 1005-S at the NAB Show.

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... in Canada: Farinon Electric of Canada, Ltd., 657 Orly Ave., Dorval, P.Q. H9P 1G1, Canada.
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Farinon

For More Details Circle (41) on Reply Card

If You're Spending Too Much On Tape, Dictaphone Can Show You How To Cut Down.

When it comes to voice logging, the slower the better. The more tape you use, the more money you spend. Our new 400 Logging Recorder is not only slower and better, but, when teamed with our 4400 Time Code Generator, also surer.

How does it save you so much tape? Easy. First of all, the 400 gets more than 300 hours of audio on one 3600 ft. reel of ¼", 1.0 mil tape. That's 24 hours a day solid recording for 12 days, with one manual reel reversal. Or, you can run the 400 unattended for 6 days, while the 400 does all the work.

All that time is also about twice the normal time you get from other loggers. That means you cut your tape costs by at least half.

But being super slow is not the only thing that makes the 400 better. Just check out some of the other features. If a tape should break, a stand-by system can automatically be triggered to take over. Transport control circuitry notes the failure and the memory logic system remembers the track and direction at the time of the break.

New 400 Logger — Now in Production at Mountain View, California

A power failure can't fool the 400 either. The memory will restart the logger in exactly the same operating mode when power is restored.

The entire transport deck of the 400 pivots out for quick, easy maintenance and testing. All electronics are in a slide drawer for the same purpose. And you can get separate or simultaneous monitoring of up to four tracks. The 4400 Time Code Generator adds a new dimension to the 400. With it you can encode time without dedicating an extra track. It gives you an even surer record—the exact words at the exact second they were spoken. That can save you a lot of worry.

The 400 Logging Recorder and the 4400 Time Code Generator—together they can save you everything you want a logger to save. And more.

For more detailed information and prices on the 400 and 4400, call or write:
Dictaphone 475 Ellis Street, Mountain View, California 94040.
(415) 968-8389 TLX 345524

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Scully | Metrotech Division

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Audio console roundup *PART 2*

In the December issue of BE, we covered a wide range of consoles from a number of manufacturers. Frankly, we ran out of time and space, so a brief Part 2 obviously was needed.

There is no doubt that the broadcast industry is not isolated from the economic problems that confront us as we attempt to get the year moving. None of us can be too certain about how things will be shaping up even a month from now. But there is something you can plan on: competition.

Competition fits into the scene like it always has. And at any station, the way you sound...or should sound...is a competitive point that cannot be overlooked. So it is that, while we might find the purse strings tightening here and there, it still - competitively - is important to continue our consideration of how we handle what sound we have.

We predict that consoles and electronic (live) journalism will again be hits of the NAB show, and these added consoles are sure to be among those attracting interest.

Let's get started with Autogram, a Texas based manufacturer. Autogram also manufactures consoles for other companies.

Autogram AM-8 Console Features

Autogram uses Daven step attenuators, and it includes - in the AM-8 version - 4 microphone and 4 phono preamplifiers. This unit has 27 inputs, and all are transformer balanced except the phono preamp.

Other features include: cassette input jack; line out switch; large illuminated VU meter; two regulated power supplies; plenty of head room on all channels; all input/outputs on terminal strips, and 8 push switches for remote deck starts.

The AM-8 also includes a separate cue amplifier with a speaker.

Collins Audio Consoles

Collins Radio, part of **Rockwell International Corporation**, has designed its new IC-6 (6 channel) and IC-10 (10 channel) broadcast audio

consoles to provide complete plug-in versatility and interchangeability of amplifier modules to meet the changing requirements of present and future AM and FM broadcast operations.

The new consoles provide these features: all-solid-state construction, integrated circuit phono preamplifiers, shielded plug-in modules, 15-Watts RMS monitor output, rear or bottom cable entrance, remote control functions, stereo and mono headphone jacks, stereo audition, two separate stereo monitor outputs, and a minijack input for cassette players.

All consoles in this series are wired for both monaural and stereo capability. Stereo performance can be added to a monaural console simply by adding the desired plug-in amplifiers and/or transformers. Both the IC-10 and IC-6 (stereo and mono versions) come equipped with stereo input attenuators that control the left and right chanels simultaneously. The plug-in preamplifiers are interchangeable in any channel at any time, as formats or operations change.

RCA Custom Audio Consoles

We all know that RCA manufactures a wide range of audio consoles. We thought you'd be interested in seeing an example of their custom line. In this case, the BE-100, shown in the foreground of the photo. (The BC-50 is at the top of the photo.)

As you can see, the BC-100 is a modular audio console. And it is this feature that allows infinite inputs, infinite outputs and infinite switching.

The package includes operational amplifiers, high level input modules, mixer modules, equalizer submodule, Iso-mix submodule, and a monitor control module. By adding modules or mixing combinations, this approach to the audio console allows anyone to select a simple or sophisticated system. Or, the option to build on.

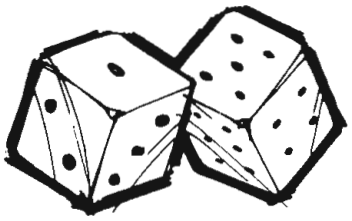
You'll note from the picture that there's ample evidence that RCA consoles are state-of-the-art.

Where It's All Going

There was a time when the Chief Engineer had a choice...although not the ones he wanted. He could modify a new console to fit the specific station needs, or he could design and build his own. But now the choices are so deep, and the prices so attractive among the alternatives that this practice should be a part of broadcast history.

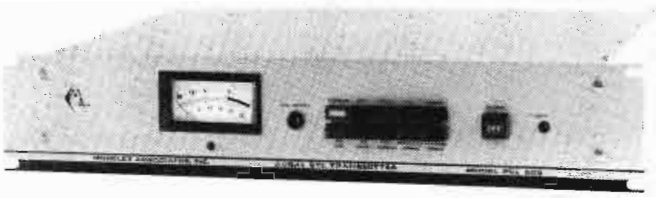
Still, one has to wonder why so many stations prefer to build their own audio remote equipment.

As we've warned before, such a vital operational tool as the control console ought to be given plenty of consideration before it is purchased. It should be a team buy, where current and future needs are used as a basis of judgement. As this two-part roundup of consoles has shown, there is a console designed for everyone already on the market.



DON'T GAMBLE YOUR AUDIO . . .

provide your own program interconnecting links. All solid-state aural studio-transmitter and remote pickup links are available to fulfill almost every requirement. Moseley Associates, Inc., has pioneered many STL and remote pickup concepts — solid-state systems, true direct FM modulation, and composite operation (FM stereo on a single link)...just to name a few. Front-panel metering of all important parameters is included on all Moseley STL and remote pickup transmitters and receivers.

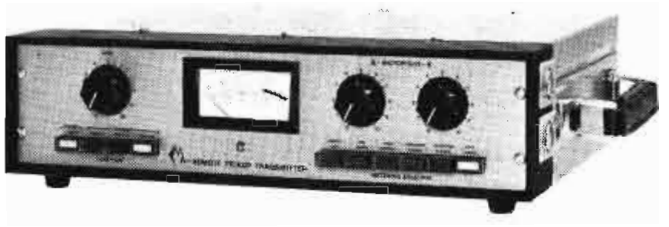


AURAL STUDIO-TRANSMITTER LINKS

PCL-101 — AM Mono — 148 to 960 MHz
PCL-505 — AM/FM Mono — 148 to 960 MHz
FM Stereo (Dual)
PCL-505/C — Composite Stereo — 148 to 960 MHz
(Single Link for Stereo)

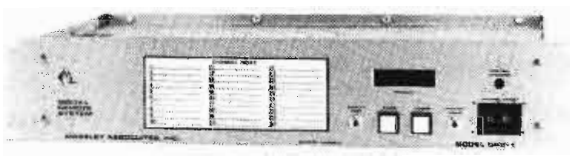
AURAL REMOTE PICKUP LINKS

RPL-3 — 2 microphones, 1 line — 148 to 174 MHz
RPL-4 — 2 microphones, 1 line — 450 to 470 MHz
AMP-3 and AMP-4 Companion RF Power Amplifiers



DON'T GAMBLE YOUR AIR TIME . . .

on unproven transmitter *remote control* systems. Moseley Associates Remote Control Systems are field proven at numerous installations. Two basic types of systems are available — analog and digital. Both systems can be operated in either a wire or wireless mode.

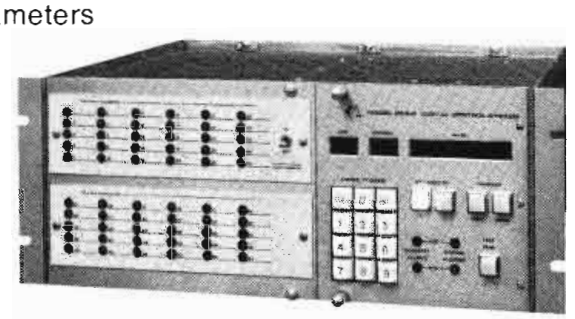


ANALOG REMOTE CONTROL

- TRC-15A — 15Channels — Push-button Channel Select

DIGITAL REMOTE CONTROL

- DRS-1A Digital Remote System —
  - ☐ Up to 30 Channels
  - ☐ Companion 24-Channel Status Subsystem
  - ☐ DLS-1 Digital Logging System Records up to 20 Parameters
- DCS-2 Digital Control System —
  - ☐ Up to 90 Channels
  - ☐ Multiple-Transmitter Site Operation
  - ☐ Up to 60 Status Channels
  - ☐ PLU-1 Parameter Logging Unit Records up to 20 Parameters
  - ☐ Computer Option — Allows Computer-Assisted Operation, Even Full Automation



ENTRUST YOUR AUDIO AND AIR TIME TO US!

There is no gamble in using Moseley Associates equipment. While attending the NAB Convention in Las Vegas, please visit us in Booth 305-N. All items shown above will be on display—as well as stereo and subcarrier generators. Win with Moseley systems.

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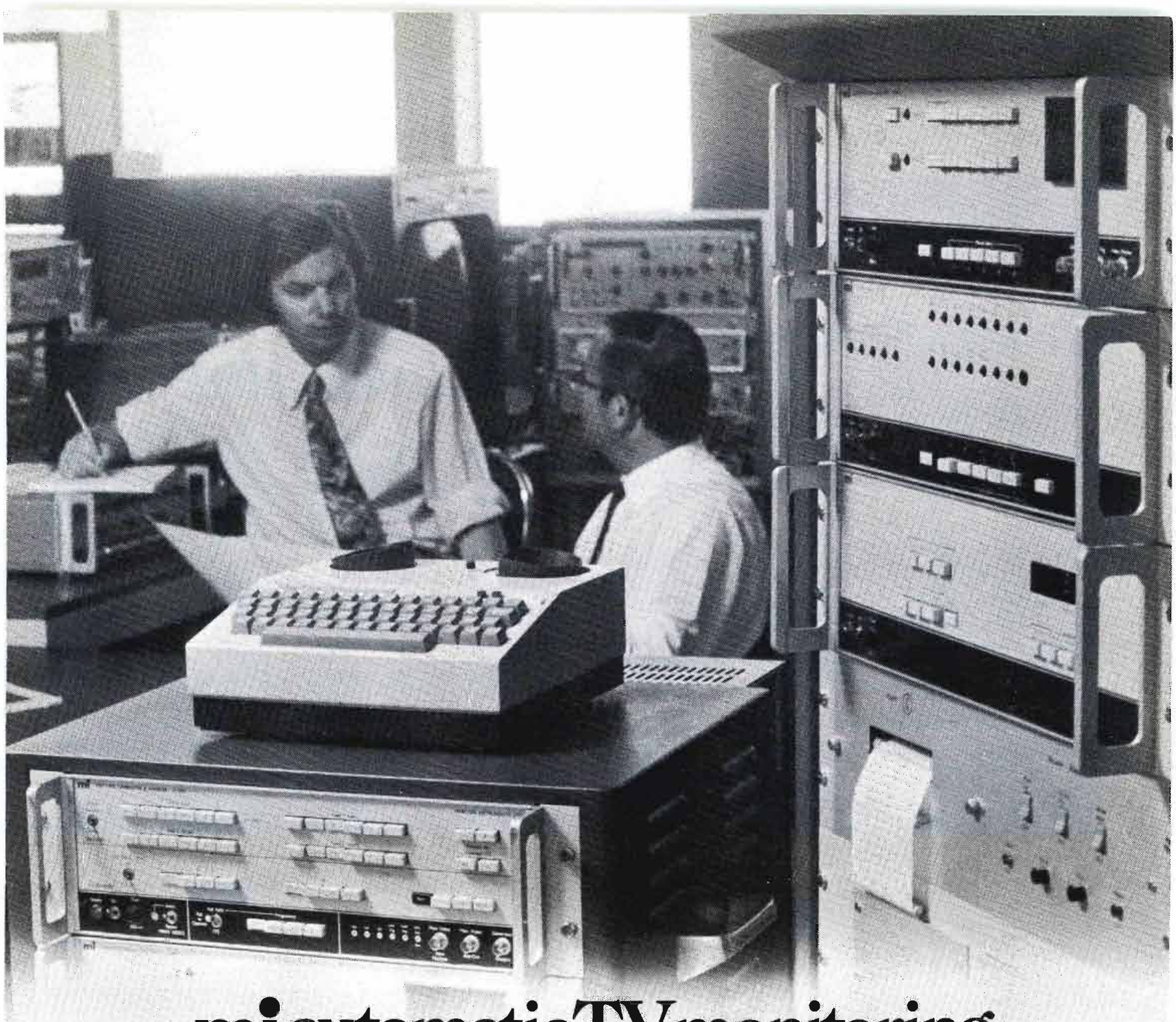

mi automatic TV monitoring sets free the engineers

Time was when highly trained transmission engineers had to waste their brains (and their time) watching a battery of waveforms and pictures– instead of concentrating on work more worthy of them.
Now the TV monitoring scene has been transformed. For TF2914 Insertion Signal Analyser, TF2915 Data Monitor and TK2916 Data Selector together form THE FIRST COMMERCIALLY AVAILABLE AUTOMATIC TRANSMISSION MONITORING SYSTEM.
In conjunction with a test line signal generator and inserter (such as **mi** TF2913), it will automatically cycle through the measurement of all the important parameters of the test line signal from five separate inputs. Comparison with pre-selected limits is continuous, and an 'out of limits' fault can initiate executive action by automatic switching to standby, with remote alarm indication and simultaneous data transmission of fault location.
Up to 16 parameters can also be measured manually by means of pushbutton selection and a self-contained digital voltmeter. Versions are available for all TV standards and over 40 systems have already been delivered to seven countries world-wide.
Like to know more? Feel free to ask for the full facts.

See us at NAB Booth #212, North Hall

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747

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yes it's TRUE...
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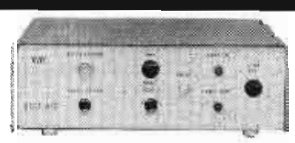

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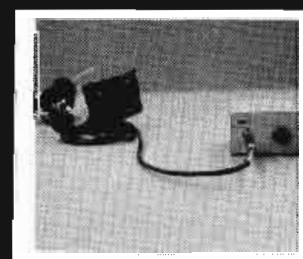

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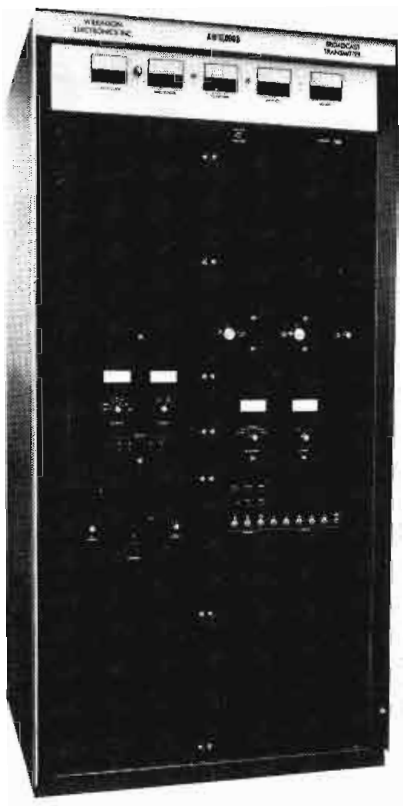

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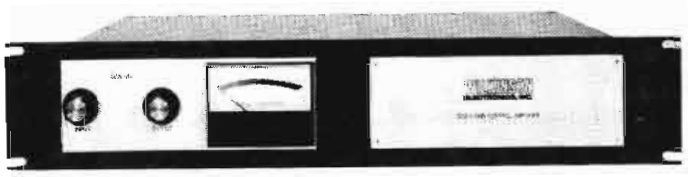

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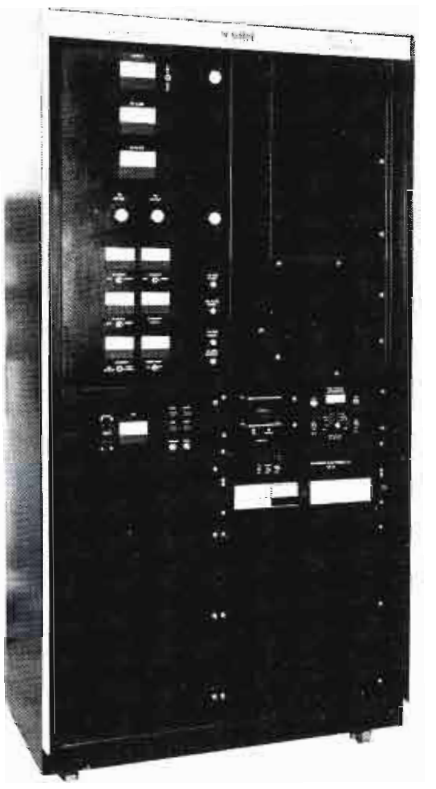

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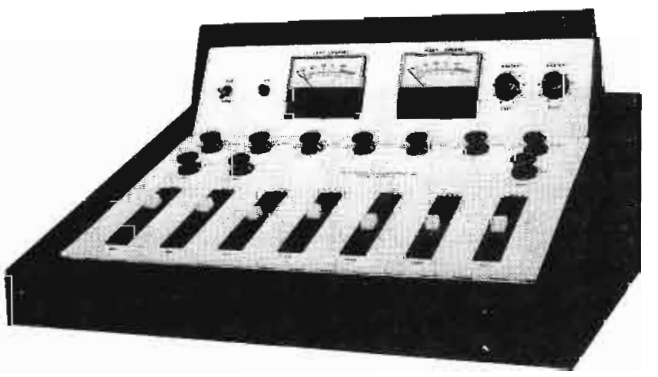

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Using the Sin^2 Window Signal

Part 1 of a series / By Harold Ennes

Note: This article contains brief excerpts from this writers' "Television Broadcasting: Systems Maintenance," published by **Howard W. Sams & Co., Inc.** and appears here by courtesy of the publisher. New and additional data included in this article is an actual circuit for "triple-triggering" the scope to obtain precise measurements of pulse-to-bar amplitude ratio, and slope of the window signal.

Television system maintenance procedures have started to become more standardized only recently, partially as a result of universally accepted "standard" test signals. Part of this standardization was brought about by development of the sin^2-window signal generator, along with the 12.5T and the 20T modulated pulse.

Basic TV Modulation-Demodulation Effects

It must be emphasized that the overall system concept is complete only when the "average receiver" is included in the analysis. Much of the processing carried out at the transmission end (picture sources, studio and transmitter circuitry) is necessary to compensate for the characteristics of the home receiver.

The combination of restricted bandwidth (4.2 MHz), the sharp roll-off's at both ends of the vsb transmission band, and the sharp sound-carrier trap in the receiver, combine to result in an overall step response as depicted in Figure 1. Under ideal conditions (without transmitter video predistortion), the demodulated step response results in a lengthened rise time (loss of resolution), a leading overshoot (white before black), and a smear axis resulting in black following black. Picture white (minimum carrier) and picture black are arbitrarily assigned values of zero and 100, respectively, in the drawing.

These facts simply mean that the basic vsb transmission and reception process results in amplitude and phase distortion. For this reason, amplitude and phase precorrection are used at the transmitter to minimize these distortions.

A gaussian response curve, while essential in oscilloscope vertical amplifiers, is not found in television camera chains or in video distribution amplifiers. The reason is the limitation of rise time in a series of amplifiers forming a cascaded system. The rise time of the original waveform is reduced by the square root of the sum of the squares of the amplifier rise time.

Thus, if we pass a signal through two identical 10 MHz gaussian-response amplifiers (0.035 μs rise time):

$$RT \sqrt{0.035^2 + 0.035^2} \sqrt{0.002450} = 0.05\mu s \text{ (approx.)}$$

This is a 40 percent increase in rise time as a result of passing the signal through just two cascaded 10 MHz gaussian amplifiers. In practice, many video amplifiers are cascaded in forming a complete system.

The practical video amplifier must have a flat frequency response up to and including the highest anticipated frequency, with a relatively rapid roll-off beyond this frequency. It can be shown from pulse theory that rise time is proportional to the **area** under the amplitude—frequency response curve; hence, cascading such amplifiers does not appreciably affect the rise time. However, such an amplifier will **not** reproduce a step transition at the output free of overshoot, ringing, or other transient distortions.

Figure 2A shows the video-system amplitude response as compared to that of a gaussian-response amplifier. Remember that the transmitter has a very sharp cutoff between 4.2 and 4.5 MHz. In addition, the receiver employs a sound trap with even sharper cutoff.

Figure 2B shows the phase response. Phase shift cannot be proportional to frequency around and above the cutoff frequency of the system. A pulse (step transition) requires transmission of the higher-order harmonics, which are actually above the passband intended, to be free from wave-shape distortion.

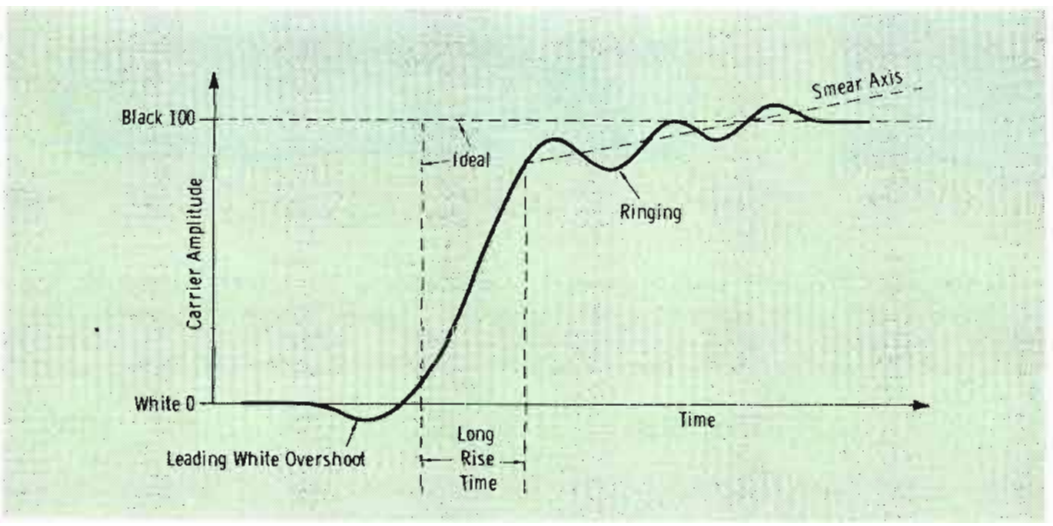


Fig. 1 Average demodulated step response without transmitter video predistortion.

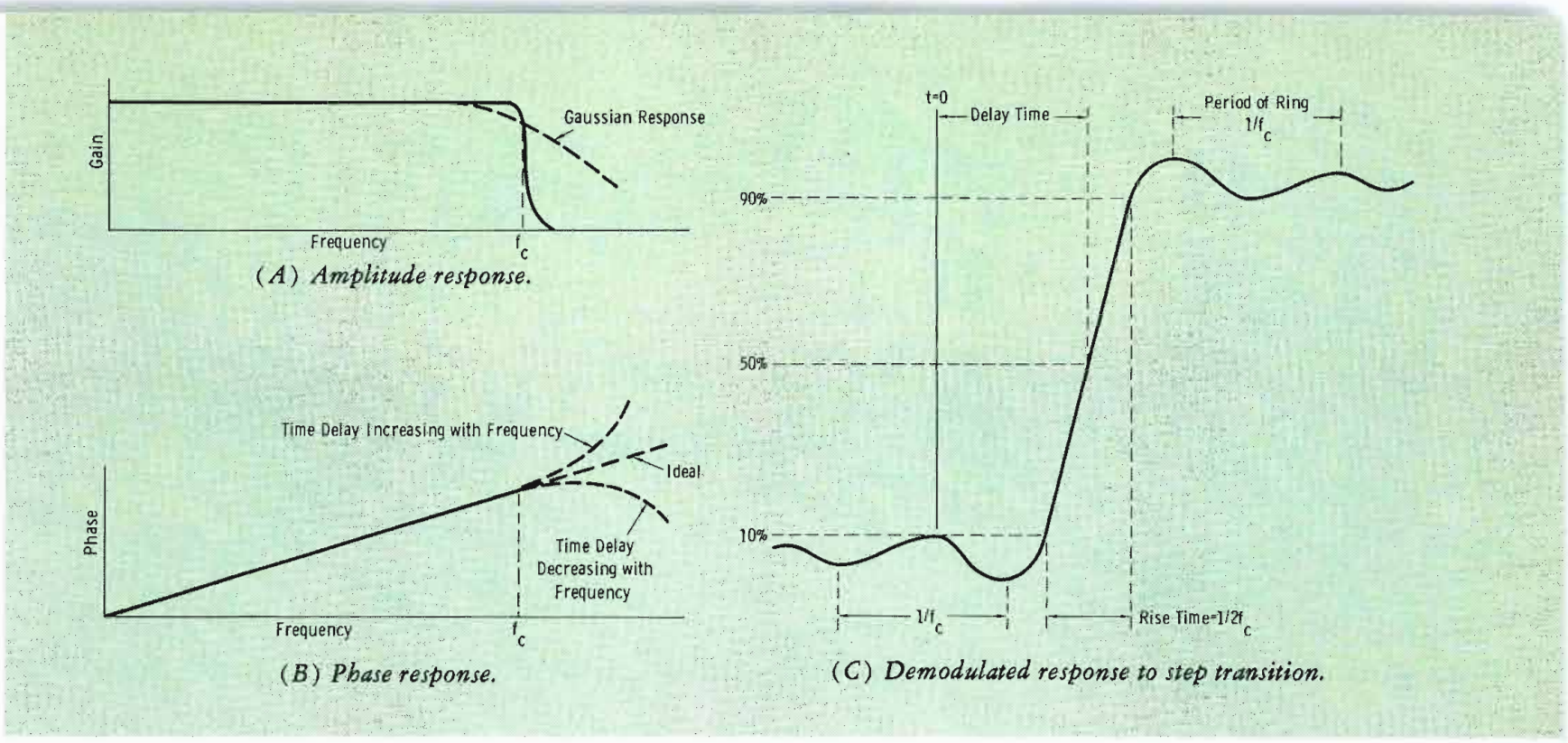


Fig. 2 Overall response of a practical television system.

Figure 2C shows the resultant demodulated step transition response of a pre-corrected transmitter, along with the frequency relationships. Since the cutoff frequency (f_c) of the overall TV system is 4.2 MHz, the total overall (ideal) rise time (between 10 percent and 90 percent points) is:

$$RT = \frac{1}{2f_c} = \frac{1}{8.4 \text{ MHz}} = 0.12 \text{ } \mu\text{s (approx.)}$$

and the period of ring is:

$$\text{Period of ring} = \frac{1}{f_c} = \frac{1}{4.2 \text{ MHz}}$$
$$= 0.24 \text{ } \mu\text{s (approx.)}$$

The **amplitude** of ringing depends on the step transition rise time for a given amplifier bandwidth and roll-off characteristic. The distribution of ringing (leading and trailing) is an indication of direction and degree of phase shift. Late arrival of high-frequency components causes most of the ringing to occur on the trailing edge of a pulse; early arrival of high-frequency components causes most of the ringing to occur at the leading edge. Figure 3 shows a phase-corrected signal (transmitter pre-correction), indicated by the even distribution of ringing at the leading and trailing edges.

Development of the Sine-Squared Pulse

The sine-wave response of a video amplifier does not provide a complete story of the amplifier performance for a video signal. Likewise, a step transition (or a square wave signal) is not a particularly useful signal for evaluation unless the exact rise time of the pulse is correlated with the intended passband of the amplifier. The very important **transient response,** which accounts for the degree of picture ringing, smearing, or streaking, requires a rather precise analysis method to assure valid tests in practice.

First of all, it is necessary to understand what a picture element is. A picture element is determined by the available bandwidth. Our complete TV system is fixed by FCC standards which allow the visual transmitter only about a 4 MHz bandwidth for the picture signal. One cycle occurs in a time equal to the reciprocal of the frequency; therefore:

$$1 \text{ cycle at 4 MHz} = \frac{1}{4(10^6)}$$
$$= 0.250 \text{ microsecond}$$

In Figure 4A the scanning beam encounters a sharp transition; the resultant waveform is a sine wave superimposed on a ramp.(1) Now consider the beam scanning across a thin white bar on a black background. Figure 4B shows the resultant pulse output when the fine detail approaches the size of the scanning beam. (Scanning "aperture" effect). The significant energy content of the pulse is measured by the half-amplitude duration (h.a.d.). Note that one picture element (black to white) occurred in one time T and another picture element (white to black) occurred in another time T.

The relationship between half-amplitude duration and cutoff frequency (f_c) is:

$$\text{h.a.d.} = \frac{1}{f_c}$$

Therefore:

$$f_c = \frac{1}{\text{h.a.d.}}$$

For example, if the h.a.d. of the pulse is 0.125 microsecond, the cutoff frequency is:

$$f_c = \frac{1}{\text{h.a.d.}} = \frac{1}{0.125 \text{ } (10^6)}$$
$$= 8 \text{ MHz}$$

Therefore a picture element of a 4 MHz system is 0.125 microsecond (one **alternation** of the complete cycle). In the $\sin^2$ technique, a time duration of one picture element is given the symbol T, and a time duration of two picture elements

(*Continued on page 86*)

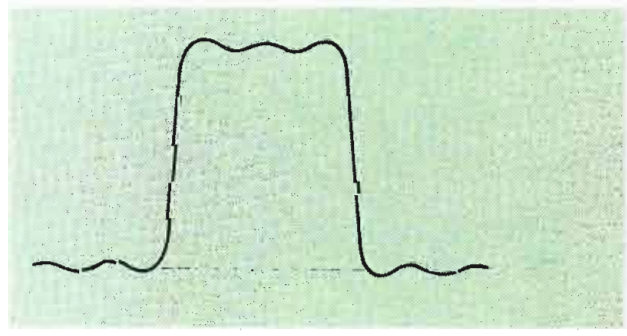
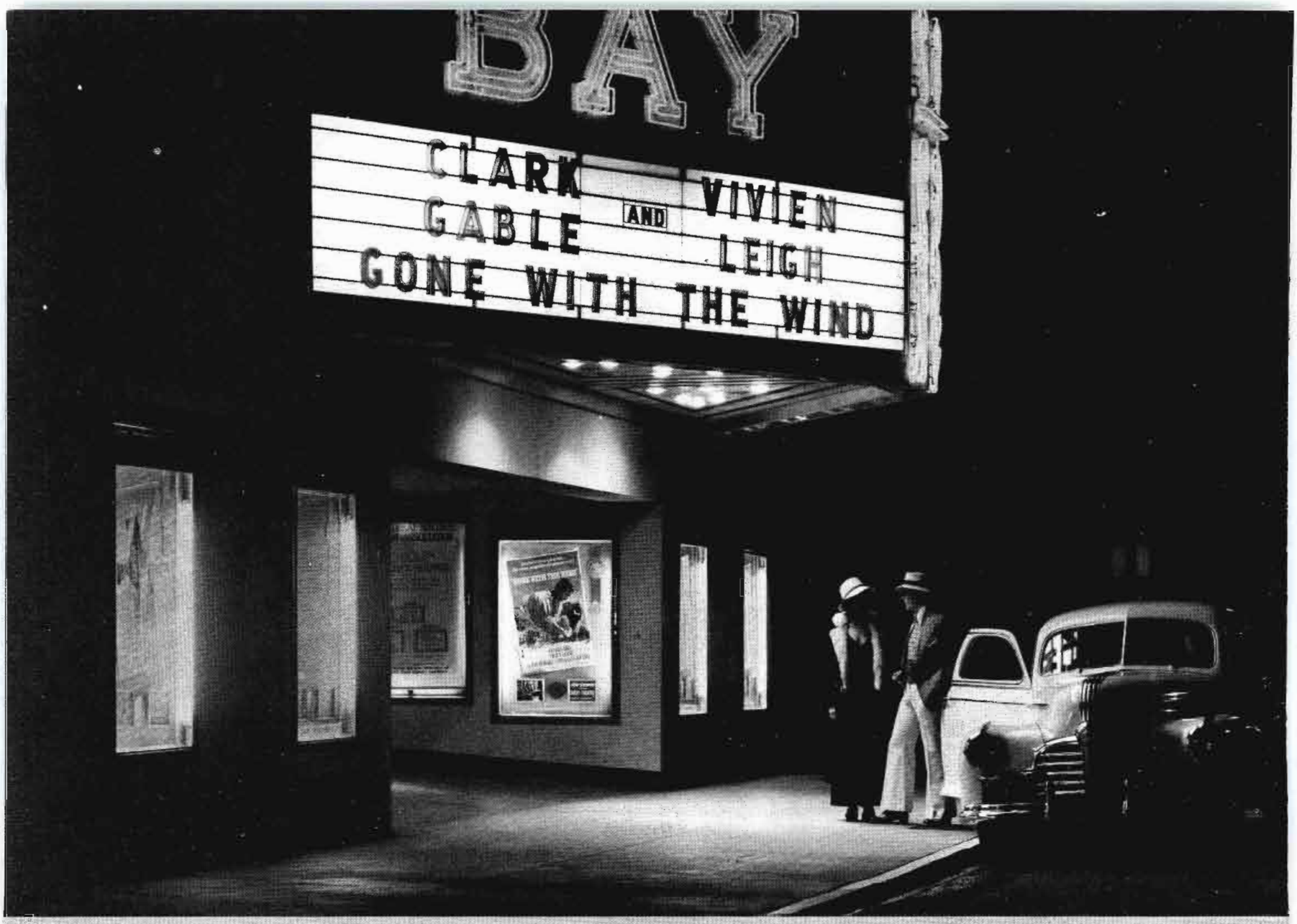


Fig. 3 Ideal pulse response of overall television system.



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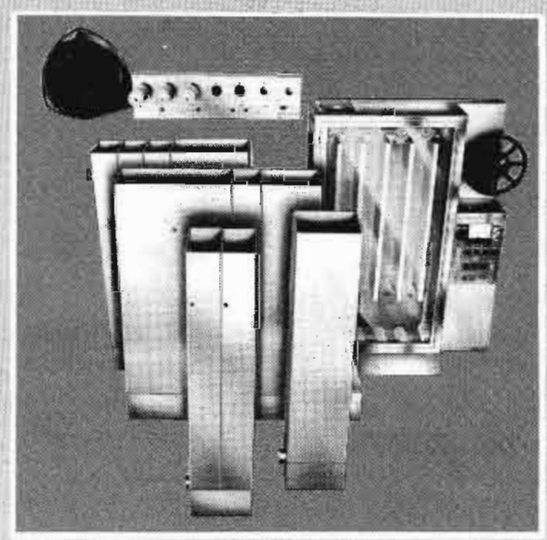

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Lens Surface (k)	Transmittance (%)			
	Uncoated T=(0.95)^k	Single Layer T=(0.98)^k	Triple Layer T=(0.995)^k	EBC T=(0.998)^k
2	90	96	99	99.6
4	81	92	98	99.2
6	73	88	97	98.8
10	59	81	95	98.0
20	35	66	90	96.0
30	21	55	86	94.1
40	13	45	81	92.3
50	8	36	78	90.4
60	5	30	74	88.6

Fujinon lenses with Electron Beam Coating (EBC) can have up to 11 separate coatings; and it is these coatings that make our lenses the almost perfect transmitters of light.

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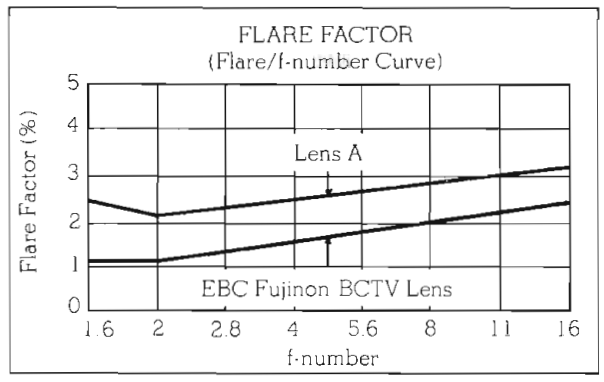

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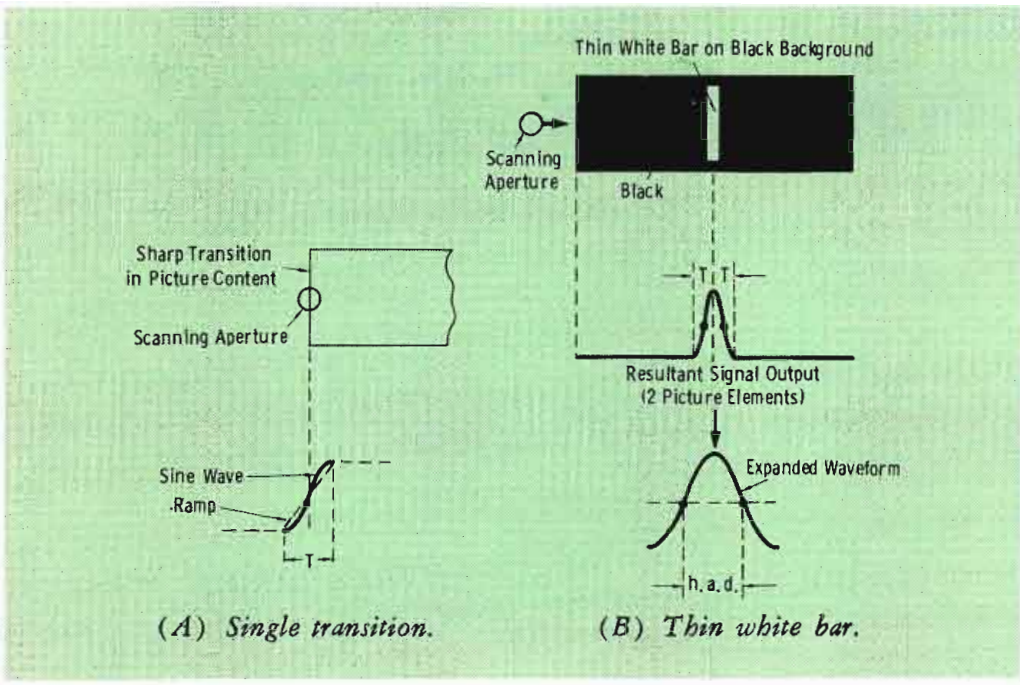

Fig. 4 Waveforms for sharp transitions.

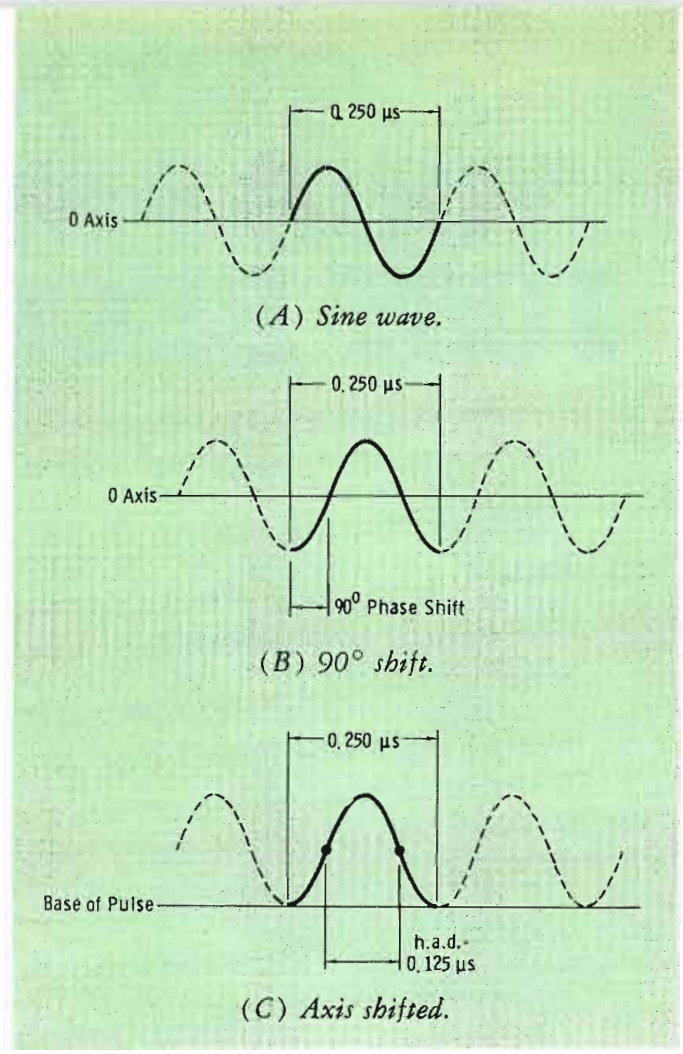

Fig. 5 Derivation of sine-squared pulse.

(*Continued from page 83*)

(for the system bandwidth under test) is symbolized by 2T.

A basic tutorial method of explaining the sine-squared pulse is shown in Figure 5. Figure 5A gives the conventional continuous sine wave at a frequency of 4 MHz; one cycle of this wave occurs in a time interval of 0.250 µs. You realize from fundamental theory that any phase shift of a continuous sine wave is measured only by laborious methods not suitable for routine testing of transmission facilities. Also, the amplitude-frequency characteristic of a system simply shows the amplitude of the continuous sine wave relative to a reference frequency, unless you are equipped to measure the phase relative to a known reference.

Observe Figure 5B. If we shift the waveform 90°, we have one complete cycle of a 4 MHz cosine wave, starting and finishing at its negative peaks. Now if we add a DC component of such value as to raise the negative peaks to the zero power line, we have the T pulse of a 4 MHz system (Figure 5C). As shown in Figure 5C, the half-amplitude duration (h.a.d.) is 0.125 µs, equivalent to one picture element for a 4 MHz bandwidth. Figure 6 shows that the significant energy spectrum of the T pulse is 50 percent (6 dB) down at 4 MHz, and there is practically no energy beyond 8 MHz. The 2T pulse (h.a.d. of 0.250 µs is 50 percent (6 dB) down at 2 MHz, and there is no significant energy beyond 4 MHz.

Thus the system can be checked with a pulse that essentially duplicates actual picture conditions and which provides known frequency content upon which to base judgment of system performance. Please note that any similarity to the sine wave no longer exists; a **pure** sine wave has no harmonic content at all.

Figure 7 shows the preceding definition in terms of T and system bandwidth. Note the similarity of this test pulse to an actual scanned picture element where black is represented as a DC component and the pulse simulates a black-to-white leading transition and white-to-black trailing transition.

Figure 8 shows the terminology used with a pulse that has passed through an amplifier or (more usually) a complete system. The first lobe is a negative overshoot, and the second lobe is a positive overshoot, either preceding or following the pulse.

The $\sin^2$-pulse generator normally also generates a window signal following the pulse, so that an amplitude reference to low frequencies is established.

The 20T Pulse

The TV transmitter and demodulator combine to form a 4 MHz (approx.) low-pass filter. The 2T pulse for a 4 MHz system (h.a.d. = 0.25 µs) has practically no energy at the high end of the band, and therefore does not reveal errors that occur around the high-energy color-subcarrier region. The T pulse for a 4 MHz system (h.a.d. = 0.125 µs) has

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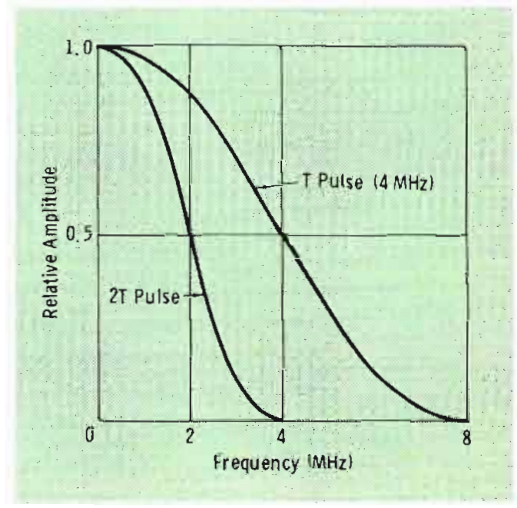

Fig. 6 Frequency spectrum of sine-squared pulse.

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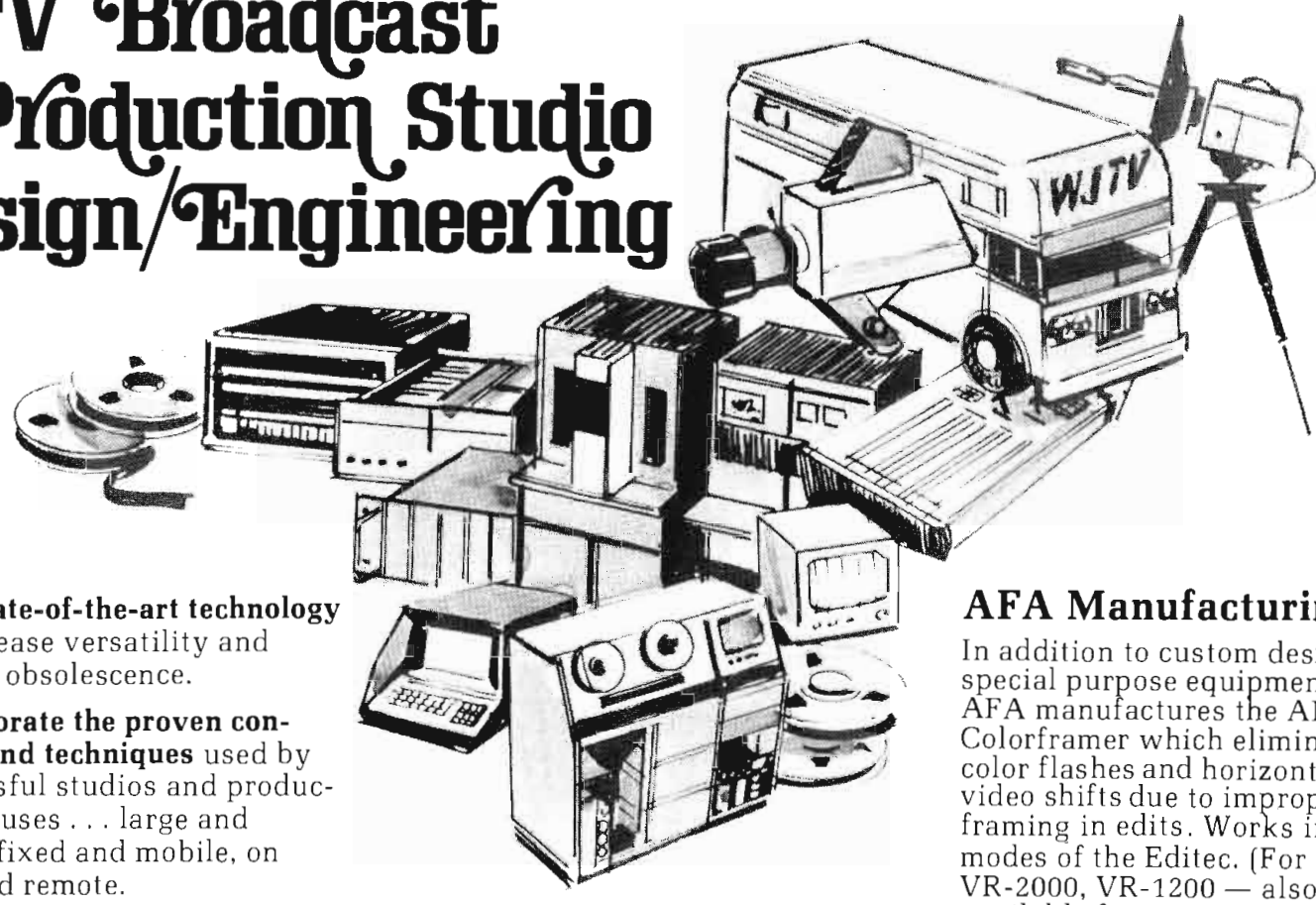

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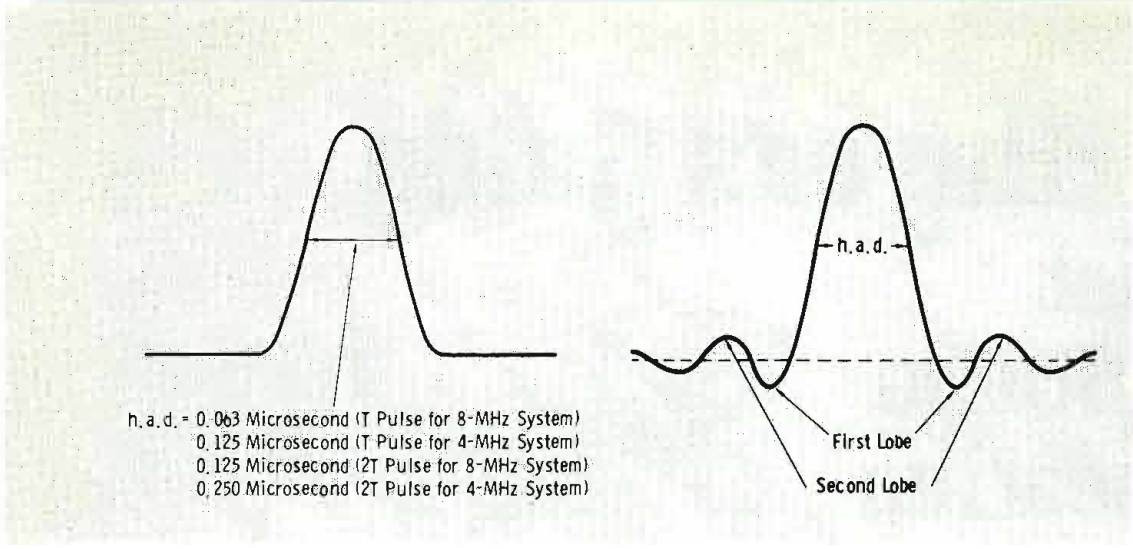

Fig. 7 Sin^2 pulse in terms of T and bandwidth.

Fig. 8 Nomenclature of pulse overshoots.

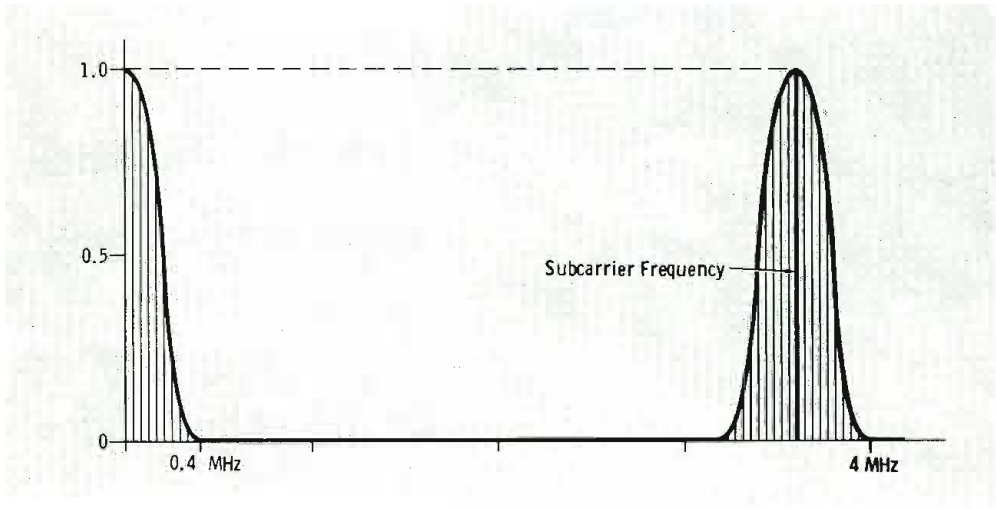

Fig. 9 Spectrum of modulated 20T pulse.

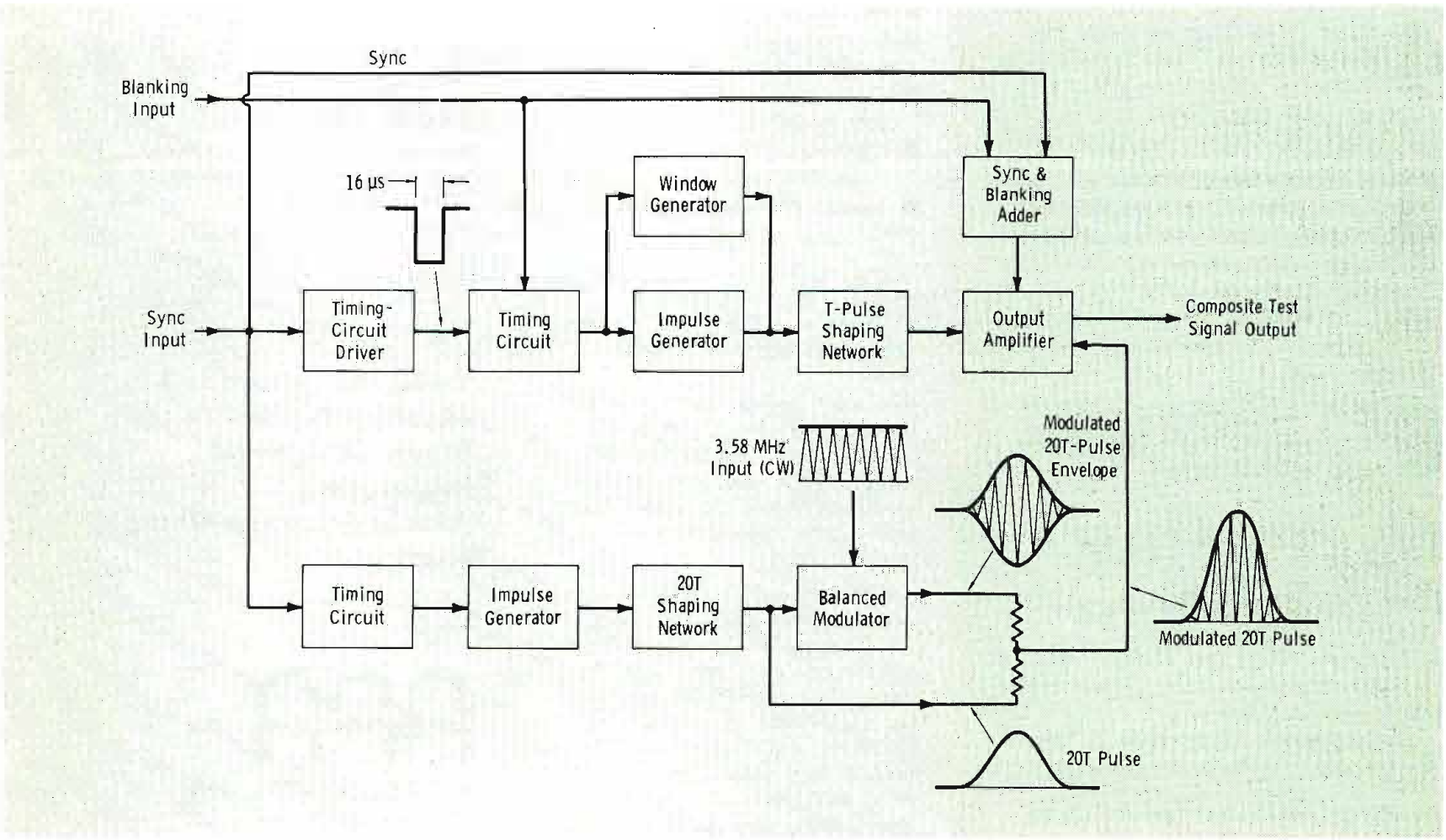

Fig. 10 Basic block diagram of sin^2 pulse and window generator.

(*Continued from page 86*)

an energy spectrum up to twice the cutoff frequency and therefore has high energy content in the color-subcarrier region. However, this pulse is also distorted by an "ideal" 4 MHz low-pass filter because of the energy beyond the usable upper range. The usefulness of the T and 2T pulses is confined to indicating transients as pointed out in practical applications to follow. It will suffice at this time to understand that the 2T pulse is a sensitive indicator of transmission distortions up to 60 or 70 percent of the nominal upper video-frequency limit.

The 20T pulse shifts measurement emphasis from determining the ability to reproduce transients to determining:

(A) The gain **difference** between the high and low ends of the video frequency spectrum and,

(B) The relative **delay** time between the high and low ends of the video frequency spectrum. Essentially, the 20T pulse is a signal at the frequency of the color subcarrier, modulated by a sine-squared pulse. The h.a.d. of the modulating pulse

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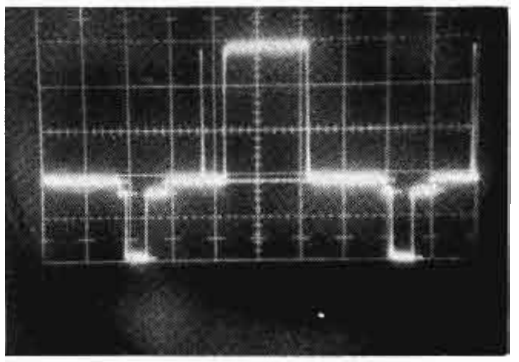

Fig. 11A Waveform at generator output.

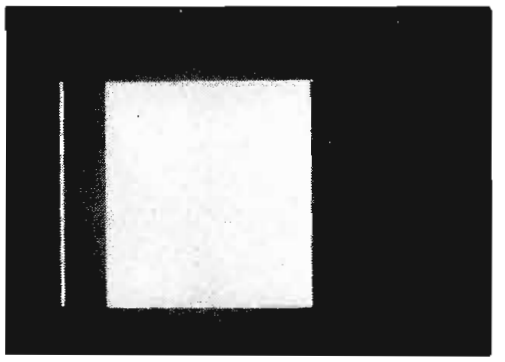

Fig. 11B Picture monitor display.

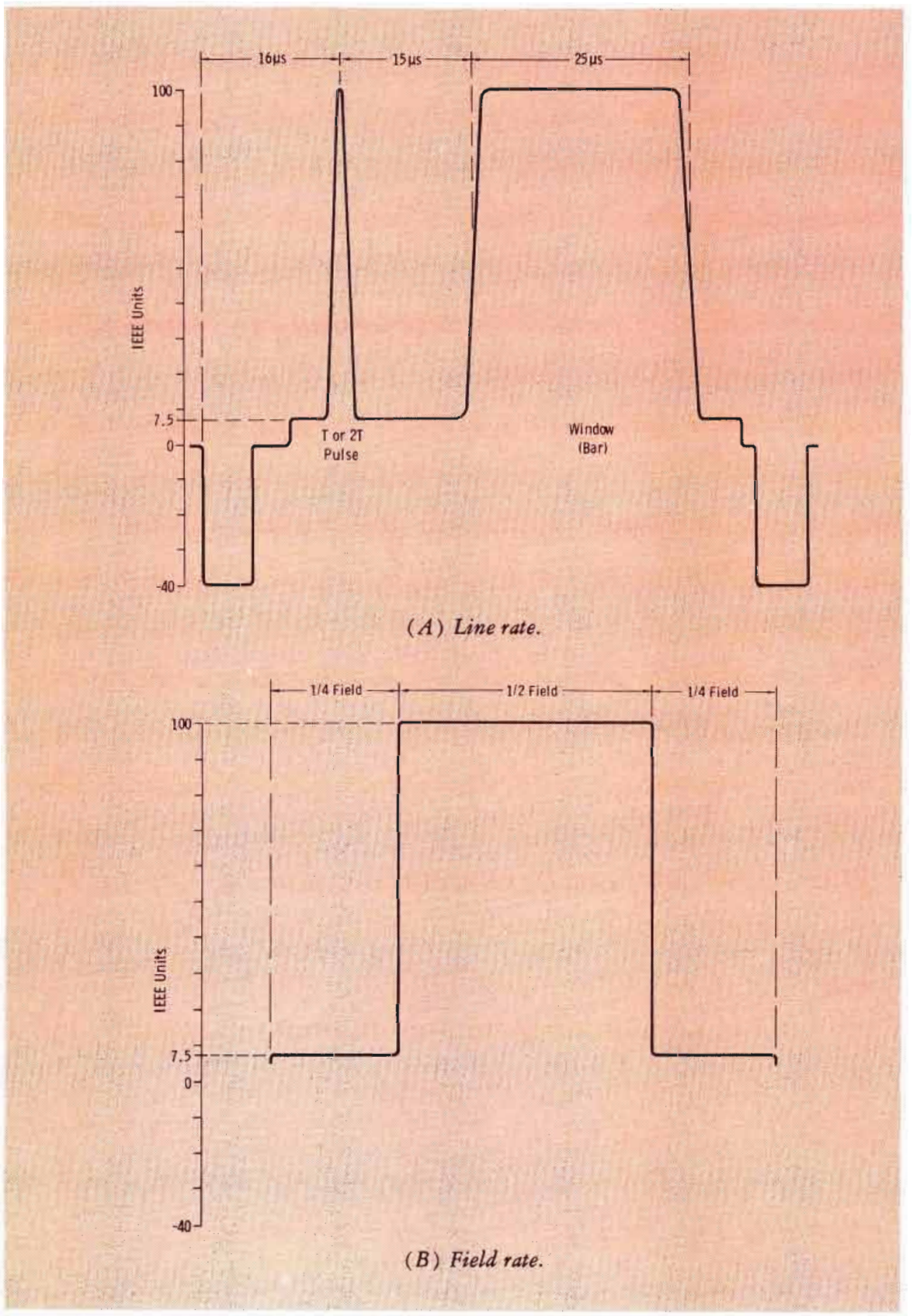

Fig. 12 Pulse-window signal displays.

was chosen so that the sum of the subcarrier frequency and the highest spectral frequency of the pulse does not exceed the upper video band limit of 4 MHz.

If we take the color-subcarrier frequency rounded off to 3.6 MHz, we can see that an added 0.4 MHz (400 kHz) takes us to the upper limit of 4 MHz. Therefore, the h.a.d. of the modulating pulse is:

$$\frac{1}{0.4\ (106)} = 2.5\ \mu s$$

and we observe that the h.a.d. is ten times that of the 2T pulse.

The resultant spectrum is shown in Figure 9. The modulating envelope (pulse of 20T duration) produces a frequency spectrum from 60 Hz to 400 kHz. The second spectrum extends 400 kHz above and below the color-subcarrier frequency. The subcarrier normally is **not** locked to the line repetition rate, so that the envelope shape is more clearly defined on the scope.

The 12.5T Pulse

A somewhat more sensitive indicator of the prescribed performance values is provided by generating a 12.5T pulse, and this is now available along with the 20T. It has the same characteristics as that of Figure 9 except for the following:

h.a.d. = 12.5 X 0.125 = 1.5625 us

$$\text{spectrum cutoff} = \frac{1}{1.5625\ \mu s}$$
$$= 640\ \text{kHz}$$

Therefore, using the actual subcarrier frequency and adding the spectrum of the 12.5T pulse:

3.579545 MHz subcarrier
+0.64 MHz 12.5T spectrum cutoff
= 4.219545 MHz cutoff frequency at upper end

The actual energy above 4.18 MHz (upper limit of video) is quite low, while utilizing to the fullest extent the upper video region.

The Sin^2-Window Specifications

The sin^2 pulse signal is normally accompanied by a half-line and half-field **window** pulse, which is sometimes called a **bar.**

Figure 10 shows a basic block diagram of such a generator which also includes the modulated 20T

Unretouched monitor photograph of an off-the-air ABC network program, November 26, 1974, at 2:20 P.M.

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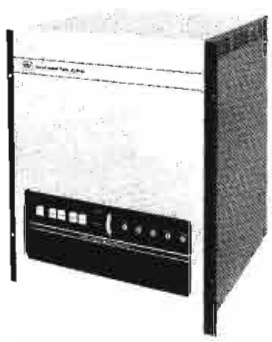

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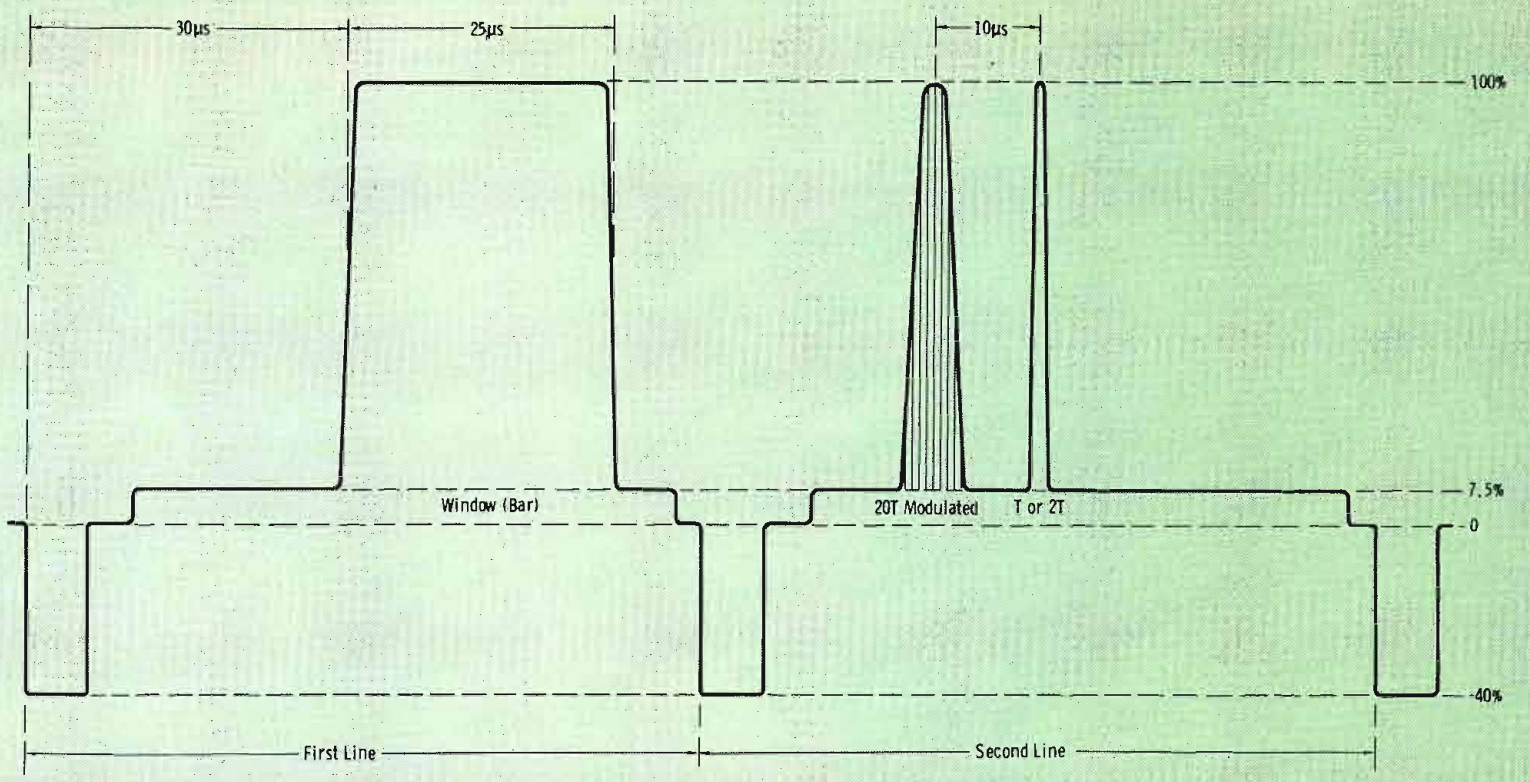


(A) Consecutive-line display.

Fig. 13 Displays of 20T pulse, T pulse, and window.

pulse. The timing-circuit driver (monostable multivibrator) is triggered from the leading edge of sync and generates a rectangular pulse of about 16 µs duration. The trailing edge of this pulse initiates the operation of the pulse and window timing circuit, which positions the pulse and window leading and trailing edges relative to sync. Blanking pulses are used to inhibit the timing-circuit action during field blanking. The output of the impulse generator is an 18ns "spike" which becomes the T pulse after shaping in the T pulse shaping network. A switch is normally provided so that either 2T, T, or T/2 pulses are available. Note also that the leading and trailing edges of the bar signal, since they pass through the same shaping filter, have the same rise and fall times as the associated T pulse.

The 20T (or 12.5T) pulse is shaped by appropriate $\sin^2$ filters and applied to a doubly-balanced 3.58 MHz modulator in a manner similar to that in which chroma information modulates the color subcarrier in an encoder. Thus both the 3.58 MHz carrier and the original 20T pulse are cancelled, and the output is only the product, or the modulated sidebands of the carrier. This produces the modulated 20T pulse envelope shown in Figure 10. Finally, the original 20T pulse is linearly (resistively) added to the modulated pulse, producing the symmetrical pulse with a base line.

The horizontal-rate display of the conventional pulse-window waveform at the generator output is illustrated in Figure 11A. The video monitor display (Figure 11B) consists of a thin line followed by the white "window" of about one-half of the active line duration and one-half the active field duration.

Figure 12A gives the line-rate specifications of the standard pulse-bar signal, with relative timing from the leading edge of horizontal sync. Figure 12B gives the field-rate specifications of the same signal.

Figure 13 illustrates the addition

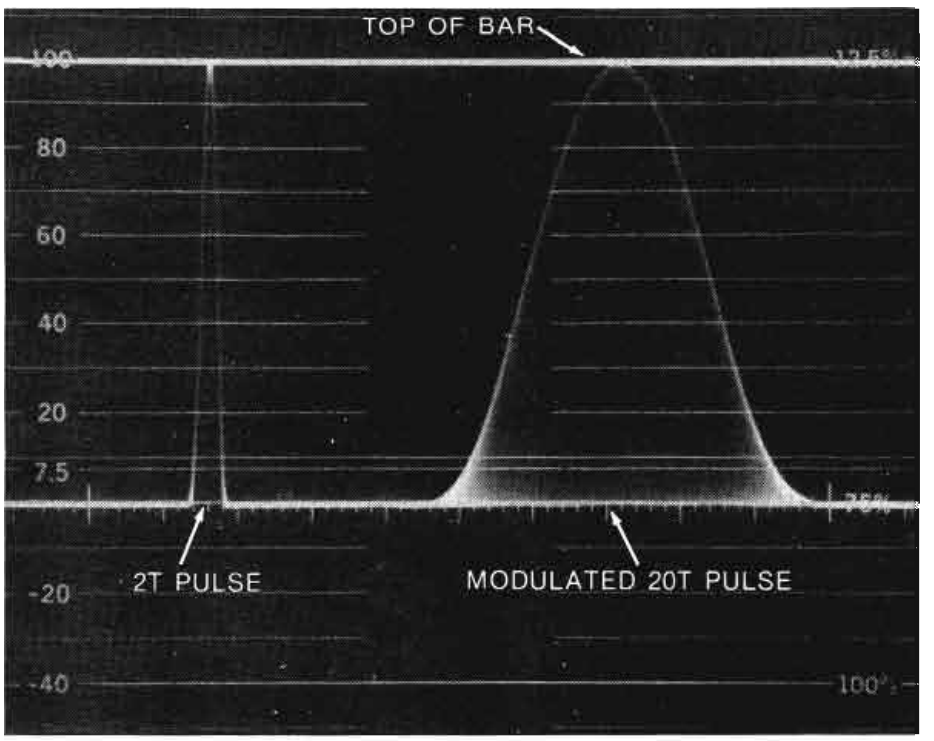
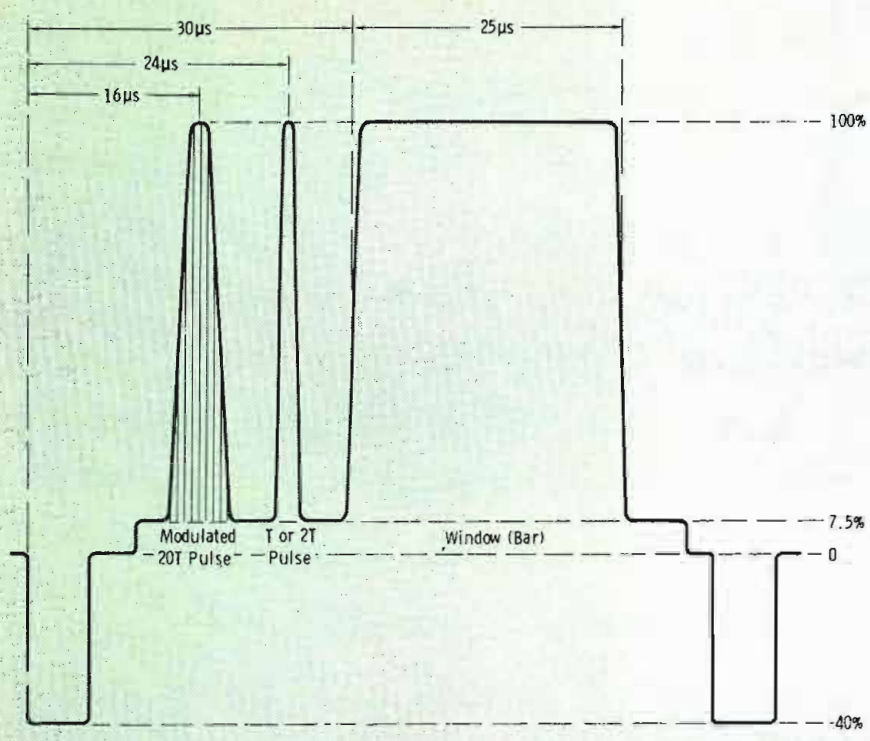


Fig. 14 2T pulse and modulated 20T pulse displayed on a waveform monitor.



(B) One-line display.

of the modulated 20T pulse to the composite test signal. Figure 13A is the display of two consecutive lines in which the window occupies one line and the pulses are contained in the following line. In Figure 13B the pulses and window are generated in each line. In some generators, the positions of the pulses are interchanged; i.e., the T or 2T pulse precedes the modulated 20T pulse as in Figure 14.

The type of display shown in Figure 14 is convenient for one of the tests associated with this signal; the top of the window provides a reference for comparing the relative amplitudes of the window and pulses. When all the pulses and the window are in a single line, the scope must be double-triggered; that is, it must be triggered from successive sync pulses. The two-consecutive-line signal (Figure 13A) eliminates the need for double-triggering, since a repetitive sweep automatically provides the double-triggered display. However, the two-consecutive-line signal has the disadvantage of being subject to error from frequency distortion because of the large difference in APL between the two separate lines (window on one line and pulses on the other).

A convenient method for triple-triggering for a still more effective display is suggested by the Australian Broadcasting Commission(2); this method is illustrated in Figure 15. The unit strips sync pulses from the incoming signal and uses them to fire delay multivibrators (Figure 15B), for producing cro-trigger pulses (Figure 15C). Trigger 1 displays the pulse, trigger 2 starts the leading-edge bar display, and trigger 3 starts the trailing-edge display. The multivibrator delay between times 2 and 3 can be made variable so that the pulse height can be used as a "pointer" to detect line tilt should the height of the bar vary along its length. When the bar height is constant along its length, there is no separation along the top of the resulting waveform in Figure 15D. The waveform shown in this example indicates tilt by the separation of the top lines.

NOTE: Some waveform generators have a special cro-trigger output for either double or triple-triggering requirements. Many of these, however, are custom-built.

If you are interested in building such a unit, the very simple but effective circuit of Figure 16 will use parts you probably have in

(Continued on page 96)

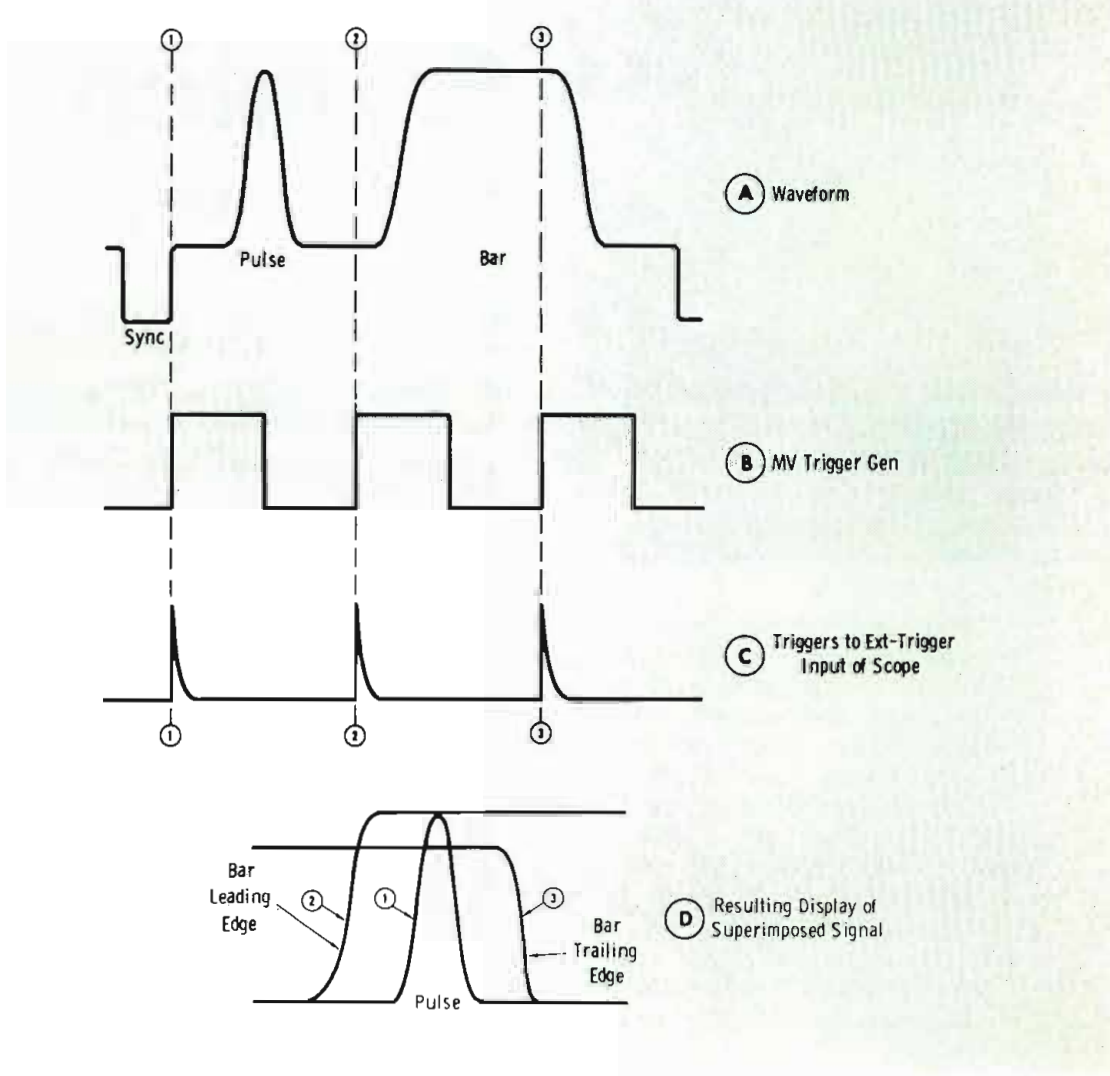
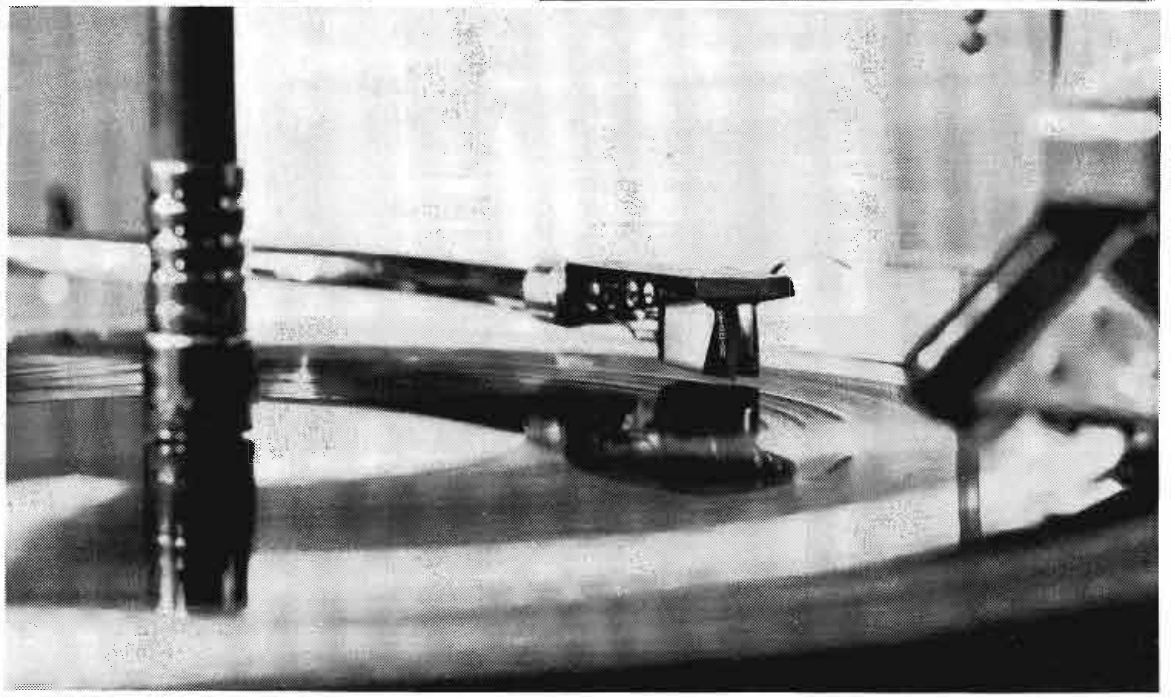
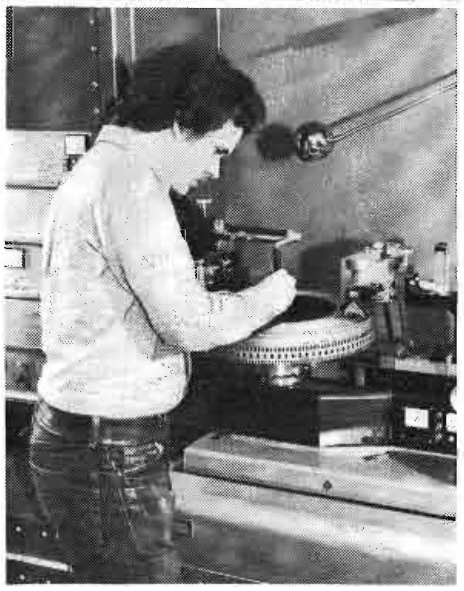


Fig. 15 One method of triple-triggering oscilloscope.





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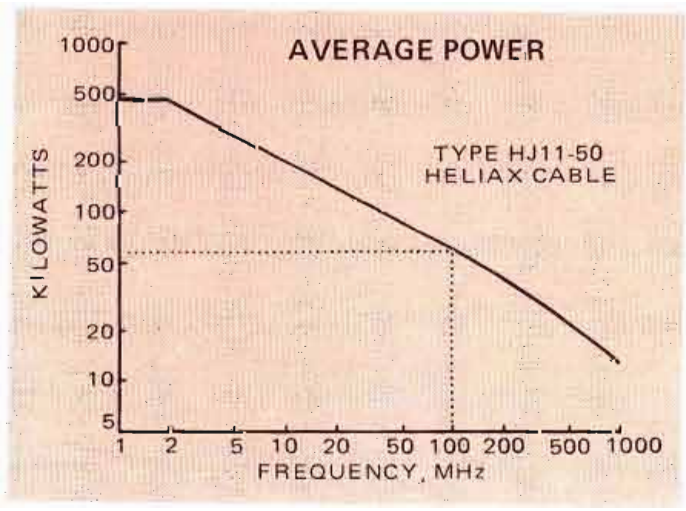

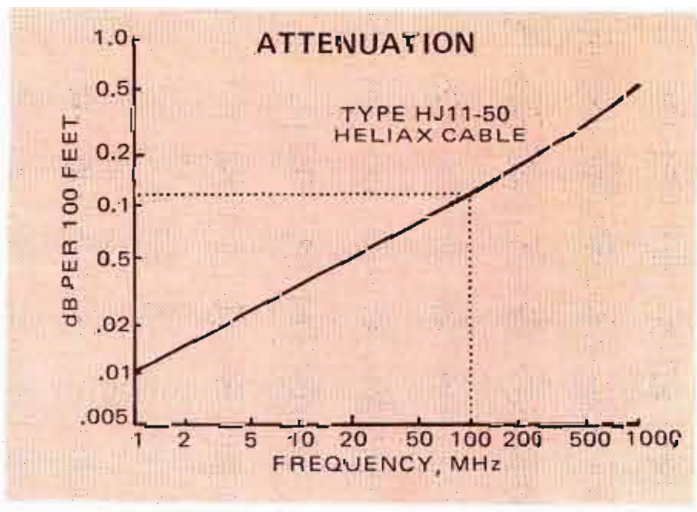

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(Continued from page 93)
stock. Although 2N1307's are shown, almost any medium-speed switching type **pnp** transistor can be used. Horizontal drive is used for generating triggers at three-times the rate of a single line. Of course, if you want to use this on a network or other "remote" source, you must use separated sync from the network or remote stabilizing amplifier.

Trigger 1 is supplied at the trailing edge of horizontal drive (or sync) as observed in Figure 17. The time constant C1-R1 determines the spacing between triggers 1 and 2, and C2-R2 determines the spacing between triggers 2 and 3, where: width = 0.7 RC (approx.) (3).

The power supply voltage is limited by the amplitude of the input pulse, which is nominally 4 Volts. A 4.2 Volt battery will do, such as the RCA VS163, or the Burgess E163. Trigger output amplitude for a 4 Volt supply is about 3 Volts. If your scope will tolerate a 2 Volt external trigger input (usually satisfactory), two 1.5 Volt "D" cells in series (3 Volts) can be used. The input pulse amplitude should be retained at 4 Volts.

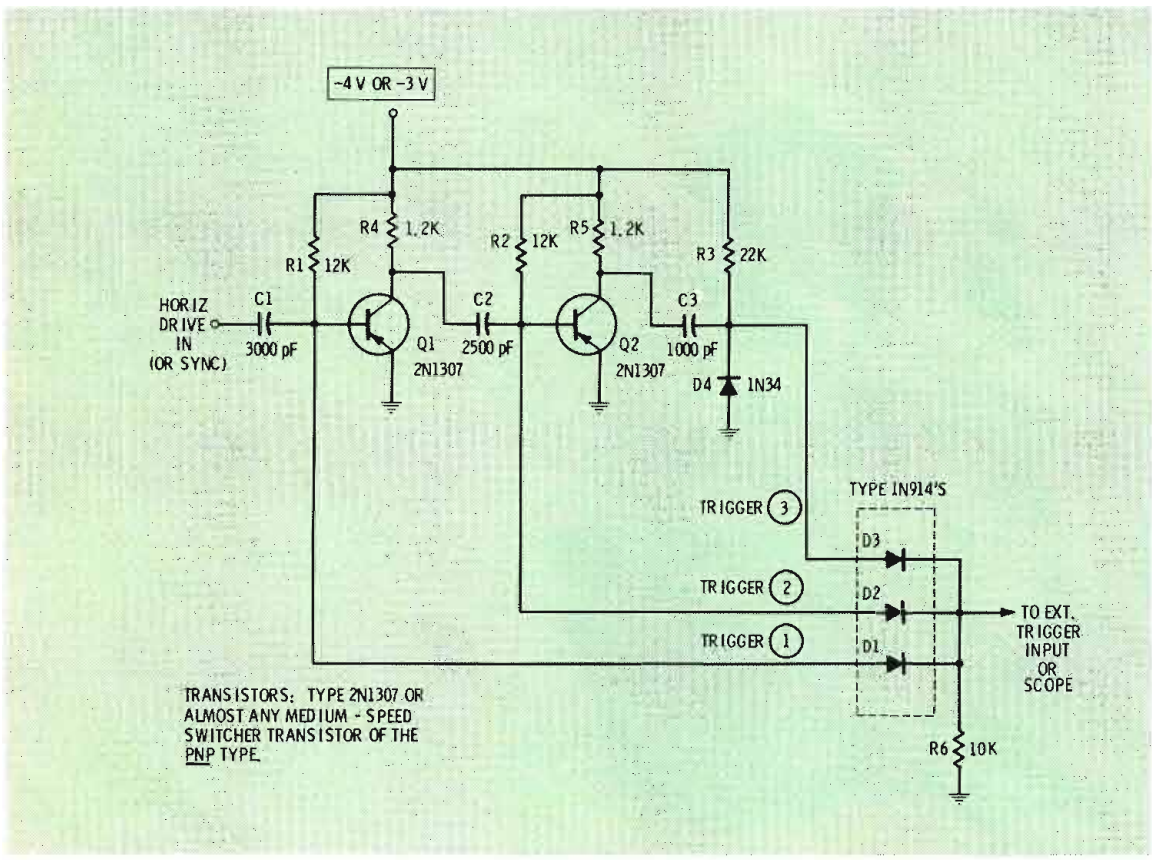

Fig. 16 Simple circuit for triple-triggering.

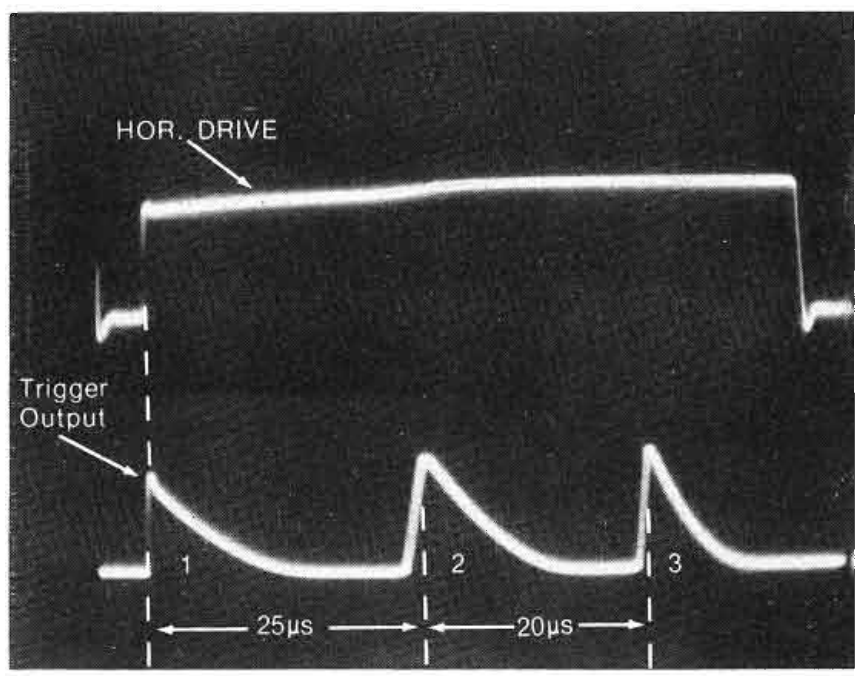

Fig. 17 Waveforms for circuit of Figure 16.

For identical amplitudes of triggers (important for stability), juggle the collector loads R4 and R5 (also R3) slightly around the nominal values indicated to obtain matched saturation currents. Place the scope trigger on positive slope. The Trigger Stability control on the scope is more critical than with normal triggering. Usually the Trigger Level control on the scope can be placed on Automatic (when provided). Otherwise, adjust Trigger Level and Trigger Stability for optimum trace.

The timing shown in Figure 17 is nominal, and will depend on the tolerances of the resistors and capacitors used. Most $\sin^2$-window generators have adjustable spacings in 2µs steps. If you need to vary your timing, a 20K pot in series with a 2.2K fixed resistor can be substituted for the fixed values of timing resistors R1 and R2.

Use of the pulse-window signal in practice involves a special graticule to indicate certain **K-factors,** particularly for routine testing to provide a quick observation of go/no-go quality. This is developed in the concluding Part 2 of this article which explores the practical applications in TV system measurements.

References for Part 1

(1) From Chapter 3, **"Television Broadcasting: Equipment Systems and Operating Fundamentals,"** Howard W. Sams & Co., Inc. 1971.

(2) **Australian Broadcasting Commission, Engineering Div., Report No. 25.**

(3) For description and design techniques of "boxcars," see pp. 205-209 and 240-241 of **"Workshop in Solid State,"** Howard W. Sams & Co., Inc. 1970.

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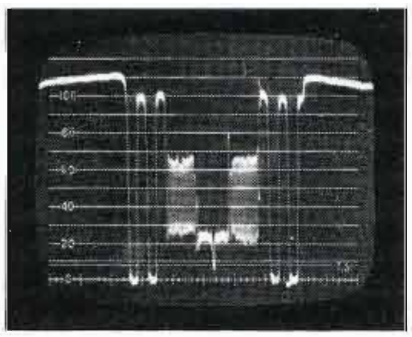

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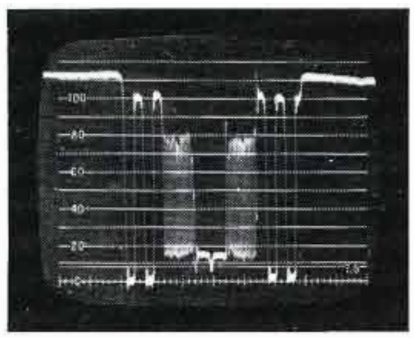

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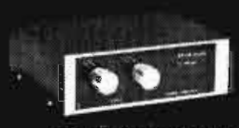

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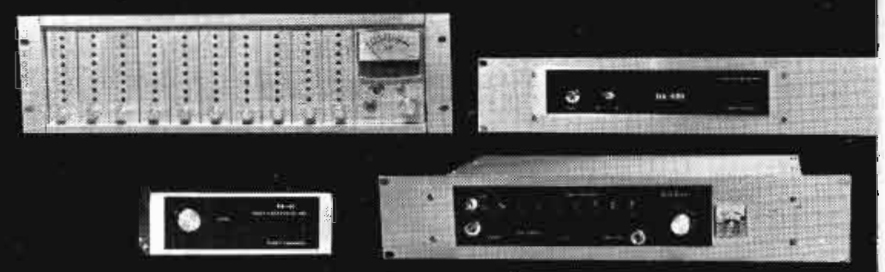

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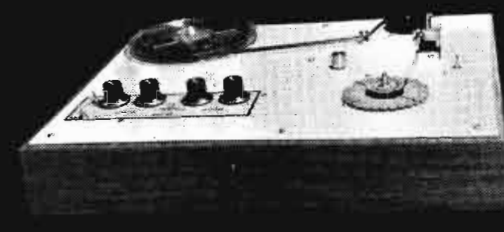

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Shure Brothers Inc.
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SHURE®

Vidtronics developes postproduction flexibility

By Jack Calaway*

First thing in the morning, tapes in hand, comes the director. Behind him lie high pressure taping hours spent in the studio and on location. He (or she) now wants a comfortable chair, a cup of coffee, and—most soothing of all—the feeling that he is surrounded by technical competence.

In our view, the ideal place for such a person to be at a time like that is a postproduction facility that offers three basic comforts: infinite flexibility of operation; the complete range of technical editing capability and competence; and a degree of isolation from the technical side of the operation, so that he is free to concentrate on editing decisions, undistracted by machines and technicians.

*Director of Engineering, The Vidtronics Company, Hollywood, Calif.

An important part of Vidtronics' capability is a special film-to-tape transfer system. Director of operations Tom Mann is shown using the system. "Godfather" and "My Fair Lady" are recent transfers Vidtronics has done for television.

Flexibility of Operation

This we have attempted to provide by giving ourselves a massive number of signal-routing options—so that anything can literally be hooked up to anything. Of course, almost all jobs will best be served by the standard configurations. But the options are there in great variety should we need them. Video, syncs, time code—everything can be set up specially for an unusual editing situation. Overhead wiring channels facilitate changes that are more basic.

Any quad or IVC-9000 VTR can be connected to any of the five switchers—manual and CMX types—available through Master Control, and there are patch panels almost everywhere to give us wide choice in setting up any signal path.

When setting up for a given job, we double-check the timing of the hookup to get the cleanest possible switches. All sending and receiving lines are equalized; an unusual additional step that helps us to deliver even better picture quality. On prime video paths, we use 8213 large-diameter cable for the same reason.

Another contributor to plant flexibility is the presence of a number of sync pulse generators. Most two-inch VTR's have their own sync generators, which can be slaved to a master sync generator to allow greater flexibility for system timing. Eventually **every** two-inch VTR will have its own sync

Silent Partners

Now that the FCC have approved the use of a 25 microsecond characterisic on Dolby transmission, more and more FM stations will be taking advantage of this ruling to effect even better quality for their listeners.

Obviously now, more than ever, source quality is of paramount importance and in tape the Revox/Dolby B is the obvious answer.

Already most manufacturers of automated programming equipment have come to rely on Revox—such prestigious names as Schafer Electronics Corporation, CCA, Gates Division of Harris-Intertype, Sparta Electronics Corporation, IGM/NTI and SMC Systems Marketing Incorporated (Sonomag) all employ Revox tape recorders as an integral part of their installations.

If your application depends on ultra-reliable, high performance and outstanding signal to noise, shouldn't you be using Revox too?

"More proof that Revox delivers what all the rest only promise."

As for the Beyer DT109 microphone/headphones, they are in a class by themselves. Highly sensitive and capable of withstanding immensely high sound pressure without overload or distortion, they feature modular construction with a unique multi-pin plug in lead allowing separate wiring of left and right headphone channels, independently of the microphone.

Add featherweight comfort and effective ear sealing together with a wide frequency, true cardioid, broadcast quality microphone specially designed to work under extremes of temperature and humidity, and it is easy to understand why the DT109 has become so popular for live remote broadcasting, studio, film, television, disc jockey and language laboratory applications.

Together or separately, our remarkable Silent Partners will open your ears to recording and broadcasting possibilities you never knew existed.

Your nearest Revox/Beyer dealer will be delighted to arrange an introduction.

Once you have met them, you will wonder how you ever did without them.

Please tell me where I can see and buy Revox ☐ A77 Dolby B Revox ☐ Good used machines* Beyer ☐ DT109

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BSI/3 *As and when available from our dealers

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Illustrations may contain optional extras.

Revox Corporation in USA: 155 Michael Drive, Syosset, N.Y. 11791 & 3637 Cahuenga Boulevard West, Hollywood, California 90068.
Revox in England: Lamb House, Church Street, Chiswick, London W4 2PB.
Revox Canada.
Revox International: Regensdorf 8105 ZH Althardstrasse 146, Switzerland.

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generator, slavable to one of three or four master sync sources. At present all edit record VTR's have a video processing amplifier at the input which adds plant sync, blanking and burst to the signal at the last point in the system before the edit machine. As a result, the VTR sees no difference between video sources. Edits are cleaner, and there are no visible errors in the master.

Each edit bay includes either two or three two-inch VTR's and a control rack with patch panel, vector scope, and color monitor. Each VTR bridge holds a CMX Control and Display unit that permits the CMX editors to access the machine. A rotary switch permits the selection of the appropriate SMPTE time code source for recording.

Each room can be reached by a house paging system or by a special engineering page.

A Wide Range Of Technical Services

It goes without saying that any postproduction house worth its salt must be quick to investigate new developments, assess their value, and implement them when desirable. We continuously monitor these things and adopt those we consider practical and effective. fairly recent examples would include CMX computer-assisted editing systems. We have, on occasion, invented our own techniques to solve special problems: the Technimatte® device and our tape-to-film transfer system exemplify this approach. We have also designed and built specialized equipment for automated editing. But in any case, we feel we must make important improvements available to our customers to maintain our position in the industry.

One new commercial device that we have recently integrated into our system is the IVC-9000 broadcast VTR, which we feel offers advantages in overall production quality. Two minor modifications were made on site at our request by IVC engineers to permit a more satisfactory interface. One involved altering a PC board to allow E-to-E audio preview. The second changed the lockup time to permit operation with the CMX system.

The 9000 normally locks to a color frame by means of a 15 Hz control track pulse; the CMX system locks up at the same rate. However, when we first attempted CMX edits with the 9000's, the two systems were out-of-phase and fought one another. At our request, IVC design engineers modified a PC board to provide the switch-selectable choice between 15 Hz and 30 Hz lockup, which solved the problem.

We are selling the 9000's capability on the basis of excellent picture and audio quality. Our extensive pre-purchase evaluation of this machine showed us an excellent picture with the total absence of banding and a noticeable reduction in noise. We have already put our three 9000's to work in in-house teleproduction of commercials and in editing for quad release. Our intention is to use them chiefly as mastering machines, dubbing to the quad format for distribution. And by virtue of their excellent picture quality, we will favor them as sources for tape-to-film transfers.

We are also exploring ways to use two interesting advantages of these VTR's. A segment of the show "In the Attic" with Linda Ronstadt was recently taped with audience reaction recorded on one program audio track and program audio on the other track as well as on an eight-track audio recorder, expanding our options for post production audio treatment. A second feature is the 9000's ability (with optional equipment) to record and playback an 8 MHz signal. This can provide us with a playback signal of superb resolution for tape-to-film transfers, as IVC recently demonstrated at the SMPTE Winter Conference in San Francisco. Slides were shown there indicating 700 lines resolution.

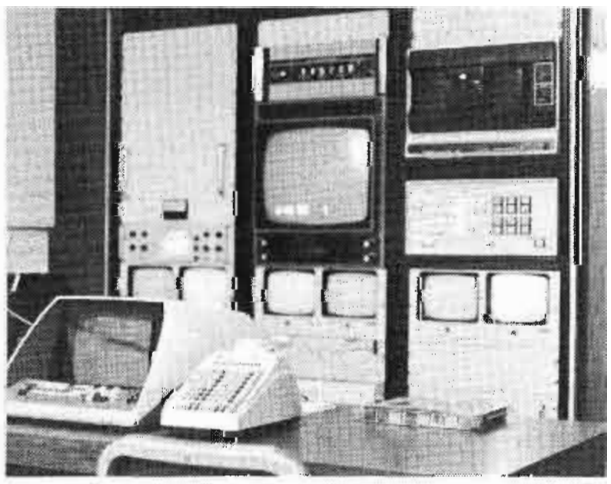
Isolating The Editor

The best environment for editing decisions is one with a minimum of distractions. People and equipment can interfere with the continuity of thought necessary for a smooth, coherent finished tape. Our approach to this need is to build off-line editing bays in which edit decisions can be made using computer-assisted equipment and one-inch VTR's.

One-inch work tapes offer several advantages. For one thing, they take the wear of several edit passes off the two-inch original tapes. They liberate the two-inch VTR's, which are more costly on a unit time basis. The IVC one-inch VTR's provide good-quality video and permit **still-frame** viewing for precise time-code editing. When the edit is complete, the CMX system will have recorded it on a paper punch tape. At the appropriate time, the two-inch VTR's are hooked up to the CMX switcher, the punch tape is fed into a reader, and assembly takes place automatically.

This approach permits the edit decisions to be made in a low-key, low-pressure environment in which the editor sees only picture monitors and a CRT terminal operated by our editor. We also use EECO editing equipment and our own-design time-code-controlled automatic switchers in various plant locations.

The customer-oriented philosophy pursued in these three basic areas by Vidtronics has helped us to maintain a continuously strong position in the teleproduction industry.



This is the off-line edit bay with CMX computer edit system. After off-line edit on one-inch VTR's, punched paper tape is fed through reader (top right) for auto assembly on two-inch VTR's.

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Econco Broadcast Service Inc., the largest power tube rebuilding factory in the United States, can save you approximately one-half the cost of a new power tube simply by rebuilding your used tube! Manufacturers, in making new tubes, must pay the high cost of rare and expensive metals. In rebuilding used tubes, Econco reuses most of the original parts, thereby saving you money.

Here's how it works...send your used tubes to Econco: Upon receipt Econco will perform tests to determine whether tube is in rebuildable condition. If acceptable, your tube is processed through several rebuilding steps (some of which are shown on these pages) and shipped back to you. By having your used power tubes rebuilt you can realize a second, third or fourth life from them. Before shipping, Econco tests all rebuilt tubes to original manufacturer's specifications, thereby providing you with low cost, reliable tubes that are equal in every respect to those tubes available from any manufacturer.

Econco buys used tubes

Econco will buy your used tubes even if you do not intend to use our rebuilding service. Econco will pay a minimum of $10.00 per tube (depending on acceptability, size, cost) plus all shipping costs. Econco's rebuilding prices are based upon receipt of an acceptable tube. Econco buys all used tubes that are listed on the rebuilding price list, so you may contact the factory to check the availability of a needed tube even when you do not have a trade-in tube. Add 20% to rebuilding price list for no trade-in tube. No authorization is needed to ship tubes for rebuilding or sale to Econco.

The Price Is Right

Emergency tube stock

Econco maintains a 24 hour answering service for emergency tube delivery. Econco also maintains a stock of popular tubes such as the 5762, 4CX5000A, 4CX10, 000D, etc. so that emergency tube delivery can be accomplished in as little as 24 hours to your nearest airport, and Econco will pay the freight!

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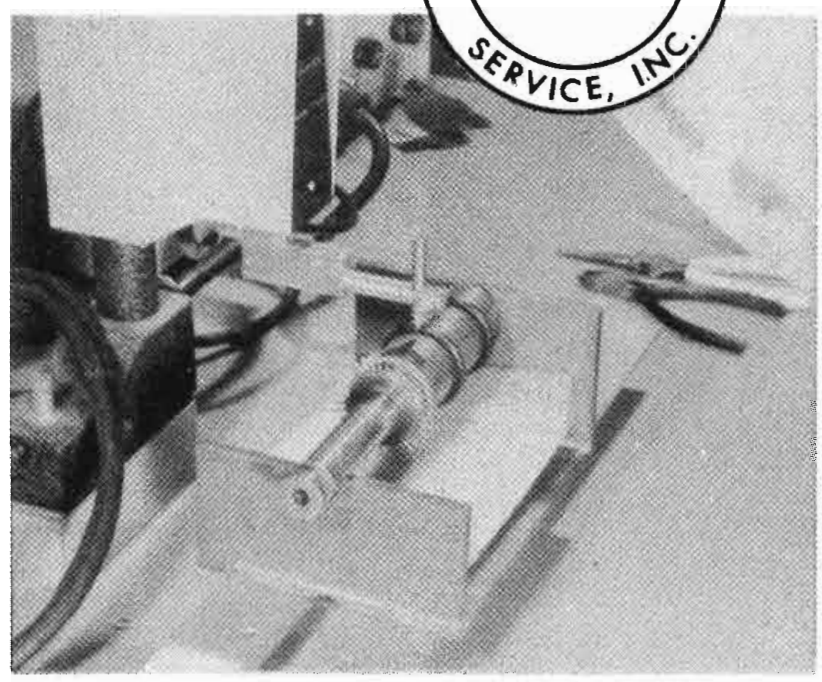
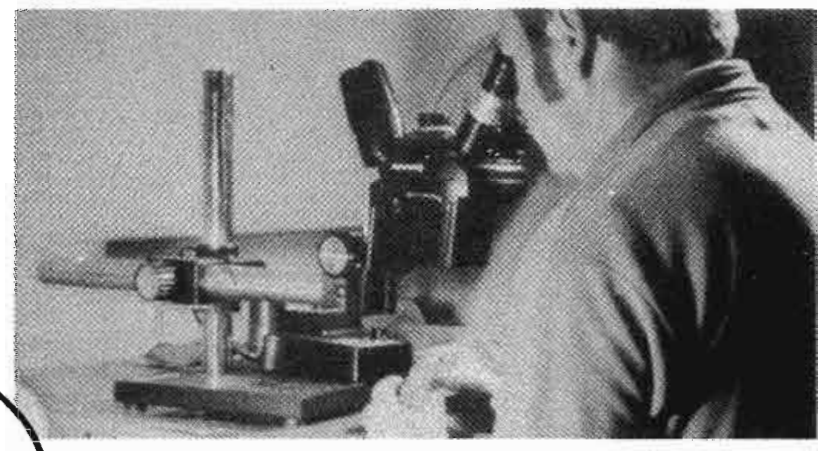
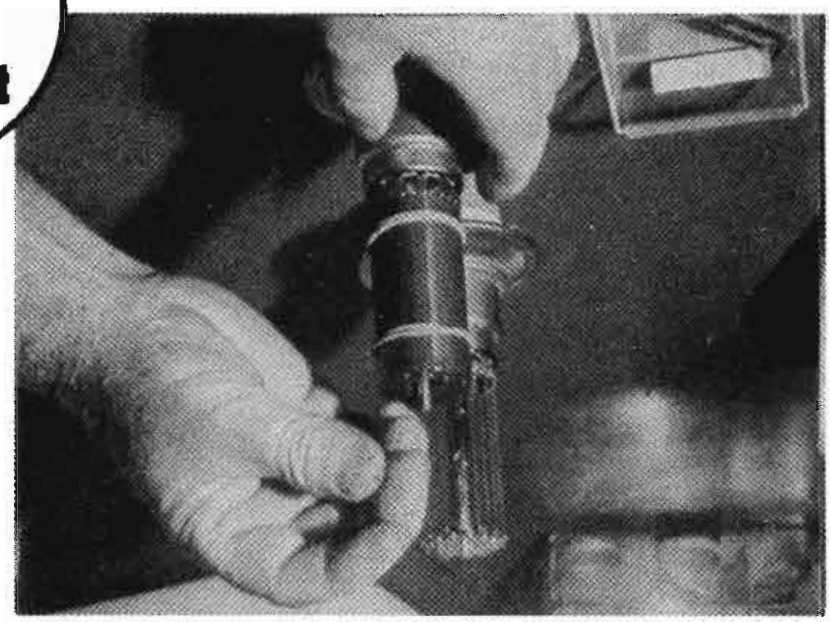


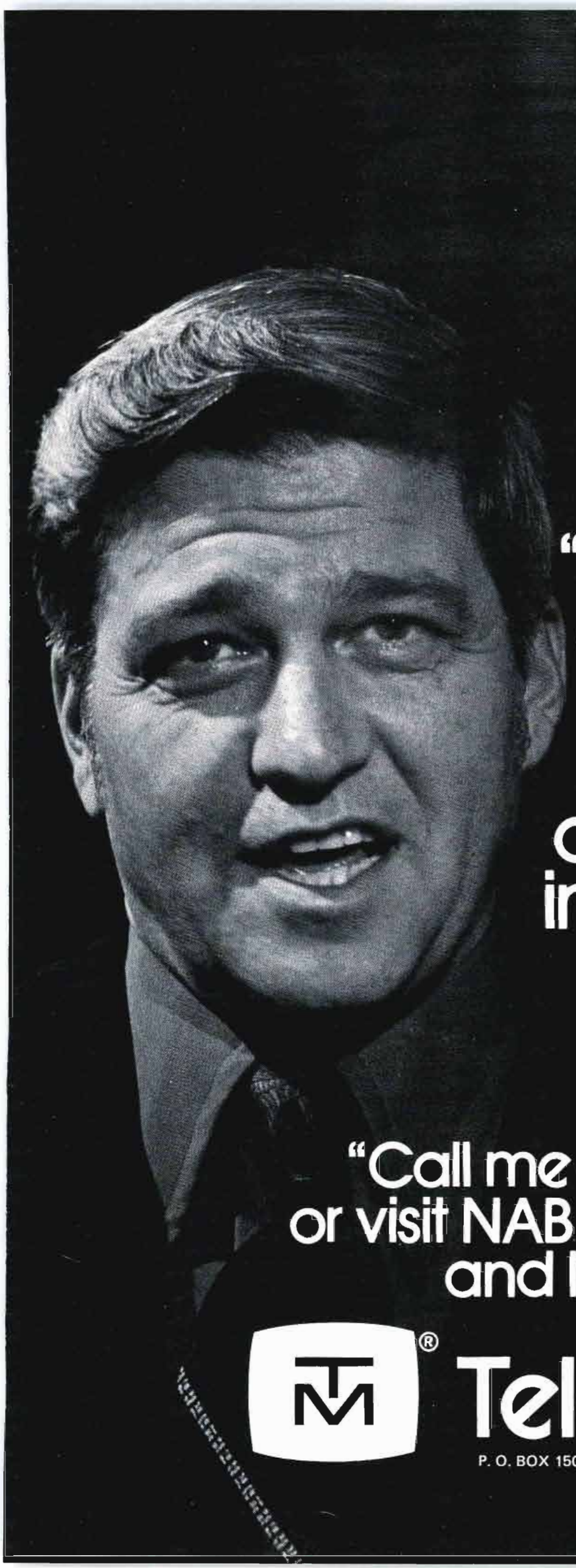
Grid Making
A 3CX2500 grid being spotwelded on a mandrel



Inspection
A finished grid assembly being inspected



Filament Mounting
3CX2500 Base assembly getting new filaments spotwelded in



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PEOPLE IN THE NEWS

Vedco, Incorporated has announced the election of **Francis Jacob, Jr.** as President of the company....**Nyall D. McMullin** has been named Vice President of Marketing at Consolidated Video Systems, Inc. Also from Consolidated, **Harold C. Blakeslee** was promoted to Vice President of Business Planning.... Communications Technology Corp., Los Angeles, has announced the appointment of **Francis L. Ross** to the position of Western Operations Sales Manager....**E. Craig Marcin**, formerly of A.I.C. Photo, joined Tele-Cine Inc. as a Technical Sales Representative for Schneider Television Lenses.

Andrejs A. Vanags has been named manager, IVC Canada, Ltd....**Harold E. Hawkins** has been promoted to marketing specialist for Belden Corporation's Electronic Division....**Robert D. Eisenhardt, Jr.** has been named corporate vice president of General Instrument Corporation and president of its wholly owned Jerrold Electronics Corporation....Altec Sound Products Division announced the appointment of **Barry Wolfson** to the post of Regional Sales Manager, Metro New York. The International Division of Altec Corp. has announced the promotion of **Roger Faust** to the position of marketing manager.

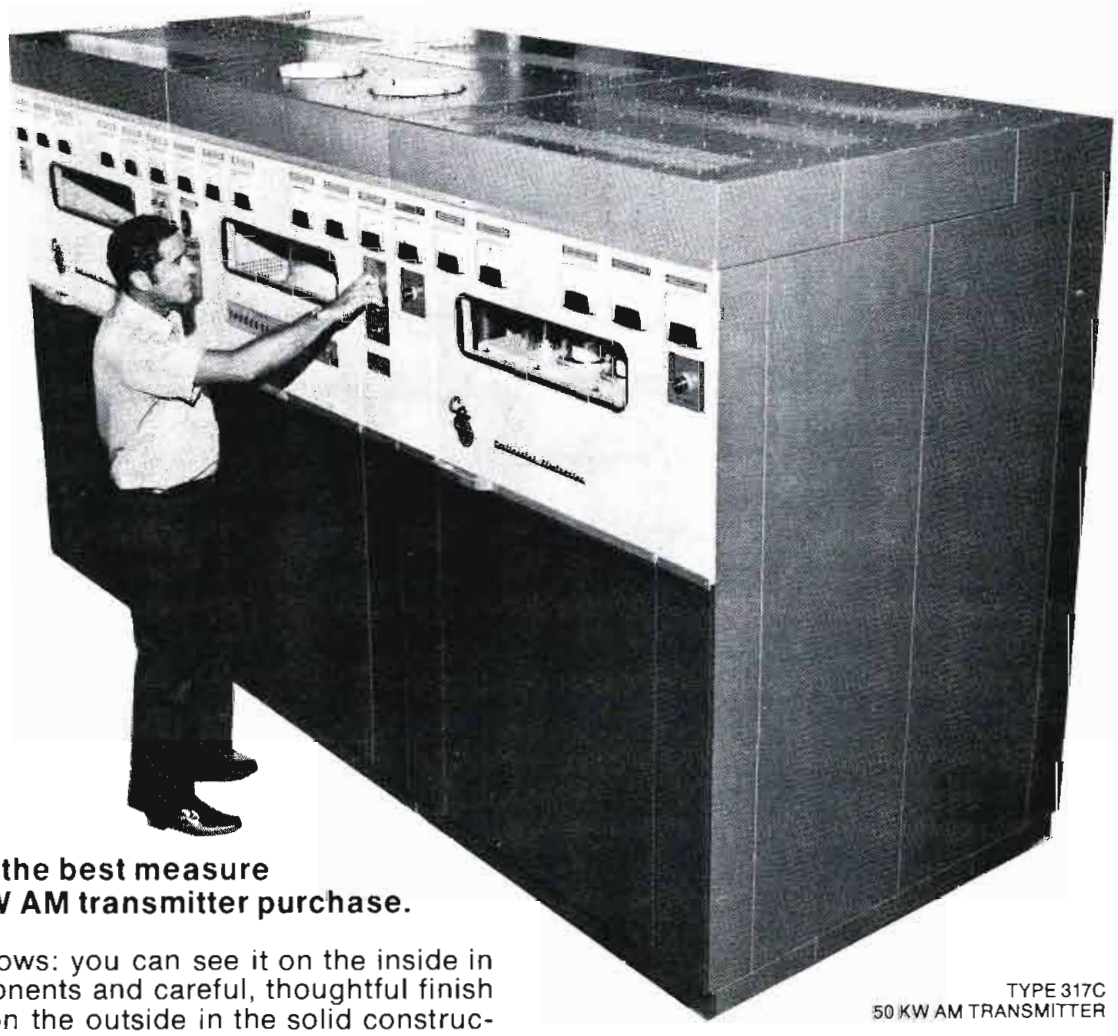
The appointment of **Dr. Merton H. Crowell** to the newly created position of Technical Assistant to the President was announced by Amperex Electronic Corporation and Ferroxcube Corporation....**Gordon H. Schutte** has been named Marketing Manager, Professional Recording and Broadcast Markets of 3M Company's Magnetic Audio/Video Products division. **Daniel E. Denham**, vice president of 3M Company's recording materials group, has been unanimously elected chairman of the board of the International Tape Association for 1975....**Guy J. Roney, Jr.** has been appointed technical support specialist at Conrac Division, Conrac Corporation....**Lucius D. Battle** is rejoining Communications Satellite Corporation (COMSAT) as Senior Vice President-Corporate Affairs ....**Herb R. Hammer** has been named corporate news manager for Ampex Corporation in Redwood City, California.

Robert W. Cochran has joined Electro Sound, Inc., a Division of Viewlex, Inc., as Vice President of Marketing and Sales. Electro Sound also announced that **Charles Link** has been named Vice President and General Manager of Electro Sound, Inc., and **Mort Fuji** has been appointed Vice President of Technical Operations....**Mark L. Sanders** has been named product manager, industrial video products, for Ampex Corporation's audio-video systems division....Altec Corporation has announced the promotion of **Jerry Hogerson** to marketing manager, Professional Products ....Miratel Division of Ball Brothers Research Corporation, has announced the appointment of **Jack**

(Continued on page 108)

Quality shows & tells.

BOOTH 302 NAB SHOW



TYPE 317C
50 KW AM TRANSMITTER

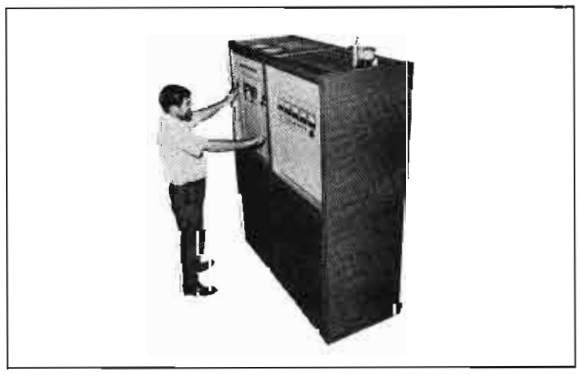
Continental Quality: the best measure for any 5, 10 or 50 KW AM transmitter purchase.

Continental Quality shows: you can see it on the inside in the selection of components and careful, thoughtful finish work. You can see it on the outside in the solid construction; the well thought out and easy to use control panels. Continental Quality tells: you can hear the difference on-the-air, and that's where it counts.

It adds up to Continental Quality performance: few tubes; 125% positive modulation; reserve power capabilities; efficient, reliable operation without the limitations of high power audio iron core components or the high voltages associated with series modulation.

Quality talks for: XETRA WRKO WKVM KWJJ WMOO AFRS WCCO CHQM KOMA KYW WOR WNEW WLAC CBU CKDA WBZ WFNC KYAK WCFL WHDH CFAC WBAP CKFH KSDO WSB WTIC CJRP CJRC CBL CJBC XEQ CBF CBM WZAM XEMR CBW WHAS KIRO CBK CHQR CKY CKLG CJOB XEFB CJRB WOAY CKKW CFQC CJAT CKEK CHSJ CHNR CFQR WRAI CHAB KUOA WPOP WENE WTAE KGMC KKAA KITE KWTO WKY CBAF WLW

TYPE 315/316F
5/10 KW AM TRANSMITTER



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People In The News

(*Continued from page 106*)

Shearer as new Midwest Regional Sales Manager.

The appointment of **James E. Wickersham** to the Board of Directors of Coastcom was announced....**Rod Bell,** National Sales Manager for James B. Lansing Sound, Inc. (JBL) has been appointed Vice President, Consumer Products, a new office in the company. In his new position, he will be responsible for long range planning and promotion of all JBL consumer products. Additionally, he will direct all marketing programs; establish policy for Marketing and Fair Trade; direct educational and dealer training programs and continue to function as National Sales Manager.

Communications Satellite Corporation announced today that **Melvin R. Laird,** former Secretary of Defense and Presidential Counsellor for Domestic Affairs, has been elected to the Comsat Board of Directors. Laird fills a vacancy on the Board created by the resignation last month of **Phillip W. Buchen,** now Counsel to President **Gerald R. Ford....Richard J. Shiben,** Chief of the Renewal Branch of the Broadcast Bureau, has been appointed Chief of the Renewal and Transfer Division....C-Cor Electronics, Inc. of State College, Pa., has appointed **Stanford G. Cook** to director of manufacturing....**James A. Ross,** 82, president of the Astatic Corp., Conneaut, Ohio, died September 23 in Youngstown, Ohio. Active in the electronics field since 1930, he was also the owner of Ross Radio Co., Youngstown, Ohio, an electronics distributorship....Theta-Com has announced the creation of a regional sales office in Toledo, Ohio to be headed by **Dennis Ashcroft.** They also announced the appointment of **C. E. Maki** as President and General Manager of Theta-Com in Phoenix, Arizona.

Waldon O. Watson, formerly Sound Director of Republic Studios, Universal Studios and MCA (retired), has been given the Samuel L. Warner Memorial Award for 1974 by the Society of Motion Picture and Television Engineers. **Joseph A. Flaherty**, General Manager Engineering and Development, CBS Television Network, has been awarded the David Sarnoff Gold Medal of the society of Motion Picture and Television Engineers for 1974.

SMPTE has elected new Fellows. Those upon whom this honor has been conferred are: **Romauld W. Bachmayer**, Vice President & General Manager, Cinema Systems Div., Technicolor, Inc.; **Robert A. Castrignano**, General Manager, TV-EVR Dept., CBS Laboratories; **Ellis K. Dahlin**, Manager, Video Tape Systems Service Engineering, CBS Television Network; **James J. Frezzolini**, President, Frezzolini Electronics, Inc.; **Everett L. Hanson**, Plant Engineer, DeLuxe General, Inc.; **Edward B. Krause**, President, Filmline Corp.; **Manfred G. Michelson**, Engineering Consultant; **Leo J. Nicastro**, Process Supervisor, Technicolor, Inc.; **Melvin G. Sawelson**, Executive Vice-President, Consolidated Film Industries; **Donald J. Sheaff**, Vice President of International Operations, Technicolor, Inc.; **Christos A. Siocos**, Chief Consultant Engineer, Canadian Broadcasting Corp.; **Robert M. Smith**, First Vice President, DuArt Film Laboratories, Inc.; **Jan W. Varossieau**, Director, Educational Media Institute,

(*Continued on page 110*)

Satisfy the FCC and your monitor budget ...and still get the best

TV (UHF&VHF)

Model 701: Frequency and Modulation
(FCC Type Approval 3-187)

Model 702: Modulation only
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AM

Model 713: Frequency and Modulation
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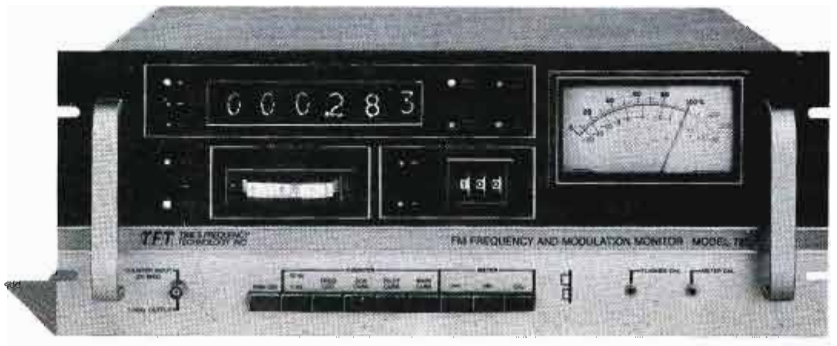
Model 732: Modulation only
(FCC Type Approval 3-209)



FM/STEREO /SCA

Model 723: Frequency and Modulation
(FCC Type Approval 3-202)

Model 734: Modulation only
(FCC Type Approval 3-214)

Model 724: Stereo (FCC Type Approval 3-217)

Model 730: SCA (FCC Type Approval 3-225)

TV, AM and FM monitors that measure both frequency and modulation. Or modulation only. Plus full compliance with all applicable FCC regulations. Those are the choices you get from TFT.

And no matter which monitor you choose, you get all the advanced features that make TFT monitors the standards for accuracy, convenience, and reliability.

For example, frequency synthesized design allows you to calibrate frequency directly against the National Bureau of Standards. You can use either a TFT Model 735 WWV Receiver or any standard receiver.

What's more, all TFT instruments have a built-in, off-the-air capability that doesn't require an RF amplifier. Result? Intermodulation interference is eliminated.

You also get digitally settable plus and minus peak flashers – a TFT first. They eliminate ambiguities and allow you to set the peak limit up to 129 percent in one percent steps. So, you can operate at the maximum allowable modulation, without fear of exceeding FCC limits.

Other TFT features you won't find in conventional monitors include digital readouts and a proportional-controlled oven master oscillator for exceptional frequency stability.

So for precise, accurate and reliable monitoring, and guaranteed satisfaction, make your choice TFT. To arrange a demonstration on your frequency, contact your local TFT representative, or call.

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People In The News

(Continued from page 108)

University of Utrecht, Holland; **Joseph Westheimer**, President, Westheimer Co.; **Irwin W. Young**, Chairman of the Board, DuArt Film Laboratories, Inc.

Byron S. Roudabush, President of the Society of Motion Picture and Television Engineers, has announced a number of distinquished commendation awards to be presented during the Society's 116th Conference. Those receiving the Special Commendation Awards will be: **Prof. M. V. Antipin**, Institute of Film Engineers, Leningrad, for his contributions to motion-picture technology; **Georges Hansen**, Director, EBU Technical Centre, Brussels, for his contributions to radio and television technology; **Bernard Happé**, formerly Technicolor, Ltd., London, for his contributions to motion-picture technology; **Alphonse Ouimet**, past President, Canadian Broadcasting Corp., Ottawa, for his contributions to radio and television technology; **Dr. Richard Theile** (Deceased), formerly Director, Institut fur Rundfunktechnik, Munich, for his contributions to radio and television technology; **William T. Wintringham**, formerly Bell Telephone Laboratories, Murray Hill, New Jersey-for his contributions to radio, television and motion-picture technology.

Radio/TV

Dale L. Morrell has been promoted to the position of Assistant Chief Engineer for KAKE-TV & Radio, Wichita, Kansas....**John P. Gallagher** leaves WOR, New York/RKO General Broadcasting, to form Media Concepts, Inc....**Harold Lincoln Hadden** retired after 47 years with WOR and WOR-TV as Supervisor of Television Projection....**Bill Buckmaster** has joined the news staff of the Donrey Media Group's KORK-AM/FM, Las Vegas, Nevada....**Authur C. Hafer** has been named as the Director of Engineering for WGTE, Channel 30.

Martin McAndrew has been appointed to Director of the Operations Center and Production Services of the Hughes Television Network....RCA announced the appointment of **Randy S. McCallister** as a product analyst for RCA Broadcast systems....**Alan Henry** has joined Fairchild Industries, Inc. as General Manager of its Broadcasting Group....**Joseph P. Cullinane** has joined Collins Radio of Rockwell International Corporation as director of public relations....**Michael Loures,** formerly an Account Executive with WFTL/WGLO in Ft. Lauderdale, has joined WIOD as an Account Executive....**George C. Wetmore,** Manager of the Post-Newsweek Stations Central Frequency License Bureau died in The Hague, Netherlands, while on vacation. He was 55 years old and lived in Jacksonville, Florida.

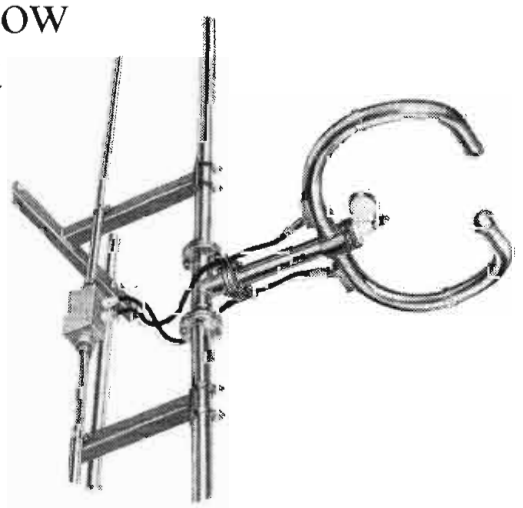
installed as a result of recently completed elections conducted by the International Industrial Television Association. New ITVA President is **Robert McEmber.** Vice-Presidents are **Jo-Ann Ordano** and **Al Bond. L. G. Gibson** is Secretary, **Louis Jackson, Jr.** is Treasurer.

Newly elected to the ITVA Board for six year term is **Tom Richter. Lynn Yeazel** was named Board Chairman.

Saul Esocoff for Phelps Dodge: the fact that we build FM broadcast antennas is one of the best kept secrets in the industry.

We have well over ~~100~~ 200 circularly and horizontally polarized FM broadcast antennas radiating signals daily, yet many people in the business don't know we build them. We're counting on the power of product quality to change all that. You see, because of the technology we've developed over the years in land mobile antennas, cavities, duplexers and rigid transmission line we started out a step ahead.

Our FM broadcast antennas are different. The elements are hard drawn high conductivity copper. They are less susceptible to corona. You get perfect phase coincidence of the vertical and horizontal components. There are 24 types to choose from. Low power or high power. You can use an element as a single bay antenna for limited coverage requirements. Or, use multi-element arrays. The model you choose arrives complete, ready for installation, with a tunable input transformer to match the antenna to the location. Deicer kits and radomes are optional. For FM we also have circularly and horizontally polarized stainless steel educational antennas, directional couplers and low pass filters. May I tell you more? Please write or call me: Saul Esocoff, Manager Special Products, Phelps Dodge Communications Company, Rt. 79, Marlboro, N.J. 07746, 201 462-1880. **See us at the NAB Convention, booth #609**



phelps dodge Communications Company

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bookreview

AM-FM Broadcasting: Equipment, Operations, and Maintenance, by Harold E. Ennes, was written for all who need a practical insight into the use of electronic circuitry as applied specifically to broadcasting.

The first 10 chapters make up the engineering section of the text. This section is not intended as a design course for broadcast equipment; rather, it presents the engineering fundamentals needed by the chief engineer or maintenance technician, or trainee for these positions, of an AM and/or FM broadcast station.

Such subjects as mathematics, semiconductors and logic, transducers, the magnetic tape system, the monaural studio and control room, and the stereo control room are discussed.

The final four chapters are devoted to a discussion of modern station operations. Studio operations, remote pickup operations, studio maintenance, and transmitter operations and maintenance are covered in depth.

The book has many charts and illustrations and exercises are included at the end of each chapter. Answers to these exercises are given at the end of the book.

The book is available from Howard W. Sams & Co., Inc., Indianapolis, Indiana.

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Plunging prices in the semiconductor field have brought even "LSI's" (large-scale integrated circuits) into the pocketbook range of the experimenter. The **Handbook of IC Circuit Projects,** written by Jim Ashe, tells how to use ICs in practical, simple circuit projects that were once too complicated or expensive to be of general appeal. From hi-fi audio circuits right down to a complete digital counter in a single package, the authors covers the field thoroughly with projects he has personally built, tested, and perfected.

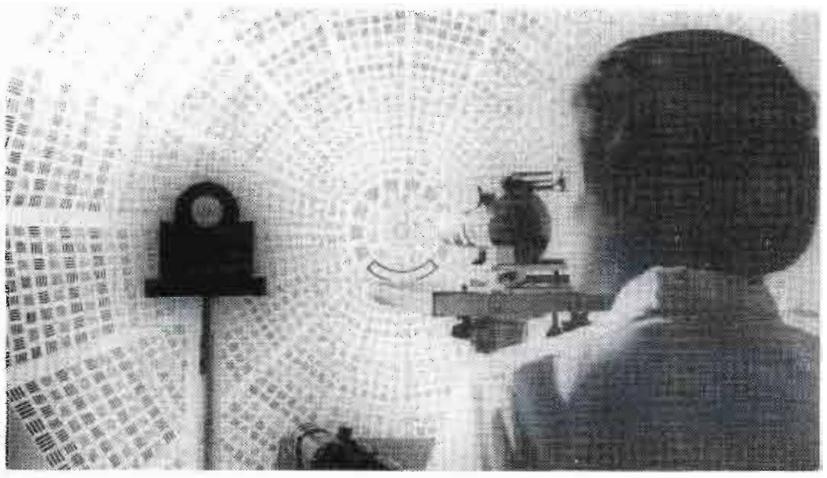
IC work requires construction practices that differ markedly from those used in other solid-state operations, and the author uses the first Chapter to delineate these differences—in shielding, bypassing, grounding, and component layout. The plain language and straightforward presentation of information is thorough enough to prepare even the novice experimenter for the "different" world of IC construction.

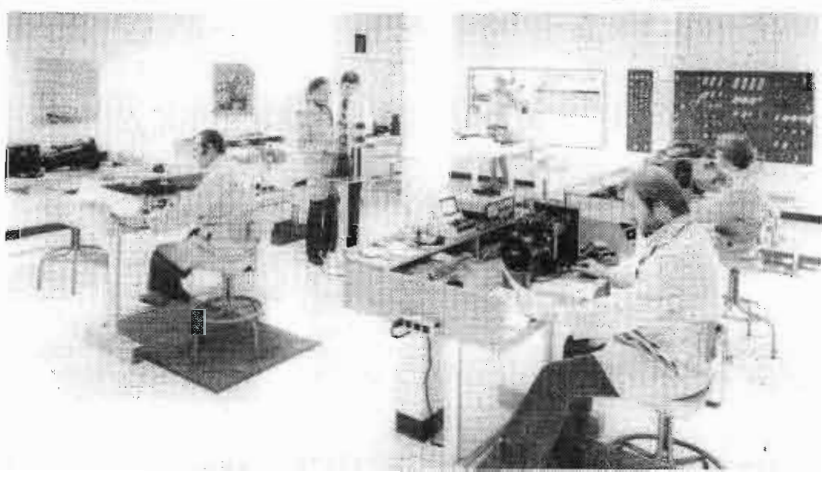
Then, there are more advanced projects such as test instruments and digital devices. With circuit projects geared to every experimenter's taste, this book provides the broadest appeal of any IC applications book yet. The radio amateur, the amateur scientist, the audiophile, the auto enthusiast, and the shortwave listener will find an abundance of specially oriented projects of specific interest.

This book is available through Tab Books, Blue Ridge Summitt, Pa.

For More Details Circle (173) on Reply Card

why is the **angenieux** 15 to 1 still the most popular lens in the world?





technology

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WIDE ANGLE: 51°
SPEED: *f*/2
MAGNIFICATION:
FULL SCREEN AN OBJECT ABOUT ¼″ HIGH

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Station to Station

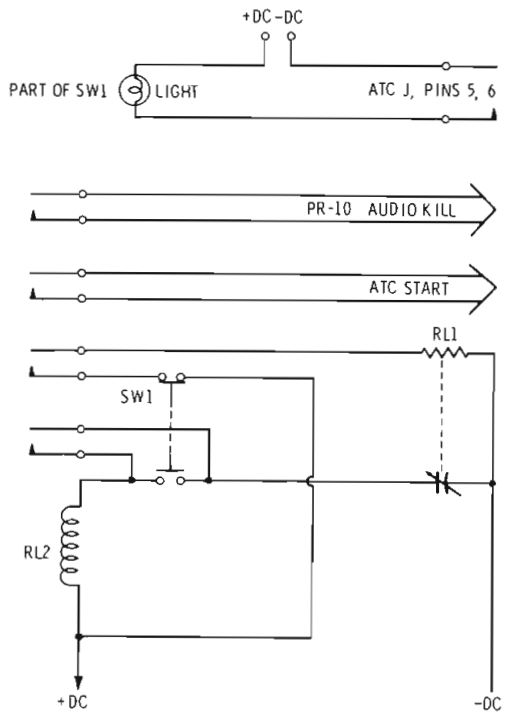
Talk radio delay system

If you have been looking for a simple, cheap delay system this might be your introduction to talk radio. Although there are many different ways to "talk", this system has gotten our talk show off the ground with good success.

Being pressed for time, we started simply with a PR-10 tape recorder with the heads rearranged. A length of tape 38½ inches was used giving us a delay time of six seconds. We further improved the PR-10's operation by removing voltage from the supply and takeup motors with a DPDT switch. This allowed the reels to freewheel rather than fight the tape. This was so the tape recorder could be used for delay or as a normal recorder for those precious airchecks! Five inch empty reels with three inch hubs provide for tape tracking around the deck.

A two channel audio board is also needed. The audition channel is used to mix all live mics, cart machines, net, etc., and feeds the audio into the delay tape deck. The output of the delay tape deck is fed into the program channel for gain setting and then off to the transmitter. The telephone audio problems were solved by a speakerphone supplied by "Ma Bell". Step #1 was to wire the speaker phone directly into the console. We found we needed to pad the line before running it through a matching transformer (8 to 600 Ohm). We tapped directly across the speaker output at the control unit. Step #2 was to give the announcer/moderator editing control for those prank calls.

A simple relay system costing but $12.00 is shown in Figure 1. RL_1 is a 6 Volt 6 sec. N.C. time delay relay. The switch is a Dialco #513-0301-604 two circuit N.O. N.C. lighted. RL_2 is a 4P2T P & B relay. Set #1 contacts automatically short the audio output of the PR-10 when the "panic switch" is hit. Set #2 starts the cart machine which has a six second jingle inserted. The playback of the machine goes to the program side of the board. Set #3 contains the heater element of the time delay relay. As long as the "panic switch" is held down, the heater will not be activated. However, as soon as the switch is released, the heater will become active. Set #4 is the latching circuit to keep the circuit activated until the time delay times out.



To get into the delay from live programming, the announcer simply pushes the "panic button". This will start a jingle and keep the delay shorted of any ambient noise. At the same time, the announcer begins his opening on the audition channel which is being recorded on the delay and will pass the play head as the panic relay releases, keeping a tight format. At any time during the show, a simple push of the switch keeps us clean.

To get back to live programming the announcer has to remember to quit talking six seconds prior to the network. The network is then brought up on the program side of the board and all keys are returned to program for normal use of the board.

Here is a complete explanation of the kill circuit. (All relays and switches are shown in their normal positions.) When an edit is needed, the announcer pushes SW_1. SW_{1a} closes and completes a path through the time delay contacts and

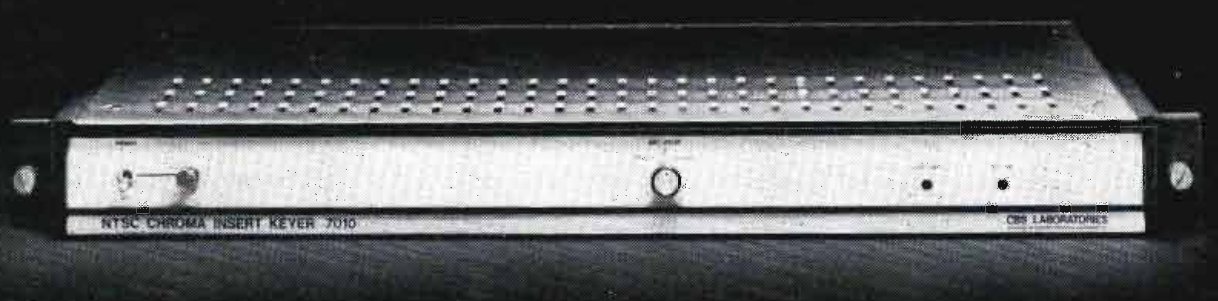
(Continued on page 116)

Here's a new Chroma Insert Keyer that's clear and simple.

Simple, because it has "zero-H" delay which means no installation and retiming hassle, since through delay is less than 25 nanoseconds! And clear, thanks to a unique comb filter which minimizes noise and color-edge crawl from the key signal.

With this new Chroma Insert Keyer, there's no need for a separate insert keyer, or separate RGB switcher. The unit is also equipped with a remote control unit and 50 feet of cable for easy operator control.

The Model 7010, NTSC Chroma Insert Keyer, from CBS Laboratories. It's that clear and simple.



CBS LABORATORIES

A Division of CBS Inc.
227 High Ridge Road, Stamford, Connecticut 06905

For More Details Circle (216) on Reply Card

Station-To-Station

(Continued from page 114)

relay RL_2. The energized coil pulls, which shorts the audio PLAYBACK of the delay machine and starts the cartridge machine (J_1 pins 2 and 3). The third set of contacts would close the heater element of the delay relay except the N.C. contacts are held open until the announcer releases the push switch SW_1. When released, a complete circuit causes the heater to warm-up and release the N.C. contacts of RL_1. Set four contacts latch the circuit on until released by the time delay contacts. If the caller is persistant in any way, you may continue to hold the switch down in which case the six-second jingle will continue to play until the time delay relay opens up.

To light the pushbutton, we simply used the normally open contacts of the ATC playback machine. When running, contacts 5 and 6 of J_1 close. The power supply and lamp are then simply connected in series.

We use Scotch 206 tape and have found the splice to be very critical, as well as no finger prints on the tape. With the tape passing the head every 6 seconds or in our case 3,000 times per show, the tape must be handled with care. We replace the tape every day to assure a clean sound each night. In the first year of service, no tape head wear can be seen. The reason being, the tape does not have the reverse tension on it found in the normal reel operation.

If you want to try talk radio without the big money layout, and without sacrifice of quality, why not try this system.

David Gale
WTRX
Flint, Mich.

Phasing stereo playback units

In an Engineer's Exchange item, Tom Arledge discussed a method for phasing stereo playback units. I believe a more simple method to do this can be accomplished by using an oscilloscope, assuming a station has one.

The procedures are the same except we use the audio generator to record a 1 kHz signal in phase on both channels, thus eliminating the need for a 1:1 line transformer. Monitor your recording by feeding the left channel to the vertical input of the oscilloscope and the right channel to the horizontal input of the oscilloscope. Assuming your recorder has equal outputs, adjust your scope trace for a diagonal pattern as in Figure 1, thereby recording your test tape in phase and of equal amplitude per channel.

Now place the recorded tape on the PB unit to be adjusted. Connect the scope vertical input to the left output of the PB unit and the horizontal input of the scope to the right output of the PB unit. If it were possible for the unit's azimuth to be misadjusted by 90 degrees, a pattern such as Figure 2 would result. If there was only a slight ad-

justment required, the pattern of Figure 3 will show that there is a slight phasing problem.

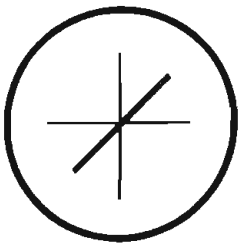


Fig. 1
In phase

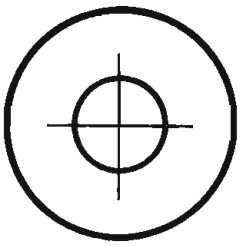


Fig. 2
90° out
of phase

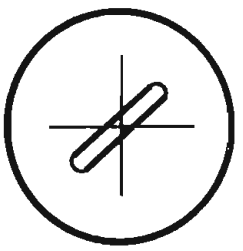


Fig. 3
Slightly out
of phase

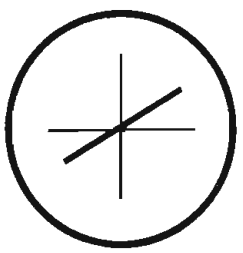


Fig. 4
In phase,
tilt off

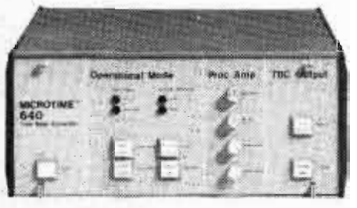
If the forward tilt is off, a pattern such as Figure 4 would show up on the scope. This trace shows the PB unit is in phase, however one channel has more amplitude than the other and an adjustment of the tilt is needed.

This test can be accomplished with both 1 kHz and 5 kHz signals.

Len Petrulis
WOPA
Oak Park, Ill.

Which TBC?

ANALOG.



DIGITAL.

Only MICROTIME can give you an unbiased answer. Because we are the only people who make both analog and digital time base corrector systems. Sometimes one system is best, sometimes the other. With MICROTIME, you always get the system best for you:

The new MICROTIME 640 TBC is now in production. This state-of-the-art TBC overcomes all the VTR and signal format restrictions of earlier digital units. With its wide window, it easily handles wild and wiggly signals from low-cost VTRs with large tension errors. It offers an outstanding signal-to-noise ratio and optimized differential phase and differential gain.

The 640 also offers direct/heterodyne processing, a built-in Proc Amp, and is the only digital with Signal Status Indicators.

Our MICROTIME 610 HETEROCOLOR analog TBC is an outstandingly versatile and cost-effective performer where VTR signals are more stable. As the most advanced analog TBC in the industry, it replaces all the separate stand-alone units that preceded it and handles the output of any VTR from quarter-inch to quad, NTSC direct or heterodyne color, EIA broadcast or industrial sync.

Experience. We introduced the first stand-alone TBC three years ago and have been known for reliability ever since. You'll find our equipment designed with such unique features as front-panel Proc Amp controls to control and optimize the signal quality. Rear-lighted operating mode selectors. Input Signal Status indicators. And hot new features like DCS (Derived Coherent Subcarrier) mode, to let you dub up from a battery-pack to quad. A combination of features available in MICROTIME TBCs and nowhere else.

Our approach. We never try to sell you any TBC until we understand your system's requirements. Then, if a TBC will help, we'll recommend the MICROTIME model that's your best price/performance buy—we're not locked into pushing one system or the other at you. We meet **your** needs—not vice versa.

Send for our free new illustrated applications brochure that discusses time base error correction in non-technical language. Or call us for the name of the nearest distributor and a no-obligations demo at your facility.

We offer both.

See us at NAB Booth 700, South Hall.

Television Microtime Inc.

1280 Blue Hills Ave., Bloomfield, Conn. 06002
Call us for immediate attention to your needs. (203) 242-4242

For More Details Circle (73) on Reply Card

NAB Products

(Continued from page 38)

TV Monitor

Marconi Instruments will be displaying an automatic TV quality monitoring system at the NAB Show, Booth 212 North Hall.

This unique VIT signal analysis system is now offered with a data selector, TK2916, which provides necessary storage and interface to operate a teleprinter output at the measuring point or connections to the appropriate modem for relaying the measured data to a remote monitor or control point. The data selector also permits access for interrogating the monitor to measure any one parameter or scan one or more video inputs.

The new unit now makes the 2914/15 system a complete measuring system for studio and TV network links.

For More Details Circle (174) on Reply Card

Production Switching System

American Data Corporation, located in Booth 329 of the north exhibit hall will be introducing the all new ADC 558 "Dualkey" production switching system.

The 558 is capable of chroma keying and title keying over A/B transistions on each mix/effects amplifier as well as providing such features as quad split, chroma key, pattern modulation as standard features. Also as standard features, is a unique catalog of special effect wipes which include "Spirals-Rotarys-Windshield Wipes-Inverting Wipes" and more.

Along with the 558 the 900 I.C. routing switcher with multi control configurations will be shown. Controls on the 900 include telephone "touch tone" keyboards, computers plus the traditional pushbutton systems. The 1100 series vertical interval/VIR test sets and amplifiers, and the "Mini/Max" 556 will be demonstrated. The 1200 master clock and econoline terminal systems will also be on display.

For More Details Circle (175) on Reply Card

Quad VTR Modification Kit

R-Mod is a modification kit for quadruplex video tape recorders to provide controlled tension tape handling capability like vacuum buffered tape drives have. **Recortec** is at NAB Booth 806, where they will also be showing their video tape cleaners and

evaluators and their popular Video Tape Timer.

The R-Mod is easy for VTR maintenance personnel to install on their own VTR's and requires only a few hours. The benefits provided by the finished product are so surprising someone else has not previously introduced the concept.

For More Details Circle (176) on Reply Card

FM Transmitters

Collins Radio of **Rockwell International Corporation** has announced introduction of eight new Generation 4 FM broadcast transmitters featuring the totally new Phase 4 exciter.

The new transmitters cover the full FM power range, including the 40 kW (model 831H-2), 22-½ kW (831G-2B), 20 kW (831G-2), 10 kW (831F-2), 5 kW (831E-2), 2 kW (831D-2), 1 kW (831C-2), and 10-Watt educational transmitter (model 831A-2).

In announcing the new line of FM transmitters, Howard L. Kirby, general manager of Collins' Broadcast Division, said, "Our new Generation 4 transmitters are the latest addition to Collins' 40-year history of quality commercial broadcast equipment.

"At the heart of these new transmitters is a new Phase 4 exciter we have developed that produces such clean sound that Collins gives a guaranteed specification on IM distortion of only 0.50% in stereo, and half that in mono."

Kirby also pointed out that another outstanding feature of the new Collins state-of-the-art exciter is its built-in capability to accept discrete four channel signals.

For More Details Circle (177) on Reply Card

Helical Editing System

The EA-5 Editing Control System from **TRI** is designed to control a variety of open reel Helical Scan VTR's for the purpose of doing frame accurate post production editing.

Features include VTR still frame for edit point selection, repeatable preview, and flashing illuminated push buttons for directing the editor/operator sequentially through the editing process. The unit interfaces to 1", ½", and ¼" format machines and can be field installed in approximately one hour.

For More Details Circle (178) on Reply Card

Cordless Mike

Here's one of those seldom heard of items, a wireless microphone system. The model 54/58 **Vega** system is a complete system. Designed for use with professional talent, the 54/58 delivers full fidelity sound to a PA amplifier without trailing wires or mike cables. The system includes a model 54 microphone/transmitter and a model 58 receiver.

The uni-directional cardioid mike is a Shure SM-58 designed to eliminate pops and the necessity of adding a windscreen when used outdoors.

Effective range of the transmitter is 50-feet in virtually all conditions; up to 1,000-feet on clear channels.

For More Details Circle (179) on Reply Card

Frequency Receiver/Controller

The long term stability of secondary atomic frequency standards and high precision crystal oscillators can be improved by orders of magnitude if their output is compared to one of the standard frequencies transmitted by the radio stations of the National Bureau of Standards or similar standard frequency transmitters.

In the past this simple method was not widely used because the applicable commercial available equipment was not flexible enough; often mechanical feedback mechanisms were

utilized which did not allow optimal control schemes. This situation is now changed with the introduction of the electronic frequency receiver/controller model EFR by **Efratom California, Inc.**, the same company that has pioneered the design of miniature rebidium frequency standards with their model FRK.

The new model EFR receiver/controller contains two subassemblies; (1) a LF/VLF receiver which can be connected to the optional Ferrite loop antenna model AAF (frequency selection between 10 kHz and 200 kHz; sensitivity 10 uV/m) and (2) the circuits for phase comparison and generation of the error control signal. The wide band receiver is designed to be free of phase bias errors. By comparing the phase of the received radio signal with that of the frequency standard to be controlled, an error signal is derived.

For More Details Circle (180) on Reply Card

TV Remote Audio Console

As expected, audio consoles are still new product front-runners. And at the show, **Dyma Engineering** will show their TVR-77. It has 14 mixing channels feeding three output busses.

Microphone channels: there are six microphone channels, with manual on-off controls or "preset" for turning on a selected group of microphones together.

All microphones are assignable to any or all of the three output channels—as are all channels on the TVR-77.

Muting closures are provided for the six microphone channels, as are remote on/off contact closures which may be used for automatic timer starts, warning lights, or any other similar purpose.

Audio-follow-video capability: all channels are capable of being remotely turned on to their assigned program buss by means of a remote audio-follow-video contact closure. In addition, each channel has an audio-follow-video defeat to provide for breakaway operation.

High level channels: the remaining eight channels of the TVR-77 are intended for high level inputs and provide transformer isolation of those inputs. Similar on/off closures and audio-follow-video capability are provided on these channels.

For More Details Circle (181) on Reply Card

Rack-mount Monitors

There should be some interesting new monitors on display, and one that's new and unique will be unveiled by **World Video.** The company will show—dual rack-mount 9-inch color monitors.

Other booth features will be their single or dual rack-mount tuner/demodulator, a 17-inch rack-mount color monitor, and the 6210A series color monitors with plug-in circuitry.

For More Details Circle (182) on Reply Card

TV Station Automation Systems

Central Dynamics will give a first time demonstration of the CDL system 100. It will be operating the Ampex ACR-25 automatically, using CDL's data communications "ARCH" software program.

This system fully exercises the random access capability of the ACR-25, utilizing Ampex's accessory systems IDA and ADA. Other products will include the PEC-102, a computer controlled tape editing system, handling three Ampex AVR-2's. Central Dynamics also will show their production switchers and processing equipment.

For More Details Circle (183) on Reply Card

Triax Color Camera

Service-proven color cameras that operate on light triax cable have been a long-heralded wave of the future. Now one such camera is a working reality with over three years of field service behind it. It's the TTV 1515 by **Thomson-CSF.**

The U.S. broadcast industry will meet Thomson's TTV 1515 at the coming NAB Show. Over 300 TTV 1515's are now serving in the field. The CBS Television Network is now using TTV 1515's in their Field Operations.

The TTV 1515 has a long list of features: continuous automatic registration; automatic synchronization; pick up tubes removable from rear without disturbing deflection yokes; quiet picture because head amplifiers surround targets for full shielding; converts from triax to ½" multiconductor cable; excellent picture at light levels down to 10 foot-candles; automatic cable compensation; contour correction with adjustable comb filter; built-in diascope; light weight: camera 77 lbs., viewfinder 11 lbs.

For More Details Circle (184) on Reply Card

Audio Consoles

Ampro will deliver a new line of audio consoles to the NAB. These will include mono, dual mono, stereo, dual stereo, and simulcast.

These will include both rotary and slide fader versions. In keeping with the trend to recognizing individual needs, Ampro will feature modular plug-in circuitry. A further refinement is remote start capability on all high level inputs.

The company also has an updated electronic splice finder option for their cart recorders. This is the first time it'll be shown at NAB.

For More Details Circle (185) on Reply Card

Video Monitors

Hitachi Shibaden Corporation of America is introducing a newly improved line of monochrome and color monitors for the professional.

The VM-502 5" monochrome monitor is a compact and rugged video monitor incorporating latest State-of-the-Art solid state electronics with improved circuitry design for increased stability and efficiency. Suitable for use in a 3-abreast standard 19" rack panel mount (VM-502-3RM as shown), for studio and broadcast application, the monitor will withstand rigorous commercial use in such fields as broadcast, commercial and security installations.

The VM-904 9" monochrome monitor is a high performance solid state video monitor ideally suited for surveillance, industrial, institutional and commercial broadcasting. Its compact design utilizes the latest electronic circuitry incorporating features such as black level clamp for improvement of picture contrast over a wide range, and delivering a horizontal resolution of 600 lines. This new lineup of monitors also includes 12,17, and 18-inch models.

For More Details Circle (186) on Reply Card

Helical Editor

A new editor designed to edit on helical and transfer to quad will be shown by **Datatron.** They'll call it the Vidicue 5050.

With the 5050, you can expand from two to three machines or move up in logical steps to a completely automatic on-line, off-line system. Using a simple keyboard entry approach, the editor offers a visual display of tape position and all edit points. And their "jam-sync" feature eliminates the need to pre-record SMPTE edit code on the tape. During pre-roll, the system time code generator is automatically set and sync'd so that time picks up exactly where it left off...to the frame.

For More Details Circle (187) on Reply Card

Compact Video Production Switcher

Ross Broadcast Products Ltd. has introduced a new super compact video production switcher. The model RVS 16-4 is a 16 input, 4 bus switcher incorporating color black and background generators, 96 pattern special effects generator, joystick positioner and modulator, downstream keyer and features soft wipes, soft key, bordered wipes and spotlight effects. The high performance, low cost package occupies little space (electronics 3½ inches rack space) and consumes little power (50 VA).

The switcher has had overwhelming acceptance in the Canadian market with several systems placed in service since July 1974 including 12 for the Canadian Broadcasting Corporation.

For More Details Circle (188) on Reply Card

Chroma Corrector

Television Equipment Associates will be showing the Matthey Chroma Corrector.

This unit is designed to cure low chroma and evelope delay. One knob gives control over ±40 percent chroma level and another over ±100 ns chroma delay. Adjusting the chroma does not affect the luminance signal.

It can be used for cleaning up chroma after distortion by microwave.

For More Details Circle (189) on Reply Card

Equalizer

A new state-of-the-art graphic/shelf equalizer with repeatable equalization is available from Modular Audio Products, a unit of **Modular Devices, Inc.**

Model 3100 is the latest in a series of equalizers, and joins Modular Models GME-20, AE-20, SME-20 and 3000. The new Model 3100 features three independent overlapping frequency ranges-50Hz to 500Hz, 300Hz to 3KHz, and 1.5KHz to 15KHz with eleven detented center frequencies per range.

Other features include: selectable bell-shaped or shelf response curves on high and low frequency ranges; -15dB to +15dB cut and boost with eleven detented positions; silent equalization in-out switch with LED indicator; high output capability of up to +27dBm into 6000Ω; TYP THD .05%; and low noise of -90dBm unweighted, 20Hz to 20 KHz.

The Modular Model 3100 is only 1½"w x 5¼"h x 5¾"d and is ideal for a wide variety of audio applications.

For More Details Circle (190) on Reply Card

Digital And Analog Time Base Correctors

Television Microtime, Inc., has announced two new TBC systems, the Series 610 and Series 640.

According to Microtime President A. Norman Into, the new Series 610 is the most advanced analog TBC in the industry and replaces all the separate stand alone units that preceded it. The Series 640 is Microtime's entry into the standalone digital TBC field and features a wide window with better signal to noise ratio than what was previously available.

Both of the new systems include a host of features such as built-in sync generators, full proc amps and direct/heterodyne processing. In addition, both the Series 610 and 640 will accept RS-170 or RS-330 composite sync and may be interfaced to H lock, V lock (capstan servo'd) or no lock VTR's.

Microtime is offering to retrofit its present customers' TBC's to assure them of obtaining full benefit from the advanced design of the newer Microtime systems.

For More Details Circle (191) on Reply Card

Modulation Monitor

Belar Electronics Laboratory has announced the addition of a new AM modulation monitor, AMM-2, to its list of broadcast monitors. This FCC type approved unit (#3-224) is unique to the industry because it incorporates a modulation-cancellation scheme to recover the unmodulated carrier, to which the modulation peaks are referenced. Levels are displayed via true ratio-type indicators.

The AMM-2 contains a phase-linear filter that reportedly will not produce overshoots when the transmitter has a built-in negative peak clipper. The true modulation peak is then measured rather than false, higher peaks introduced by the non-linear phase filters found in other AM modulation monitors.

In addition to operating across the AM band, the AMM-2 will operate as high as 160 MHz. Also available is a complementary remote meter panel, off-air amplifier and associated antenna.

For More Details Circle (192) on Reply Card

Turntable Preamps

Ramko has a new "E" series turntable preamps that will provide high sensitivity, inaudible distortion and RFI suppression.

Designed for both versatility and professional performance the MP-8E (mono) and SP-8E (stereo/dual mono) will provide at least +4dBm out with as little as 500uV in at 1 kHz. Adjustments are provided to enable the preamps to accept up to 100mv in before distorting. In addition to the individual front panel level controls, the units have rear terminals for remotely switching to one of three modes of operation. RIAA response ±1dB, scratch filter or brilliance boost.

The "E" series feature balanced 600 ohm outputs capable of at least +21dBm out, signal/noise ratio of 77dB, distortion less than 0.05% and greater than 700dB channel separation.

For More Details Circle (193) on Reply Card

TV Production And Broadcast Consoles

Ward-Beck Systems, Inc., who design custom and standard broadcast and TV production consoles will be taking the wraps off their newest TV production console.

Ward-Beck Systems features the latest in state-of-the-art circuitry and physical designs. They will also show their regular line of consoles and modules. This unique console line will be on display in Booth 1201.

For More Details Circle (194) on Reply Card

Refurbished Video Heads

Computer Magnetics will be one of the few companies showing refurbished video head assemblies. The company claims the fastest turnaround time in the industry. They also will be introducing audio heads for RCA VTR's.

For More Details Circle (195) on Reply Card

Splice Finder

Lauderdale Electronic Labs announces availability of a new high speed automatic splice finder for broadcast tape cartridges. It will accept all sizes of cartridges and uses latest state-of-the-art infrared opto electronics to sense the splice and forwards it 2-inches beyond the capstan for viewing. An audible tone then alerts the operator when the splice has been found.

An automatic torque control allows attainment of speeds up to 30 IPS for high speed operation.

For More Details Circle (196) on Reply Card

Modular Audio Console

A new audio control console, Model 1604, from **Automated Processes, Inc.,** offers flexibility to the audio professional. Performance options can be selected from among plug-in modules, and a variety of interchangeable equalizers are also available.

The relatively low cost of this console makes it suitable for use for either fixed or remote recording, and by broadcasters as a production or on-the-air console. It will accommodate 16 inputs, 4 echo channels, 2 foldback circuits, 4 output channels, 4 submasters, 4 speaker monitoring, slate, tone and intercom circuits, and audition and cue facilities. For broadcast applications, the 1604 console has the necessary foldback, audition, intercom and program interlock features, and may be equipped with optional modules offering remote control of tape machines and turntables, or remote input pre-selection.

All external connections are plug-in to allow rapid installation.

For More Details Circle (197) on Reply Card

Microwave Xmtr, Receiver

TEPCO Corporation announces a completely repackaged and improved microwave transmitter and receiver. Years of experience in the field combined with added years in the lab have resulted in a rugged, reliable microwave system. The new microwave is all solid state except for the klystron which was retained because it is so reliable and easy to maintain.

The new receiver is available in the entire range of 2 GHz through 13 GHz. The transmitter is designed for the 2, 7 and 13 GHz bands. The new units are available for rack mounting or for a portable system. The new system accepts single program feed in monaural or stereo and two additional subcarriers.

For More Details Circle (198) on Reply Card

Attention SBE Members
Annual Membership Meeting
Sunday, April 6
2:30 pm
Conference Rooms 2 & 3
Las Vegas Hilton

FM Generator And Exciter

Wilkinson Electronics, a familiar name in AM and FM, is offering a stereo generator and FM exciter. (They'll also be showing transmitters.)

The SG1E generator features: 60 dB separation from 50 Hz to 7500 Hz; 55 dB separation from 7500 Hz to 10,000 Hz; 50 dB separation from 10 kHz to 15 kHz; and FM noise at -75dB and crosstalk at -60 dB.

The FME10 exciter features: frequency response of ±¼dB 15 Hz to 350 kHz; FM noise level -70 dB below 100% mod.; 0.3% distortion; 18 Watts adjustable power output; and stability at 1 part in 100,000.

For More Details Circle (199) on Reply Card

LED Meters

Quad-Eight Electronics has announced two new additions to their "PK Series" of LED indicating meters.

In addition to the PK-16 vertical scale and PK-14 arc-scale meters, the line now includes the PK-100: the same amplifier electronics of PK-14/

16 which converts conventional VU meters into Peak Level monitoring instruments. The circuit board module features simple attachment to existing meter terminals and mating connector, shallow behind-meter profile, accessible adjustments for electronic change of integration time, fall-back & tracking.

The PKM400: Four independent channels of LED indicating level monitoring. The alternate made PK-16 is utilized in a self-powered, small portable "console top" package. XLR input connectors, and a built-in display brightness control are additional features.

For More Details Circle (200) on Reply Card

Video Titler

Datavision Video Products, Mincom Division, 3M Company, will be exhibiting their new D-3400 Video Titling System at Booth 706-S of the 1975 NAB Show.

The D-3400 Video Titling System features excellent character structure due to 1120-element resolution.

The D-3000 Video Character Generator of the system is a stand-alone unit, for video titling using high-resolution characters, and with an internal random access memory of four full pages, 1 to 10 lines per page, 22 characters per line. The unit is entirely housed in desk-top enclosure, easily portable for use on "remotes". Other features include: 2 type fonts; character edging; flexible display format; full cursor controls; two-channel display, preview and program; 3-speed roll and crawl modes; word flash; title insert mode; and internal video mixing.

For More Details Circle (201) on Reply Card

Professional Recorders

OTARI Corporation will introduce an entirely new product line at NAB '75.

Five models of the new line will be demonstrated for the first time at NAB '75.

- MX-5050 Mini-Pro Recorder, a compact professional recorder, with 10½-inch reels and two or four channels. Professional features include front panel edit and cue controls, motion sensing, splicing block precision mounted on head cover, synchronous reproduce, optional dc capstan servo system, XL connectors for line in and 600 Ohm +4dB output, front adjustable bias and equalization, built-in test and cue oscillator, standard reference level calibrate position, and rack mount kit.
- MX-5050 Mini-Pro with DC capstan servo.
- ARS-2000 Automated Radio Station Reproducer. This is a rack mounted reproduce machine designed to meet the special needs of the automated radio broadcaster. It uses the same basic transport as the MX-5050, with its reliability—2000 hours MTBF—and tape handling characteristics. ARS-2000 features include reproduce only electronics with +4dB 600 Ohm balanced output and optional 25Hz cue tone sensor and notch filter.
- MX-7300 Series. This new series includes one, two, four, and eight track versions (two and eight track models will be demonstrated at NAB). The MX-7300 features three speed operation (3¾ to 15 ips or 7½ to 30 ips), motion sensing, front panel edit and cue, synchronous reproduce, DC capstan servo, 600 Ohm +4dB outputs, XL connectors, console, portable or rack mounted versions.
- MX-7300-8 One-Inch Eight-Track Professional Recorder. Same professional features as MX-7300 series except two speed operation 7½/15 ips or 15/30 ips with direct drive hysteresis motor or optional DC capstan servo, and synchronous reproduce with optional remote capability on all channels.

For More Details Circle (202) on Reply Card

Portable Videocassette Recorder

A portable, ¾-inch color videocassette recorder that features a small, 20-minute cassette which is compatible with all full-sized videocassette machines, has been introduced by **TEAC Corporation of America.**

Called the VT-1000, the lightweight (less than 30 pounds) video tape deck marks TEAC's entry into the U.S. video tape market. A companion black-and-white portable video camera, the HC-100, is being introduced simultaneously.

The VT-1000 is designed for portable use and comes with a sturdy handle and optional leather case and strap. It is powered by rechargeable batteries or other 12-volt sources, or from household AC power through the AC/color adaptor.

The TEAC video deck features extended stop motion, automatic circuitry that selects either color or black-and-white operation, dual audio channels, and audio dubbing capabilities.

Technically, the VT-1000 utilizes full interlace recording of 525 lines,

with 240-line resolution in color and more than 300 lines in black-and-white; a memory system that can engage rewind and fast forward modes even when tape is threaded or unthreaded; automatic shutoff for end-of-tape and beginning-of-tape; optional plug-in RF channel modulators; and with the unit's self-contained VB-301 battery pack the unit can record up to 40 minutes of color recording without recharging.

For More Details Circle (203) on Reply Card

Aural Studio-Transmitter Link

The new all solid-state Model PCL-505 Aural Studio-Transmitter Link has been announced by **Moseley Associates,** Inc., of Santa Barbara, California. This new low-profile STL is available in the 150-174 MHz, 215-240 MHz, 300-330 MHz, 450-470 MHz and 890-960 MHz bands. The Model PCL-505 Aural Studio-Transmitter Link will replace the current Moseley Models PCL-202, PCL-303, PCL-303/C and PCL-404 STL's.

As in the past, direct FM modulation, a technique pioneered by Moseley Associates, is employed in the PCL-505 Transmitter. A brand new approach to AFC circuity design enables a 100 percent duty cycle greatly improving AFC locking capability and providing frequency stability of better than 0.005 percent. The new system accepts one program feed, monaural or stereo, and two additional subcarriers.

Also considered in the design of the PCL-505 was quadraphonic stereo. The PCL-505/C has the capability of accepting a quadraphonic stereo signal.

For More Details Circle (204) on Reply Card

Compact Color Monitor

Amtron Corporation announces a new low cost compact color video monitor, designed to meet the needs of broadcasters, cable TV, private networks, and teleproduction applications.

Designated the AM-12, the monitor features a single gun 12-inch tube, and the unit occupies only 10½-inch of rack space. This new unit widens Amtron's line of low cost color monitors and monitor receivers.

Using the single gun color system, the AM-12 has updated circuitry to produce a bright, sharp picture without moray and convergence problems that often are common in conventional monitors. It also has separate RGB gun switches as standard equipment as well as internal/external sync and a tally light.

The RGB controls permit control of blue gun setup of hue and luminance. Optional features include dual video inputs with front panel A-B selection and independent horizontal and vertical scan delay.

For More Details Circle (205) on Reply Card

Sports Mic

Broadcast engineers can now simplify the set-up of remote broadcasts and reduce the amount of equipment taken on location by using the new Model SM82 unidirectional microphone from **Shure Brothers Inc.**

This new microphone contains its own line-level amplifier, peak limiter and 9.8V battery, for single-channel remotes where simple, space-saving audio equipment is necessary. Its balanced line-level output can drive telephone lines or other line-level inputs.

In parade or rally coverage, for example, the Model SM82's line-level amplifier allows up to a mile of unshielded cable to be used between the microphone and the broadcast equipment without equalization, while the built-in peak limiter makes the SM82 ideal for play-by-play sports coverage by preventing overloading of the remote broadcast amplifier.

For More Details Circle (206) on Reply Card

Cartridge Tape Splice Finder

The introduction of a new 240 Volt/50 Hz senstrol automatic cartridge tape splice finder and bulk eraser, designated Model SFE-3, has been announced by **UMC Electronics Co.**

The automatic splice finder can cut broadcast cartridge handling time by at least 50 percent by automatically locating a splice on a cartridge and kicking out the cartridge with the tape stopped just beyond the splice point. In this way, station personnel may perform other tasks while the splice finder scans each cartridge tape.

The essential function of the splice finder is to avoid the possibility of a "blip" on a recorded commercial or segment of programmed material which can occur if the cartridge tape splice is recorded over. Recording which begins immediately after the splice precludes the possibility of an audible blip.

For More Details Circle (207) on Reply Card

Digital Timers

Two new digital timers employing solid state circuitry have been intro-

duced by **Standard Electric Time.** The instruments are used to measure elapsed time. The reset to zero is instantaneous and absolutely silent.

Users of the Millisecond Model (STD-11-2) have at their disposal four times in one. Selection of the four available read-outs is made by push-buttons on the face of the instrument. Alternate readings can be made in seconds, tenths, hundredths and thousandths of a second.

The Minute-Second Model (STD-12-2) totalizes up to 99 minutes and 59 seconds. On both models, start stop and reset is accomplished with a handswitch supplied with the instrument. Display numerals are 5/8" high of the gas discharge type, capable of being read at 40 feet.

For More Details Circle (208) on Reply Card

EBS Encoder/Decoder

Audio Services Inc., has increased the size of their NAB booth this year, and the main feature will be their EBS Encoder/Decoder system that is, according to the company, campatible with the FCC's newly issued test requirements.

Nine months from now, broadcast stations will be required to broadcast a specific audio tone combination instead of the carrier cut/1000 Hz tone now used. And, all EBS reception equipment will be required to activate upon reception of these tones. The Audio Services encoder sets up the tone system, and the decoder will trigger the necessary alarm function.

ASI also will show their new digital master clock system.

For More Details Circle (209) on Reply Card

Wireless Sound System

Edcor, manufacturers of professional wireless sound equipment, will unveil the ST-3/PM-4 Wireless Video Sound System for professional recording studios. Edcor, innovators of wireless video sound systems, developed the ST-3/PM-4 Studio System to provide complete freedom from cumbersome wires, while meeting more sophisticated requirements of the professional video recording industry.

The System consists of two solid-state units; the ST-3 Sensatuner and the PM-4 Lavalier microphone. When connected to your existing studio recorder, the system offers both mobility for the subject, (up to 200-feet from the receiver) while removing cumbersome wires from the studio set.

For More Details Circle (210) on Reply Card

Audio Cart Machine

The convention will feature some interesting changes in audio cart machines. And, as you'd suspect, **Broadcast Electronics** is right in the middle of it. Their Series 2000 is designed for low power consumption, reducing cart usage effects. Their noise figure exceeds 57 dB.

Start-stop times are quite fast, hitting under 80 milliseconds.

Standard features include a balanced transformer output, 1000 Hz cue, 150 Hz cue, and provision for remote control and telephone interface.

For More Details Circle (211) on Reply Card

Tape Recorders

Nagra will show a new line of broadcast quality portable tape recorders that has more features than their mini-Nagra, yet they are less than two-thirds the size and weight of the Nagra standard version.

The new intermediate size recorders have to mixer volume controls for mic or line level inputs, along with LF filtering. The tape transport has three motors, and this new motor system permits very fast winding and rewinding. The capstan motor has a full closed-loop servo control, and the reel motors are electronically controlled by tension arms.

The new line has three versions: IS-D, the simplest with one tape speed (7½ ips); IS-DE has universial mic preamps; IS-DT that is similar to IS-DE except that it has two tape speeds (7½ and 3 3/4).

For More Details Circle (212) on Reply Card

Microwave Relay

For those interested in electronic journalism, **Farinon** has a new series of IF hetrodyne microwave systems for point-to-point relay (intercity and STL) of video signals in all frequency bands from 2 GHz to 13 GHz.

The FV13F features high selectivity inherent in advanced dual conversion design that allows close parallel-channel spacing without spurious tones. Typical video figures are: 65 dB signal-to-noise ratio; 56 dB signal to hum ratio; 0.5 dB differential gain and 0.7 degree phase differential (over a seven-hop system).

For More Details Circle (213) on Reply Card

New Video News Film

A new color film for television news

coverage that offers finer grain and more rapid and economical processing was announced today by **Eastman Kodak Company.**

Eastman Ektachrome video news film 7240 (tungsten) offers television news departments the flexibility of using one film that can be exposed at various exposure index ratings. With 10-footcandles illumination, normal density ranges can be obtained using typical film equipment. The new film maintains the excellent quality of Kodak Ektachrome EF film 7242 (tungsten) and, when shot at higher ratings and force-processed, it exhibits significantly improved grain compared to that film.

Because Ektachrome video news film 7240 is prehardened during manufacture, the new process VNF-1 eliminates the prehardener and neutralizer solutions of process ME-4. The remaining steps in process VNF-1 are the same as the corresponding steps of process ME-4.

Process VNF-1 is compatible with current machinery and, because two steps have been eliminated, offers operating economies over the current process. These include a 15 to 35 percent reduction in chemical costs and 18 percent shorter wet time.

The film will receive a trade trial as SO-333 and will enter general distribution as Eastman Ektachrome video news film 7240 (tungsten) at mid-year.

For More Details Circle (214) on Reply Card

Portable Video Camera

A black-and-white C-mount video camera weighing five pounds with a six to one zoom lens has been introduced by **TEAC Corporation of America.**

The new "handy camera"—the HC-100—was developed to enhance the recording capabilities of TEAC's VT-1000 portable color videocassette deck. The two units comprise the company's initial package in the U.S. video market.

The camera features a 1½-inch viewfinder that doubles as instant playback monitor; 350-line resolution; flip-down magnifying lens in the viewfinder for group viewing; electronically locking record/start/stop function; built-in uni-directional electret-condenser microphone; and LED indicators to advise of record (red) and low-battery (orange) conditions.

For More Details Circle (215) on Reply Card

NAB Products Begins on page 28

Back-Pack Color Camera

The new Minuteman back-pack color TV camera offering production quality performance was featured at the annual NAB convention by **CEI.** (Booth 105)

Designated the CEI-290, the camera is designed for mobile video taping and live TV broadcast production applications.

The Minuteman system includes: (1) camera head with standard 10:1 Angenieux f2.8 lens; (2) detachable view finder; (3) back-pack electronics and Bell hip-pack mounting adapters; and (4) camera control unit with NTSC encoder and operating control panel.

Refurbished Quad Heads

Videomax Corp., booth 107 North Hall, will exhibit its selection of refurbished quad heads.

Featuring a "better than new" guarantee, the Videomax line includes the Mark III and Mark X in the "L" Series with a 500-hour warranty, and the "M" Series hi-band and low-band quad heads with a 200-hour warranty.

Technology in the newsroom

By Pat Finnegan

There are bound to be days when the recorder taken out on a news gathering assignment won't work. Or mikes that go bump in the night and die away.

There are bound to be those days when it doesn't pay to get up. You enter the newsroom and find the monitor not working. . . .and then you see someone has spilled a cup of coffee on it. Ugh! The teletype machine is clacking away but the paper isn't moving. And you find a paper jam you wouldn't believe. Rushing in to fix it, you step on a news cartridge and. . . .crunch!

And as you stand in the middle of this chaos, you could go into an overload condition. But after all, a station committed to news gathering seems equally committed to overflowing ashtrays, half eaten donuts, and cold coffee in cups stacked three deep.

There isn't much you can do about the nature of newsmen. And if you don't have to wear a janitors hat along with your others, the best you can hope for is a challenge. Keep 'em supplied and running.

Basic Concept

News personnel are seldom technical people. Naturally, they are more interested in the news itself rather than the mechanical operations of news gathering equipment. With this in mind, whenever equipment is designed or arranged for news use, it should be kept as **simple as possible.** An engineer may design and wire up an "engineer's dream", with flashing lights, readouts and the whole works—only to discover news personnel can't operate it because they don't understand the system.

To keep it simple, use plugs that only go in one way or one place and simple on/off switching where possible. This is not meant to be critical of news personnel. Gathering news is demanding work, requiring alertness to subtle meanings in interview statements, quickly thinking of the correct question to pose at that moment etc. They can't also be trying to operate complicated machinery at the same time! Make their job easier!

Outside Equipment

The small tape recorder is a constant companion on most news assignments. This unit is usually a small transistorized, battery operated recorder with half track heads. Most in-station recorders are full track, so it is important that tapes are bulk erased before taken out on assignment. The full track head on

the studio unit will play back both tracks at the same time, and if one track is not "clean", the tape will be unusable unless it can be dubbed off onto another tape. Bulk erasing will insure that the other track is clean, and the recording should only be made one way on the tape. In this manner, the tape will be playable on the full track machines without dubbing, providing a proper tape speed is used.

Batteries used are generally of the rechargable type, so, after each assignment the batteries should be placed back on charge. The small chargers may have a light or button or some other device that shows the charger is delivering a charge to the batteries. Carelessness in observing this small detail can result in batteries that are not up to full charge and the loss of an important interview because the batteries went dead in the middle of it.

Failure to charge can be due to several causes, and the obvious one is a defective battery. But more often, it is due to defective cables, plugs, or the plastic plug cover has slipped and kept the plug from making contact in the socket or jack.

It should be made a common practice to observe that the battery is actually taking a charge when plugged in, and before taking the recorder out, the batteries should be checked for a full reading on the meter or whatever is used as an indicator.

Electronic problems most often center in the head and capstan area. The heads need cleaning on a regular basis or the oxide will build up on them. This area is not the easiest to get to on small recorders, but if an adequate cleaning job cannot be done, the covers should be removed occasionally and the whole unit cleaned out. Bits of tape will often lodge in the area, or may even wrap around the capstan drive shaft and effectively change its diameter and consequently the speed of the tape. The pressure pad arrangement is often a flimsey device that can be easily caught by the tape and pulled out of place or jammed in such a manner that the tape can't make good head contact. But when removing the cover, observe carefully the construction so that it can be removed without damage.

Cassette recorders are becoming popular with news personnel because of their very small size. Heads and pinch rollers should be kept clean in these. There is a small cassette cartridge available that is helpful in cleaning the heads.

Mobile Van Radio

A mobile radio may be installed in a news van or other news vehicle that is also loaded with other electronic equipment. The mobile transmitter will place a heavy demand on the vehicle battery, so this should be one that can handle the load. With this heavy demand, the battery should be checked often for proper charging. Remember that this battery is supplying power for everything mounted in the van. The battery may work alright when the engine is running because the alternator is actually supplying the power, but there may be times that a broadcast must be made with the mobile transmitter and it is not allowable to have the van engine

running. This could be the case if an important interview was to be made from a location where the van was allowed in close but it can't be noisy. In this situation, the battery must supply the entire power by itself, and if it is not up to par, it may quit before the interview is over.

Antennas

The antennas on the vehicle can be another trouble spot. These vehicles are often run through a car wash so that a "clean" appearance may be made to the public. But some of the car wash operations can also tear off the antennas. After the vehicle has been through a wash, the antennas should be inspected to make sure they are still there and OK!.

Vehicles are often equipped with one or more receivers to monitor police, fire, and other important frequencies. These units usually have a squelch control. There may be complaints that the squelch is intermittently breaking open without a signal. This can be caused by a vehicle battery in low charge condition, which can show up when the vehicle idles. The squelch is designed to operate at normal voltages and when the battery voltage drops, the squelch will break open.

An allied problem here is 'over-squelching', that is, setting the squelch much further than it should be to overcome this break out condition. You may miss important calls because the signal may not be able to break open the squelch, or the audio may be chopped up. There is nothing wrong with the receiver, it's the battery.

Inside Equipment

The open reel tape recorder is a basic equipment item in any news room. This may not be as "big" as those in the production booth or control room, so it may have somewhat less reliable components or mechanical elements. The usual problems can be oxide clogged heads or dirty pinch rollers. A not uncommon problem is a thrown drive belt, if such is used, or glassy drive wheels and oil on drive shafts if that type is used. Repair means opening the equipment and cleaning or replacing belts. The unit in these conditions may not run at all or it will show a fluctuating tape speed.

Cartridge recorders will also be a heavily used item, and the majority of problems will be the cartridges themselves. These news carts get a higher percentage of use than others, so will wear down more often. Visual inspection from time to time is called for. There will be tapes with almost all the oxide gone, or pressure pads will be distorted or missing, and other obvious mechanical defects.

Before running off to rewind a cartridge, check with the news personnel to make sure there isn't an important interview or other recording on the tape that should be saved.

In both the outside and inside equipment, there will be numerous adapter cords, plugs, etc. that get considerable use and abuse. These are seldom coiled up neatly and put away. More than likely you will find them crumpled into an unmanageable mess crammed into a drawer, cabinet or tossed on a shelf. These items contribute to a high percent-

age of all the operating problems the news operation will have. Wires will break off in the plugs, or plugs will be bent because someone stepped on them or caught them in a vehicle door.

Maintenance and Other Hints

The recorders, both the reel and the cartridge, should be considered as a "Master", just as much as those in the main production booth. These machines will produce a considerable amount of air programming. The heads should be kept in proper alignment, and the tapes made on these machines should closely match those made in the production booth. After alignment, make up a test tape on the news machine and play this back on the production "Master" unit. The measured results should be similar.

On the simple program switcher in the news room, one of the positions should terminate in the station's regular jack field. This will expand the switcher's flexibility by allowing many sources to feed to the news equipment. But, inside the switcher, wire in bridging resistors so that there will be no impedance upsets when patching into other circuits. For the normally used patches the news uses most often, put colored name tags on the jacks for quick identification.

There are many times when it is desirable to play a tape back over a telephone for someone at the other end to hear. A simple, non-locking switch should be used that requires someone to hold it on all the time it is in use. When it is let go, it switches off. This method will prevent someone inadvertently leaving a recorder across the telephone line.

There are also numerous occasions when recordings are made directly off the telephone line. A better recording is made if the connection is to the line itself rather than a pickup off the phone earpiece. But use a transformer for isolation, and 1 md. capacitor in each side of the line (in series) to block out the DC voltages present on the line. In this manner, the recording can be made and the operation of the normal telephone circuit will not be affected.

Summary

Much news gathering today relies on fragile electronic equipment that must be operated by non-technical people. News personnel are more intent on the news than in mechanical operations, so any equipment designed for them should be simple in operation. The more complicated you make it, the less likely it will be operated up to expectations. Oversee and check on the equipment on a routine basis so that defects can be corrected before they cause loss of an important news story. . . somewhere between the coffee pot and the van. □

(Continued from page 16)

New SBE chapters in the making

Area Of Chapter In Development	Person To Contact
San Francisco-San Jose, Calif.	Robert B. Daines, Time and Frequency Technology, 3000 Olcott St., Santa Clara 95051 (408) 246-6365
Long Beach. Calif.	Merton Garlick, 3758 California Avenue, Long Beach
Thousand Oaks,	Paul H. Lee, Lawrence Behr Assoc., Inc., 125 W. Avendia De Las Flores, Thousand Oaks 91360
Oceanside, Calif.	Bill Montgomery, 3635 Mira Monte Drive, Oceanside 92054
Tulsa, Oklahoma	Joshua A. Socolof, C.E., KKNG Stereo 92, 100 Northeast 48th St., Oklahoma City, Okla. 73105
Oklahoma City, Okla.	Same as listed for Tulsa
Tampa, Florida	Raymond Murphy, Engineering Dept., WFLA Television, P.O. Box 1410, Tampa, Fla. 33601 229-7781
Quincy, Ill.	Lynd Carter, Tektronix, Inc. 422 Anglum Rd., Hazelwood, Mo. 63042 731-4696
Petersburg, Va.	Paul H. Bock, WSSV, Petersburg, Va. (804) 733-4567
Youngstown, Ohio	Leno Leo Laner, NABET Local 47, 7447 Southern Blvd., Youngstown, Ohio
Columbus, Ohio	Richard L. Walsh, WRFD Radio 88, Columbus, Ohio (614) 885-5342
Johnstown, Pa.	W. B. Martin, 70 Colgate Avenue, Johnstown, Pa. 15905
Alexandria, Va.	Charles F. Riley, Tele-Color Production, 708 N. West St., Alexandria, Va. 22314
Portsmouth, Va.	Barry A. Ziegenfus, 303 Effingham St., Apt. 7-B, Portsmouth
Albuquerque, N. Mexico	Guy Smith, KRZY/KRST, Albuquerque, N. Mexico.
Harrisburg, York, Lancaster, Pa.	Charles Morgan, WARM, P.O. 590, Avoca, Pa. 18641 (717) 346-4646

Chapter 2: Northeastern Pa.
Chairman: John Kowalchik
Kingston, Pa. 18704

Art Silver, Gates Division, Harris Intertype presented a tutorial and technical session on modulation techniques, leading into a presentation on the Gates MW-5 AM transmitter which utilizes pulse-duration modulation. The meeting on January 13th was held at the studios of WVIA-TV FM, Pittston, and was arranged by Paul Evanosky, WVIA Asst. Mgr., Engineering and chapter director. John Kowalchik, new chapter chairman presided.

Beginning their terms at this meeting were Assistant Chairman, John Saul, EMCEE, White Haven; Treasurer Milan Krupa of WPTS; and Secretary, Gary Koerner, Lackawanna Area Vo Tech Schools.

Chapter 9: Phoenix, Ariz.
Chairman: Leon Anglin
Phoenix, Ariz. 85001

Al Hillstrom and Chuck Deen, chairmen of the annual Christmas Party, reported that the event was most successful. Further details in a later issue.

January 20th meeting at KTVK-TV was on the Ampex Time Base Corrector Model 800 and 7900 Video Tape Machine.

Chapter 15: New York, N.Y.
Chairman: John M. Lyons
Woodside, N.Y. 11317

The January 9th meeting was held at WQXR Presentation Theater, 229 West 43rd Street. Optional dinner in the New York Times cafeteria preceded the program presented by Michael Aranoff, design engineer, Broadcast Electronics on New Developments in Limiters and Cartridge Machines. Aranoff was assisted by David Bain of Port Washington, representative for Broadcast Electronics.

As a result of recent election, John Lyons was re-elected chairman; Larry Strasser of WTFM was elected vice chairman and Phil Harper of Harris Corporation was elected secretary-treasurer.

Chapter 17: Minneapolis-St. Paul, Minn.
Chairman pro-tem: Joel Humke
Minneapolis, Minn. 55406

Joel Humke of KSTP-AM/FM has set a reorganizational meeting of the Minnesota Chapter of the SBE for 7:30 PM, Thursday, March 20, 1975 at the 3M Complex, East of St. Paul, Bldg. 236. Free parking is provided in the lot adjacent to the building for SBE members and guests. Aside from being a reorganizational meeting, a technical session will feature Dennis Farmer and other engineers of the 3M Company who will demonstrate and discuss a number of new video and audio items.

Chapter 20: Pittsburgh, Pa.
Chairman: Jim Hurley

At the December 19th meeting, the newly elected officers assumed their duties: Chairman, Jim Hurley; Vice Chairman, Jack Cvetic; and Secretary-Treasurer, Frank Davis.

The January 16th meeting was scheduled for 12 noon at Buddies Restaurant.

Chapter 21: Spokane, Wash.
Chairman: T. O. "Jorgey" Jorgenson
Spokane, Wash.

Five meetings were held in the month of December at the Schooner on Regal and 57th. On December 2nd, the meeting was devoted to Strobe Daylight Lighting of Towers, and Technical Training of Broadcast Operators. December 9th, Don F. Robin-

son of Q-TV spoke about Prompters, and William Bridges of Control Design Corporation covered Audio Automation.

A discussion relating to problems that delay applications at the FCC was held on December 16th. V. Hoffart, representing Kaye-Smith Enterprises, presented a talk on Phasor Coils for Directional Antennas at the December 23rd meeting. The December 30th meeting centered on Automatic Control of Television Transmitters.

Chapter 22: Central New York
Chairman: Mort Miller
Syracuse, N.Y. 13214

The January 16th meeting was held at the Northway Inn, Syracuse and featured the new Ashton Communications System television van. Bob Ashton explained and demonstrated the new Sony DXC-1600 7-pound, battery-operated portable Trinicon color camera which, coupled with the new Sony VO-3800 portable video cassette recorder, is said to be "extending the horizons of news coverage". Also shown were the new computer-controlled VO-2850 video cassette editing recorders. Equipment in the van included other studio cameras, reel-to-reel VTR's, Shintron switching and special effects system, and a character generator. Chairman Mort Miller presided.

Chapter 26: Chicago, Ill.
Chairman: Robert Churchill

The December 17th meeting, held at the Catholic Television Network Studios, jointly with the SMPTE, was "The History and Development of the Archdiocesan ITFS Project" by the manager, program director, and chief engineer. Tours were provided of the nearly completed facilities. One of the Sustaining Members of the SBE chapter, Rich Engineering, who is a prime contractor for the CTN, provided a festive table of refreshments to help celebrate the occasion.

Chapter 28: Milwaukee, Wisc.
Chairman: Bob Truscott
Milwaukee, Wisc. 53209

The November 13th meeting at WBCS/WRIT studios featured Leroy Wolniakowski, WBCS chief engineer, who gave an overview of the operations of WBCS and WRIT, with a major portion of the meeting centering on the computer-automated broadcast operation. A Digital Model PD8/m with 12K of ferrite core memory controls, three 24-cart IGM carrosels, two Revox A77's, two 14"

reel-to-reel decks, a 48-cart random access deck and a time present cart package was there to provide 24-hour live-sounding country music.

The December 10th meeting was held at the Wisconsin Electric Power Plant with vice chairman David Dzurick presiding. Armand Trinitapoli, using slides and audio aids, explained the operation of the largest Wisconsin generating plant and then provided an interesting tour of the facilities.

The January 14th meeting, held at Radio City Auditorium, WTMJ, Inc., featured Morris Hornick of the Heath Company whose program was "Anyone Can Do It" and included a display of Heath equipment.

Albuquerque, N. Mex.
Chairman: Guy Smith
Albuquerque, N. Mex.

With Vice Chairman Fern Bibeau presiding, the December 4th meeting, held at Quality Inn, Albuquerque, featured A. A. Albaugh of AT&T. Albaugh covered the work AT&T does for the TV networks.

In the business session, Mike Langnors resignation as secretary-treasurer was accepted and the nomination of Ann Mize was accepted for the purpose of carrying out the duties for the remainder of the season.

Chapter 32: Southern Ariz.
Chairman: Hobart J. Paine
Tucson, Ariz. 85717

The January 14th meeting held at the University of Arizona, College of Medicine, featured Richard N. Lawrence of Telemet who presented an audio-visual program on the 3706 Side Band Analyzer and other related transmitter testers and applications.

Attention SBE Members
Annual Membership Meeting
Sunday, April 6
2:30 pm
Conference Rooms 2 & 3
Las Vegas Hilton

This Is Your Journal

Through these pages, provided through the courtesy of the publisher of **Broadcast Engineering** magazine, members of the SBE may communicate with each other; also, SBE headquarters can pass along information to the general membership and to other potentially interested and affected persons in the field of broadcast engineering. SBE chapters can report and announce information concerning their meetings or other activities; and we can air issues of vital concern to all those who are employed in any way in the field of broadcast engineering.

Some requests to members: When corresponding with the national SBE office, be sure to use your membership number. The national office is operated by Virginia Doss, Assistant Secretary-Treasurer of the SBE. The mailing address is P.O. Box 88123, Indianapolis, Ind. 46202. If you change your address, notify Virginia as soon as possible.

New CCTV standards

The Electronic Industries Association has developed a new standard, RS-420, "Electrical Performance Standards for Monochrome Closed Circuit Television Cameras 525/60 Random Interlace." The RS-420 is the result of over six years of committee work by the EIA Engineering Department's TR-17 Working Group on Closed Circuit Television under the chairmanship of Carlos Kennedy of Ampex Corporation.

Random Interlace cameras have been manufactured almost since the development of industrial television cameras, but there has been no standard waveform for this class of cameras. TR-17 felt that the volume of product being introduced without a standard would ultimately cause growing pains for the industry.

The Working Group has undertaken development of the electrical performance standards for the monochrome random interlace CCTV cameras to define significant parameters descriptive of operation of these devices and to outline minimum levels of performance deemed desirable to develop an acceptable display.

This effort will promote interchangeability of the product of different manufacturers, eliminating confusion on the level of performance that can be expected from an appropriately specified device. It will assist the purchaser in selecting and obtaining the proper product for a particular need.

Looking Ahead

The six-year development of this standard required many laboratory sessions and meetings as well as research done by the individual committee members in their own laboratories. This standard was difficult to develop because of the proliferation of equipment now in the field. Chairman Carlos Kennedy explained, "We wanted a standard not to obsolete this equipment but to be definitive for future product developments in this area."

Among those contributing to the development of this standard were

George M. Bates of Dynair Electronics, Inc.; Alan Bedford from Ball Brothers Research Corp.; Barry S. Brown of General Telephone & Electronic Services Corp.; John Harshbarger from Visual Information Institution, Inc.; Herbert P. Lavin of General Electric Company; Jude Schmidt of Motorola, Inc; and Arthur D. Sterling from Visual Educom Company.

RS-420 is available from the Standards Sales Office of EIA at $2.50 per copy. Orders should be directed to Standards Sales Office, EIA, 2001 Eye Street, N.W., Washington, D.C. 20006. An Index of EIA & JEDEC Standards and Engineering Publications is also available free of charge.

NBC buying EJ cameras

Robert Bosch has announced that NBC News will purchase up to 29 of the new KCN hand-held portable cameras.

The initial delivery of five of the cameras represents the most recent direct order for equipment from a major network.

Richard C. Wald, President of NBC News, said the KCN cameras are intended to enhance the network's news gathering facilities. The KCN's are equal in quality to standard studio cameras and are simpler to operate than hand-held battery operated cameras presently in use. The new generation of electronic hand-held color cameras offers mobility which, until now, has been possible only with film cameras.

The new KCN cameras will be used by the NBC News Bureaus at the NBC owned television stations. The addition of this equipment will enhance measurably the capability for electronic news gathering which now exists in New York, Washington, Chicago, and Los Angeles, and also will provide the same type of rapid facilities in Cleveland.

FCC changes report forms

The Commission has proposed changes in the rules that would revise the Cable Television Annual Financial Report (FCC Form 326) and reduce some of the restrictions on consolidated and fiscal year reporting.

The proposed amendment of Part 76, Subpart I of the rules, subject of a proposed rulemaking proceeding, would ease the reporting burden by restructuring the format of the form to resemble normal bookkeeping reporting and would add definitions of all terms for clarification purposes.

The modification was required because a "cable television system" as defined in the FCC's Cable Television Report and Order (FCC 72-108, 36 FCC 2d 143 (1972)) does not always correspond with an actual financial entity, the Commission said.

In the past, the Commission

pointed out, it has permitted consolidation of FCC Form 326 information where cable television systems are under common ownership and normally keep a consolidated set of bookkeeping records. In such cases, one fully completed copy of the form could be filed for all systems involved in the consolidation.

However, the FCC said, later guidelines presumed that a "consolidated set of bookkeeping records" did not involve more than five cable communities. After three years of experience, the Commission said it found that this presumption did not include a sufficient number of financial entities located in densely populated areas.

Five Community Limitation

The Commission said it was therefore proposing that the "five community" limitation be dropped and a new limitation be added stipulating that, for consolidated filing purposes, a single operating entity may include systems located within a 40-mile radius of the lead system, keeping a consolidated set of bookkeeping records, and technologically connected either by private microwave or by cable.

The Commission also proposed to delete the requirements that all systems use the calendar year basis of reporting. Instead, it said, all information would be reported as of the last day of a system's fiscal year, and all forms would be filed within 90 days of that date.

Other changes would include a requirement in Question 5(b) that lead systems list all systems included in the consolidated financial data.

Schedule 1 of Form 326 would be revised to be comparable to the income statement used by industry accountants and would provide a line-by-line definition of accounts.

Schedules Deleted

The Commission proposed that Schedules 2 and 3 be deleted, and a new Schedule 2 be added to include balance sheet schedules, and would be accompanied by a line-by-line list of definitions and instructions. It would supersede the present Schedule 3.

The present Schedule 3 requires original cost data on tangible and intangible property and is not intended to cover total investment in the system. In the past, the Commission said, there have been incomplete guidelines on how original cost should be calculated that have caused a variation in reporting and that have affected the reliability of the data.

The Commission said the proposed rulemaking was designed not only to obtain more relevant and reliable data but to relieve some of the reporting burden and expense for the cable television industry. While the requirement for additional data normally places more burden on the respondent, the Commission said it proposed that the design of the forms be reasonably similar to the bookkeeping schedules already used by industry accountants. It also proposed that the consolidated guidelines be more flexible so that fewer forms need to be filed.

Revised standard

The Electronic Industries Association announces the new revision of "Minimum Standards for Portable/Personal Land Mobile Communications FM or PM Equipment 20-1000 MHz," RS-316-A. RS-316-A was developed by the EIA Engineering Department's TR-8.13 Subcommittee on Personal and Portable Land Mobile Communications Equipment Headed by Randall J. West of Motorola.

The revised standard is designed to improve the organization of the original document, bring it up to the present state-of-the-art, reduce the number of differences between RS-316 and other standards covering mobile communications and

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incorporate methods of measurement covering important performance parameters not covered in the original RS-316 standard.

The new RS-316-A will provide the user and manufacturer of portable and personal radio communications equipment with a modern standards document covering both methods of measurement and minimum performance standards.

Among the industrymen making key contributions in the revision of RS-316 were Hugh Barnes of E. F. Johnson, Co., Norm Mortenson of RCA, Inc., and Fred Mann of General Electric Company.

The parent committee of the Personal and Portable Land Mobile Communications Equipment Subcommittee is the EIA TR-8 Land Mobile Engineering Committee. The TR-8 committee has 6 other standing subcommittees covering electronic equipment (and antennas) used in the land mobile services. Other current EIA standards covering the land mobile communications field include: RS-152-B, "Land Mobile Communication, FM or PM Transmitters," RS-204-A, "Minimum Standards for Land Mobile Communication FM or PM Receivers," RS-220, "Continuous Tone-Controlled Squelch System," RS-237, "Minimum Standards for Land Mobile Communication Systems Using FM or PM in the 25-470 MC Frequency Spectrum," RS-329, "Minimum Standards for Land Mobile Communication Antennas Part I — Base or Fixed Station Antennas," RS-329-1, "Minimum Standards for Land Mobile Communication Antennas Part II — Vehicular Antennas," RS-374, "Land Mobile Selective Signaling Standard," and, RS-388, "Minimum Standards for Test Conditions Common to FM or PM Land Mobile Communications for Equipment 25-470 MHz."

RS-316-A as well as the other standards listed above are available from the EIA Standards Sales Office. RS-316-A costs $4.70 per copy. Orders should be addressed to Standards Sales Office, EIA, 2001 Eye Street, N.W., Washington, D.C. 20006. An Index of EIA and JEDEC Standards and Engineering Publications is also available free from this office.

Bradley elected NCTA chairman

Rex A. Bradley, president of TeleCable Corp., Norfolk, Va., was elected Chairman of the National Cable Television Association at the NCTA Board of Directors meeting in Atlanta.

Bradley, currently NCTA vice chairman, will assume office at the Association's national convention in New Orleans, April 13 to 16.

TeleCable Corp. operates 15 cable systems in ten states; it serves more than 125,000 subscribers, making it the nation's 14th largest cable TV company.

Bradley has been active in NCTA affairs and has been a member of the NCTA Board since 1971, and its Executive Committee since 1973.

He has been chairman of NCTA's ETV Committee, Engineering Advisory Committee and Ad Hoc Committee on Air Force Contracts.

Bradley also served on NCTA's Labor Relations, Pole Line, Legislative and Satellite Committees.

He has also been chairman of the Cable Satellite Access Entity since that organization was established in 1973.

Burt I. Harris, president of Harris Cable Corp., Los Angeles, was elected vice chairman of the NCTA.

Harris has been an NCTA director since 1972 and was chairman of the 1973 convention committee. He is also a member of NCTA's Subscription Cablecasting Committee.

Harris entered the cable TV industry ten years ago when he purchased cable systems in Palm Springs, California and Flagstaff, Arizona. After a series of mergers, his company was part of the nation's second largest cable company. Harris later sold his participation and established Harris Cable Corp.

Also involved in broadcasting, Harris is president of Harriscope Broadcasting Corp., which operates TV and radio stations in several states. He is a member of the National Academy of Recording Arts and Sciences, Hollywood Radio and Television Society and the National Academy of Television Arts and Sciences.

Broadcast fees

The National Association of Broadcasters has petitioned the U.S. Court of Appeals to review the Federal Communications Commission's refusal to refund annual fees and other charges collected from broadcasters since 1970.

NAB asked the court of appeals for the District of Columbia to review a Commission finding that broadcasters are not entitled to refunds as a result of last year's Supreme Court ruling which required FCC to return annual fees paid by cable operators.

Contrary to FCC's view that the Supreme Court ruling applied only to cable, NAB contends that the decision undermined the entire FCC fee schedule in effect since 1970. It contends that all fees collected from broadcasters since that time suffer the same legal infirmities found to exist for cable in the Supreme Court's ruling.

Commission changes rules on lotteries

The Commission has amended its broadcast and cable television rules to conform to the new Federal policy concerning the broadcast and transmission of information on state held lotteries.

Section 1304 of Title 18 of the criminal code and FCC rules prohibit the broadcast of information concerning, or advertisements of, lotteries.

On January 2, however, Congress adopted Public Law 93-583, which modified the scope of Section 1304 to permit, under Section 1307 of Title 18, the broadcast of information or advertisements pertaining to lawful state held lotteries by radio and television stations licensed to that state, or licensed to a location in an adjacent state if the adjacent state also conducts a lawful lottery.

To conform the FCC's lottery rules to the new exemption set forth in Section 1307, the rule sections dealing with the broadcast of lottery information in the various services (Sections 73.112 for AM, 73.292 for FM, and 73.656 for TV) were eliminated, and their substance together with information pertaining to the exemption was set forth in a new Section 73.1209 found in Subpart H which applies to all broadcast services.

The Commission also applied the exemption to its cable television rules, and amended Section 76.213 to permit the transmission of information concerning state held lotteries by cable systems located in the same state; by cable systems located in adjacent states which also conduct state lotteries; and by cable systems located in another state if the system is integrated with a cable system falling in the first two categories, and when termination of the receipt of such a transmission by the cable system in the other state would be technically infeasible.

For the purpose of the new exemption, the FCC noted a lottery is defined as "the pooling of proceeds derived from the sale of tickets or chances and allotting those proceeds or parts thereof by

chance to one or more chance takers or ticket purchasers. 'Lottery' does not include the placing or accepting of bets or wagers on sporting events or contests."

In addition the Commission noted that the legislative history indicates that the word "adjacent" used in the exemption is intended to mean adjoining or contiguous—having a common boundary—at least in part. The FCC also pointed out that it is the licensed location of a station, rather than the actual location of a transmitter or studio, to which the statute refers in providing a limited exemption from the prohibitions of Section 1304.

The Commission emphasized that the exemption to the provisions of Section 1304 provided by P.L. 93-583 was limited to the specific circumstances described, and that the general prohibition set forth in Section 1304 was still applicable to broadcasts about all other lotteries.

Ownership rules amended

The FCC has amended its rules to prohibit newspapers in the future from acquiring radio or television broadcast stations located in their markets.

It also voted to require newspapers to divest television or radio stations in 16 cities.

Existing radio-newspaper combinations must be divested by January 1, 1980, if the only general circulation daily newspaper in a community and the only radio station or stations placing a city-grade signal over the entire community in daytime hours are under the same ownership. Nine cities are affected by this requirement.

Divestiture of existing newspaper-television combinations will be required by January 1, 1980, if the only general circulation newspaper in a community and the only television station placing a city-grade signal over the entire community are under common ownership. Seven cities currently are affected by this requirement.

The action amends parts 73.35 (AM radio), 73.240 (FM radio) and 73.626 (television) of the Commission rules.

Owners of a newspaper-AM-FM combination may satisfy the divestiture requirement by selling the newspaper, the AM, the FM, or the AM-FM. Waivers will be granted on proper showing. The formation of new radio-newspaper combinations in the same market is barred.

Radio stations are considered to be in the same market if the normal service area (2mV/m) contour of an AM or the normal service area, (1mV/m) contour of an FM station completely encompassed the community in which the newspaper is published.

The television divestiture requirement may be met by selling either the paper or the television station. Divestiture will apply whether the station is UHF or VHF. Waivers will be granted on proper showing.

The formation of new television-newspaper combinations in the same market is barred.

Television stations are considered to be in the same market if the Grade A signal contour of the television station completely encompasses the community in which the newspaper is published.

No divestiture of existing television-radio combinations or AM-FM combinations is required, and existing FCC rules governing such combinations continue in effect.

In adopting the rules, the Commission said its major concern was diversity in ownership as a means of enhancing diversity in programming service and viewpoints presented to the public rather than in terms of a strictly anti-trust approach taken by the Department of Justice.

The idea of diversity of viewpoints from antagonistic sources is at the heart of the Commission's licensing responsibility, it said.

"It was unrealistic to expect true diversity from a commonly owned station-newspaper combination. The divergency of their viewpoints cannot be expected to be the same as if they were antagonistically run," the FCC said.

The Commission said it had examined all the instances of common ownership before adopting the list of cities and stations where divestiture would be required.

Westinghouse develops solid state five kW transmitter

Just when we thought we were up to date on what's happening in the industry, here comes another development. Westinghouse will introduce a 5 kW all solid state AM transmitter at the NAB show. Earlier in this issue we ran an article on the Harris (Gates) 1 kW all solid state rig.

According to a Westinghouse spokesman, the company is looking to see what the industry interest will be in such a transmitter. As happens with many companies, they will introduce their new unit at NAB, and it will be operational there. You can see this one in booth 1100, South Hall of the convention center.

This first five-kilowatt, totally solid-state, AM broadcast transmitter is "on the air" at WIND radio station in Chicago.

According to reports, the WIND transmitter has an excellent frequency response between 30 hertz and 15,000 hertz and very low audio distortion. Westinghouse Electric Corporation's electronic systems support division, Baltimore, Md., developed the solid-state transmitter now in operation.

Total weight of the WIND transmitter is 776-pounds (352 kilograms) including isolation transformer. This is about 2.5 to 3 times lighter than current tube-type transmitters. Less than 30 cubic feet (0.8 cubic meters) of space is needed for the solid-state transmitter—almost four times smaller than recent tube units. Conversion efficiency (radio frequency power output/line power input) of the Westinghouse-developed transmitter is about 75 percent compared to about 50 percent for most tube units.

WIND radio station in Chicago operates at an AM broadcast frequency of 560 kilohertz with five kilowatts of output power. A directional-pattern antenna system with four towers is used by the station.

Cox studys predictions, sees bright future

A comprehensive study containing predictions about the future of the broadcasting and cable industries through 1985, based on a series of surveys conducted among industry experts, has just been released by Cox Broadcasting Corporation.

Consensus predictions by experts interviewed in the Cox study indicate substantial growth for both broadcast media and cable over the next ten years without serious competition between the two industries. Key predictions on the broadcast side include continued strong growth of advertising expenditures in broadcast media, particularly local, and increased time spent viewing TV and listening to radio. On the cable side, FCC rules will be relaxed and will allow substantial growth in penetration, and cable will emerge as a limited advertising medium according to the predictions.

The surveys were conducted by Cox, under the supervision of James A. Landon, Vice President - Planning and Research, in conjunction with the company's long-range planning study. The Delphi ap-

proach, which involves the use of a series of questionnaire surveys among a group of experts to obtain judgemental data about the future, was utilized to obtain the predictions. Cox conducted Delphi surveys among five groups of experts between October and December 1974. The five groups contained participants from the fields of: (1) advertising, (2) programming, (3) broadcast technology, (4) government regulation and (5) cable and pay TV. The participants in each group were carefully selected to represent all segments of the broadcasting and cable industries. Within each segment, the individuals judged to be most knowledgeable and perceptive about the future were invited to participate.

Two questionnaire surveys were conducted among each of the five groups. In the first survey, respondents were asked to indicate whether they agreed or disagreed that certain events would happen by 1985, when they expected the event to happen, what they expected certain industry statistics to be in 1980 and 1985 and, finally, opinions of additional future trends. The second questionnaire contained the consensus results of the first survey and gave the participants an opportunity to change their answers after seeing the predictions from the overall group. A combined total of 158 experts responded to the first survey, representing 80 percent of those individuals originally invited to participate. Of these, 85 percent also participated in the second phase.

Ad Volume Up

According to the experts participating in the Cox study, ad volume is predicted to increase at a slightly faster pace during the next ten years, enjoying an average annual growth rate of 7 percent between 1975 and 1980 and then 8 percent between 1980 and 1985. This growth would jump total ad volume from a present level of about $28 billion to about $60 billion by 1985.

Both television and radio are predicted to capture larger shares of ad volume by 1985, with the greatest growth occurring locally. TV expenditures will increase from

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a present 19 percent share of ad volume to 22 percent by 1985, representing an average annual growth rate of 9.2 percent, according to the study. Radio expenditures will jump from 6 percent to almost 8 percent of ad volume, also representing an average annual growth pace of 9.2 percent. Local TV and local radio will increase 11.8 percent and 9.9 percent respectively, according to the study. Expenditures in network TV, spot TV, network radio and spot radio will enjoy lesser growth rates, according to the predictions.

Television viewing levels are expected to increase slightly over the next ten years, but more fractionalization is also predicted. The experts forecast TV viewing per day on the part of the average family to increase about 30 minutes over present levels, reaching six hours and 53 minutes by 1985. However, the typical household is also expected to receive 9.1 TV stations by 1980 and 11.0 by 1985 compared to a present figure of about 7.2.

Listening Time

Time spent listening to radio will increase significantly, according to the study. By 1985, the average person will spend three hours and 55 minutes listening to radio per day, up over 30 minutes from present levels, according to consensus predictions. In addition, FM radio will enjoy substantial growth in the form of more FM stations on the air and a greater share of listening to the FM side of the dial. FM's share of total radio listening is predicted to climb from about 28 percent presently to about 48 percent by 1985, including 55 percent in the top 25 markets. In addition, over 500 additional FM stations are forecast to be on the air by 1985.

The Technology

In the area of broadcast technology, the experts interviewed expect about half of all TV stations in the U. S. to have circular polarized antennas by 1985. In addition, over half of all TV and radio stations will be operating with transmitters that are automatic and unattended by 1985. Of encouragement to UHF operators is the fact that 79 percent of those participating in the tech-

nology survey agreed that technological advances would enable UHF stations to perform at least 90 percent as well as VHF stations within ten years. In addition, 79 percent agreed that TV networks would be delivering programs to affiliates by direct satellite-to-station.

The government regulation survey predicted that, by 1985, the prime time access rule will still be with us in a modified form, legislation will be enacted to provide some form of copyright liability for cable operators, FCC rules for distant signal importation will be relaxed for cable and antisiphoning rules relaxed for pay TV. The experts also predicted that the advertising industry will be troubled by increased government restrictions, particularly regarding children's advertising and certain drug products.

The Delphi surveys were conducted by Cox in order to determine what the future might hold for broadcasting so that the company might plan accordingly. The Cox planning study also includes the application of advanced statistical forecasting techniques and will establish a continuous long-range planning model for the company.

Renewals denied Alabama stations

The Commission has formally denied the renewal applications of all eight educational television stations licensed to the Alabama Educational Television Commission (AETC). The Commission also denied AETC's application for a license to cover a construction permit for a ninth station at Demopolis, Ala.

The FCC said the decision was based on AETC's conduct during its 1967-1970 license term, conduct the Commission said fell far short of the high standards it expected broadcast licensees to maintain.

AETC, the Commission said, followed a racially discriminatory policy in its overall programing practices and, through its "pervasive neglect" of Alabama' black population, failed to adequately

meet the needs of the public it was licensed to serve.

The Commission said "the serious underrepresentation of blacks both on the air and at the production and planning levels, together with the overt actions of the licensee in rejecting most of the black-oriented programing available to it, constitutes persuasive evidence that racially discriminatory policies permeated AETC's programing practice."

The Commission said that while it recognized "the vital function which educational television has come to serve", it could not condone AETC's derelictions and deficiences simply because the licensee was a "public broadcaster."

The Public Interest

"A history of disservice during the license term of the magnitude disclosed by the evidence of record in this proceeding makes it impossible for us to find that renewal would serve the public interest, convenience, and necessity," the Commission declared. Nor could it accept extensive post-license-term improvements made by AETC as outweighing the shortcomings demonstrated during the period involved, the Commission said.

Noting the improvements since 1970 and the pressing need for public television in Alabama, the Commission ruled that the public interest would be served by granting AETC interim authority to continue operating the eight stations and the station for which it holds a construction permit.

The Commission also held that in light of the fact that AETC is an agency of the state of Alabama and the improvements to increase its responsiveness to the special needs of Alabama's black citizens undertaken since 1970, AETC should not be ruled ineligible to file applications for construction permits for the nine stations. In this connection, the Commission waived its rules governing the filing of repetitious applications.

Inviting Applications

The Commission stressed, however, that applications for the nine

stations could be filed by any persons or groups and it invited such applications to be submitted not later than April 1, 1975. Because its renewal applications were denied, AETC would not be entitled to any preference by reason of its prior status as a licensee, the Commission said. Rather, AETC must compete on an equal footing with any other applicants.

The proceeding is an outgrowth of informal complaints about racial discrimination in programing and employment practices during the 1967-1970 license term filed by the Rev. Eugene Farrell, Linda Edwards, and Steven Suitts. Initially, the Commission concluded that "there is no substantial problem warranting further inquiry," and renewed the licenses June 29, 1970.

However, on February 11, 1972, the FCC rescinded the renewal order and designated the applications for a hearing to determine whether AETC had followed a racially discriminatory policy in its overall programing and whether it had made reasonable and good faith efforts to assure equal opportunities in its employment policies and practices. The action was in response to a petition for reconsideration of the renewals.

Hearings were held on various dates between March 28, 1972, and January 31, 1973, when the record was closed.

In an Initial Decision August 22, 1973, Administrative Law Judge Chester F. Naumowicz recommended renewal of the licenses and grant of the license to cover the construction permit.

He held that although AETC was the licensee for all state-owned noncommercial television stations in Alabama, its officials did not actively involve themselves in program matters. He found the responsibility for production or acquisition of programing was vested in autonomous production centers throughout the state and neither the State of Alabama nor AETC had any direct control over the programing these centers acquired or produced, nor any authority to regulate the policies under which they operated.

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Unique Needs

Judge Naumowicz ruled that although AETC had failed to serve the unique needs of the state's black citizens, the failure "was the product of ignorance rather than malice," and that AETC had "not been shown to be lacking in the basic qualifications required of a Commission licensee."

The Judge concluded that AETC "is prompt to remedy its shortcomings when it becomes aware of them," that it could be expected to recognize the need of its black viewers for a certain amount of special programing, and to "respond to that need in a reasonable manner."

The Commission said that while for the most part it affirmed the Judge's findings, it drew different inferences from them and consequently concluded that the applications must be denied.

It said the Judge appeared to have misconceived AETC's obligations as a renewal applicant in the proceeding and that the burden was on the petitioners to establish that adverse findings were warranted. The Commission pointed out that the Communications Act imposes on a renewal applicant the burden of showing that renewal is in the public interest. This obligation, the FCC said, was underscored by its hearing designation order which specifically placed both the burden of coming forward with evidence as well as the ultimate burden of proof on AETC.

The Commission also said the Judge had erred in giving decisional weight to his finding that "neither the State of Alabama nor the AETC has any direct control over the programing they acquire or produce, or any authority to regulate the policies under which they operate," and that the "production or acquisition of programing has been placed in the hands of entities over which the AETC has little legal control."

AETC Responsibility

The Commission said that "as a matter of lawn and public policy, AETC has ultimate responsibility for any inadequacies in station operations during its license term regardless of the reasonableness of its delegation of programing responsibility to outside agencies."

It said it has repeatedly emphasized that a licensee cannot escape responsibility for the actions of those to whom it delegates programing responsibilities simply because it was unaware of such actions or was misled by an employee.

The Commission also said Judge Naumowicz had failed to give sufficient weight to his finding that the lack of black-oriented programing could not be attributed to its nonavailability since NET (National Educational Television Network, a precursor to the present Public Broadcasting Service which provided programing to its network affiliates) offered a substantial amount of such programing, but that AETC, a NET affiliate, "elected to broadcast virtually none

of these programs."

30 Percent Black

In a state whose black population is approximately 30 percent, this obviously presents an issue of grave importance, the Commission said. Noting that while there was no evidence that direct orders were ever issued to discrimination may be inferred from conduct and practices which display a pattern of underrepresentation or exclusion of minorities from a broadcast licensee's overall programing."

The Commission said that in light of the facts of record, it found "a compelling inference that AETC followed a racially discriminatory policy in its overall programing practices during the license period."

NCTA hits NAB ads

The National Cable Television Association charged the National Association of Broadcasters with false and misleading advertising about pay cable TV and urged Federal Trade Commission to order the broadcast trade organization to halt publication of such ads.

In a formal complaint with the FTC, NCTA maintained that NAB advertisements during the past year have charged that pay cable television intends to remove from commercial television popular sports and entertainment programs.

NCTA said that such a claim is "false, deceptive, and misleading in clear violation of Federal law, that the advertisements are a disservice to American consumers and are designed to thwart competition in video communications."

NCTA cited advertisements published in major newspapers and magazines which stated that cable operators were planning to buy exclusive rights to sports events and movies on commercial TV and keep those programs off broadcast outlets.

The ads are part of a half-million dollar broadcast industry public relations/advertising campaign against pay cable.

NCTA said the ads accused the cable industry of actions not possible under FCC regulations and as

such were misleading the public. The CATV industry trade association pointed out that even members of the NAB had questioned the accuracy of the ads.

NCTA said that the ads were also deceptive in that they claim that commercial television is "free" and that this is in clear contravention to guidelines set down by the FTC concerning the advertising of free merchandise or service.

"So called 'free TV' had advertising revenues in 1973 of $3.46 billion dollars with pre-tax profits of $653 million and advertising expenditures of $4 billion. This billion dollar industry is not non-profit, not philanthropic, and not free. Just as a hidden tax is still a tax, increased payments for goods is the price which viewers pay for advertiser supported television," NCTA charged.

"NCTA believes that the broadcast industry has carried its propaganda campaign regarding 'free TV' too far. It has gone past the limits of exaggeration or puffery and placed its advertisements into the category of false, misleading and deceptive advertising in violation of Section 5 of the FTC Act."

The CATV group requested the FTC to issue an order requiring NAB to cease and desist from publishing ads that indicate that commercial TV is free or that pay cable TV intends to lock up programs now on commercial TV.

NCTA president on programming

National Cable Television Association President David H. Foster has called upon the nation's religious broadcasters to endorse cable TV as "the most fruitful means of authentic intracommunity communication."

Speaking to the annual convention of the National Religious Broadcasters here, Foster cited the "ingenious and innovative ways in which churchmen and religious broadcasters are using cable TV's local origination channels and public access channels to bring an entirely new dimension of religious programming to their communities."

advertisers' index

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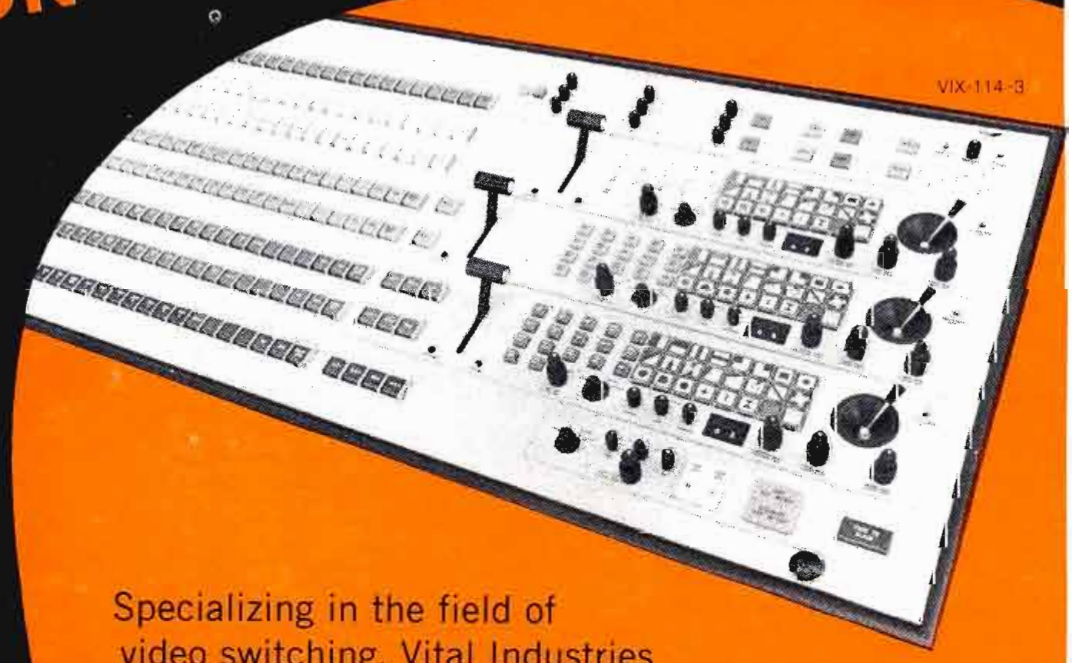

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