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July, 1976/75 cents



Video At The Olympics

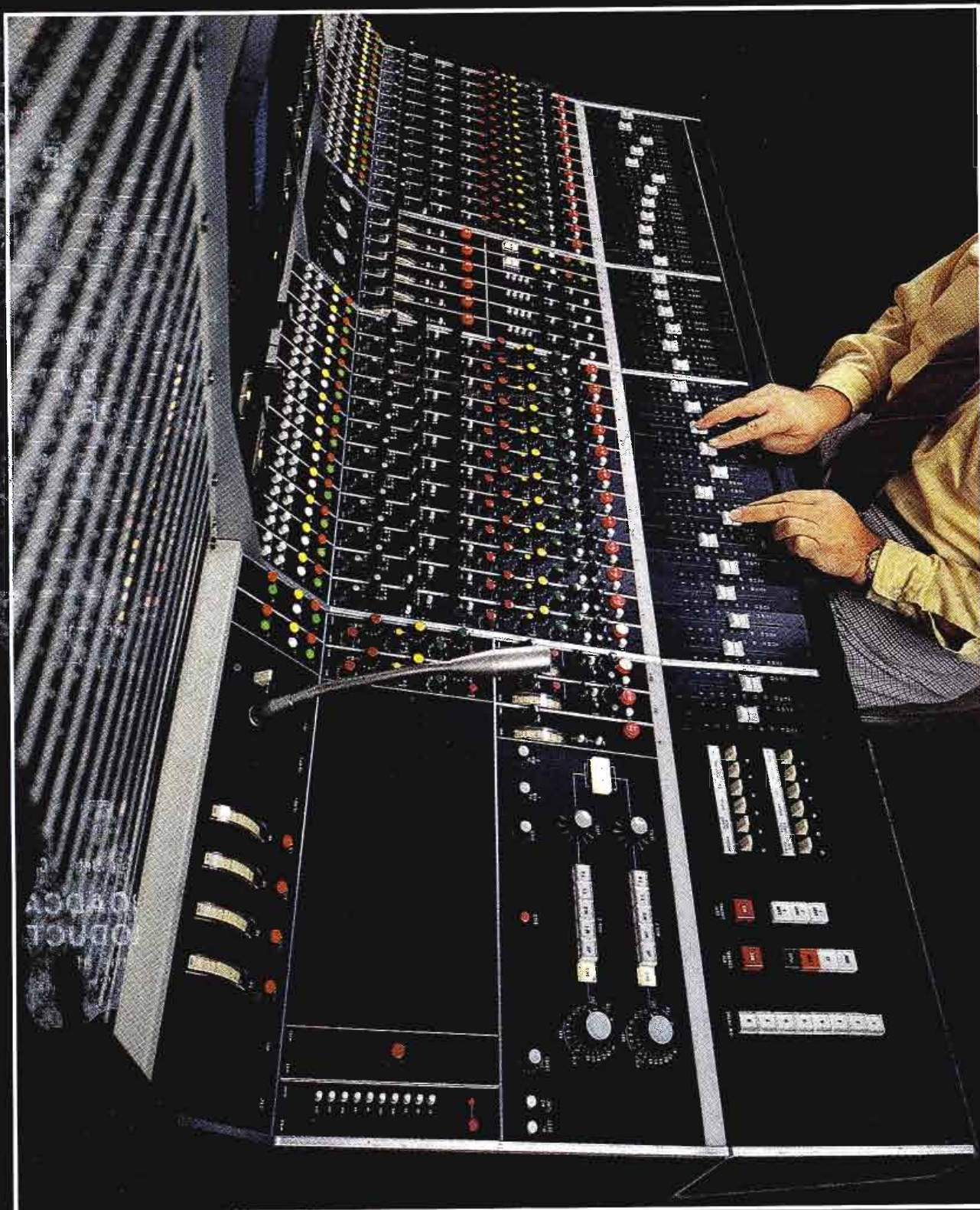
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Radio Workshop

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DIRECT CURRENT FROM D. C.

(Continued from page 4)

-
- in view of the wide variety of radio stations licensed by the FCC and unique requirements of some of these stations, would it be desirable to issue a basic operator/technician class of license with optional specialized endorsement such as AM, FM, TV, Land Mobile, Radar and Microwave;
 - if so, what provisions should be made for persons now holding a Radiotelephone First or Second Class License.

Comments are due by September 1 and Reply Comments by September 15.

New Campus Radio Rules

In a rather substantial change in concept, the FCC is now proposing (Docket 20780) to change Part 15 of its rules insofar as they relate to carrier current systems. They will be called Campus Radio Systems and are defined as: "A communication system having the output of one or more low power transmitters coupled into a power distribution network or other network of conductors, in which RF signals are picked up by conductive connection to the network or by space radiation in the vicinity of the network and which is operated in the AM broadcasting band on the campus of an educational institution." Hence, they will recognize the fact that new systems are actually designed to radiate rather than to confine the radiation to power lines. A new radiation limit of 50 microvolts per meter at 30 meters across the entire AM band is being proposed. The FCC says if the signal can be heard on a good radio at 30 meters, the system probably exceeds the limit. The operator can select any vacant frequency in the AM band. He may use any identification he desires so long as no confusion results with a licensed station.

TV Circular Polarization Rules

Based upon a petition filed by ABC, the FCC has issued a Notice proposing to amend its TV rules to permit the use of horizontal, elliptical, or circular polarization provided that with the latter, clockwise rotation must be used and the effective radiated power cannot exceed that authorized for horizontal polarization. The Commission concluded by saying that because of the deficiencies in horizontal polarization, the overall public interest requires expeditious action in the ABC petition.

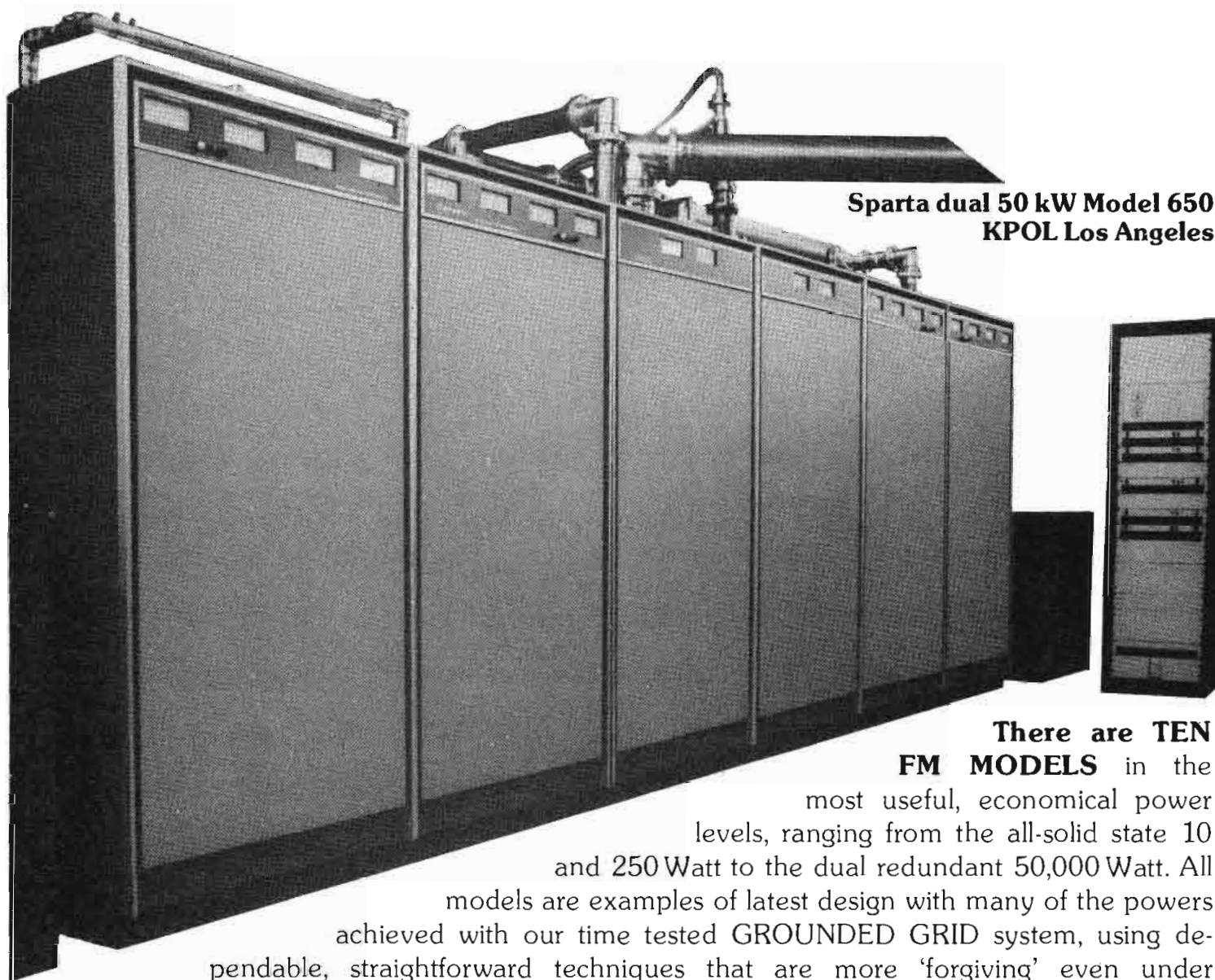
New Reregulation Order

In its 11th Reregulation Order, the FCC's Broadcast Reregulation Task Force has made several more simplifications to its broadcast rules. Among its changes are: (1) permission to keep station licenses in folders or binders like operator licenses; (2) finally, a definition of "skeleton" and "partial" proofs of performance; and (3) remote control DA stations with type-approved monitor and approved sampling systems no longer are required to make readings at the transmitter every second day.

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

Inquiry Into Operator Rules

In a rule-making proceeding which could have a substantial impact on the future of most licensed operators, the Commission is opening an inquiry (Docket 20817) to solicit comments and recommendations as to the relevancy of its radio operator rules to the current state of the communications industry.

The Commission has requested comments on the following:

- the desirability of eliminating or retaining the service operator requirements in the various services, and if retained, the degree to which the service operator should be held responsible for the technical performance of the equipment he installs, services and maintains;
- should technical performance responsibility rest mainly on the station licensee, as it now does, or on the service operator;
- what should the responsibility of the service operator be when he notices a technical discrepancy and the station licensee elects not to correct it;
- should the service operator be required to notify the licensee in writing and/or should he notify the FCC of such technical discrepancies;
- should additional sanctions be available to the FCC to enforce service operator responsibility and how should they be applied.

It also requests comments on the desirability of retaining or waiving the requirements for licensed operators for routine operation of broadcast transmitters.

It is also seeking answers to the following questions:

- are current examinations producing technically qualified service operators;
- are the examinations outdated and compromised to the extent that licenses can be obtained by technically incompetent persons;
- does the scope of the examinations accurately reflect the knowledge required in light of the current technical state of the communications industry;
- should a period of "apprenticeship" under a "beginner" class of license be required prior to the issuance of a regular license to assure some degree of practical experience;

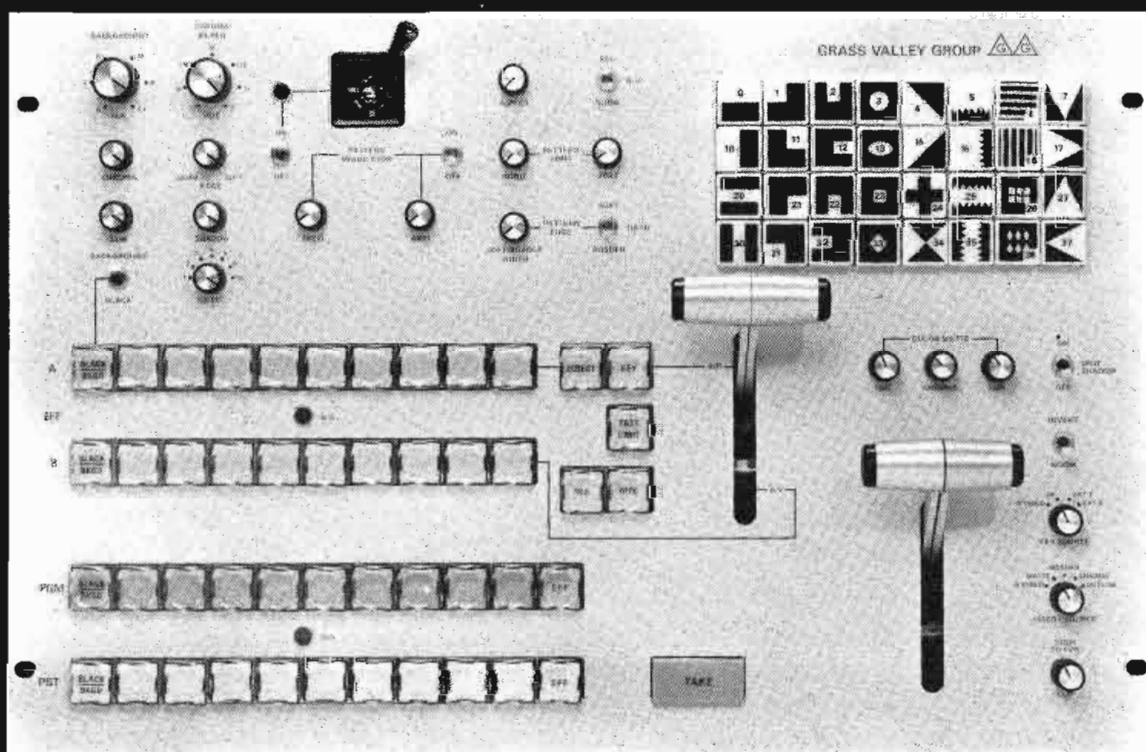
(Continued on page 6)

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- 20 Video At The Olympics.** Our Video Editor travels to the site of the Summer Olympics to report on some unusual users of video, and recalls the first use of video at the Berlin version in 1936. **Joe Roizen.**
- 30 Radio Workshop: Breaking The Sound Barrier.** Our monthly radio article moves to the cart machine and talks about head alignment and cartridge tape. **Peter Burk.**
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- 48 Globecasting: Yugoslavian TV.** A special report on how this country is moving ahead in television. **David McClurg.**
- 54 Sweeping The Video Transmitter System.** Includes scope shots and describes how to sweep the system. **Thomas Wimberly.**

About The Cover

The cover depicts the Olympic theme of our annual Olympic coverage. For some unique uses, see page 20 of this issue. Photos by Donna Foster Roizen.

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Carl Babcoke, *Technical*
Pat Finnegan, *Maintenance*
Howard T. Head, *FCC Rules*
Robert A. Jones, *Facilities*
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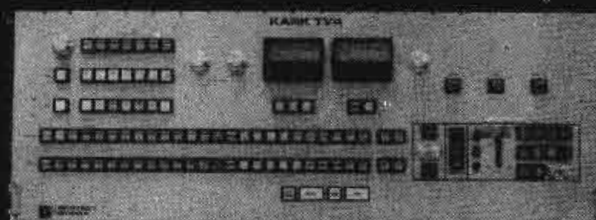
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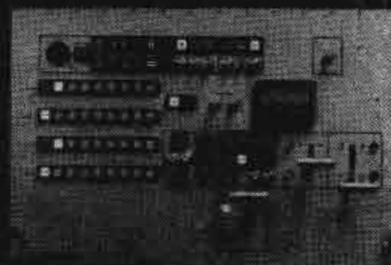
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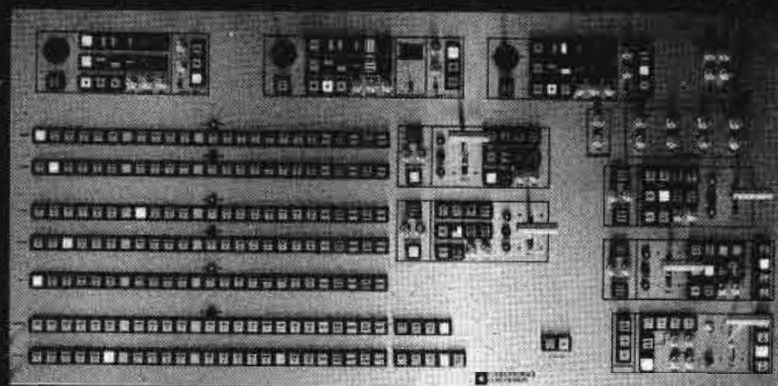
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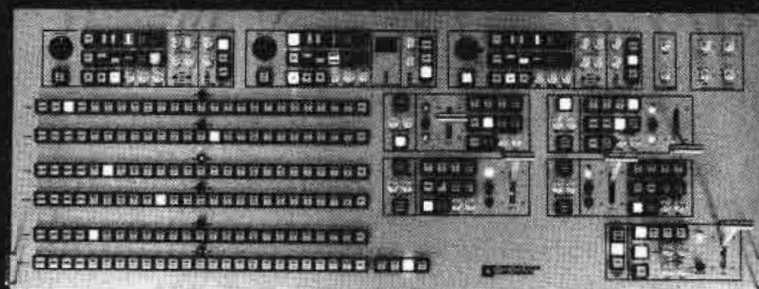
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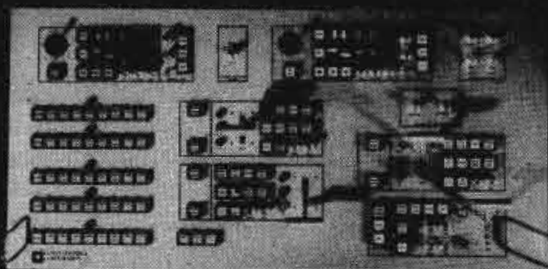
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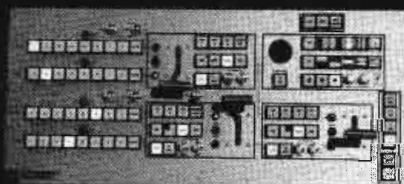
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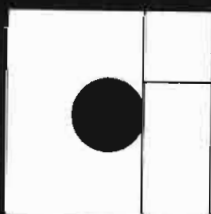


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FCC Eases Program Log Rules

The Commission has liberalized the requirements pertaining to program logs for AM, FM, educational FM and television stations, as part of its continuing regulation of broadcasting.

The modified rules **which go into effect this month** include:

- deleting the requirement for initialing corrections to program logs and simply requiring the person keeping the log to certify, when signing off duty that the log, with any changes or corrections made before he signed off, is an accurate representation of what actually was broadcast;

- in the case of automatically kept logs and of automatic main-

tenance of logging data, the person responsible for keeping the log must certify that he checked the automatic equipment periodically throughout his tour of duty, and that to the best of his knowledge and belief, at no time during his tour did the equipment fail or malfunction, unless otherwise noted; and, that any part of the log which was kept manually, with any corrections or additions made before he signed off duty, was an accurate representation of what actually was broadcast;

- combining into one, the present requirements for two entries (1) identifying the sponsor of commercial matter, and (2) showing that

sponsorship identification was given over-the-air, thereby deleting the confusing check mark (✓) option.

While it saw merit to the recommendations of the Idaho State Board of Education that program definitions in the logging rules conform with the program definitions in the renewal form for non-commercial educational stations, it said consideration of that recommendation should be in a separate rulemaking proceeding.

Similarly, it said, Idaho's proposal that the name of donors be kept in the educational station's public files rather than in the program log, would best be considered in a separate proceeding.

Election Rules Are Heating Up

In response to a complaint by Senator Frank Church involving his attempt to purchase time for a political broadcast in Oregon, the Commission has ruled that a station's offer to sell time in prime time for programming no more than 5 minutes long did not constitute reasonable access.

The decision, in an oral ruling to the parties, stemmed from Senator Church's request to buy, before the May 25 Oregon primary election, a half-hour in prime time to present a political broadcast as part of his campaign for the Democratic Presidential nomination.

The Commission said the facts before it indicated KGW-TV, Portland, had turned down efforts by the Idaho Senator to purchase the half-hour and instead had offered a 5-minute slot in prime time on Saturday, May 22, and a similar time on Sunday, May 23.

The limitation to 5 minutes did not constitute reasonable access under Section 312(a)(7) of the Communications Act, the Commission said. That section provides

that the Commission may revoke a station license "for willful or repeated failure to allow reasonable access or to permit purchase of reasonable amounts of time for the use of a broadcasting station by a legally qualified candidate for Federal elective office on behalf of his candidacy."

NAB Opposes Notification Rule

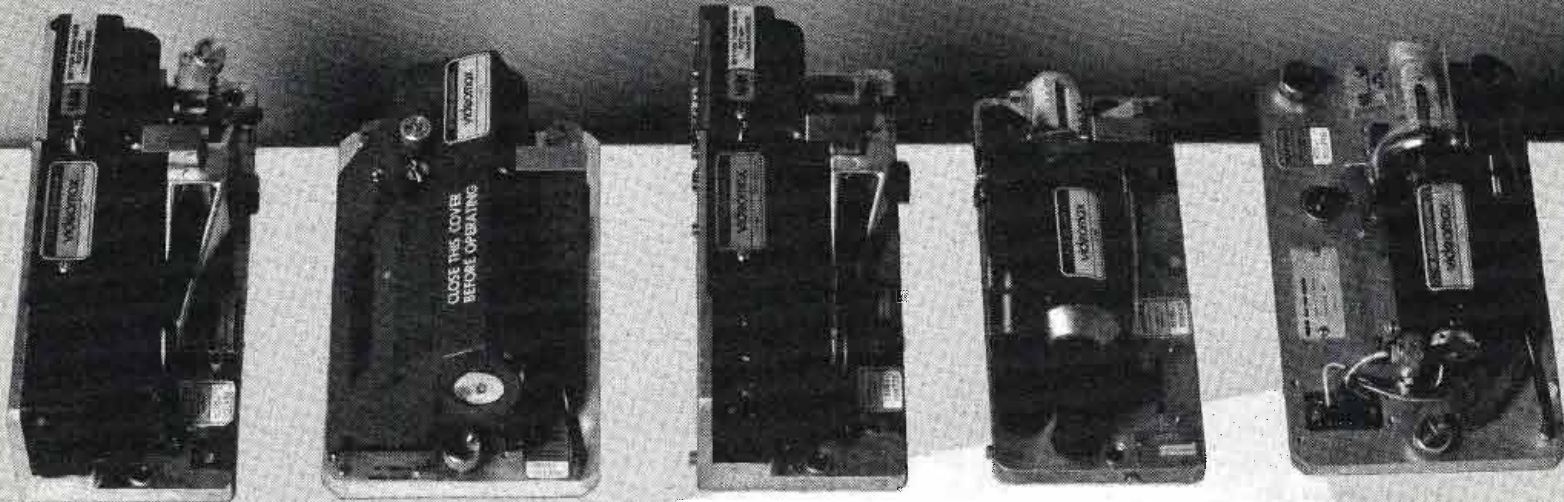
The National Association of Broadcasters has opposed a proposed new FCC rule that would require broadcasters to notify all legally qualified candidates of free time given to one candidate 72 hours before an election.

NAB suggests that the FCC, instead of adopting a new rule, change present rules to allow that broadcasters place information regarding such donated political time in their public files. Rules now require that information go in the public file only with regard to paid

political time. To extend the rule to free time would give other candidates a chance to request equal time, without putting the entire burden on the licensee. NAB pointed out that the FCC proposal places more responsibility on the broadcasters who give time than those who only sell time during the 72 hours before an election.

NAB also said the FCC proposed rule is too broad because it does not draw a distinction between time purposely offered by a licensee and time "innocently and unintentionally provided." For example, the rule would come into play if a candidate unexpectedly telephoned a station's talk show within 72 hours of an election. Since many innocent situations such as this could occur, NAB requests that FCC require notification only when the licensee initiates a donation of free time to a candidate within 72 hours of an election.

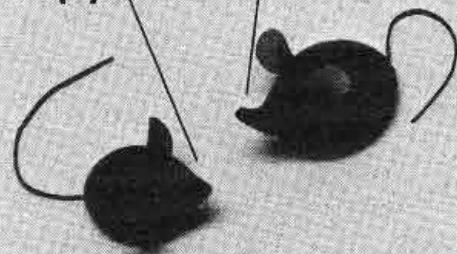
NAB further opposes the FCC proposal to require similar notification whenever a licensee donates time to supporters of a legally qualified candidate. This would be an expansion of Commission policy which holds that only **major** candidates need be notified.



This Is National Be Kind To Tape Supervisors Week

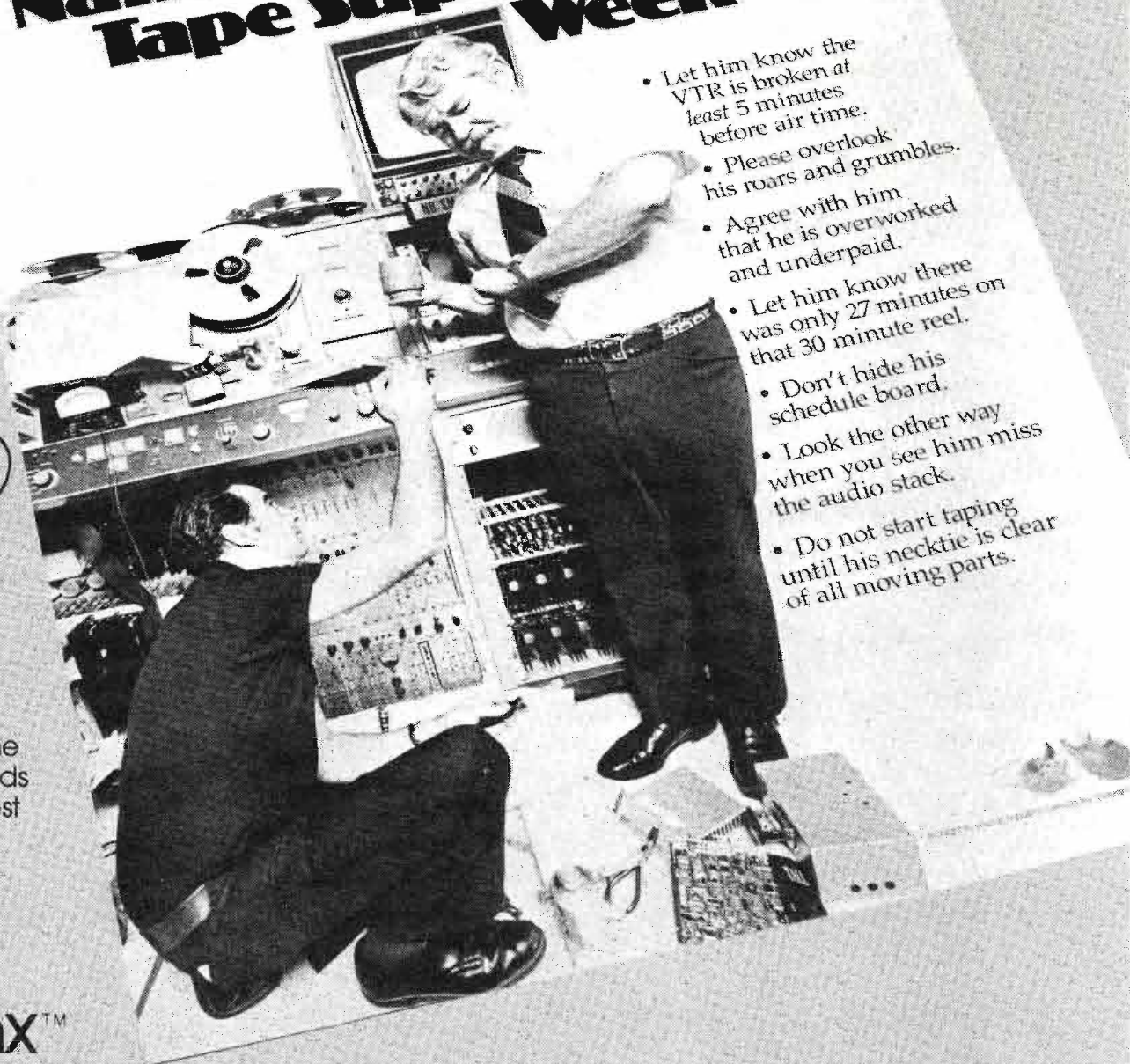
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I wonder
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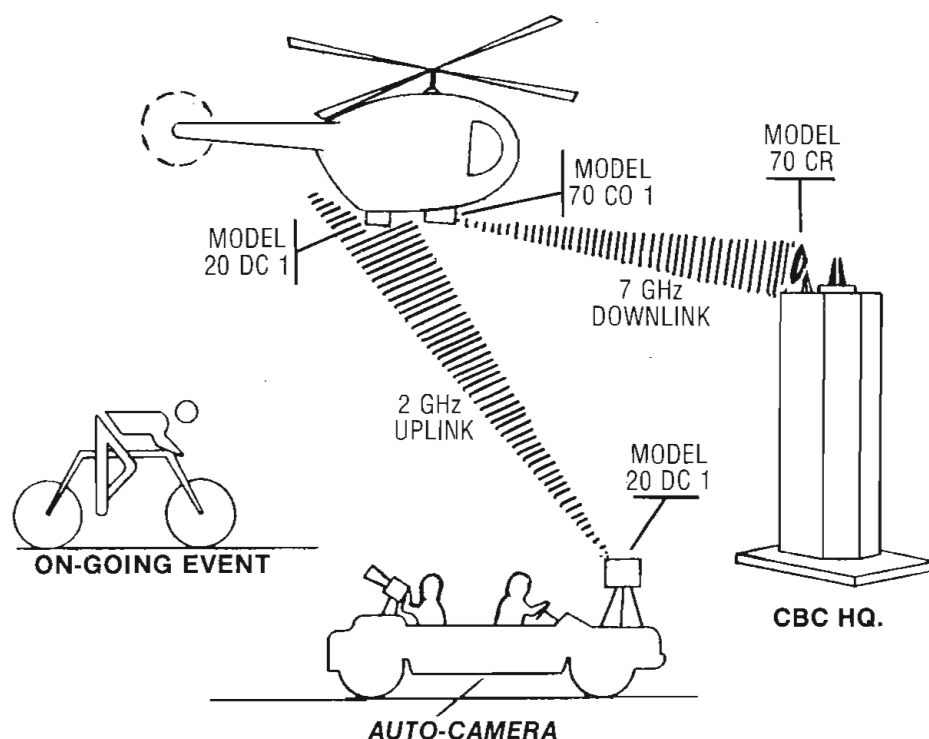
New TV Antenna On The Way

The Commission has proposed amending its rules to permit the use, on a permissive basis, of circular or elliptical polarization for television broadcast transmission, as is now permitted and generally used by FM stations.

The action was in response to a petition by the American Broadcasting Companies, Inc.

The Commission noted that its rules now require that all television broadcast stations employ horizontal polarization. It said this provision was incorporated into the TV technical standards on the recommendation of the National Television System Committee (NTSC), in a report to the FCC, January 27, 1941.

A NEW LIVE NEWS GATHERING TV SYSTEM FROM NURAD NOW OPERATING IN CANADA COVERS THE 1976 OLYMPICS



This system utilizes NURAD *circularly* polarized antennas throughout. Shakedown tests have proven that these antennas eliminate the signal dropout and multipath reflection effects that occur with *linear* polarized antennas.

FOR FURTHER DETAILS CONTACT:

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• 301-462-1700

At that time, the Commission said, NTSC was considering either vertical (as employed in AM broadcasting) or horizontal polarization. Confronted with a meager amount of measured data which was inconclusive, an unanimous agreement of the Committee could not be attained, and horizontal polarization became a standard for lack of better information, the FCC said.

However, the Commission said, it was well documented at the FCC, by the broadcast industry and the viewing public that horizontal polarization was an inappropriate means for minimizing such problems as reflections (ghosts), spotty coverage, and multipath interference. Additionally, the FCC said, horizontal polarization requires critical antenna orientation for maximum signal and minimum distortion.

Noting that the deficiencies in horizontal polarization have been a source of serious viewer consternation, the Commission said the overall public interest required expeditious action on ABC's petition.

The FCC noted that in a "Report on Field Test of Circular Polarization in Television" conducted on WLS-TV, Chicago, under FCC authorization, ABC contends that the theoretical advantages of circular polarization over horizontal polarization were indeed observed in practice.

ABC said that the use of circular polarization, based on the tests, does not appreciably change a station's service area or its interference impact on co-channel stations operating with conventional polarization, and where both stations operate with circular polarization, a decrease in interference can be expected. Such polarization also tends to eliminate ghosts on the receiver screen, and improves reception, ABC added.

The Commission said that ABC's proposal merited industry comment on both its technical and economic aspects.

It said that its experience with FM circular polarization has shown that broadcasters have adopted the approach almost as a standard. The FCC said that throughout a station's service area, the freedom of its signal from distortion and other

(Continued on page 12)



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Automatic nulling and the automatic set level option (ASL) give you ex-

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An additional optional bonus is that the 1710A also measures intermodulation distortion. After you've made a harmonic measurement, just push the "IMD" button. In 3 seconds you'll have the IM reading. With this option you'll be ready for future IM requirements.

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Circular Polarization

(Continued from page 10)

aberrations may provide a significant competitive advantage.

Therefore the Commission proposed to amend its rules to show that while it would be standard to employ horizontal polarization, circular or elliptical polarization could be employed if desired, if clockwise rotation was used, and the effective

radiated power in no event exceeded that authorized under horizontal polarization.

The Commission also proposed to amend its rules with respect to the determination of antenna height above average terrain to state that where circular or elliptical polarization is employed, the antenna height above average terrain shall be based on the height of the radiation center of the antenna which transmits the horizontal component of radiation.

In addition to general comments, the Commission requested specific information and views on the following:

- Additional experimental data available from the WLS-TV tests;

- Data regarding the effects of circular polarization where indoor home receiving antennas are employed;

- Additional measurement data on the effects of "ghosting" as a result of the WLS-TV tests;

- Any increase in interference received;

- Cost, size, electrical characteristics and estimated availability of receiving antennas for use with circular polarization;

- The facts resulting in improved quality, and the fact that the location variation factor was not improved by use of circular polarization.

SMPTE Meet Set For October

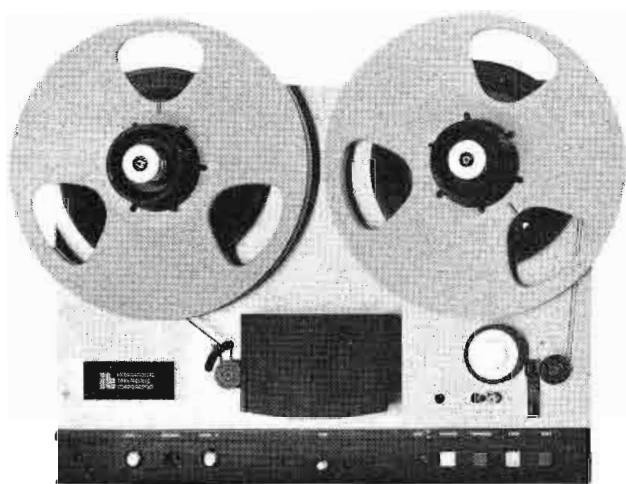
More than one third of the available booth space for SMPTE's 118th Technical Conference Equipment Exhibit has been sold, it was announced by SMPTE Exhibit Chairman Charles Ahto, Tape-Films, Inc.

The SMPTE Conference and Exhibit is set for New York City's Americana Hotel, October 17-22, 1976.

According to Ahto, since the exhibit space first became available less than a month ago, a steady stream of orders have been coming in. There are 167 booths available, of which 70 have already been taken. In fact, Ahto said, orders are coming in at a faster rate than they did for SMPTE's Los Angeles Conference which last year broke all previous SMPTE records for exhibit size and which ended up at a sold-out 162-booth show after an expansion from an original offering of 92 booths.

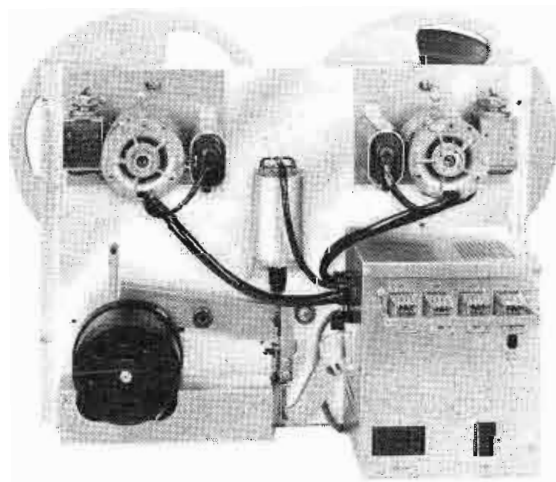
Ahto said that he's not surprised that the exhibitor response has been so good because New York has always been a great town for SMPTE exhibits. When the SMPTE last met in New York in 1973, the Exhibit drew the largest attendance ever for an SMPTE show up to that time.

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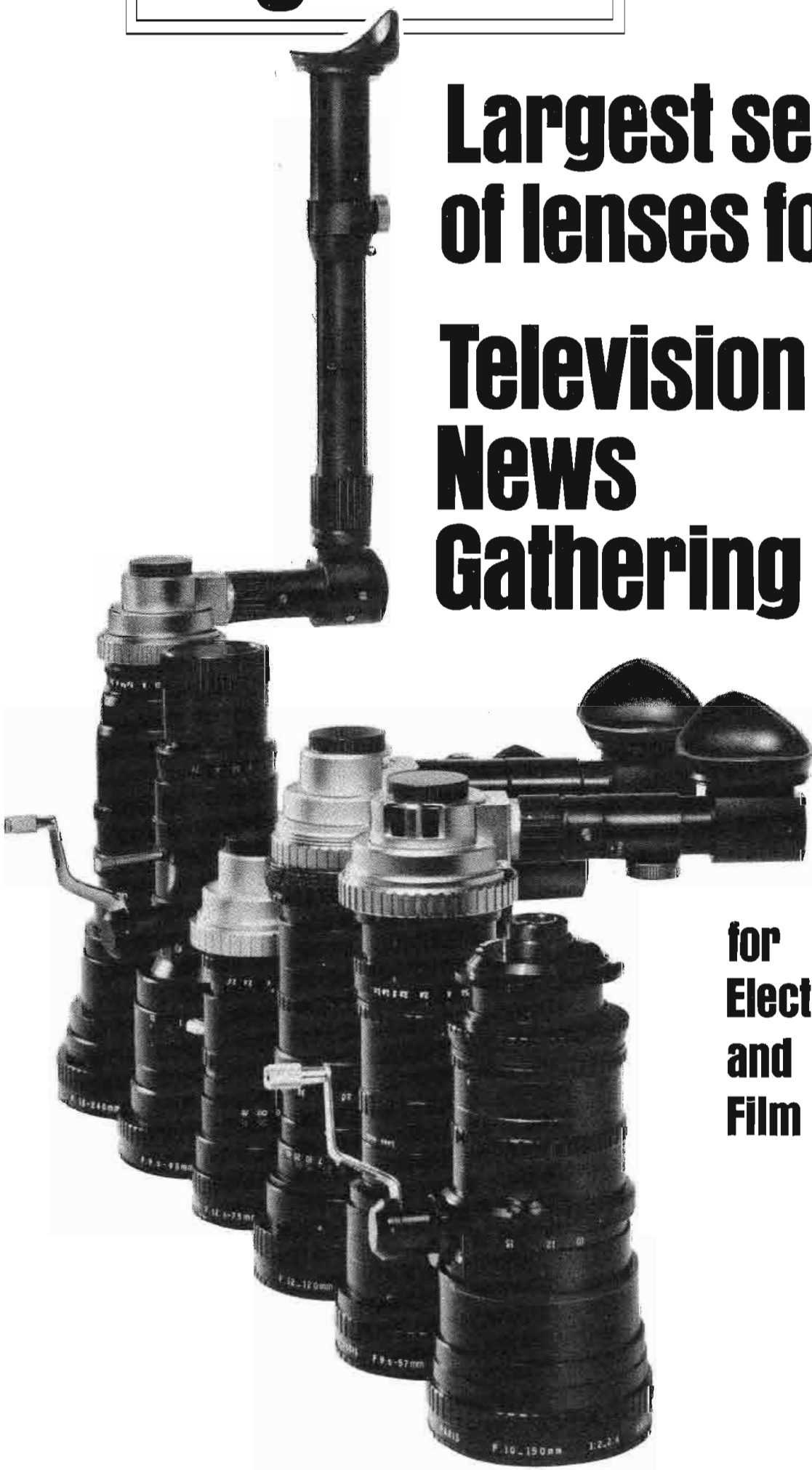
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CERTIFICATION

Applications under the Grandfather Provision that have been approved by the Certification Committee are being received by the Certification Secretary. A letter of notification will be immediately sent to the candidate stating that his application has been approved. The certificate, however, will not be ready for mailing until after August 1st and it will be sent to the candidates' chapter chairman for presentation at their next meeting. If there is no chapter in the candidates' immediate area the certificate will be sent directly to him.

For those of you who are interested in the Certification Pro-

gram an article concerning it appeared in the June issue of B/E starting on page 36. To receive your application forms send your name and address to:

CERTIFICATION SECRETARY
Society of Broadcast Engineers, Inc.
P.O. Box 88123
Indianapolis, IN 46208

Membership

For those interested in applying for membership an application form appeared on page 23 of the April issue of B/E.

The SBE Award for Ingenuity

If the Society gave an award to the Chapter that came up with the best new method for soliciting members I believe that Chapter 39 (Tampa/St. Petersburg) would be among the finalists.

During the Winter Olympic Games a new station ID appeared

on the screens of WLCY-TV. In addition to the call letters there appeared the SBE logo and the following statement:

For Information Write:
SOCIETY OF
BROADCAST ENGINEERS
P.O. Box 20692
ST. PETERSBURG
33742

This ID is in their regular file and is still being periodically used. And, of course, it will be used during the Summer Olympic Games. Yes, they did get new members by using the ID.

Chapter Reports

Chapter 2: Northeastern Penn.

Mr. William Meola, Broadcast Sales Engineer for Cable Wave Systems of North Haven, Connecticut gave a talk on "Applications of Continuous Feed-Line Transmission Systems" to the chapter on May

(Continued on page 16)

R-MOD AUTOMATES YOUR OLD VTR

LAST YEAR we said R-MOD is for all quads except AVR-1.

THIS YEAR they even R-MOD'D AVR-1 into AVR-3.

NOW we can safely say R-MOD is good for all quads.

R-MOD upgrades the transport portion of your old VTR giving it many more years' of operation at the same performance level as new VTRs. It's not a new VTR but it is the best investment for your VTR. Every R-MOD owner is a good reference. Call us toll free for details, (800) 538-1586.

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PRIME TIME

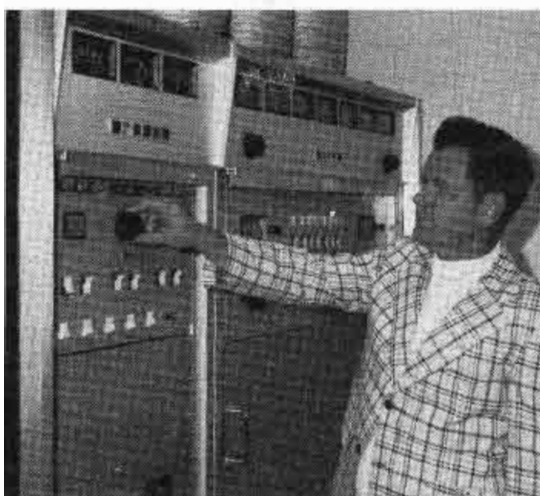
ANTENNAS AND TRANSMITTERS

HOW RCA ANTENNAS AND TRANSMITTERS BRIGHTEN THE PICTURE FOR TWO VERY DIFFERENT TV STATIONS

KGUN-TV, Tucson, Arizona, and WEDH-TV, Hartford, Connecticut are about as different as two TV stations can get. The first is a highband commercial station; the second, a UHF public TV outlet.

One thing they had in common was the need to improve their transmission facilities in a way that would assure stability, low maintenance and improved picture quality.

RCA helped both stations attain their objectives. Here's how:



RCA TT-25FH TRANSMITTER "AN ALL AROUND PERFORMANCE WINNER," SAYS GLEN HILLS, KGUN-TV.

"Our 25 kW RCA transmitter has been operating for well over a year now, from the top of 8500-foot high Mount Bigelow," reports Glen Hills, Chief Engineer, KGUN-TV. "The

"...improved our picture quality substantially."

transmitter has been reliable, very stable, and has improved our picture quality substantially.

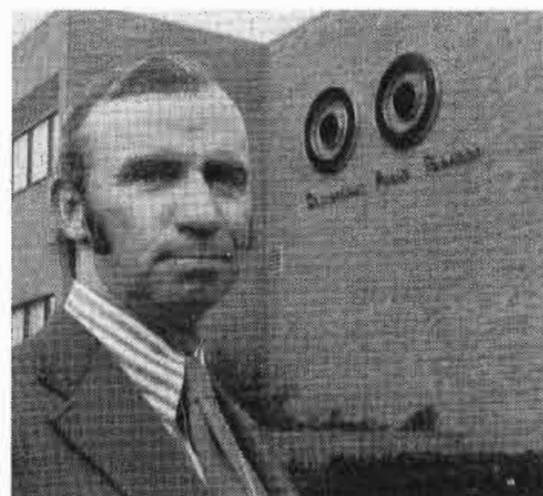
"With only two broadband stages, the TT-25FH is easy to tune, but that's rarely necessary. Ours goes three or four months without more than a touch-up. The automatic controls minimize the need for constant tweaking.

"Sometimes in the summer, lightning storms turn Mt. Bigelow blue, but we've had no lightning problems. It doesn't affect the transmitters' solid state circuits. Our picture even looks good when we're

"...just sits up there and runs!"

transmitting with our emergency diesel generator—and the transmitter seems immune from generator effects.

"The TT-25FH just sits up there and runs. It's a winner!"



"TOP-RATED TRANSMISSION ON A BUDGET," SAYS JACK KEAN, VP/ENGINEERING, WEDH-TV.

"Public television needs a quality picture as well as worthwhile programming to get and hold audiences," says Mr. Kean.

"Our RCA Antenna/Transmitter system was installed in 1973. It has given us excellent coverage and signal strength—to the point where WEDH is currently the top-rated Public Television UHF station, and #5, among all Public TV outlets.

"Our new TFI-20J omnidirectional antenna resulted in a phenomenal

"...phenomenal improvement in signal clarity."

improvement in signal clarity, in null areas and giving us excellent reception to all of Hartford, minimizing the need for roof-top antennas."

The new transmitter for WEDH was an RCA TFI-60BX with an economical standby power option. It is a single-ended 60kW transmitter with a klystron switching arrangement that permits one of the visual klystrons to function as an aural amplifier in the event of an aural klystron failure.

"The TFI-60BX transmitter is remote-controlled from the studio, and its redundancy features are

"...support as outstanding as the equipment."

excellent. The spare exciter with automatic switchover gives us full protection—and we no longer have to man the transmitter site.

"RCA support has been as outstanding as the equipment."

RCA

July, 1976

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SBE Journal

(Continued from page 14)

10th. The program included a visual display of the types of line referred to, including coaxial and heliax line.

The Chapter held its Ninth Annual Dinner and Ladies' Night on May 22nd at the Irem Temple Country Club. (John Kowalchik, RCA Solid State Division, Crestwood Road, Mountaintop, Pennsylvania 18707, (717) 474-6761).

Chapter 9: Phoenix, Arizona

Chapter 9 held their April meeting on April 14th at the Straw Hat Pizza Palace and discussed the NAB Convention activities over pizza and beer. Dalis Electronics was the host. Results of the Chapter elections are as follows: Chairman: Roger Johnson, KOY, Phoenix; Vice Chairman: Jim Doyas, KTVK, Phoenix; Secretary/Treasurer: Bob Golder, KTAR, Phoenix; Member-at-large: Leon Anglin, KTAR, Phoenix. The

chapter meets the second week of each month, rotating days of the week (Roger Johnson, Chairman, KOY, 840 N. Central Ave., Phoenix AZ 85004, (602) 258-8181).

Chapter 11: Boston, Mass.

On April 29th the chapter met to discuss the Regional Convention to be held in October. The contact for this convention is Frank Shufelt, 5 Garden Street, Grafton, Massachusetts 01519 or he can be reached at Tektronix (617) 861-6800.

Nomination of officers for the coming year were held. Those nominated were: Chairman: Robert F. Molloy; Vice Chairman: Ross Kauffman; Secretary/Treasurer: Wilbur G. Remick, Jr. (Robert Molloy, Chairman, WKBR, 155 Front Street, Manchester, New Hampshire 03102, (603) 669-1250).

Chapter 16: Seattle, Wash.

Chapter 16 held a very successful Regional Convention on May 26th and 27th at the Quality Sherwood Inn where the largest display of broadcast equipment in the northwest for many years had been gathered.

Papers and videotape presentations were presented by IVC, Tektronix, Century Lighting, Ampex, CVS, RCA, Shure and Brian Medley. Some of the topics were: Economical Videotape Techniques, Lighting Fundamentals and Tips, Time Base Correcting Fundamentals, AM Stereo, NTSC Transmission Measurements, and Microphone Tips and Usage. (Bob Ingalls, Chairperson, 5441-187th Avenue NE, Redmond, Washington, 98052, (206) 543-7774).

Chapter 17: Minneapolis/St. Paul, Minnesota

The Chapter met on April 21st for a demonstration and discussion by Mike Shields, Chief Engineer from KSJN. Shields used various equipment furnished by North Star Sound. He was assisted by Tom McCarthy and Mike Boom of North Star Sound.

The second part of the program had Denny Doty of D & L Broadcast Services Inc. demonstrate a McMartin Industries B-1100 T.V.H.F. Transmitter and TBM-

(Continued on page 86)

We've packaged our compact Criterion three different ways.

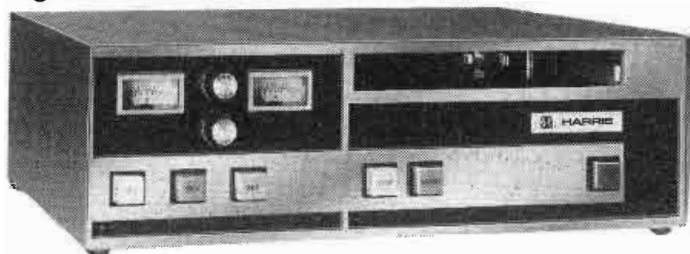
Criterion I... only 8-1/2" wide. Direct capstan drive comparable to the finest reel-to-reel machines. Speed accuracy of 0.2%. 1, 2 or 3 cue signals available for automatic equipment. Handles A & B cartridges. Mount two units side by side in a standard 19" rack.

Criterion II... offers both record and playback in a single unit.

Handles A, B and C cartridges. Fits in 7 inches of standard rack space.

Criterion III... combines three playback decks in a single compact unit. One, two, or three decks may be operated at the same time, each feeding a different program input. Handles A & B cartridges. Mount twin playback units side by side in 12-1/4" rack space.

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



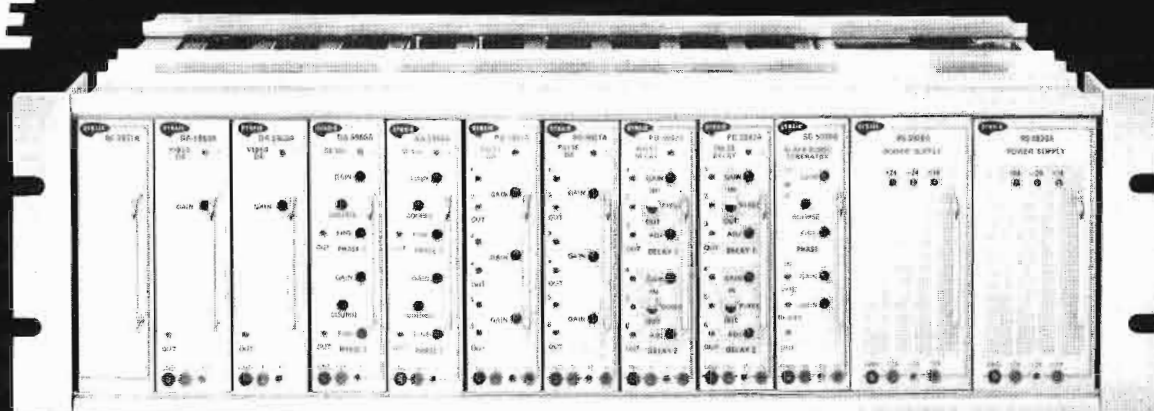
HARRIS
COMMUNICATIONS AND
INFORMATION HANDLING

Harris...originators of the tape cartridge machine.

If you don't think this is the **BEST LOOKING**
DA PACKAGE
AROUND,

then buy it

for the **PRICE** and **SPECS!**



	VIDEO	SUBCARRIER	PULSE	PULSE DELAY	BURST GEN.
INPUTS	UNBALANCED DIFF. OR BALANCED IMPEDANCE: One, 20K (loop) RETURN LOSS: 40 dB LEVEL: 1-2 VPP CMR: 60 dB at 60 Hz	UNBALANCED IMPEDANCE: One, 50K (loop) LEVEL: 1-4 VPP	UNBALANCED IMPEDANCE: One, 50K (loop) LEVEL: 1-5 VPP RETURN LOSS: 40 dB	UNBALANCED IMPEDANCE: One, 50K (loop) RETURN LOSS: 40 dB LEVEL: 1-5 VPP	UNBALANCED SYNC: One, 20K (loop), 2-4 VPP BLANKING: One, 20K (loop), 2-4 VPP SUBCARRIER: One, 50K (loop), 1-3 VPP
OUTPUTS	IMPEDANCE: Six, 75 ohm ±1% RETURN LOSS: 40 dB LEVEL: 1-2 VPP COUPLING: DC ISOLATION: 40 dB to 3.58 MHz	IMPEDANCE: Six, 75 ohm (two groups of three outputs each) LEVEL: 1-3 VPP (each group of three outputs adj.) REGENERATIVE	IMPEDANCE: Six, 75 ohm ±1% (three groups of two outputs each) LEVEL: 2-4 VPP (each group of two adj.) COUPLING: DC ISOLATION: 40 dB REGENERATIVE	IMPEDANCE: Six, 75 ohm ±1% (two groups of three outputs each) LEVEL: 2-4 VPP (each group of three adj.) COUPLING: DC ISOLATION: 40 dB REGENERATIVE	IMPEDANCE: Two, 75 ohm SYNC AMPLITUDE: 0 to 0.5 VPP PEDESTAL: 0 to 0.1 VPP BURST AMPLITUDE: 0.2 to 0.5 VPP
PERFORMANCE	GAIN: ±6 dB RESPONSE: ±0.1 dB to 10 MHz; +0.1 dB, -2 dB to 20 MHz DIFF. GAIN: 0.2% DIFF. PHASE: 0.1° TILT: 0.2%, 50 Hz BOUNCE: 2% HUM & NOISE: 1 mVPP STABILITY: 1%	DISTORTION: 1% PHASE RANGE: 0 to 360° (each group of three outputs adj.) HUM & NOISE: -60 dB PHASE STABILITY: ±1° GAIN STABILITY: ±1%	RISE TIME: 100 ±20 ns OVERSHOOT: 1% TILT: 0.5%, 50 Hz HUM & NOISE: -60 dB WIDTH STABILITY: ±20 ns PULSE WIDTH: Equal at 50% point LEVEL STABILITY: 1% DELAY: 120 ns (approx.)	RISE TIME: 100 ±20 ns TILT: 1% HUM & NOISE: -60 dB PULSE WIDTH: Equal at 50% point DELAY: 0.35 to 4 us (each group of three outputs adj.) DELAY STABILITY: 1%	RISE TIME: 100 ±20 ns BURST PHASE: 0 to 360° TILT: 1% PHASE STABILITY: ±1° GAIN STABILITY: ±1%

The following DYN AIR broadcast equipment dealers will welcome your inquiry concerning price for your specific
SERIES 5900 Distribution Amplifier package:

Alexander Electronics
1820 Wyandotte St.
Kansas City, MO. 64108
(816) 474-6656

Bennett Engineering Assoc.
5005 - 91st Ave., S.E.
P. O. Box 23
Mercer Island, WA. 98040
(206) 232-3550

Davis Audio-Visual, Inc.
Video Systems Division
1801 Federal Blvd.
Denver, CO. 80204
(303) 433-7443

Electronic Products Corp.
16006 Waterloo Rd.
Cleveland, OH. 44110
(216) 692-3050

General Electronic Systems
1440 San Pablo Ave.
Berkeley, CA. 94702
(415) 527-7700

K & M Electronics of
Todd Communications, Inc.
7360 Ohms Lane
Minneapolis, MN. 55435
(612) 835-3080

Lebow Labs, Inc.
424 Cambridge St.
Boston, MA. 02134
(617) 782-0600

Long Engineering
961 Burke St.
Winston-Salem, N.C. 27101
(919) 725-2306

Midwest Telecommunications
300 First Ave., S.
P. O. Box 385
Nitro, W.V. 25143
(304) 722-2921

Midwest Telecommunications
1395 Air Rail Ave.
Virginia Beach, VA. 23455
(804) 464-6256

Midwest Telecommunications
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Miami, FL. 33126
(305) 592-5355

Midwest Telecommunications
3000 Carlisle St.
Dallas, TX. 75204
(214) 741-1440

Peirce-Phelps, Inc.
2000 Block N. 59th St.
Philadelphia, PA. 19131
(215) 879-7171

Ronco Communications & Electronics, Inc.
595 Sheridan Dr.
Tonawanda, N.Y. 14150
(716) 873-0760

Tele-Measurements, Inc.
145 Main Ave.
Clifton, N.J. 07014
(201) 473-8822 (in N.J.)
(212) 581-9020 (in N.Y.)

Thalner Electronic Laboratories, Inc.
7235 Jackson Rd.
Ann Arbor, MI. 48103
(313) 761-4506

Tri-Tronics, Inc.
4019 Tujunga Ave.
N. Hollywood, CA. 91604
(213) 877-9912

Vidcom, Inc.
1908 E. McDowell Rd.
Phoenix, AZ. 85006
(602) 253-2103

DYN AIR ELECTRONICS, INC.
6360 FEDERAL BLVD., SAN DIEGO, CA. 92114
PHONE: (714) 582-9211; TWX: (910) 335-2040

DYN AIR

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The Sony BVH-1000. Consider the concept.

The BVH-1000 brings a new, two-in-one concept to professional high band video recording. It meets current broadcasting needs for a top-of-the-line recorder, and does it in an economical package without compromising video or audio quality.

But more than that, the BVH-1000 is the machine of the future. Designed for production and post-production applications, it is a 1" video recorder that can compete with 35mm film techniques.

It wasn't easy, but we have combined transparent picture quality, plus two professional quality audio tracks with advanced editing techniques. That combination simply is not available in any other recorder, no matter what the format or tape width.

Before considering another recorder, examine these eight BVH-1000 features:

1. Exclusive 1.5 head. This completely avoids the problem of missing information caused by head switching of single head machines. It also insures, for the quality user, a continuity of video information, as well as VIRS record/playback, which may be required of all machines in the future.

2. Advanced servo design.

The BVH-1000 incorporates drum servo, capstan servo, tension servo, reel servo. This servo system, combined with dual capstan drive, provides highly accurate tape speed and quality interchange, plus gentle tape handling in fast forward and reverse modes.

3. Five motors. These eliminate the use of unreliable and inaccurate belt systems for drives.

4. Standard VH and color framing modes. Both are standard equipment in the BVH-1000. Two high quality audio tracks and a separate cue track, plus 400Hz tone generator are also standard.

5. Biderex search control. Built-in bi-directional search control allows shuttling of the video tape in either direction from 1/3 frame jog to high speed rewind and fast forward. The non-segmented formats allow the operator to see the picture and make fast editing decisions either manually or with computer control.

6. Standard tape timer. This features a special memory that prevents the tape from unthreading. SMPTE reader/generator is a plug-in option.

7. Versatile mounting. A flexible mounting system and built-in wave form select enable the BVH-1000 to be adapted to any number of mounting or console configurations. The BVH-1000 is at home in a small van or big studio.

8. New Sony time base corrector.

The BVH-1000 can be used with Sony's new BVT-1000 time base corrector or any other quality TBC. If you don't require time base correction, an optional heterodyne recovery board is available.

This is just the beginning of the BVH-1000 concept. To learn more about the economy, technical performance and specifications, contact your Sony Broadcast representative, or write Sony Broadcast.

Sony Broadcast

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

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Video Scores New Firsts At The Summer Olympics

By Joe Roizen

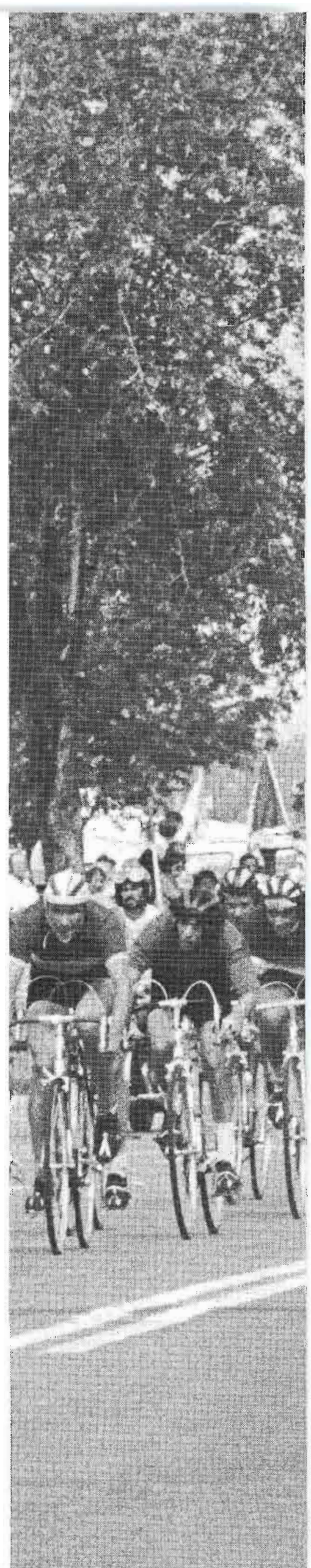
Our bicentennial year is also an anniversary of note for an area of modern communications which has virtually reached into almost every household of our global television village. 40 years ago, the first crude television system involving both the latest in mechanical scanning, as well as the earliest electronic devices was assembled in Berlin to bring live pictures of the athletes to a select small group of specially invited visitors who were ushered into darkened rooms equipped with dual cathode ray tube receivers. In this short span of time, television coverage of Olympics has benefitted from a mushrooming technology that can bring the human element of the individual athlete's struggle with time and space in full color and with revealing proximity to every remote spectator who is interested.

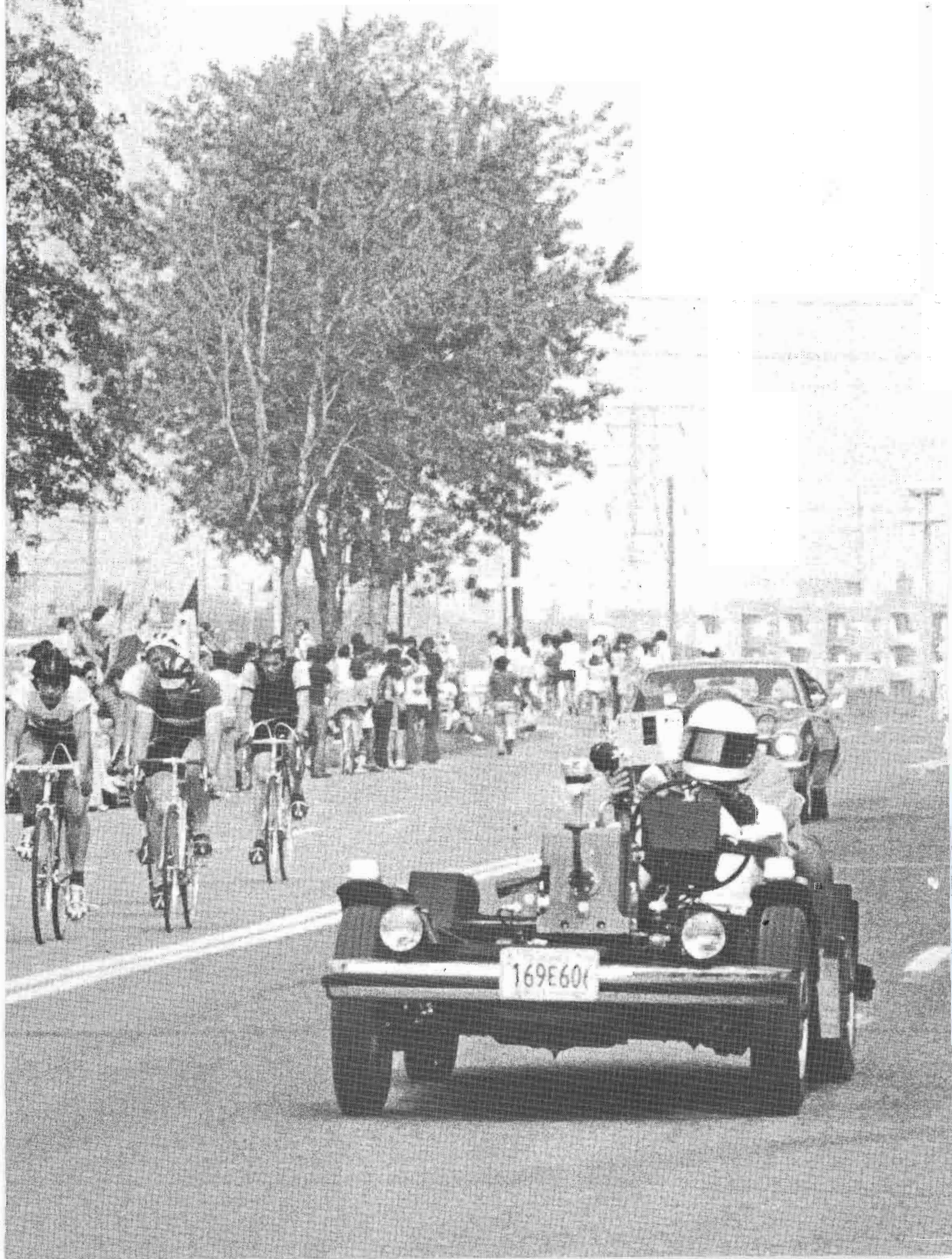
The Montreal Olympics have already been characterized by ORTO, the special group set up under the Canadian Broadcasting Corporation's aegis as emphasizing this human element to the rest of the world through the latest techniques in television technology. To do this adequately, ORTO's engineering group have designed and put

into service special facilities which will permit them to meet this worthwhile goal.

The major sports that involve courses which cover considerable distances outside of the Olympic Stadia themselves (cycling, marathon, etc. have always presented a difficult challenge to the television services that need to cover them. ORTO has come up with a solution for this problem which has already proven itself in the world cycling championships held in 1974 where they were able to use their Auto-camera on a mobile vehicle conceived and built for this type of function. The vehicle itself is designed to permit very close coverage of the athletes and carries a self-powered portable broadcast camera.

In order to relay the images back to the switching center for inclusion in the overall program coverage, the vehicle is equipped with a pair of Nurad microwave units operating on 2 Gigahertz with omni-directional circularly polarized antennas. The up link from the vehicle is to a helicopter which can hover within 1000 ft. of the Auto-camera and follow along its course. The chopper can then relay the signal on a 7 Gigahertz down link to a receiving





antenna on top of the Maison de Radio Canada where it can be sent by cable to the Olympic Center switching facility at ORTO's headquarters.

The system has already been tested out in the recent fire at the American Geodesic Dome Pavillion on the Expo '67 grounds. It is planned that this system will be a vital link in the live TV coverage on July 17 (opening day) for the Olympic torch relay and will, of course, be used frequently during the Games for other sports that require it.

There are several technical innovations in the system to guarantee accurate color rendition between the camera and the final picture display. These include special antennas which through circular polarization minimize out-of-phase multi-path signals and reduce undesirable effects such as ghosting and smearing. In addition, the antennas are configured with an extra

wide (40 degrees) elevation beam width to insure good signal return in the event of helicopter banking, rolling or erratic flight caused by air turbulence and ground proximity.

The Auto-camera is the first such television vehicle which, because of its lack of interference with the athletes, has been authorized by the World Cycling Union and subsequently the Olympic Committee to cover a race at the heart of the competition. Using the hand-held mini-color camera, the operator can reach positions only a few feet from the competitors and in effect becomes part of the pack. With modern zoom lenses, it will be possible to provide the best color action shots that have ever been made in this type of television coverage.

Electric Carts, Too

While the autocamera was acceptable for covering cycling, it still was felt that the emissions could have some ill effects on runners. So, the need for pure air along with mobile coverage brought about the use of two electric carts. (You may recall that KREM-TV took a similar approach to their Expo coverage.)

Both electric carts will carry a camera. From the cart, the signal will be lifted to a hovering helicopter. From there, it will be relayed to master control. Another interesting point here is that the helicopter also will be carrying a camera, so this will represent a very unique set of coverage possibilities.

These same electric carts will cover the 20 kilometer walk event. This is the first time the event has ever been covered live. All vehicle cameras will be especially designed Editel models.

During the marathon, the carts will be deployed so that one is always with the leader, the other back in the pack. Fortunately, these carts can reach 40 mph and have an operational radius of 50 miles.

Color Phase Lock

The largest single problem with regard to multiple video remote feeds, especially with the NTSC color system, is to achieve accurate phase matching (hue) between all

picture sources and master control where switching is done.

In Munich at the '72 Games, this problem was solved by installing the Legger System developed by Fernseh which properly phased the PAL color signal through an electronic servo with feedback correction signals to each source color generator.

In Canada, ORTO has also adopted a special system supplied by Leitch Video Ltd., a local manufacturer of color synchronizing generators and distribution amplifiers. This system employs a Rubidium frequency standard at the master location which acts as the reference against which the local and incoming feeds are compared in phase comparators connected to each video source ahead of the program switcher. The error signal is PCM encoded and sent over a 2.7 kHz audio line (telephone circuit) back to the source color sync generator. Correction to the origination generator is in increments of 4 nano seconds of horizontal phasing and 0.3 degree steps of subcarrier phasing, thus giving very precise hue matching between sources.

At the Montreal Olympic Games, both the master sync generator and the remote video source synchronizers will be driven by Rubidium standards to achieve maximum accuracy, even though the remote location could normally operate without a Rubidium clock. Because of the large number of venues and potential outside picture sources from mobile vehicles and helicopter relays, there could be as many as 20 remote feeds appearing simultaneously at master control and requiring phase synchronization so that the final program output will not exhibit hue shift when different sources are selected. Most of the signals will be arriving via microwave systems which could also introduce phase problems of their own.

To accommodate these remote sources, banks of video phase compactors in series with the master control switcher input will make direct phase comparisons with all the remote video signals against a reference color black signal supplied by the master sync generator which in turn is genlocked to the Rubidium standard. Phase coincidence will then be achieved in each



One of two mobile TV vans with a film camera on the roof that fed the film processor and optical disc scanner inside. Pictures were in monochrome, non-interlaced, and had 180 lines at 25 frames.

IT'S DECADE TWO

...and the company whose innovations over the past 10 years revolutionized color television cameras in the U.S. and throughout the world, now puts its 3-Plumbicon picture and a beam-splitter prism into the most exciting new lightweight camera value on the market.

The PHILIPS LDK-11. Full broadcast quality for both ENG and commercial production!

With the LDK-11 no longer must broadcasters or production companies sacrifice picture quality or operational features for portability. Broadcasters started using the LDK-11 in January, 1976 and the reactions have been outstanding. A typical report from one of the first stations to get delivery... "the field pictures look as if they were shot in our studio!"

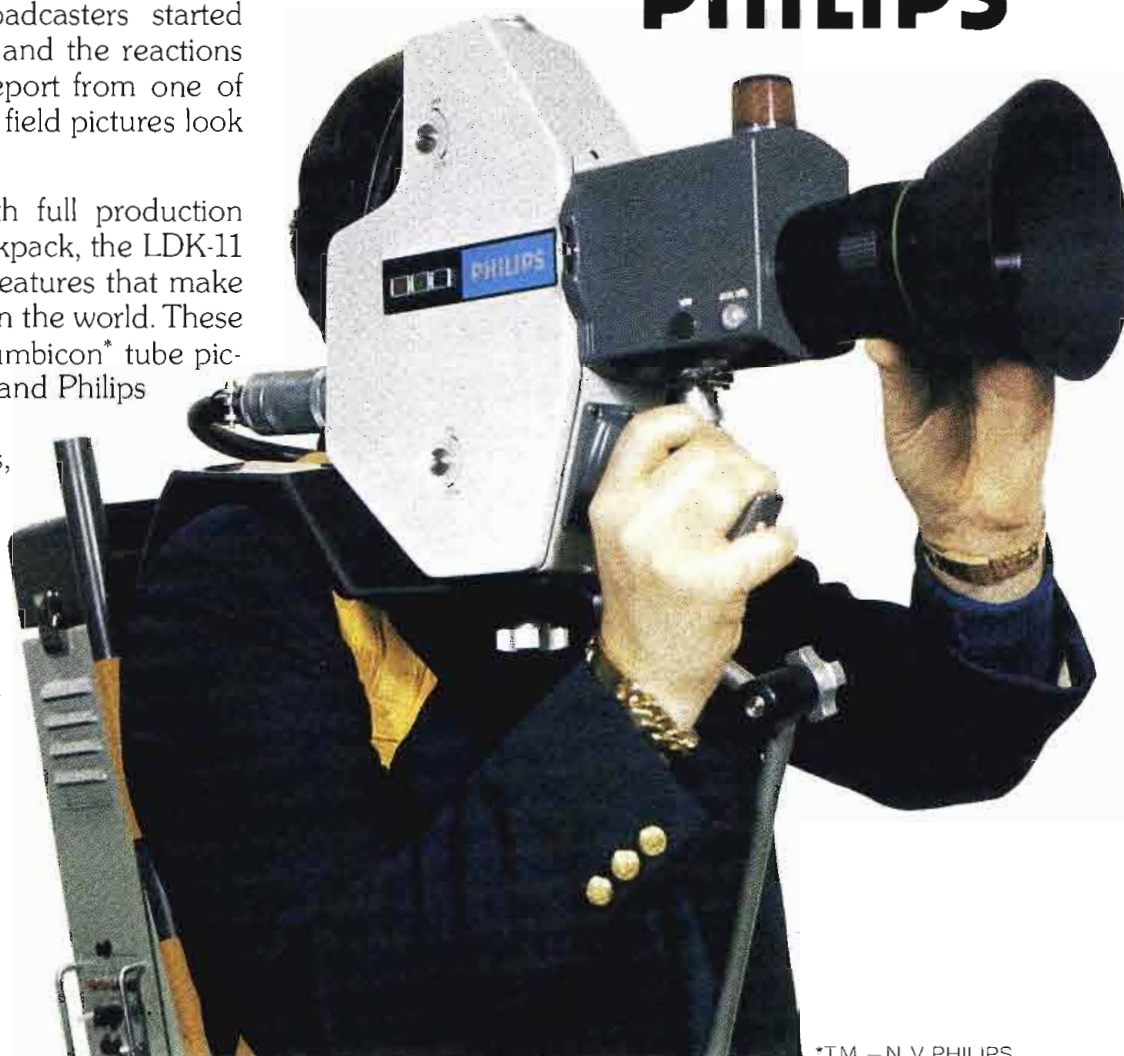
Battery or AC powered and with full production control either remotely or at the backpack, the LDK-11 has all the key Philips engineering features that make it like no other comparable camera in the world. These features include Philips famed 3-Plumbicon* tube picture, beam-split prism with bias light and Philips linear matrix for superb colorimetry. Also included are H & V contours, auto iris, auto white balance, gen-lock sync generator, switchable gain and gamma, built-in color bars, remote VTR and zoom controls, and two audio channels.

All this and more add up to the

utmost flexibility and economy for ENG, local remote and studio production...without compromise. And the LDK-11 is available now!

Send for more information. Or, better still, have your Philips representative set up a demo for you. But do it today before you get TKO'd into anything else. Broadcast Products, Philips Audio Video Systems Corp., 91 McKee Drive, Mahwah, New Jersey 07430. (201) 529-3800.

PHILIPS®



*T.M. — N. V. PHILIPS

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circuit to an accuracy of better than 1 nano second. As a result of this, all of the incoming signals can be handled as though they are locally sourced for switching, special effects, overlays, chroma keys, etc. Even the momentary lows of the phasing control signal or interruptions of the remote or reference video will not cause erroneous phase corrections. In addition, a parity pulse code modulation is utilized in the system so that the phase control signal is relatively impervious to interference such as impulse noise and other transients.

The use of ordinary phone lines for the error signal feedback circuit makes it especially easy to employ this system at remote locations since such telephone facilities are almost universally available. Both the sync pulse generators and the video source synchronizers supplied by Leitch use digital design and employ reference oscillators operating at 4 times color subcarrier (14.31818 MHz) to provide high stability. Color identification at half the frame rate is also supplied for precision editing and when the Rubidium standard is used as an external frequency reference, a 5 MHz frequency converter is inserted in the system. The block diagram shows a typical installation with 2

remote sources feeding into master control.

In today's world, the thought of any obstacle standing in the way of an all prevailing television coverage for any international athletic event is almost inconceivable, but in 1936 plans to inaugurate television at the Berlin Summer Olympics were not so readily accepted by German officialdom.

The architect of the main stadium objected to television because it might destroy the symmetry and give a bad impression of his greatest creation. The head gardener resisted for five weeks as he did not want his lawns dug up to bury equipment and cables. Even the TV staff had a few unusual problems.

The sports commentator had no monitor to see what the camera was covering. He announced blind while the TV camera operator, who did have earphones, tried to follow the action being described. That was not easy, as the angle of view was restricted, the bulky cameras were hard to move, and zoom lenses were yet to be invented. Cameras in those days were called "person scanners" as they could not yet make good, wide view images, and stuck to close-ups of people as much as possible. Nevertheless, the world press that attended the IX

Olympiad, hosted by Berlin in 1936, had nothing but high praise for the technical achievement of Germany's fledgling television industry.

Television (Fernsehen in German) was at a transitional stage in the mid-thirties. Electro-mechanical systems were going out and electronic image conversion and display were beginning to lay the groundwork for the television explosion that was to occur in the forties. The equipment assembled at the Summer Games that year was an interesting combination of Teutonic technology and imported inventions from America that were assembled and operated by German engineers to create television history.

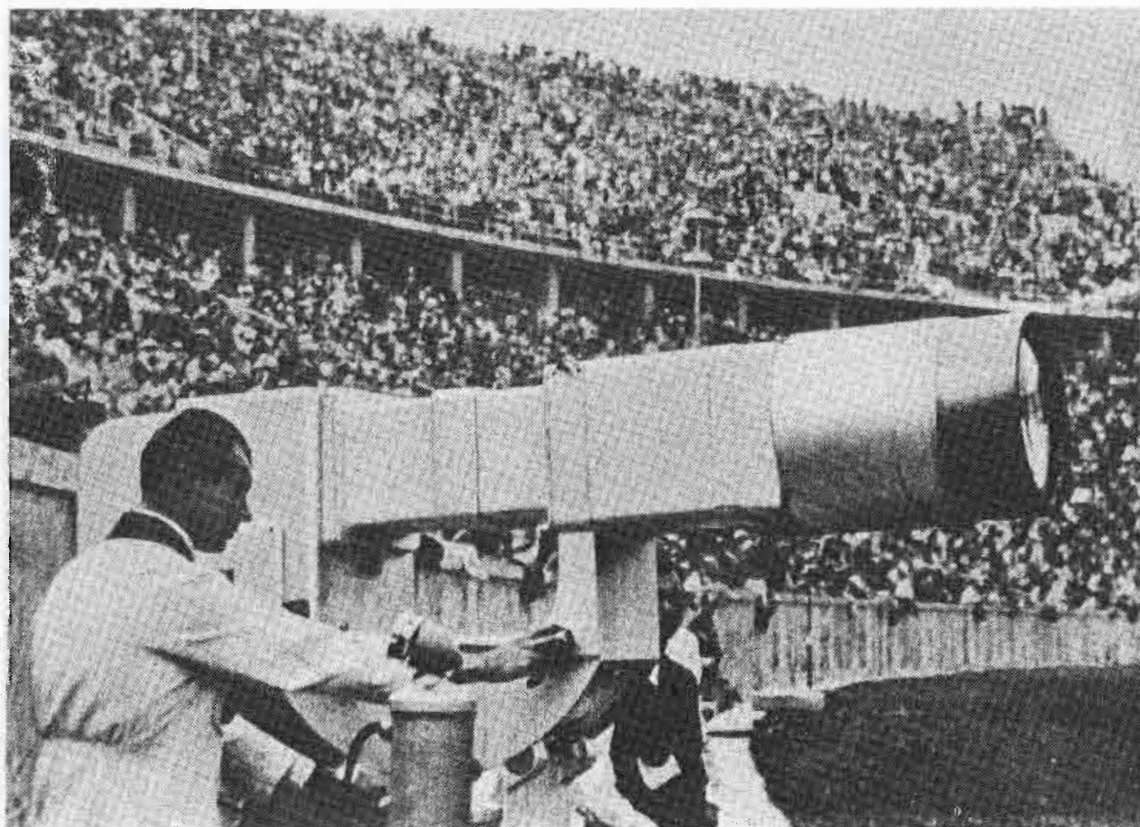
The "Zwischenfilm" System

A literal translation of this descriptive term would be: the "film in between (or intermediate) television system". It was a most unusual television camera developed by Fernseh A.G. and the Reichspost for live coverage at the Marathon gate of the Olympiastadion in Berlin.

Actually, it was not really a TV camera but a film camera installed on the roof of a mobile van. The film from the supply magazine ran through the camera and down into the van body through a light-tight tube in the camera pedestal. The exposed film was then continuously developed, fixed and dried in 90 seconds, after which it ran through a mechanical scanner illuminated by a powerful Hinisol arc lamp which provided a light intensity sufficient to generate an adequate video signal in the seven grid photocell pickup tube. The video amplifier used 6 RC coupled stages followed by a black level adjustment and no aperture correction. The output signal was relayed to monochrome receivers which provided television pictures to over 100,000 viewers in 21 locations that included "Olympia-Fernsehstube" (pubs) and tents specially set up.

The Reichspost had two such mobile vans built in time for use at the games. The second unit had some significant improvements such as one hour recording time, and slower film speed.

The pictures produced were 180 line, 25 frames, sound limit was 5 KHz and the sound recording was



Telefunken's TV camera using the Zworykin iconoscope tube had a one meter lens and took two men to operate. One of the cameramen was Walter Brusch, later to invent the PAL color system now in use in West Germany and many other parts of the world.

"CANON'S NEW P18X16B2* 'INSTANT CLOSEUP' LENSES HAVE TURNED WPIX'S YANKEE BROADCASTS INTO A WHOLE NEW BALLGAME". Otis Freeman

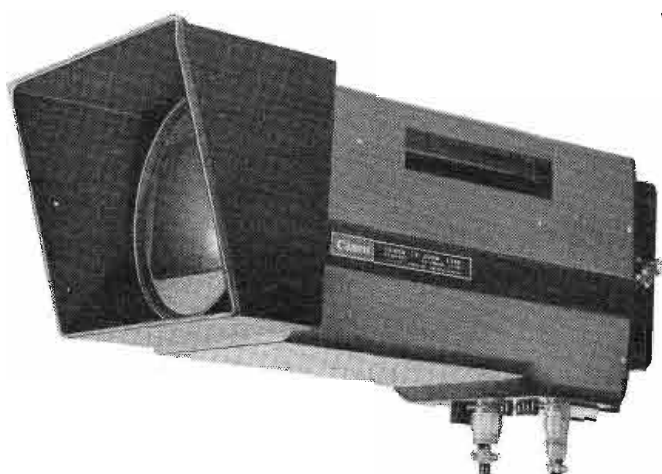
Vice President/Engineer, WPIX-TV

When WPIX, in New York City, bought 5 of our new lenses for their Yankee Stadium installation, it was the biggest news for viewers since instant replay.

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P18x16B2* lenses have random access to all range extenders. Because they don't have to cycle through, the director isn't forced to cut away to another camera when he's already got the best angle... and he needs to move in for a tight closeup.

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And to top it all off, the extreme wide angle of our new lens gives WPIX the best panoramic shots they've ever sent down the pipe.

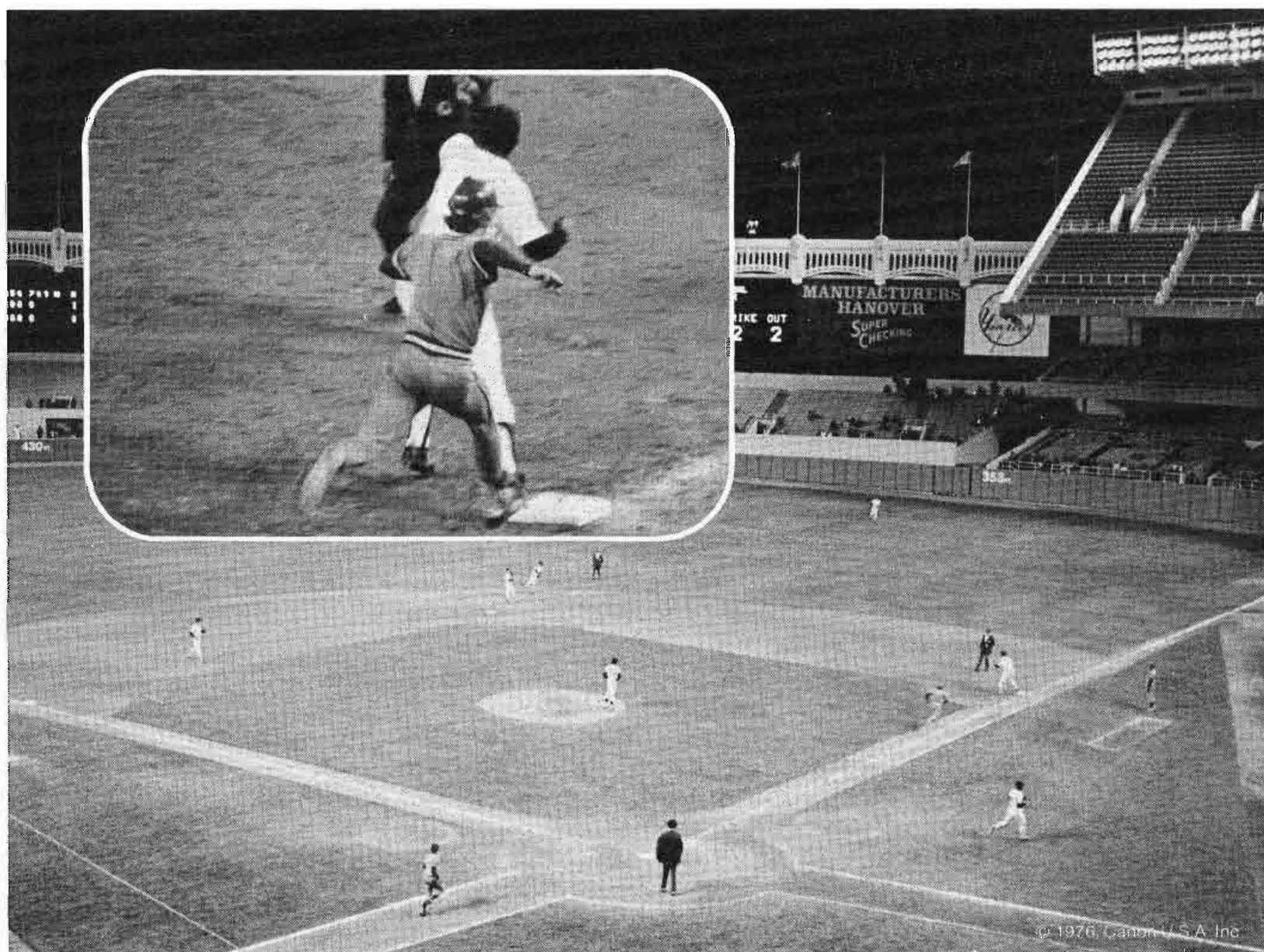
If all this sounds good to you, *seeing* what our new lens can do is even better. No matter what kind of camera you're using—or contemplating—call us to arrange a demonstration.

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Parked near the Marathon gate of the main Olympic stadium, the Reichpost's mobile van, with the intermediate film system, was restricted in position and coverage.

in the camera mechanism. The camera was made by Zeiss Ikon of Dresden and had lenses of 28, 50, 75, 135, 300 and 500 mm. The van used 20 KW of 3 phase 220 volt power and required a fresh water supply and drainage.

The optical scanning disc ran at 7000 rpm in a vacuum. The shutter inside the housing was synchronized to the hole disc by a phase control. Magnetic recording was also used with both steel delay loops and

paper based magnetic tape where sound coverage was needed.

Electronic Cameras

Two other cameras were used in Berlin and each was an early model of relatively recent developments in American experimental television. One camera was built around the Iconoscope camera tube developed by Valdimir K. Zworykin at RCA laboratories. This camera tube became the work-horse of monochrome TV all over the world, until it was displaced by Orthicons and Vidicons in the early fifties.

Finished only three days before the opening of the games, this camera was built by Telefunken and had an optical system with a lens one meter (39.38 inches) long and an aperture of F2. The camera was huge by today's standards and took two men to operate the camera head, one to change optics, and two more took care of the power supplies and associated racks that were buried in a bunker in the stadium. One of the cameramen was Walter Bruch, who was later to invent the PAL color TV system used in most of Western Europe and other parts of the world.

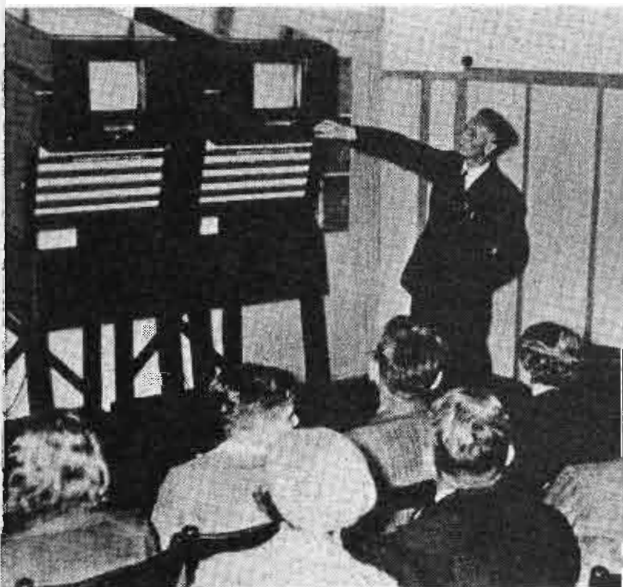
The other electronic camera was

made by Fernseh A.G. using an Image Dissector tube invented by Philo T. Farnsworth. This camera used an optical finder on the side and produced non-interlaced images at the 180 line, 25 frame standard in use then. It was installed over the Marathon gate at the main stadium.

Television Receivers

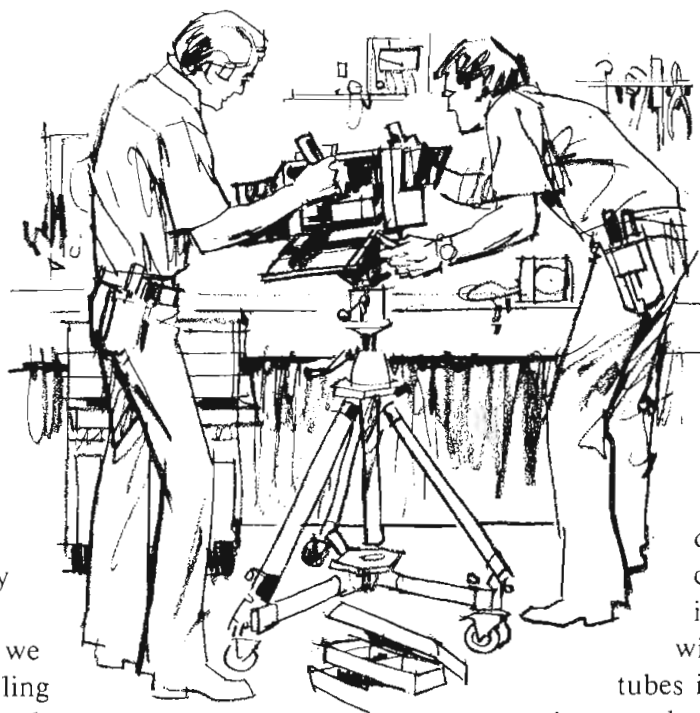
The receivers used were cathode ray tube types, with round tubes about 19 inches in diameter. Usually two receivers were set up together to assure back-up in case one failed and to give greater coverage for the up to 300 people who would crowd into the viewing rooms set up for the TV audiences.

One of the individuals who was most impressed with his first exposure to television was Jesse Owens, a four gold medal winner from the USA. He went with a group of athletes down to the Hall of Nations, where by his own description, he remembers small receivers (about 10 inches) that displayed a parade of horses and soldiers. Unfortunately, he was too busy competing to ever see himself on the new fangled Fernseh receivers spread around Berlin in 1936. □



Typical 10-inch black and white receivers used for TV reception at the 1936 Olympics.

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April 23, 1976

Mr. Paul Warnock
President
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P. O. Box 15068
Salt Lake City, Utah 84115

Dear Paul:

The new TeleMation TCG3000 Character Generator has proven to be a very delightful surprise. It seems to measure up to just about all of our expectations and then some. I thought you would like to know that it has generated more genuine excitement and enthusiasm on the part of our employees than any other piece of equipment that I have purchased for the station in the last seven years.

May I extend our thanks to you and to those members of your staff who have contributed so much in the preparation, design and provision of this forward looking equipment and especially to Dennis Fraser, Tom Meyer and Leo Lewis. It was great having those people work with us on this project and we hope that they will continue to support us as we come to be more knowledgeable and familiar with the equipment.

I just thought you might appreciate our words of thanks.

Sincerely,

R. C. Smith
Chief Engineer

RCS:rg

Introduced at the '76 NAB, the first **Compositor I** Titling/Graphics System was delivered to Time-Life station WOTV, Grand Rapids, Michigan, on April 17.

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WOTV Chief Engineer R.C. Smith writes that the **Compositor I** "has generated more genuine excitement and enthusiasm on the part of our employees than any other piece of equipment that I have purchased for the station in the last seven years."

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Breaking the sound barrier with Cartridge tape

By Peter Burke, Radio Workshop Editor and CE of WQUA.

If you've been around radio stations for more than a few years, you probably recall threading up commercials on a trusty old Magne-cord PT-6. If you were really proficient, you could rewind one reel, and thread the next spot while reading the afternoon hospital report. ("Here's the news in pinks and blues...") What the machines lacked in other conveniences was made up for by a rewind motor that rivaled the Concorde, both in torque and sound pressure level.

Enter the tape cartridge...a marvelous convenience, indeed! Just push a plastic-enshrouded loop of tape into an aluminum mouth, press the "GO" button, and listen to His Master's Voice in all its glorious high fidelity.

What? The Fi isn't Hi? The machine is eating the cartridges instead of playing them? Don't shoot the machine; Your Super-sonic Tape Transport (SSTT) may be operating sub-sonically. This month we're going to try to break the sound barrier and win landing rights.

Let's start with basic alignment. Both record and play heads must be very accurately positioned with respect to the tape. Height, zenith, and head penetration should, of course, be periodically checked, but the real gremlin is azimuth. Even a tiny azimuth error can produce a devastating phase error in stereo, and a noticeable loss of high frequencies, even on a mono cart.

The instruction book for your machines will provide the specific information for proper adjustment, so we'll concentrate here on some useful tips to make your regular alignment checks easier and more accurate.

Tape You Can Trust

The first requirement is an alignment tape that you can trust. You should really have two identical tapes, one that you regularly use and one hidden on the top shelf for comparison. If you switch to an alignment tape that doesn't agree with the one you were using, you've just thrown every cartridge in the house out of alignment.

Reproduce azimuth alignment on a mono machine is simple enough... just peak the output using a 12 or 15 kHz tone on the alignment tape. Be careful that the output doesn't

drop when you tighten the locking screw on the head assembly. A stereo reproducer is best aligned by watching the phase relationship of the two channels on an X-Y scope (see last month's Radio Workshop).

There is one other check you should make when you first align a new stereo head. This one isn't usually mentioned in the book, but can help you spot a bad head. It has to do with gap scatter (see Figure 1). Gap scatter itself is difficult to measure, and in fact most head manufacturers don't guarantee any specific limits, but the effects are easily detected.

Here's how to check for excessive gap scatter: Align the head for maximum output on the left channel and note the reading on the output meter. Next align for maximum right channel output and note this reading. Now align for best phase coincidence, using the scope. Compare the left and right channel values with the previous readings. If there is an appreciable drop in either channel, the head gaps are not in line with each other. The only cure is head replacement.

Head Monitoring

Reproduce equalization should be closely watched for the first few weeks. You'll have to gradually increase high-frequency response until the head wears in. While the head is in its infancy is also the time to closely monitor the wear pattern on the face of the head. Figure 2 shows several common

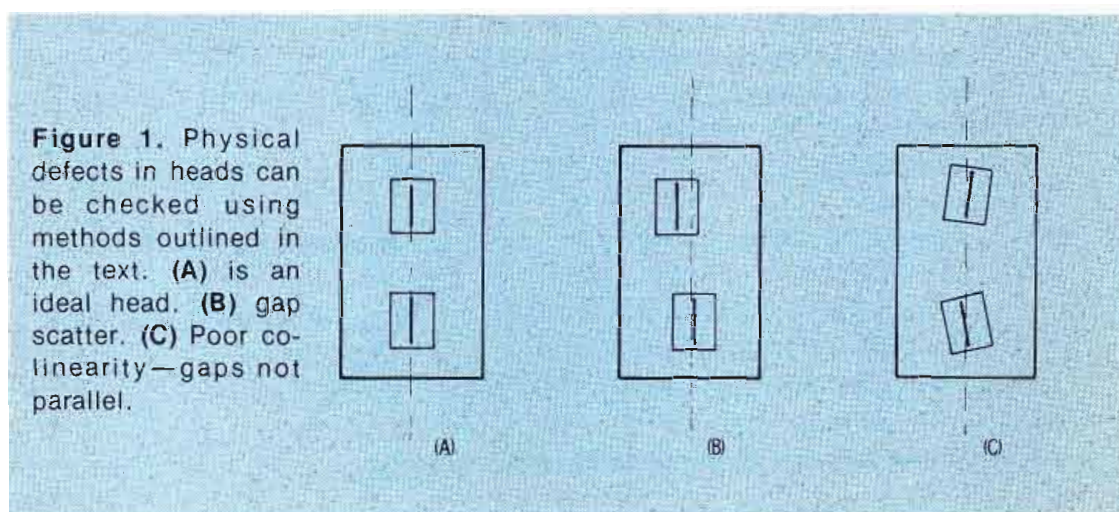


Figure 1. Physical defects in heads can be checked using methods outlined in the text. (A) is an ideal head. (B) gap scatter. (C) Poor collinearity—gaps not parallel.

misalignment problems that show up after a few weeks.

Record azimuth alignment can be accomplished one of two ways. The quickest way is to switch the head cables so that the record head feeds the program amplifier and repeat the reproduce alignment procedure. The response won't be correct because the head impedances are different, but you can get an accurate indication of azimuth alignment.

If you prefer, you can align the record head by recording a high frequency tone from a signal generator, and observing playback while adjusting the record head azimuth. The primary pitfall here is the variation from cart to cart. Use the same 3½ minute cartridge each time.

After alignment, check the overall response, and adjust accordingly. You'll probably notice a boost at low frequencies that you can't seem to eliminate. This is inherent in the design of the heads and can't be fully eliminated. Since this low frequency boost tends to make voices sound tubby, some stations have modified the record amplifier response to increase the low frequency roll-off.

NAB Standards

It's worth noting here that the new NAB standards are now available. There are several subtle changes that will affect us. The response curve has been modified

at the low end. As the manufacturers switch over to the new standard, you may notice a slight difference between a new machine and an old one but probably not enough to warrant modification of your existing machines.

We won't go into great detail on mechanical adjustments, since each make is different. The prime considerations are smooth solenoid operation, a good pinch roller, (not grooved) and proper position of the capstan. Most manufacturers have a special set of gauges available to make these adjustments. Don't attempt adjustment without the proper gauge!

Reproduce only machines should have a dummy head in the record position to keep the tape path the same as it was in the recorder. Machines with direct drive motors will last longer if the motor is strapped to run continuously rather than switch on and off with the microswitch. Constant on-off operation causes thermal cycling which will shorten the life of the motor. In addition, you will eliminate the wowing caused by starting the machine too soon after inserting the cart. (Most new machines are already set up this way.)

Cart Problems

Now that the machines are all ready for takeoff, let's look at the cartridges themselves. Many problems that are blamed on the machines are the result of malfunctioning carts.

If you adopt these basic policies, you'll reduce your cart problems substantially. First, **standardize on one brand of carts.** Pick the one you think is best, then stick with it. Find a reliable firm to load carts for you. Winding your own carts has great therapeutic value but produces a result about as consistent as rolling your own cigarettes. The time you save can be used to fix the boss' toaster.

As carts come back out of the control room, you should **check them before they go back into circulation.** It's really easy to spot the bad ones if you test each one by recording a 12kHz tone and monitoring the output of the reproducer. Compare the reproduced level with that of a known good cartridge. If it's substantially lower, or fluctuates a lot, it is in poor health, and should either be repaired or given a decent burial. You can check a lot of carts in a short time once you know what to look for. Brace yourself for a wide variation, especially among older cartridges.

To make it easier for your production people to **verify cart quality as they record**, you can shift the 8 kHz cue oscillator to 12 kHz (if you aren't using the tertiary tones) and set the meter on the record machine to monitor the cue channel. During the recording, press the tertiary cue switch for a few seconds and observe the level on the meter. Again, a bad cart will read low or will fluctuate. On some machines, you can even perform this check on a pre-recorded cart.

After you've sampled a number of carts you'll probably come to the conclusion that it's impossible to maintain all of the carts anywhere near perfect alignment. Let's look at the cause of the problem and discuss a better solution. The guide post at the left front corner of the cartridge is less than one inch from the center of the record head. It should be obvious that even a tiny vertical displacement of the guide post will result in a relatively large azimuth error. By the time the tape

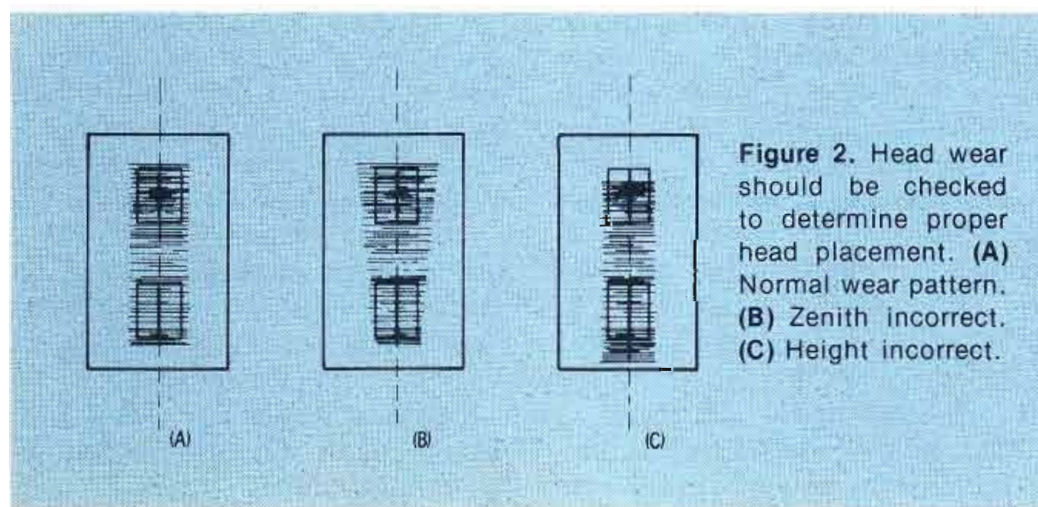


Figure 2. Head wear should be checked to determine proper head placement. (A) Normal wear pattern. (B) Zenith incorrect. (C) Height incorrect.

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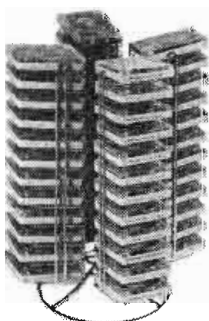
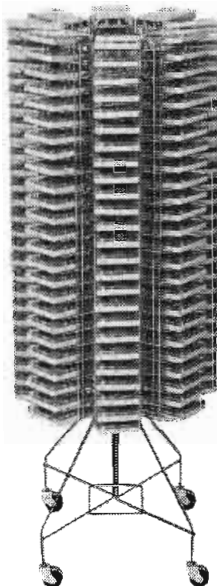


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has reached the reproduce head, it has had a chance to come into proper alignment. Therefore, if we could just adjust the record azimuth to account for each individual cartridge, we could reduce the response variation from one cart to the next.

One manufacturer has a front panel record azimuth adjustment available as an option to facilitate alignment on each cart. It consists of a servo motor linked to the record head and a front panel switch that allows the azimuth to be varied slowly in either direction. In practice, a high frequency tone is recorded just long enough to adjust the record head by watching phase (stereo) or amplitude (mono). The cart is then erased and recorded normally. After an operator becomes familiar with the procedure, it adds very little time to the recording process and makes a significant improvement in the sound of the station.

Your Supersonic Tape Transport is now ready to break the sound barrier. All you need now is a qualified pilot. While the requirements aren't as stiff as those for an Airline Transport Rating, a little ground school for the production department will improve the odds of a successful flight each time.

Cart Erasing

Probably the most misunderstood operation of all is the first one... erasure. Six announcers will demonstrate six different methods of erasing a cart. It can be amusing to watch, but the results are usually less than ideal. Embark on a campaign to convince them that it is the **slowly** collapsing field that does the erasing. The second step frequently gets bypassed when the production load gets heavy.

Find that splice! If you have no other means than sitting and watching for it manually, **sit and watch for it.** About the tenth time a splice goes thru-lubbing by on the air, the listener becomes subconsciously annoyed and thru-lubbs his way to another spot on the dial. Remember, the listener doesn't have to have a reason to turn the dial. Most of the things we do technically are felt, not heard by the audience.

Both of the above problems can be handled by a new device that

simultaneously locates the splice and erases the cart. The erasing is done by electrically collapsing the field, so it doesn't depend on operator finesse to achieve good erase depth.

Get your production people in the habit of running two or three seconds of tape before putting the machine into the record mode. This takes the slack out of the cart and provides for a much more consistent start. If the tape is slack when the recording is initiated, the cue tone may not get on the tape at all.

Leave enough space at the head of each cut to insure a clean start. Remember that the start and stop times may vary from one machine to another, especially with high-speed cue machines. If you can get your production people to leave a generous period of time at the end of each cut before hitting stop, the stop transient will be buried under the next program event when it's played back in the control room. Every little bit helps.

Extra Cues

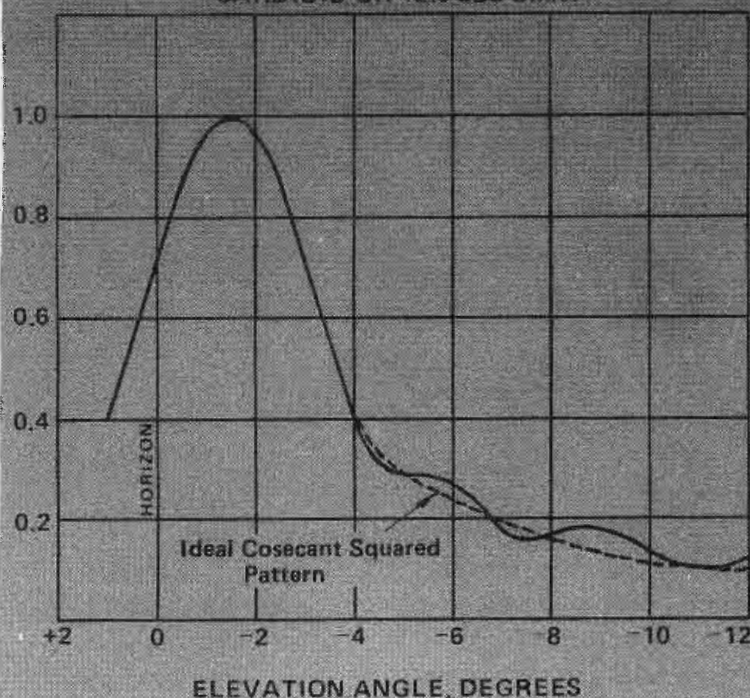
Many stations have increased the utility of their cart machines by taking advantage of the extra cue signals available. The most obvious one is sequencing a number of decks with the secondary cue signal. Some stations use the tertiary cue signal as a 5 second warning for the announcer. All the control room machines can be tied to one warning signal...a light in front of the announcer or maybe a Ford spark coil wired to the announcer's chair.

Another application of the tertiary signal is in an automated system where one cart contains a series of cuts, such as newscasts, where it is not desirable to repeat the first cut. The tertiary signal is put on after the secondary tone, following the last cut, and latches a relay that lights a light and inhibits the ready line until the cartridge is removed. This keeps the 2:30 news from running at 4:30.

The possibilities are limitless. Use your imagination to come up with other applications...timing signals for a count down clock, logging, coding of multiple cuts on a long cart. Share your ideas with the rest of us through the station-to-station column. □

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Take The Hassel Out Of Scheduling

As this article shows, there's more to scheduling than putting names in slots. You might even be causing extra expenses. There is a better way.

By Pat Finnegan

For a broadcast station to operate efficiently and effectively, many people with a variety of skills must be in the right places and at the right times. This doesn't happen by chance. It can come about only through carefully developed personnel work schedules.

Creating effective work schedules can be a real headache. Many factors must be considered during the process. And, if you schedule carelessly or ignore these factors, the result can be a source of constant irritation. What's more, poor scheduling creates inefficient operations, and it can increase the station's wage expense through needless overtime wages.

Some of the factors which go into

scheduling will be discussed in the article, along with some suggestions that you may find helpful in your own scheduling tasks. And for those who may someday be assigned the task of creating a schedule, the discussion will help you gain an insight into the process and its problems.

The work requirements, that is, the work to be done and the number of hours and people needed is the fundamental reason for a schedule in the first place. But scheduling must always take into consideration the Federal Wage-Hour Law and State Laws. And when a Union Contract is in effect, this will also have a definite bearing on the outcome.

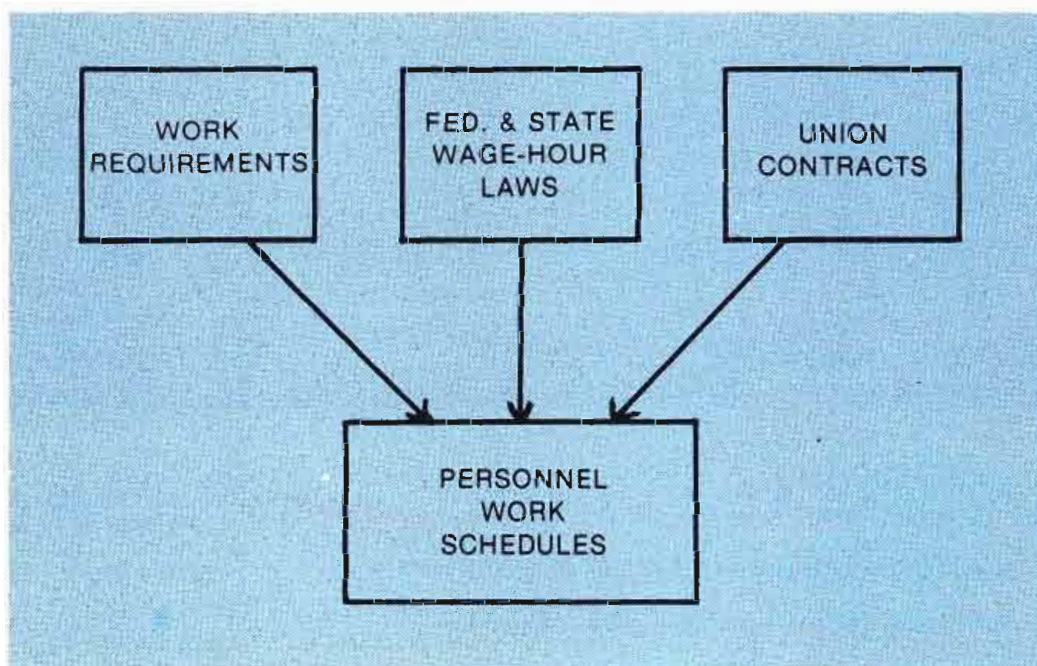


Fig. 1 Major factors which have a direct bearing on the scheduling process.

The Wage-Hour Law

In scheduling of all hourly employees, the provisions of this Law will have an overriding dominance, except in those areas where the Law permits local agreements through Labor-Management bargaining. Neither the employee nor the employer can agree to violate provisions of this Act.

As a basis for reference, each employer must establish a regular work-week, set up on a calendar basis, including the hour of the day the week starts must also be designated.

All hours worked over 40 in this work week must be paid at one and one-half times the base hourly rate (straight time rate).

Another provision is this: employees must be paid for all the time worked on the job, whether they are scheduled or not. This calls for management supervision.

Child Labor Provisions

This section of the Wage-Hour Law and the State Laws, are very restrictive for employees under 18 years of age. Not only are the number of hours in a week spelled out, but also the number in a day and what hours in a day, etc. If your station employs anyone under 18 years of age, you may need advice.

Union Contracts

When a union contract is in effect, the scheduler should be

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The day you install a DFS 3000 in your station will be your great moment in digital video history. Make a start. Call your Micro Consultants representative. Or write us at P.O. Box 10057, Palo Alto, California 94303.



The digital video people



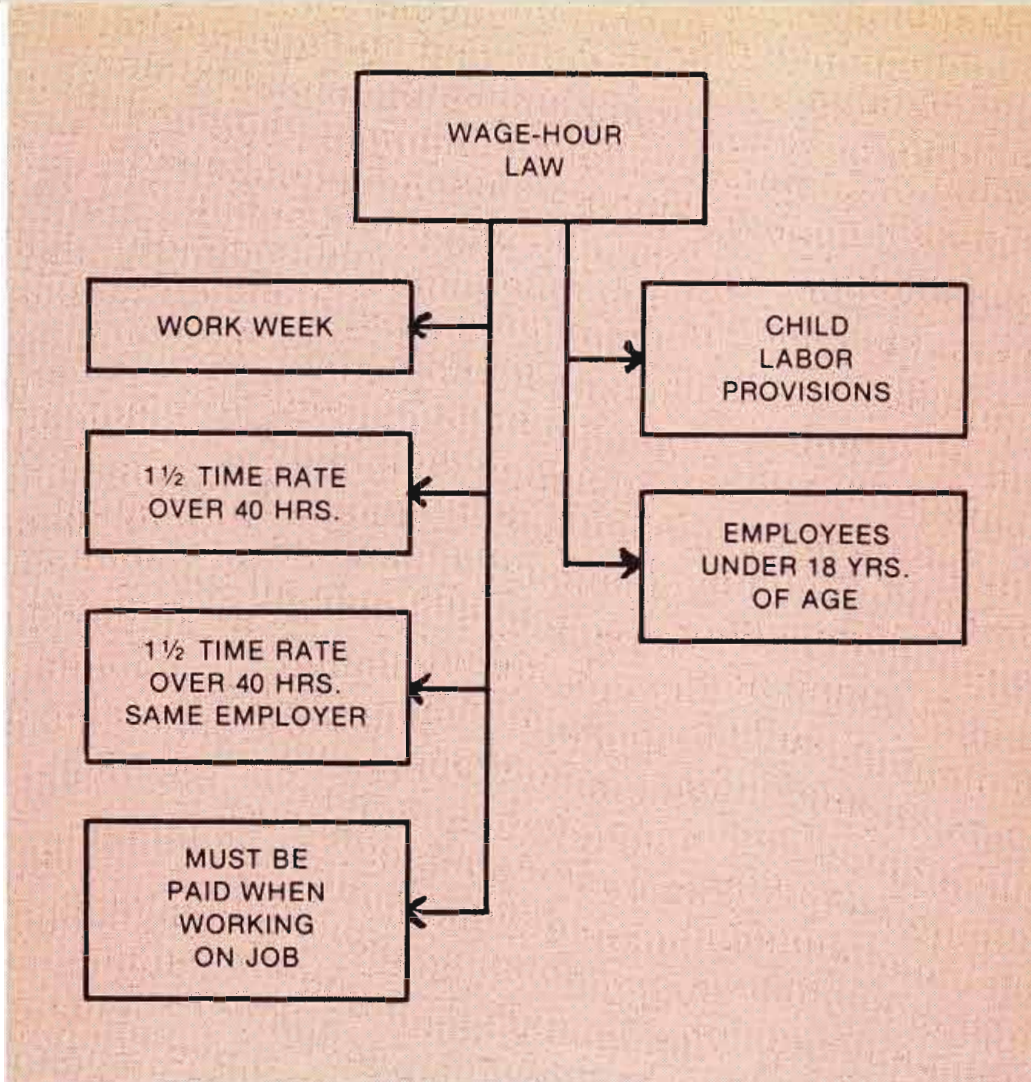


Fig. 2 Provisions of the Wage-Hour Law which affect scheduling.

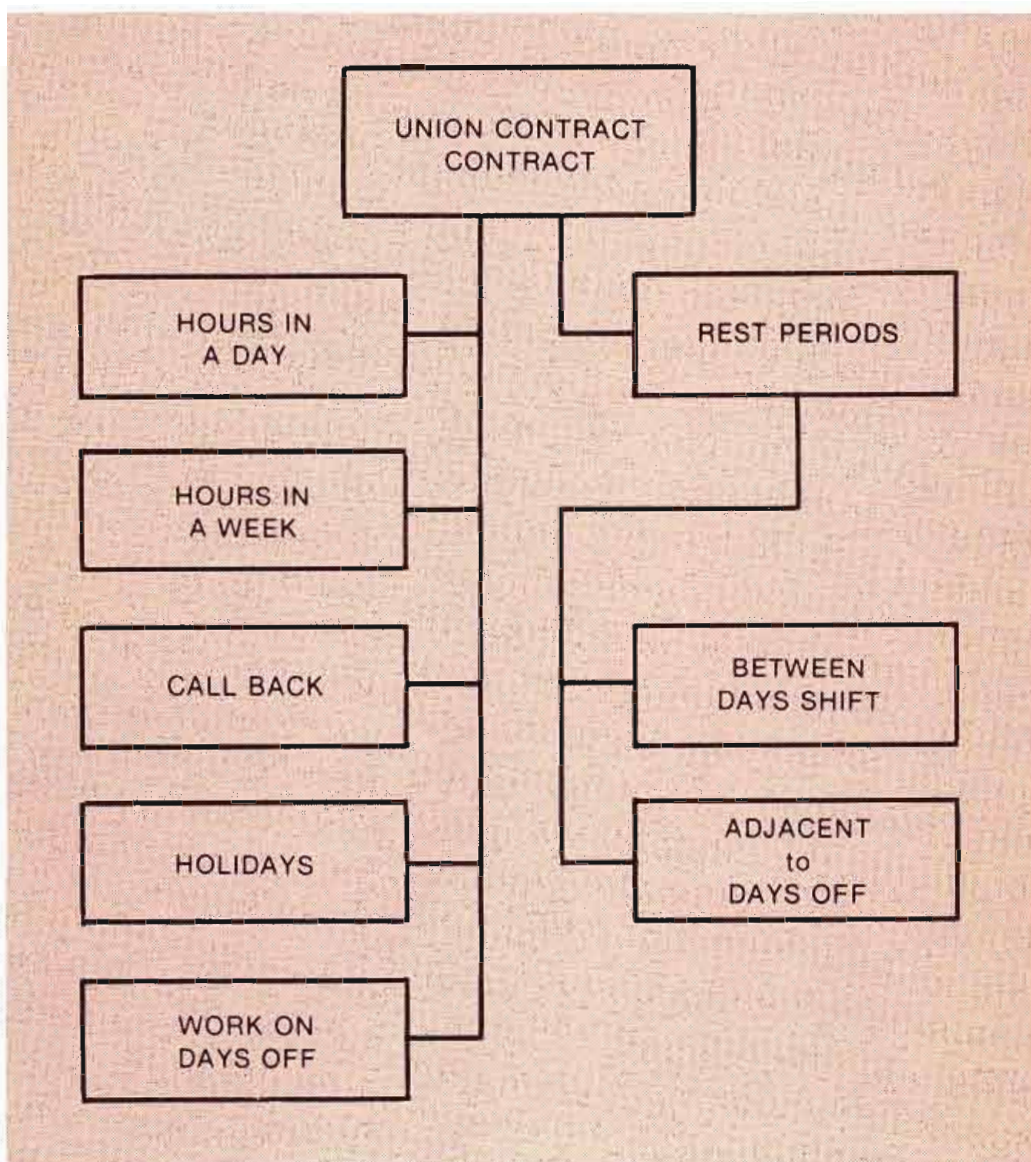


Fig. 3 Areas of a union contract that will affect scheduling.

conversant with all the provisions which have to do with hours and premium pay penalties. Particular areas which effect scheduling are the rest periods between daily shifts, adjacent to days off, the provisions for call back, and work on days off and holidays. Unless careful scheduling is done, these areas can increase the station's wage expense because you may end up paying premium wages for what should otherwise be straight time pay.

Work Requirements

All personnel needs for the entire broadcasting week can be covered with a number of basic schedules. Usually, each department will have one or more basic schedules that are repetitive on a weekly basis. That is, individuals will work the same hours each week. Developing these basic schedules, however, is a very difficult job. Not only must all times of the day be covered, but the required skills (such as grade of FCC license) must be considered in the process. On top of all this, job seniority will come into play, and in union contracts, the employee with job seniority will have first choice of all the work schedules in his particular area of activities or classification.

Most stations are dynamic operations, so there will be special events or programming activities which will have specialized numbers of personnel needed. For example, coverage of a County or State Fair, or almost daily video tape sessions. It is these projects that constantly alter the basic schedules, and this alteration is where the most pitfalls of scheduling occur. Not only can there be omissions (lack of coverage), but ignoring the penalty provisions can cause unneeded overtime pay. Of course, there are occasions when there is no other course of action, but those who cost estimate such projects should be aware of the increased wage expense beforehand (during the planning stages), rather than being surprised when the post-action costs are tabulated.

Individual Scheduling

The form that is easiest to read and work out is one that is laid out in block form, similar to a date-

book type calendar. All the individual schedules should be laid out left to right, starting with the first day of the **work week**. If your work week starts on a Thursday, then your schedule should start with Thursday.

For a basic schedule, always think in terms of the full week. First, determine what the days off will be in each individual's schedule and enter these on the form. For most operating departments, these will be distributed through the week, as few have "bankers hours" and days off. If you don't do this, you'll find that the first half of the schedule will be easy to make up because you probably didn't schedule any days off. The second half, however, becomes another story. All those people will need days off, so you find the whole crew being off the second half of the schedule. (Crumple another one for the wastebasket!)

If you schedule the top schedule as the one which has most of the sign on days, then work each schedule downward so that the bottom schedule is the one with the most sign off hours; it will be easier to check out. That is, each one is geared to actual time of day worked, rather than seniority 'billing' of individual workers.

In each day, note in the corner of the box the total hours worked that day. This will be helpful in checking out the schedule.

Once all is completed, by all means, re-check the schedules. Figure each day from sign on to sign off and make sure that all requirements are covered. (Don't be surprised to find omissions!) Also, check across horizontally for the total hours of each schedule. (Don't be surprised to come up short in some cases and long in others!)

Always save copies of the actual schedules that are posted and worked. These will come in handy for many reasons at later dates, especially periods of vacations or extended illnesses (for those stations who do not hire special vacation relief personnel). After there is a file folder full of these, it will be amazing how things repeat over periods of months. When a special situation arises, often you already have a sample on hand. A few minor changes, and the bulk of the effort has already been done.

(Continued on page 66)

	THUR.	FRI.	SAT.	SUN.	MON.	TUE.	WED.
A							
B							
C							
ETC.							
Z							

START → PAYWEEK → END

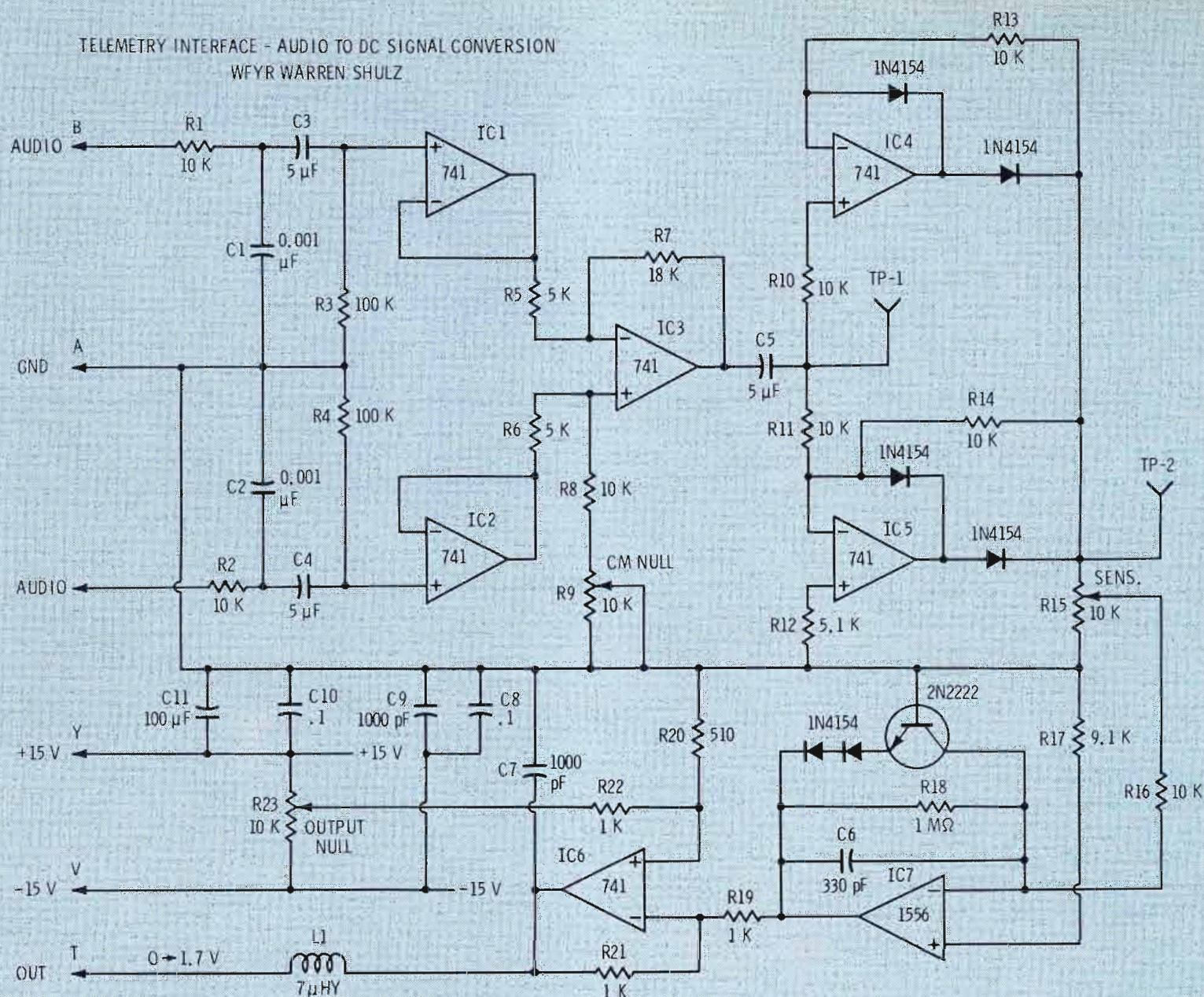
Fig. 4 This is the easiest schedule form. Start with the company pay week. In this sample, the pay week starts on Thursday and ends on Wednesday.

	THUR.	FRI.	ETC.
A	5:00 AM TO 1:00 PM		
B	8:00 AM TO 4:00 PM		
ETC.	10:30 AM TO 6:30 PM		
Z	5:00 PM TO 1:00 AM		

SIGN ON → SIGN OFF →

Fig. 5 Schedule according to the daily hours from sign-on to sign-off, rather than starting with employee seniority.

TELEMETRY INTERFACE - AUDIO TO DC SIGNAL CONVERSION
WFYR WARREN SHULZ



A Novel Approach To Verifying Audio Levels

By Warren Shulz,
Chief Engineer, WFYR, Chicago, Ill.

There are many times when it's desirable to monitor remote telco lines at a transmitter site via the remote control telemetry system to verify audio levels at various parts of the system. Here is a novel approach to the problem using a few operational amplifiers to provide an AC to DC conversion that is quite accurate.

Since it is desirable to feed balanced telco lines, or other audio circuits without loading or the use

of matching transformers, an active differential instrumentation type input is used. Two OP Amps are used as unity gain, Hi-Z inputs to a conventional differential amplifier. A 10K-ohm pot, R9, is used as a null for common mode rejection. The better the resistor match of R1, 3 and 5 versus R2, 4, 6, 1, the better, the common mode rejection. Typical rejection has been measured at 40dB.

The unbalanced output of the differential amplifier is capacitively coupled to a precision full-wave rectifier. Silicon diodes are used in the signal feedback path of two

operational amplifiers. This circuit is sometimes called an absolute value amplifier. It supplies a unipolarity output for a bipolar input. Gain for this stage is unity.

The output of the rectifier is directly coupled to a modified logarithmic amplifier. An NPN transistor is used in the feedback loop to form a logarithmic response. In practice, a 60dB range has been noted. However, for the real world application, a one meg-ohm resistor in the feedback loop limits the maximum gain to 40dB. The two diodes in the emitter circuit of the NPN transistor allow the output to

DO54

less of a handful... more of a mike!

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The DO54 joins a distinguished family of E-V dynamic microphones. Including the very popular 635A, the extended-range RE55, and the low-noise RE50. The new DO54 shares many characteristics with our other omnidirectional mikes, but its differences can provide a very useful alternative.

The runt

First, the DO54 is slightly shorter and slimmer than a 635A. The first mike designed with the cable connector in mind. It's not tacked on. Looks great for handheld use, and it's easier to tuck away in odd corners.

Truly full-range

Despite the miniaturization, the DO54 boasts a response of 50 to 18,000 Hz $\pm$ 3 dB. Which rivals some very expensive competition and makes it ideal for demanding close-in instrumental pickups.

Full output

And the DO54 puts out. With level that matches the RE55, and a dynamic element that won't be over-driven by enthusiastic horns, drums, or close-up vocals.

Quietly reliable

Our internal shock protection stops handling and cable noise with the best of them. And our Acoustalloy[®] diaphragm is almost indestructible. The DO54 easily earns the same unconditional protection against malfunction as all our other Professional Microphones. So its got to be tough.*

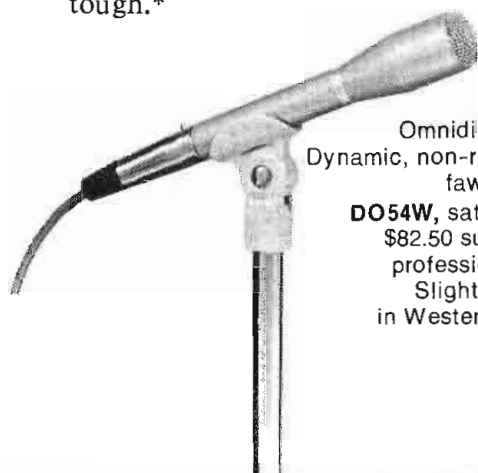
Add-on Flexibility

Of course the DO54 fits our 3/4" microphone options, like the security clamp (when you can't control access to the mike), a very neat stud mount adapter with switch, a most effective shock mount, and super Acoustifoam[®] windscreens.

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Dynamic, non-reflecting
fawn beige.
DO54W, satin white.
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professional net.
Slightly higher
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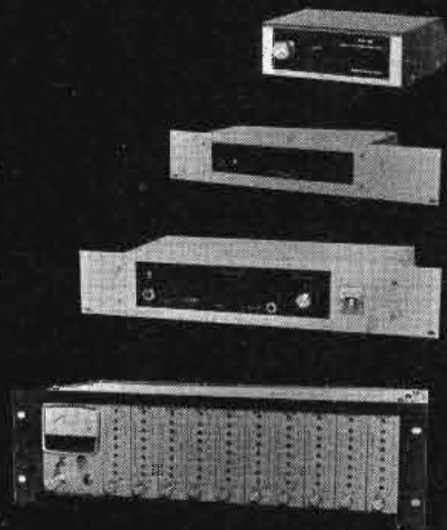
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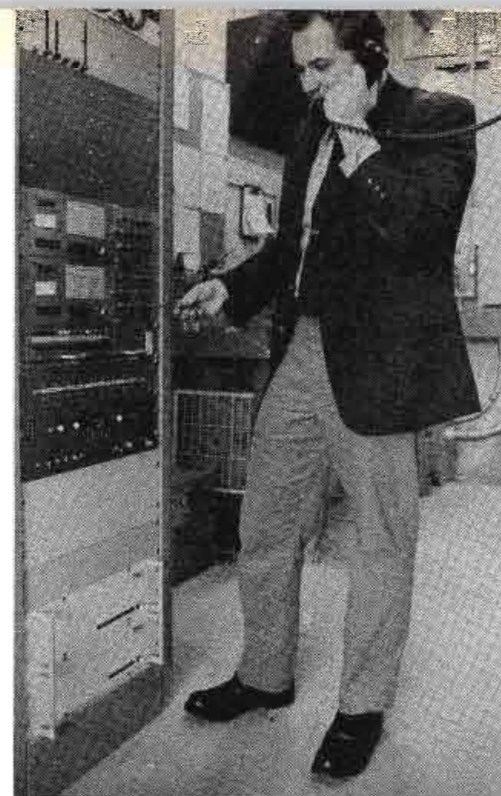
Models & Prices

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

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Chief Engineer
Warren Shulz
makes adjustments
on the telephone
with studio
technician.



approach about 1.7 VDC negative. A super-beta OP Amp is used to reduce bias current in the input stage. Use of this device was necessary to reduce output drift with temperature change.

Finally, a unity gain DC inverter OP Amp inverts the DC output of the log amp and allows null control of the DC offset of the log amp.

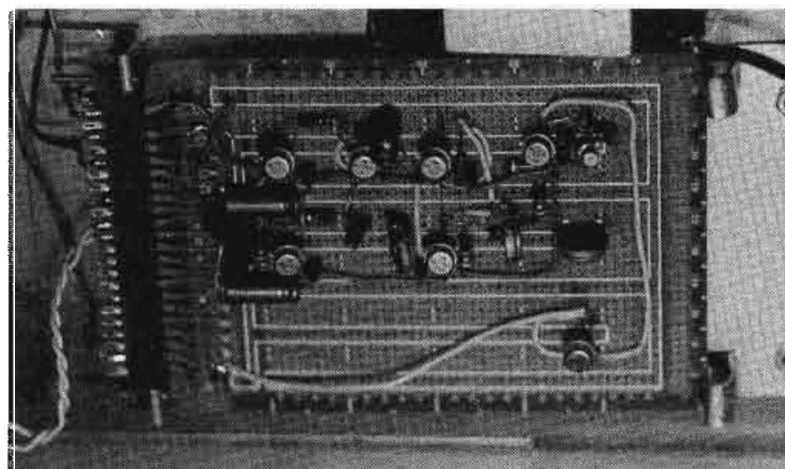
Since the unit will be used in, or near the transmitter plant, RFI

proofing includes bypassing of the inputs with 1000pf capacitors. The output also was bypassed with a 7 uhy choke and a 1000pf capacitor.

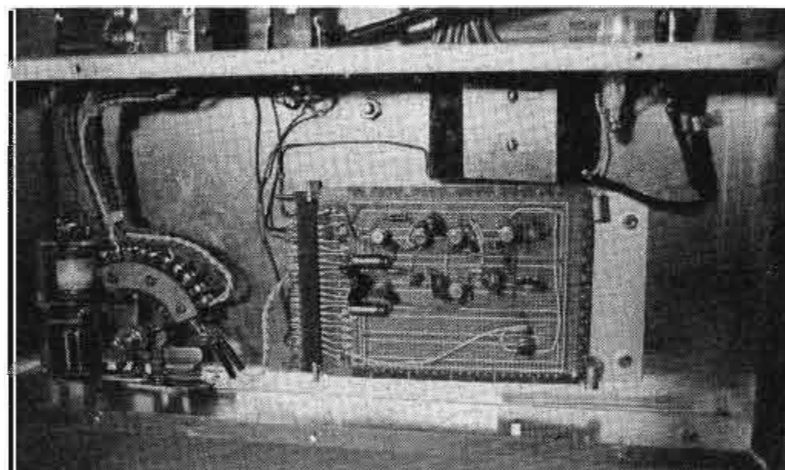
Unit Construction

The unit was built on a standard vector board using typical point-to-point wiring. Care should be used in bypassing power supply lines with 0.1 uf capacitors for stability. In the two prototypes we built, one

This photo shows the WFYR vector board construction.



Inside the chassis. The stepper relay is at the left side, vector board in the center, and the modular power supply is on the right side.



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Parts List

R1,2,8,13,10,11,14,16	10K-ohm 1/4 watt
R3,4	100K-ohm, 1/4 watt
R5,6,12	5.1K-ohm, 1/4 watt
R7	18K-ohm, 1/4 watt
R17	9.1K-ohm, 1/4 watt
R18	1 meg-ohm
R19,21,22	1K-ohm
R9,15,23	10K-ohm trim pot
R20	510-ohm
C1,2,7	1000pf ceramic disc.
C3,4,5	4.7uf tantalum
C9,11	100uf lytic
C10,8	0.1uf disc
C6	330pf disc
IC 1 thru 6	MC1741L
IC 7	MC1556G
D 1 thru 6	IN4154

Table 1

Input Level In dBm	Percentage Reading On Moseley Unit
-11.5	100
-21.5	80
-31.5	50
-41.5	10

used a module type bipolar supply and the other borrowed the dual voltage from the Moseley remote control unit. To make the unit more useful, a stepper relay can be added to select many test points. The relay could be operated by a

position of the remote control system.

Initial Adjustments

Set the common mode null by feeding a 0 dBm signal at 1 kHz be-

tween ground and both input leads at the same time. Monitor at test point 1 with an AC meter and adjust pot R9 for a null in the reading. Feed a balanced signal into both inputs and verify the level at test point 1. The 0 dBm signal

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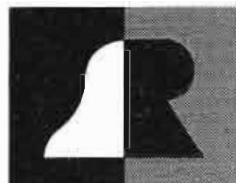
and aural carrier independently or aural intercarrier. These monitors provide continuous monitoring with inhibited off-frequency alarm drivers, switch settable to either ± 500 or 1000 Hertz. It requires three successive errors to produce an alarm. This means *no* false alarms for you.

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AC level should be about 2.7v RMS. The output signal of the full-wave rectifier should be verified on a scope. Typical level for the 0 dBm input should be the peak value of 1.7v RMS or about 3.8 volts DC.

Connect a DVM to the output terminal "T". With no signal input, set the output null, R12, for a zero reading. Now feed the 0 dBm signal to the input and adjust the sensitivity pot R15 for desired output. Keep in mind that maximum output is 1.7VDC, and the typical range displayed will be about 40dB. Changing position of the sensitivity control may require that the null be reset.

Installation

The WFYR unit is housed in a chassis box 3x11x17. Within the chassis is a 10-position, two-pole stepping relay. The coils of the stepping relay are operated from the raise/lower function of the remote control system. A module type, short circuit protected power supply was used to operate the OP Amps. Current capability is 65 ma. at 15 volts, bipolar. A blue ribbon Amphenol 14-contact plug was used for the audio input connections. The Moseley studio unit's meter dampening and overshoot trim pots are adjusted for the desired VU meter type action. On DC loops that would not have such an adjustment, the meter action may integrate the varying DC potential, tending to dampen the VU type activity of the meter movement. However, indication should still be useful. Typical setting of sensitivity vs. percent readings are shown in Table 1.

Conclusion

This circuit has been in operation for several months at the WFYR-Sears Tower transmitter site. Performance has been very good and has saved considerable confusion when telco pulls the plug.

Since the AC to DC conversion has flat response out to 15kHz, it is possible to make frequency response runs on the remote transmitter audio lines without leaving the control point. By expanding the range to the full 60dB you could also make noise measurements. However, the reading gets too erratic for normal program indications. □

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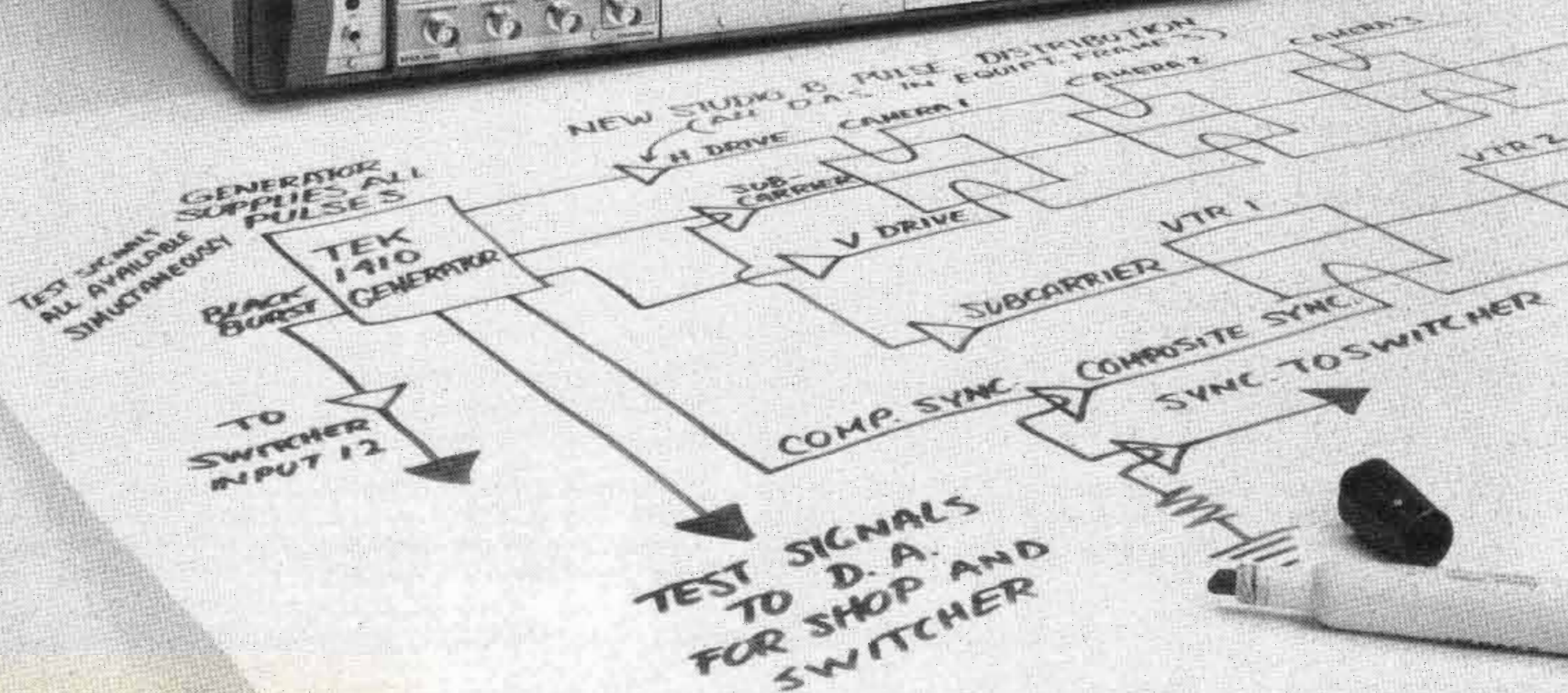
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If you don't want such a loud bell, you can substitute a door bell, or better yet, a set of door chimes. You can also substitute a solid-state electronic audible signal, such as a Mallory "Sonalert", as will be explained later in this article.

Circuit Operation

The idea is to have the bell ring for a second or two when the tower lights come on, and again when they go off, but not at any other time. Keeping this goal in mind, I designed the system around a Monostable Multivibrator, consisting of Q1 & Q2, and their associated components. This circuit was chosen for its dependability and stability, and because of its two distinct advantages: it can be triggered by either a positive or negative pulse, and its output pulse width can be varied over a wide range, without upsetting its stability or circuit constants. With the component values shown, the pulse width can be varied from a few microseconds to about four seconds, depending on the adjustment of R12.

In the quiescent state, Q1 is conducting, Q2 and Q3 are cut-off, and the TRIAC is also cut-off. The key to the operation of the system is a Pulse Forming Network, consisting of D3, C2, R1 and R2. When the tower lights come on, 6.3 VAC is applied to the Signal In terminal, where it is rectified and applied to the coil of K1, closing the contacts. B+ is applied to the junction of R1 & C2 through Charging Diode D3, producing a sharp positive spike at the junction of C2 & R2, which then falls to zero as the charge across C2 is equalized.

This positive trigger is conducted to the base of Q2 through D4 & C3. With the arrival of the positive trigger at its base, Q2 begins to conduct, producing a sharp drop in voltage at the junction of R10, D4 and R9, and a sharp increase in voltage at the junction of D6 & R6. Q1, which was conducting, is cut-off, and Q3, which was biased beyond cut-off, begins to conduct, producing a positive voltage at the junction of R14 & R16, which is conducted to the gate of the TRIAC, causing it to conduct and ring the bell.

At the same time, C8, which was charged, begins to discharge

through R12, the exponential discharge rate being determined by the setting of R12. When the charge across C8 decreases to a certain value, Q1 begins to conduct, producing a more negative voltage at the junction of R7 & R5, cutting off Q2, which produced a sharp increase at the junction of R9 & R10, cutting-off Q3, which removes the positive voltage from the gate of the TRIAC, and the bell stops ringing, and the circuit returns to its quiescent state.

When the tower lights go off, K1 opens, removing B+ from the Pulse Forming Network. A sharp negative pulse is developed at the junction of C2 & R2, which drops to zero as the charge across C2 is again equalized. This negative trigger is conducted to the base of Q1 through D5 & C4. When the negative trigger arrives at the base of Q1, Q1 stops conducting, and the cycle repeats itself, the same as before.

Regulated Power

A regulated power supply is necessary, because this multivibrator, like most other multivibrators, is delicately balanced in its quiescent state, and therefore quite sensitive to transients. Any B+ shift is likely to trigger it. The current regulator, Q4, doesn't actually regulate the current during normal operation, but serves mainly as an over-current protection. If the system current should exceed a safe value, it will cause the B+ to drop to a point where the current doesn't exceed the device ratings. It also helps stabilize the IC Voltage Regulator.

Pilot LED

The Light Emitting Diode was included for two reasons: it helps to improve the stability of the system by providing a fixed load on the power supply, and it provides a pilot lamp indication that the system is on. An LED has an almost unlimited life in operation, far exceeding that of an incandescent lamp, and it doesn't generate noise, as does a neon lamp. Therefore, it's an excellent choice as a pilot lamp.

The reason that I chose a DC relay coil, when AC is available from the tower light signal circuit,

is that the signal rectification circuit is also an excellent glitch filter, and an AC coil would generate a hum field that might interfere with the proper operation of the Pulse Forming Network. But if you have a 6.3 VAC relay lying around in your spare parts, it wouldn't hurt to try it. It might work, depending on the design.

Alarm Choice

If you chose a bell, instead of chimes, be sure that it is the type intended for AC operation only. DC bells have interruptor contacts in series with the coil that generate second and third order harmonics of high magnitude that will trigger the circuit, and prevent it from returning to its quiescent state. Furthermore, the TRIAC is strictly an AC device. If connected to a DC circuit and turned on, it will act like a latching relay, and can only be turned off by disconnecting it from a load.

If you want to use some AC voltage other than 24v, it can easily be done by redesigning the Pulse Amplifier circuit, consisting of Q3, R10, R13, R14 and R16. This circuit is DC coupled, and some of the 24v appears in the Pulse Amplifier circuit during the conduction cycle. The change might be accomplished merely by substituting a different value for R16, depending on what voltage you want to change to.

Also, you might wish to use one of the solid-state alarms, such as a Sonalert, or something similar, instead of a bell or chimes. These devices are DC operated, and many are TTL compatible. Some can be installed directly in the emitter or collector circuit of Q3, provided the current doesn't exceed the maximum I_e or I_c of Q3. You can calculate the new values for R10, R13 & R14, based on the audio device perimeters, and the perimeters for Q3.

Finally, be sure to do a thorough job of bypassing all the incoming leads to ground with .001 disc ceramics. Be particularly careful with the signal line from the tower lights, because this is the circuit most likely to pick up transients. If this precaution is taken, the system will be totally immune to glitches, and will give many years of dependable, trouble-free service.

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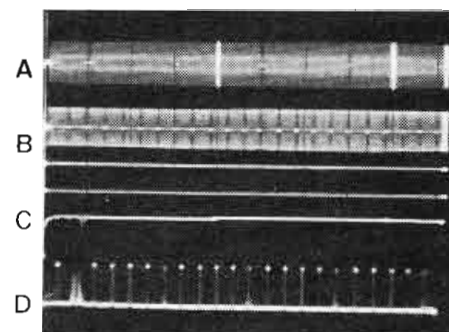


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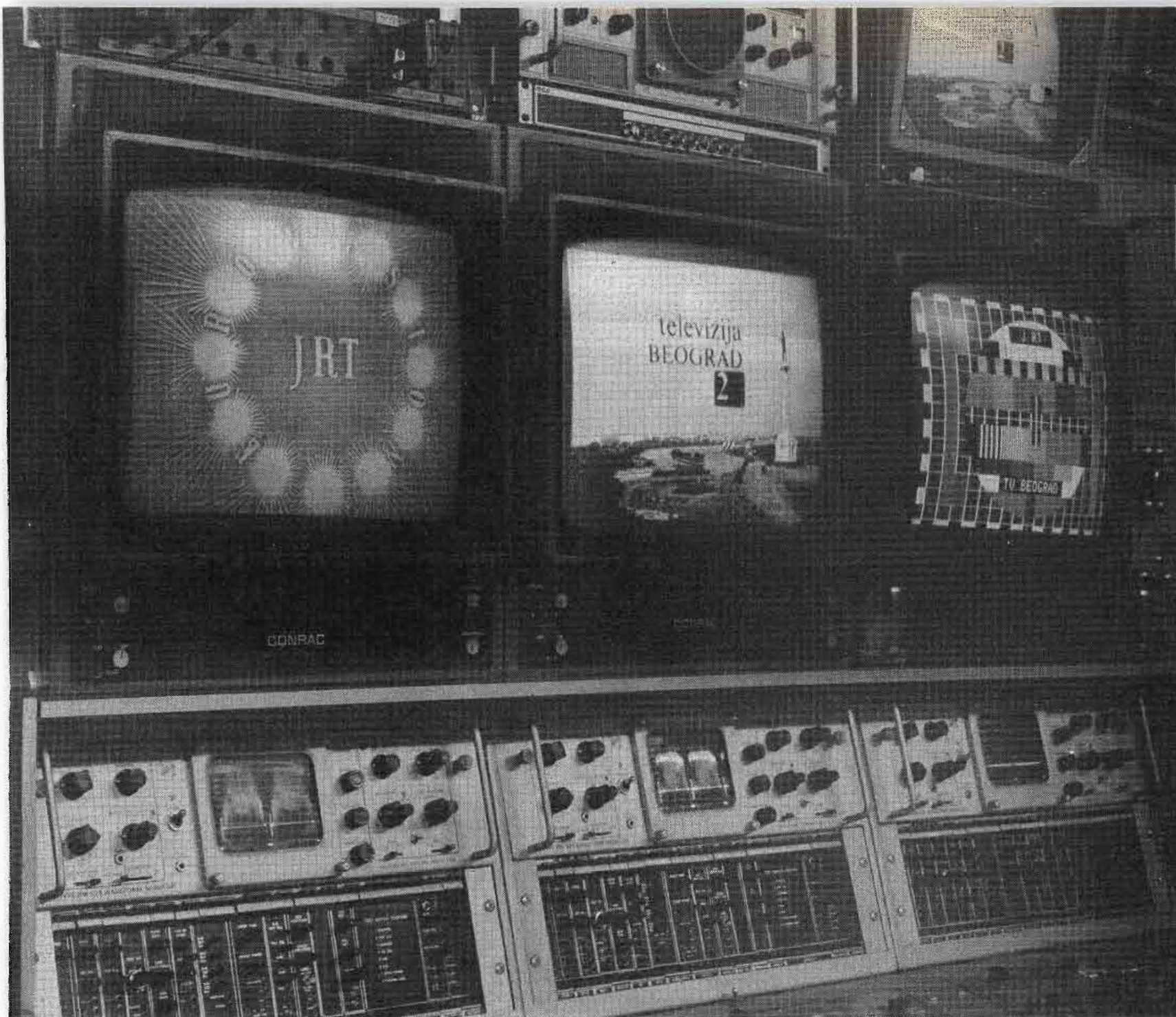
A. Modulated sweep, non-comp., 2-0-20MHz, marker blanking 5MHz intervals, variable stop markers at 7.5 and 17.5MHz.
B. Composite video sweep, 2-0-20MHz, marker blanking at 1MHz intervals.
C. Detected non-comp. sweep, variable stop markers at 7.5 and 17.5MHz.
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Consultant,
Mountain View, Ca.

Ask a group of American engineers what they know about Yugoslavian broadcasting and the answer will doubtless be: "Nothing." And yet, surprisingly enough, they would easily find a great deal that is familiar to them in Yugoslavian broadcasting—particularly in the large radio and TV centers in Belgrade, Zagreb, and Ljubljana.

What distinguishes Yugoslavian television from ours is that each of the eight broadcasting centers is completely autonomous. In fact,

each is specifically charged by legislative decree to help develop the many cultural distinctions and different languages of its particular region.

Not to go into a complicated explanation of Yugoslavian history, let it just be said that the country has had a tumultuous past, full of wars, heroism, occupations, and devastation, going back nearly 2000 years. Today it is undergoing rapid economic development. Suddenly, it is prosperous enough to be faced

with many of those familiar problems that plague all industrialized countries, such as traffic, housing shortages, and pollution.

Modern Yugoslavia is a unified but very complex pastiche of six republics plus two other semi-autonomous provinces. It has about 21 million people, its area is almost exactly the same as that of Oregon, and its terrain is nearly two-thirds mountainous. An oft-repeated jingle neatly (and perhaps too simply) summarizes this land of the south (Yugo) slavs (Slavia): Yugoslavia has six republics, five nationalities, four languages, three religions, two alphabets, and only one desire, independence.

Counterpoint Programming

Reflecting this wide diversity are the eight broadcasting institutions which, when looked at as a whole, provide an astonishing display of counterpoint programming. The most obvious example of this is the languages used by the different centers. Programming from Radio Television Ljubljana is in Slovenian, from RTV Zagreb in Croatian, from RTV Pristina mostly in Albanian, but also in Serbian and Turkish, from RTV Skopje in Macedonian, and from RTV Belgrade, RTV Sarajevo, and RTV Titograd, in Serbian (although the programming differs in each of these latter three). RTV Ljubljana also broadcasts several hours each day in Italian from a station in Koper. RTV Novi Sad does them all one better: it transmits in **five** languages: Serbian, Hungarian, Rumanian, Slovakian, and Ruthenian.

Broadcasting in Yugoslavia has a very long tradition. The year 1976 marks the 50th anniversary of Radio Zagreb. Radio Ljubljana dates from 1928, Radio Belgrade from 1929. Like many other institutions in the country, broadcasting has its legends and its heroism. During World War II, radio broadcasters, first from underground stations and later from the various cities as they were liberated from the Nazi armies, brought great jubilation and strength to the never defeated spirit of these proud

people. Color television began in 1971 and 1972 using the 625 line PAL system. The majority of transmissions are now in color throughout the country.

Autonomous Institution

In practical terms, what does autonomy mean to the eight broadcasting institutions in Yugoslavia? First, the choice of programming is made entirely by the local stations. There is no overall Yugoslavian network. This is not to say that the stations don't cooperate with each other. On the contrary, representatives from each station meet in several working committees to share common matters. For example, major purchases of equipment and international programs are pooled through an advisory committee to obtain a better price and selection. Other committees advise on technical standards, legal matters, joint programming, territorial coverage, and so forth. But when it comes to running the stations, the eight RTV centers are in control of their own operations.

Advertising

The Yugoslav economy seems to be a rather curious hybrid of socialism and private enterprise. Financing of construction and capital equipment can come from the government, private individuals, or foreign investors. For a socialist country, this is anomalous to say the least.

In broadcasting, we find the same odd mixture of government decree and western style free enterprise. Primary source of income for each station is from the license fees paid by all set owners in the country. These are about \$53 a year (perhaps to increase to \$70 soon) for a television set or \$21 a year for a radio.

Income from advertising accounts for a surprising 20% of the total income on the average in the eight broadcasting centers. The amount of advertising carried differs from station to station. Overall, some 5 per cent of broadcast time is devoted to ads. RTV Belgrade, which publishes a complete and very attractive rate card in English,

will serve as a good example.

Ads are inserted between programs, with the largest concentration being before and after the evening news program in the 7:30 to 8:00 time slot. Sponsoring of an entire film, cartoon, or sports program is also permitted, with some limitations.

Not just Yugoslav products are advertised on television, but also a good percentage of foreign products too, including as you might expect cosmetics, food, detergents, cars, and clothing to name only a few.

On RTV Belgrade, a 30 second spot in prime time (between 7 and 10 pm) sells for 6000 Dinars (\$333). Sponsoring a film (one 10 second spot before or after the film, and a 20 second spot during the film) sells for 10,000 Dinars (\$556). (1975 rate card and 18.00 Dinars = \$1.)

RTV Belgrade, Zagreb, and Ljubljana offer complete advertising production services including film, videotape, slides, animation, translations, and so forth.

Programs

As we have mentioned, most programming is in color using the 625 line PAL system. The Yugoslav viewer, like those most everywhere, likes entertainment, feature films, sports, and news (see Table 4 for percentage breakdowns). Sports are extremely popular, including soccer, skiing, gymnastics, as well as international matches in soccer, basketball, and others.

On two or more evenings a week, there are often programs from the Eurovision Network from the United Kingdom, France, Germany, Austria, Scandinavia, or less frequently, from the Eastern European Intervision Network. Of total foreign programs broadcast, the percentage from the U.S. is about 43 percent, Great Britain 16 percent, France 10 percent, and the USSR 8 percent. The biggest portion of the U.S. programming is full length feature films followed by series, including in past years *Star Trek*, *Love American Style*, *Peyton Place*, and *Sesame Street*.

There's ENG, Too

Recorders and cameras in the many well-equipped studios would

make most American engineers feel right at home. These include, for example, in Ljubljana, two Ampex AVR-1's, two VR-1200's, one RCA TR-22, and two IVC 960 recorders, plus RCA and Philips cameras. Zagreb has two VR-2000's, four VR-1200's, and a portable VR-3000, along with Marconi and other cameras. Belgrade has 16 or more VTR's: including VR-2000's, TR-22's, IVC-960's, an Ampex HS-100 for sports instant replay, and a VR-3000 for electronic news gathering, plus RCA and Philips cameras.

Both Belgrade and Zagreb have color camera equipped remote vans as well as several monochrome camera vans. Picture and signal monitors include Conrac RH series, various Tektronix and Hewlett-Packard models, as well as other well known U.S. and European names.

Electronic news gathering is no stranger to the Yugoslavian stations with more advanced equipment. In Ljubljana and Belgrade, one inch

IVC 960 recorders are used for this and other on-the-air broadcasts (with IVC time base correctors). Ampex VR-3000 recorders and associated cameras are used to produce tapes of fast breaking news events by RTV Zagreb and Belgrade. Belgrade plans to increase its ENG capability by purchase of a mini-van with two RCA TKP-45 cameras and one TR-600 tape recorder in the near future.

Program Exchange

Exchange of programs with other countries is of great interest to the Yugoslavian stations. For this purpose, RTV Belgrade in particular prepares each year a very attractive English language brochure of 50 or more pages describing its programs in detail with accompanying photos. The Belgrade productions embody great technical skill, as evidenced by the quality of the production equipment used, as well as a high degree of creativity which stems from the long theatrical and literary

tradition of the Yugoslav people.

RTV Belgrade's advertising rate card is also produced in English with excellent graphics and complete information on rates, demographics, and coverage. Both are available by writing to: Mr. Zivojin Stekic, Assistant General Manager, Radio Television Belgrade, Hilenarska 2, Belgrade, Yugoslavia.

Radio Television Zagreb also prepares English language material describing its activities. It is available from Mrs. Marija Ritz, Editor, RTV Zagreb Bulletin, Dezmanova 10, Zagreb, 41000, Yugoslavia. Zagreb, as many American purchasers of film programs are well aware, is a world renowned center of film production, particularly in animated cartoons, many of which are seen regularly on Public Broadcasting's International Animation Festival.

Similarly, Radio Television Ljubljana, which, by mid-1976 will be in full electronic production on videotape to match its extensive color film production, is very interested in the sale and exchange of programming. The person to contact there is Mr. Miha Rigl, Director Press and Foreign Relations, RTV Ljubljana, Tarcarjeva 17, Ljubljana, Yugoslavia.

Another valuable publication about Yugoslavian broadcasting is the annual JRT Handbook. The last English edition was in 1973, but it is still current enough for general information. It is available from Radiotelevision Yugoslavia, Borsica Kidrica 70, Belgrade, Yugoslavia.

TV Festival

Each year during the last week of May, a Yugoslav Television Festival is held. Its purpose is to stimulate creative competition and encourage Yugoslav and international program exchange. Each Yugoslav station presents four hours of its own productions, half of which must be premiers. In addition, regular sessions are held to enable both Yugoslav and international producers to present their programs and discuss exchanges. Information about the festival can be obtained from any of the four addresses listed above. □



At Radio Television Ljubljana, an engineer adjusts controls on an AVR-1. All RTV stations are well equipped. But unlike many other European systems, advertising accounts for about 20 percent of the income of the eight RTV centers.

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For Demonstration Only Circle (35) on Reply Card

From BLUE BANANAS to SAG TAILS

Bang Went The Strings Of My Heart

While dining with some friends at the last NAB convention, there came that point in the evening, somewhere between coffee and after dinner drinks, when a kind of Blue Banana "can you top this one" conversation prevailed.

As I recall it now, the "top Banana" went something like this. Back in the days when most radio stations had their very own musical group on hand, there was one station that employed a C&W outfit and at least one wacky engineer.

During one of their countless on-air performances, the engineer took a tubular capacitor (back when they were called condensers), cut the leads, wrapped it in a firecracker case and plunged in a fuse. Cracking the studio door just wide enough and long enough to get the attention of the performers, he lit the fuse and rolled his would-be firecracker toward them.

As the pretended firecracker rolled closer to them, they backed away from the mike. The further they backed up, the louder they played. Then, when they were nearly against the wall plucking and strumming for all they were worth, the fuse fizzled out...much to their relief.

Moments later, the engineer appeared at the studio door once more. This time with a very real firecracker. Of course the C&W

boys knew it couldn't be real. And as it fizzled and rolled across the floor toward them, they smiled and grinned, enjoying the humor of their friendly engineer.

Then, suddenly, POW!!!

The explosion erupted, up went the guitars, and down came a shower of firecracker wrapping paper. The mike was shot, one of the level meters pegged, and went south, and it was several moments before the performers could even hear each other, much less their guitars. Another set of victims for the Blue Banana peel!

And that's the way it was...in the 1930's...more or less.

Ron Merrell

As you know, the Bananas come in all sizes and shapes. Don't let your favorite become forgotten. Send it to *Broadcast Engineering*, 1014 Wyandotte, Kansas City, Mo. 64105, and we'll run it with the next bunch.

We'll Hang On If You Will!

Because of the subject matter you may choose not to use this, but it should provide a chuckle.

Several years ago we ran a schedule of spot announcements on television for Preparation-H. Each spot began with the statement: "Here's news for Hemorrhoid sufferers...."

One evening, the film broke immediately following this opening statement. Over black, and with great earnestness in his voice, the booth announcer opened his mic and requested, "Hemorrhoid sufferers, please hang on."

**Philip B. Witt, CE
WCOV-TV
Montgomery, Ala.**

Hey There, I Heard You Laughing

In regards to your "Blue Bananas" column—I've been in radio and TV since 1959 and not only have I heard some great stuff, but I've been responsible for a lot of goofs myself. Here are some of the printable ones.

What do you do when something really goes wrong? You keep going as if it were the most normal situa-

tion on earth. At WICC, our studios were in the office section of the Exide Battery Building, but we never announced that fact. One day, on my way in to work, I heard the newsman reporting that, among other things, firemen were battling a blaze at the Exide Battery Building. Sure enough, there were fire trucks all over the place, and our newsman was in the booth calmly reading the news.

Those of you who are familiar with TV know that lots of things don't "just happen." They have to be set-up, slides have to be ready, carts cued, and so on. A few years ago at WBZ-TV the newsman was talking about how, on that Easter Sunday. "All was not joy and peace in the Middle East. The Jewish and Arab troops met at the border for an exchange of bodies. There was a cantor present, and this is how it sounded."

He looked at his monitor.

The camera stayed on him, as the song "In you Easter bonnet" came over the sound. He looked up, shocked, into the camera. The "Eyewitness News" slide came up, and a commercial followed. Obviously, he had gotten one of the technicians mad at him.

One more goof that I almost forgot. I got called on this one, but not because of what I had said. I was doing the news at WALE, and mentioned that the "Women's Slow-Bitch Soft Pall Championship was being held," instead of slow-pitch softball. That was enough to get me laughing, and I chuckled my way through the weather, then mercifully into a record.

The phone rang. "Sir," some elderly lady said, "I heard you laughing during the news. I think that's disgusting. My friend is here from another city and she thinks it's disgusting too."

I explained, without going into detail, that something struck me funny, and it happens to everybody now and then. She wouldn't have that; wanted to know if perhaps I was new at the business. I wasn't.

"Then," she said, "I wonder if you have been drinking on the job?" Thank goodness she did not catch my original goof.

**Tom Carten
Notre Dame, Ind.**

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Make sure your new FM transmitter employs EIMAC power tubes. The transmission of fine sound,

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For full information on power tubes for any service, any power level, contact Varian, EIMAC Division, 301 Industrial Way, San Carlos, California 94070. Or any of the more than 30 Varian Electron Device Group Sales Offices throughout the world.



For More Details Circle (36) on Reply Card

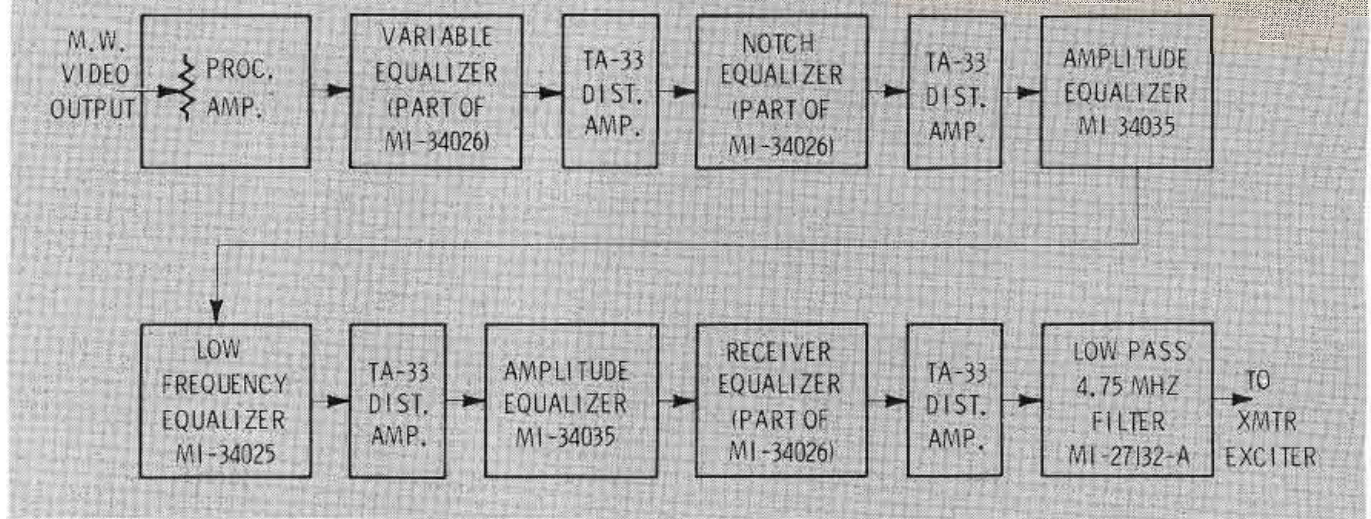


Figure 1. The system, such as this typical input arrangement, should be swept regularly.

Sweeping The Xmtr Video System

By Thomas M. Wimberly, WAND-TV, Decatur, Ill.

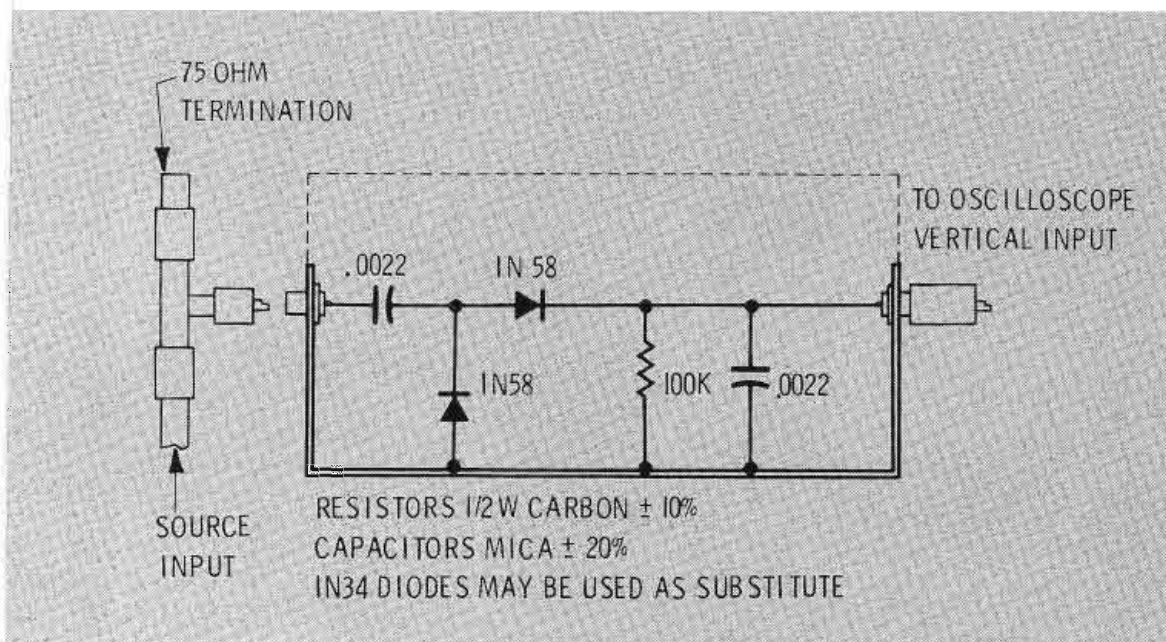


Figure 2. It usually is easier to display the signal using a video detector circuit like this one.

The transmitter video processing system includes a cleanup program, group delay correction and bandwidth limiting.

A modern day proc amp will provide video gain, white clipping, sync reinsertion and gain, color burst reinsertion and gain, chroma or high frequency gain, VITS processing, and a color phase control for VIR usage.^{1,2} The proc amp must not introduce any distortions of its own.

Because notch duplexers or filter-plexers and television transmitters don't process the color signal in the same time as the luminance signal, it becomes necessary to predistort the signals opposite to that of the transmitter. If precorrection is not used, the most apparent results would be a misregistration between color and mono signals on a home color receiver.^{3,4} Each precorrector is fed by a DA which provides both a 75 ohm source and load as well as gain compensation to cover the losses. Each corrector unit has a frequency roll-off at approximately 1 dB at 4.2 MHz. To compensate for this, amplitude equalizers are installed.

The FCC limits the bandwidth for TV transmitters to 4.2 MHz above the visual carrier. A frequency of 4.75 MHz must be attenuated 20 dB. The signal must also be attenuated 20 dB for a frequency of -1.25 MHz (below visual carrier), and 42 dB for -3.58 MHz. The attenuation of these lower sideband

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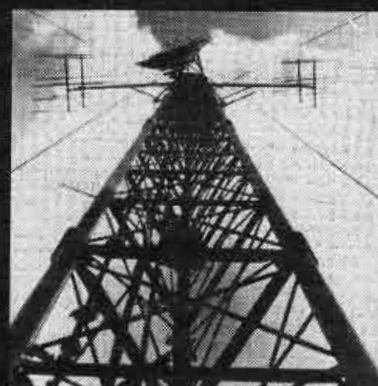
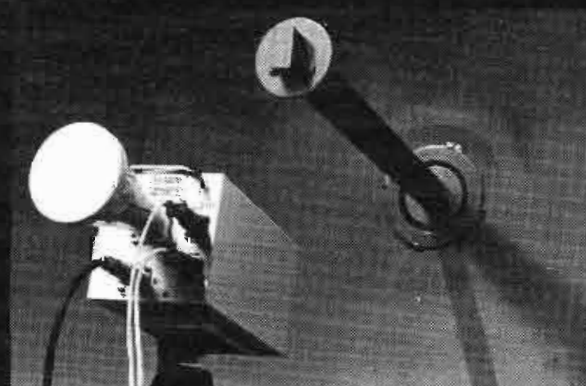
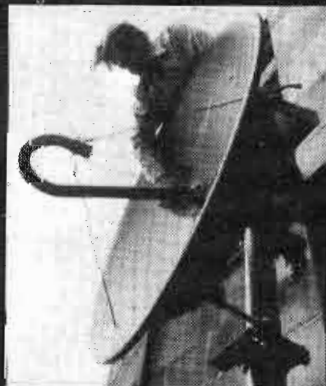
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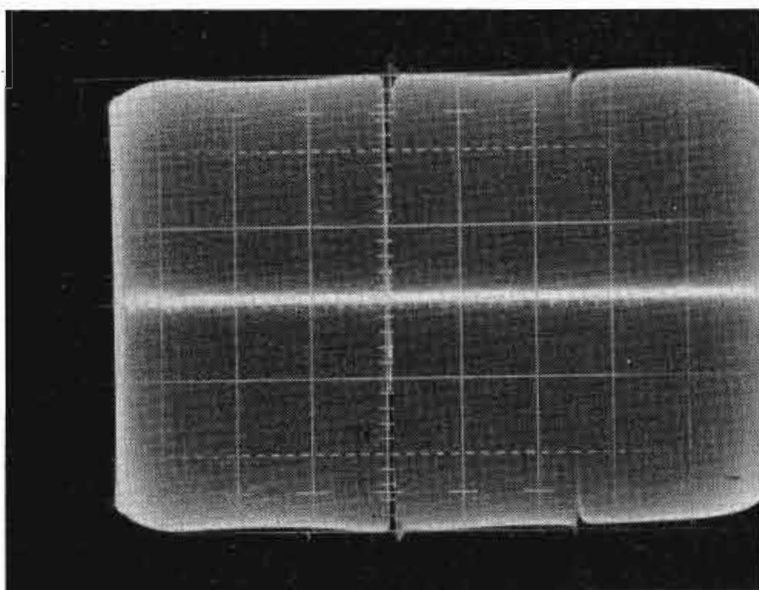


Figure 3. BW-5C2 output marker at 5 MHz.

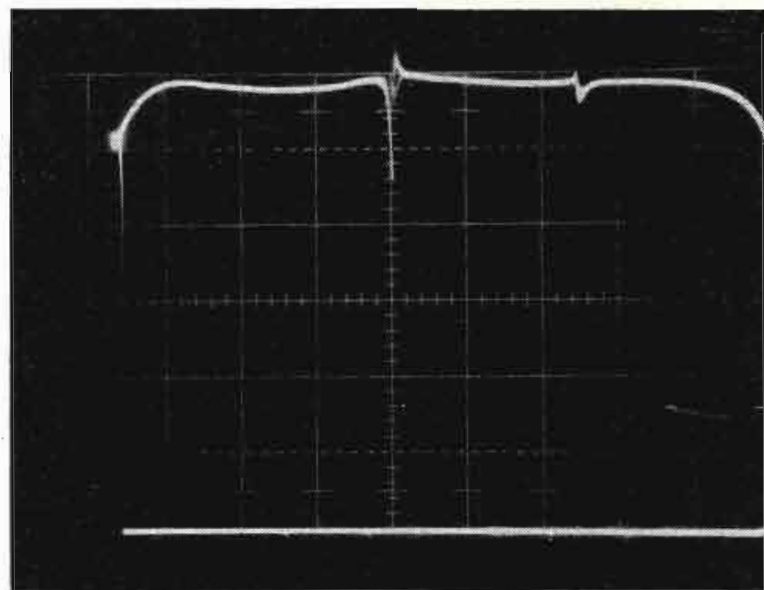


Figure 4. Detector output of BW-5C2.

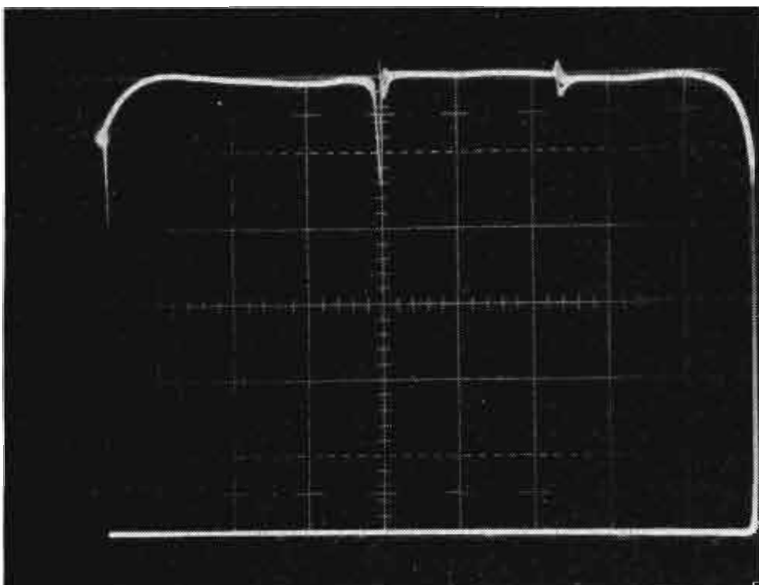


Figure 5. Transmitter input with correctors off and amp equalization disconnected.

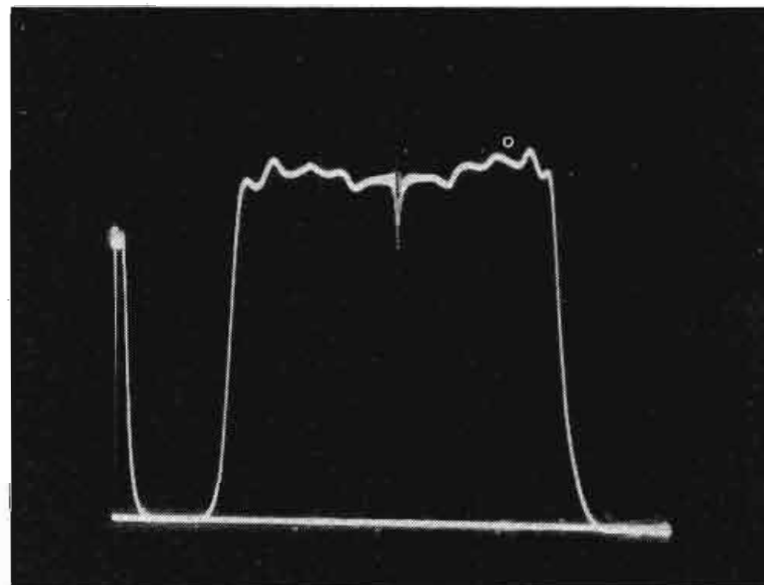


Figure 6. System output with low pass filter in circuit. Drop starts at 4.2 MHz.

frequencies is limited by the sideband filter at the transmitters output. It becomes apparent that the low pass filter provides the limit on the upper sideband.

The filters listed above do not displace proper transmitter tuning and adjustments, but are provided to ensure compliance with the FCC regulations.

Since most systems today employ all solid state components for the video processing, very little trouble usually occurs.

When the system is first installed, and at annual intervals, the system should be swept through and checked for any deterioration which may have occurred. Figure 1 shows a typical system.

To sweep out this system it is

first necessary to insure the sweep generator output is flat. Figure 3 is the output of an RCA BW-5C2 sideband response analyzer. It is usually easier to display such a signal after it is detected, for this I suggest the unit in Figure 2. Its display is seen in Figure 4. The marker for all the photos is set at 5 MHz.

Feed a 1v pp sweep into the proc amp and with its output terminated into the detector, adjust the chroma control for a flat response similar to Figure 4. Next restore the proc amp output to feed the precorrectors. Turn off all precorrectors and the low pass filter. Remove all amp equalizing installed. Feed the low pass filter output or the DA which follows into the terminated detector.

A word of caution, when each corrector was shut off, it resulted in a video gain. If this gain causes distortion, it will be necessary to either reduce each DA's amplitude, or reduce the sweep generator output, provided the flat response is not altered.

Figure 5 is the total system output which feeds the transmitter. Figure 6 is the sweep response with the low pass filter in the circuit. Note the steep almost straight sides. The drop off starts at 4.2 MHz.

This would be a good time to calibrate your marker in the sweep generator. Set the marker to 4.5 MHz on the dial and on the RCA-BW-5 series units the adjustment is L 11. For your particular generator consult the instruction



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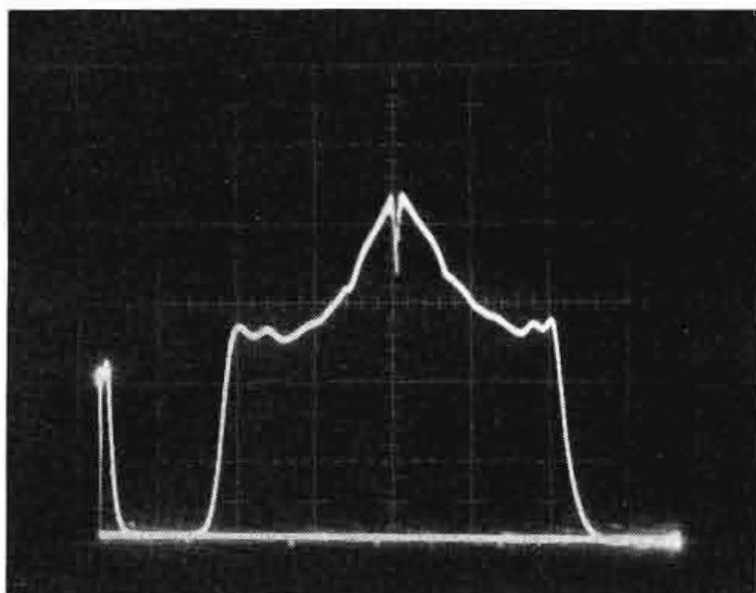


Figure 7. System output with all pre-correctors on.

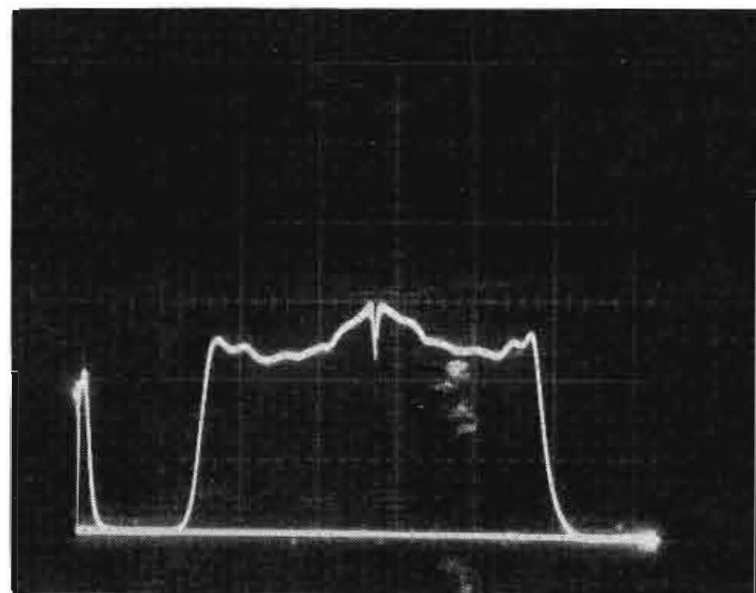


Figure 8. Same as Figure 7, but with one amp equal in.

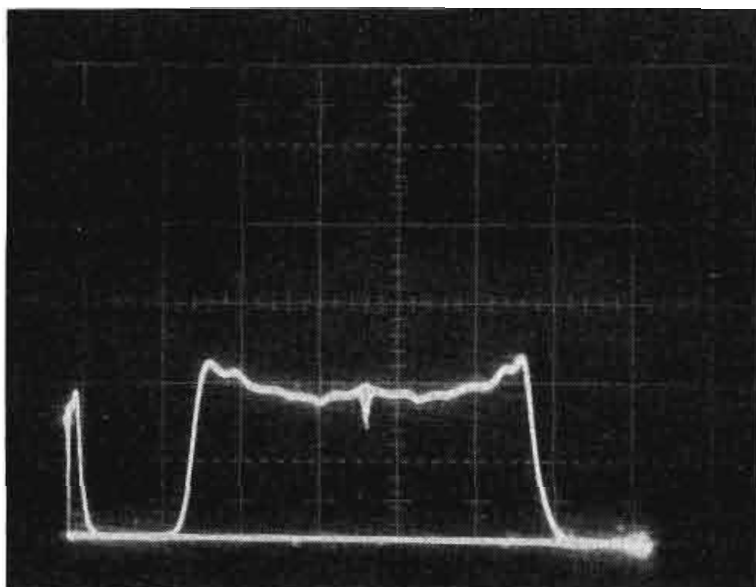


Figure 9. System output now shown with both amp equalization and pre-correctors in circuit.

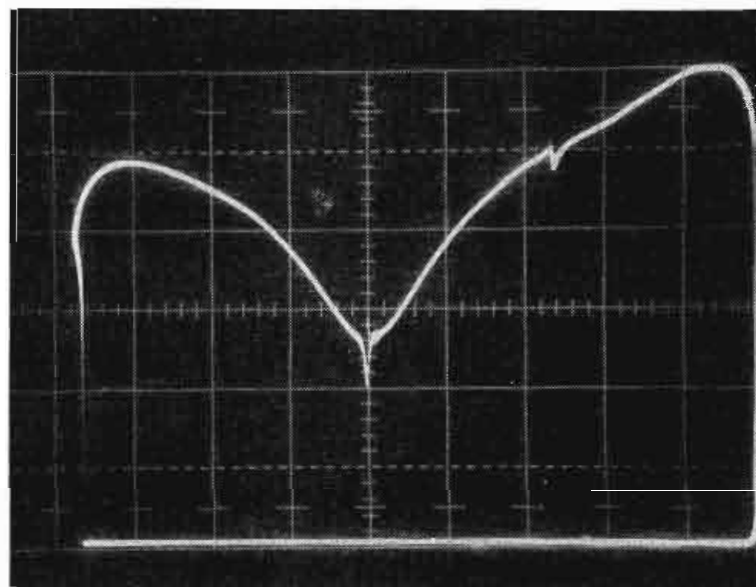


Figure 10. Now you see Figure 9 with the pre-correctors turned off.

manual. By rocking the adjustment back and forth, a pretty accurate setting can be obtained.

Figure 7 is the system response with all equalizers switched in. Figure 8 has one amp equalizer added. Figure 9 shows two equalizers added. Consult your manual for proper location. Figure 10 illustrates the results of both amp equalizers with all precorrectors switched off. Compare it with Figure 5.

If your system is not flat past 5 MHz, it will be necessary to adjust one or more DA's. Usually a module extender is necessary. Consult your service manual for the proper adjustment.

It has been my experience when adjusting DA's on a module ex-

tender, that while they're flat on the extender, they tend to show a slight loss when inserted. Of course as Figure 9 shows, the use of two amp equalizers would more than compensate for it.

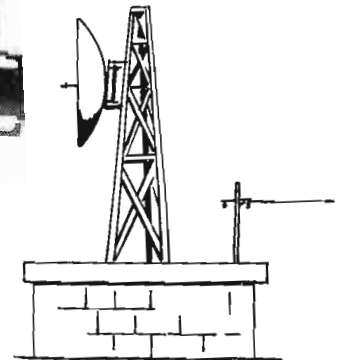
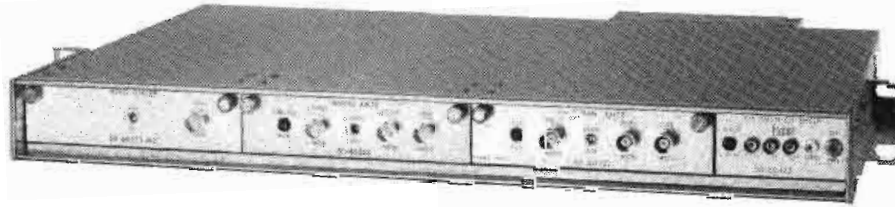
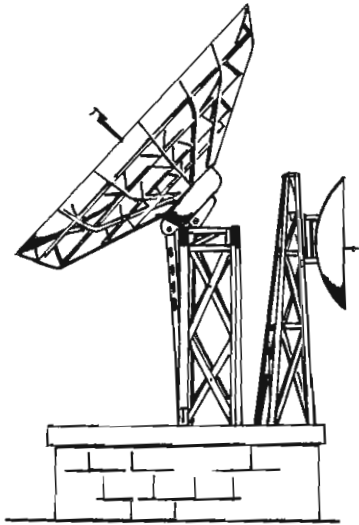
Once the system has been properly adjusted and all correctors are reset for air use, it is necessary to feed a composite video, from the studio, and adjust the proc amp and all DA's for a 1 vpp output. Unless your transmitter requires a different chroma setting, the chroma gain should be set for a flat multiburst at the input to the transmitter. A color bar can be used, provided it is properly adjusted, usually an 8 unit overlap between bottom of first bar and top of last bar. Both signals are available from

the VITS which makes an excellent reference because it is transmitted during broadcast programs.

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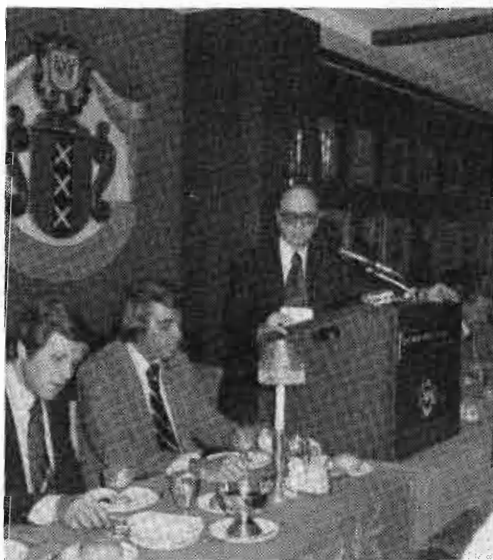
Take 1!...

ASTVC and Tom Snyder At The NY Hilton

The date was the 7th of May and the place was the Amsterdam room

of the NY Hilton. Members and their guests filled every available table, some coming from as far away as the Boston area.

Seated on the dais were Tom's



fellow members of the News Center 4 staff including Mary Alice Williams, Tony Guida et al....Also present were Mr. Yoshiyaki Suguri, Vice President and Mr. Jack Keyes, Marketing Director, both from CANON U.S.A. As the highlight of the evening, Tom received his Honorary Membership plaque from Miss Margie McKenna representing the ASTVC student members from Graham Junior College in Boston. The evening ended with Mr. Suguri accepting the Sponsors' plaque from Bob Zweck, ASTVC President.

Take 2!...

Speaking of Corporate Sponsor Members

As noted, CANON USA was formally inducted into the Society at the Tom Snyder dinner. CANON, while first as a Corporate Sponsor Member, is not alone in that category. Also accepted as Sponsor Members, and waiting for formal induction ceremonies, are SONY, AMPEX and Achro-Video Ltd....There are other leaders in the industry whose applications are being considered at this time and who will be announced later.

Take 3!...

San Diego Chapter

Mary Zoller, regional rep at KCST-TV, writes the following:

"Dear Bob, Your San Diego chapter is off to an official start! Membership drive....set for the first meeting....KCST hosting the get-together....and your 'reg-repette'.... baking a few cookies and providing the coffee....(There will be demonstrations of new hand held ENG gear as well as mock-ups of new studio camera)....I have (invited) other stations in the market...and also college and trade school telecom classes as well....I have also invited Jan Lowry and his ABC-Hollywood cronies....

Terrific Mary!....We'll all be waiting to hear how your first meeting turned out....AND send some B/W pix for **BROADCAST ENGINEERING...PROMO...**Requests for information and applications should be sent to ASTVC, Box 296, Sparkill, NY 10976. Contributions for the column should continue to be sent to: Bob Zweck, Room 670, NBC, RCA Bldg., NYC 10020....

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NCTA Still At Odds On Copyright Bill

The NCTA Board of Directors has unanimously adopted a resolution opposing the introduction of communications policy matters in pending copyright legislation.

The Board directed its staff to continue efforts to further improve copyright legislation currently being drafted by the House Copyright Subcommittee and to make every effort necessary to secure passage of that legislation during the 94th Congress.

However, the Board strongly opposed a section of the pending legislation that would require the Copyright Tribunal in future CATV rate determinations to take into account criteria relating to "economic impact on patterns of communications" and the "continuity and quality of broadcast services."

The Board's resolution urged modification of Chapter 8 of the legislation to "retain that section which establishes the public interest as a guideline to Tribunal determinations, but...(urged) elimination of those guidelines that can be interpreted by a Tribunal as establishing communications policy or as introducing extraneous economic considerations, specifically the economic interests of the broadcast industry, which we believe are beyond the scope of copyright liability considerations."

"NCTA believes that reasonable compensation to copyright owners is assured by the payment formula (now incorporated in the bill), and that determination of communications policy is beyond the purview of copyright consideration," the resolution concluded.

In other actions, the NCTA Board:

- Established a special NCTA committee on franchise renewal. The committee will be chaired by William B. Strange, Sammons Communications, Dallas, Texas.
- Authorized the General Counsel's office to seek FCC reconsideration of certain aspects of the FCC's recent rulemaking on 1977 Rebuild, Channel Capacity and Access Requirements (Docket 20508).
- Authorized the General Counsel's office to file an amicus curiae brief in an antitrust suit brought by a Hugo, Oklahoma cable operator.
- Directed the General Counsel's office to seek FCC postponement of the 1977 franchise renewal rules and to seek FCC action on simplification of the CATV certification process.
- Approved a recommendation of the NCTA satellite committee that NCTA seek FCC action permitting the CATV industry to utilize changing technology to obtain reasonable options for cable satellite receiving installations of lower cost and smaller size.
- Approved a recommendation of the satellite committee that NCTA explore with the Corporation of Public Broadcasting a possible joint study of ways and means for mutual cooperation to obtain maxi-

Continued on page CE-4

NCTA President Asks For Action

The president of the National Cable Television Association, Robert L. Schmidt, today called on Congress to move forward with the creation of legislation that would spell out national policy on cable television.

The general intent of this legislation, Schmidt said in prepared testimony before the House Communications Subcommittee hearings on CATV, must be to permit the American public access to the full value of cable technology.

The hearings, which began Monday, May 17, are the first comprehensive review of the cable industry by Congress. The subcommittee is chaired by Rep. Lionel Van Deerlin (D-Cal.).

"We urge legislation to create a separate title in the Communications Act to provide broad policy guidance to the Federal Communications Commission in its treatment of not just cable television, but other new broadband communications technologies," Schmidt said.

"The central standard in such legislation must be concerned with the totality of service to the public and not simply the protection of existing technologies against the impact of new technologies," he said.

Schmidt called for the creation of a national cable policy that would minimize governmental supervision, rely on experimentation and the marketplace and have the flexibility to respond to the still relatively new cable industry.

The first was that cable development would serve the public interest. Given the chance, given sound regulatory policies, he said, cable television could become a positive force in the nation's telecommunications system in meeting the public's entertainment, information and educational needs.

Second, Schmidt said, CATV should be recognized and treated as a distinct and unique communications medium in its own right. Because of its technological and geographical characteristics and its lack of reliance on the broadcast



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munum benefits for public television networks, affiliated stations and CATV operators through domestic satellite service.

- Passed a resolution supporting the concept of delivering FCC authorized distant signals via satellite.
- Approved for distribution the NCTA Engineering Advisory Committee's standards of good engineering practices for methods of measurements on distribution systems.
- Adopted a resolution encouraging the exploration of developing engineering designs for an all channel cable television receiver.
- Directed the Chairman to appoint an NCTA representative to establish liaison with the Dept. of the Army to assist in the drafting of standard regulations for cable systems on Army bases.

The next regular meeting of the Board will be September 20-21 at the Regency Hyatt House Hotel in Washington, D.C.

NCTA Names Members To EEO Committee

Eleven NCTA members have been named to NCTA's newly formed Equal Employment Opportunity Committee, according to EEO Committee Chairman J. Richard Munro.

The committee members are James W. Cantor, Warner Cable; Clay Blanco, Jr., UA-Columbia, Yuma, Arizona; Samuel Cooper, attorney with the Washington, D.C. law firm of Cohen & Marks; Beverly Land, TeleCable Corp.; Spencer Kaitz, California Community Television Association;

Mitchell Kleinhandler, Suburban Cablevision, East Orange, New Jersey; Don Shuler, Viacom of Dayton (Ohio); Donald E. Anderson, Home Box Office; Daniel Aaron, Comcast Corp.; Charlotte Schiff Jones, Manhattan Cable Television; Audrey Sculthorpe, Director of Personnel, TelePrompTer; and Dr. William A. Douglas, Gary Communications Group, Gary, Indiana.

NCTA staff members Kathy Hilton and Robert Johnson will serve as NCTA committee liaison, Munro said.

The NCTA EEO Committee was established by the Board of Directors to make recommendations to the board and to carry out its commitment to equal employment opportunity in the cable television industry.

In making the announcement, Munro said "NCTA has committed itself to improve the industry's equal employment opportunity record. The EEO committee will set to work on this task immediately."

The EEO Committee will hold its first meeting June 22 in New York City, he said.

"Among the areas we will address are an information program designed to help members meet equal employment opportunity responsibilities, methods of assisting companies in developing effective affirmative action programs, and possible areas of cooperation with minority training facilities," Munro said.

"At the same time, we urge members of the CATV industry to be addressing these areas at the company and local level, and we encourage all industry members to provide ideas and suggestions to the EEO Committee," he said.

frequency spectrum, cable has the potential to more fully realize its uniqueness, he said.

Third, cable's imagined or actual impact on other telecommunications media should not continue to be the basis on which CATV is regulated. Historically, Schmidt noted, the nation's policy wherever possible has been to rely on competition and to give maximum play to the forces of the marketplace.

"Yet," he said, "traditionally the FCC's regulation of cable television has been based on principles contradicting these national goals of competition and diversity." After more than 13 years of experience in CATV regulation, the FCC still follows a regulatory rationale of minimizing cable competition to protect commercial broadcasting, Schmidt said.

"This lack of clear national policy reduces the FCC to creating policy through ad hoc determinations, issue by issue with no broad

perspective for the complex inter-relationship between issues and industries," he said. "The result is restrictive rules and regulations of incredible complexity—one has only to look at the FCC's pay cable rules; or no policy at all—as in the case of the pole attachment controversy."

Campaign Rule Will Affect Cable

The Commission has proposed amending its rules to require broadcast stations and cable TV systems to notify opposing candidates of gifts of time to any other candidate, for use within 72 hours prior to the day of an election.

The Commission noted that under present regulations if an editorial is broadcast within 72 hours prior to the day of an election, the station licensee promptly must inform the candidates opposed or not endorsed by the

station so they may have an opportunity to exercise their right to a reasonable opportunity to respond before the election.

The Commission said, however, that a parallel notification procedure did not exist in cases where free time was provided for use by or on behalf of one or more but not all candidates for use within 72 hours before an election. It said that although it recognized that a licensee ordinarily had no obligation to inform one candidate that time had been given a competing candidate, it felt a failure to provide such notification when the gift is so close to election day could "effectively nullify the statutory right to equal opportunities."

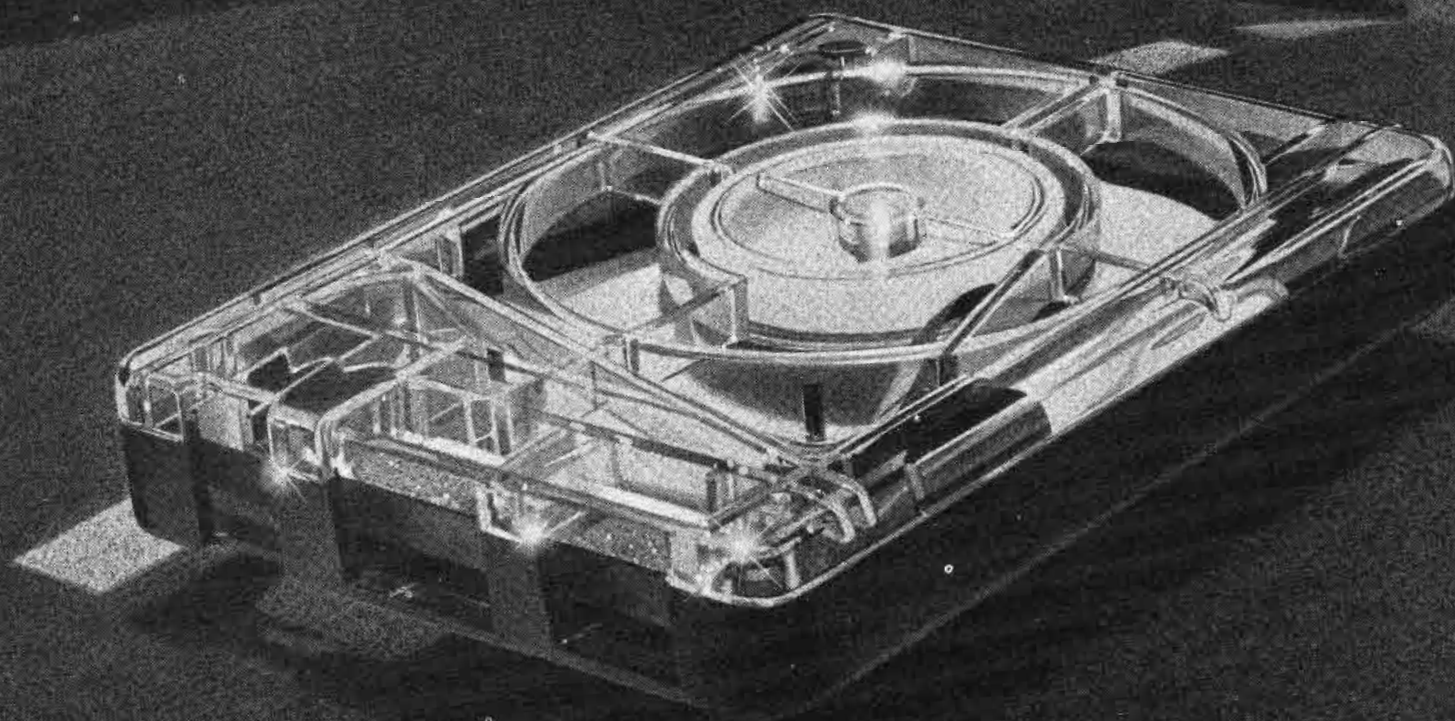
The Commission said a timely notice provision should be proposed to cover this situation, one which would not accord different treatment based on whether the time was to be used on the candidates behalf rather than by the candidate.

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NAB Urges Withdrawal Of FTC Drug Proposal

Broadcasters have joined the Proprietary Association in urging the Federal Trade Commission to withdraw a proposed regulation placing new curbs on advertising over-the-counter medications.

In a statement supporting the Proprietary Association's petition, the National Association of Broadcasters said the proposed rule has not been stated with "sufficient specificity" to permit comment in line with FTC's statutory obligations.

It also expressed concern over the regulation's "potential scope," including an apparent effort by FTC to incorporate subsequent findings by the Food and Drug Administration and require that product labeling and advertising claims be identical.

"Reliance upon FDA findings as to the efficacy of over-the-counter medications may be appropriate," NAB said, but "the matter of ad-

vertising such products...is more properly left to the expertise of the FTC.

"While NAB commends the FTC proposal for limiting advertising claims to those which are supportable by fact, there may well be instances wherein advertising claims and statements on product labels should not be identical, as long as they are not materially inconsistent.

"Terminology employed in advertisements, and most especially in radio and television commercials, must be suited to the media and the manner in which concepts are conveyed to the public. It is not inconceivable that too much specificity in advertising, as may be appropriate on product labels, may in fact engender public confusion and misunderstanding."

It would be inappropriate, NAB said, to incorporate future FDA findings in an FTC rule "without further individual evaluation."

In a separate statement identify-

ing the issues, NAB raised a series of questions it said FTC should consider. Among them:

"Would adoption of the proposed rule delegate to the FDA authority to define and, hence, to regulate advertising practices as those practices are now regulated pursuant to the Federal Trade Commission Act?

"Does the advance incorporation of future FDA findings deny interested parties access to the specific acts or practices deemed to be unfair or deceptive and thereby frustrate endeavors to comment upon those specific acts or practices and otherwise participate in the rulemaking proceeding?

Trial Run For Olympic Gear Includes Fire

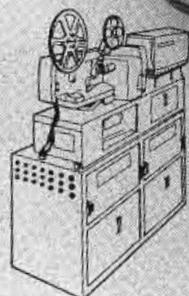
The recent fire that destroyed the United States pavilion at the Expo '67 grounds in Montreal was covered live on Canadian television in what was believed to be the first instance of unscheduled live electronic journalism in that country.

On the day of the fire, tests of a remote TV pick-up system were in progress under the sponsorship of ORTO, an organization specially created to provide electronic coverage of the upcoming Olympic Games. A key element in the system is a helicopter on which is mounted a new omnidirectional antenna developed in the U.S. by Nurad, Inc. of Baltimore. Within the overall range of the system, this antenna makes possible coverage of any event that can be seen from the helicopter.

When the fire was detected in its first stages from the helicopter, which happened to be flying over the Expo grounds at the time, a unique opportunity presented itself. Realizing that he had the capacity to cover the event as it was unfolding, an alert engineer from ORTO, Duncan Nicholson, who was aboard the helicopter, radioed to CBC to arrange for a live feed. Not only was the fire broadcast live, but at the same time it was taped and edited at the studio for broadcast on the CBC national news at 7 PM and 11 PM.

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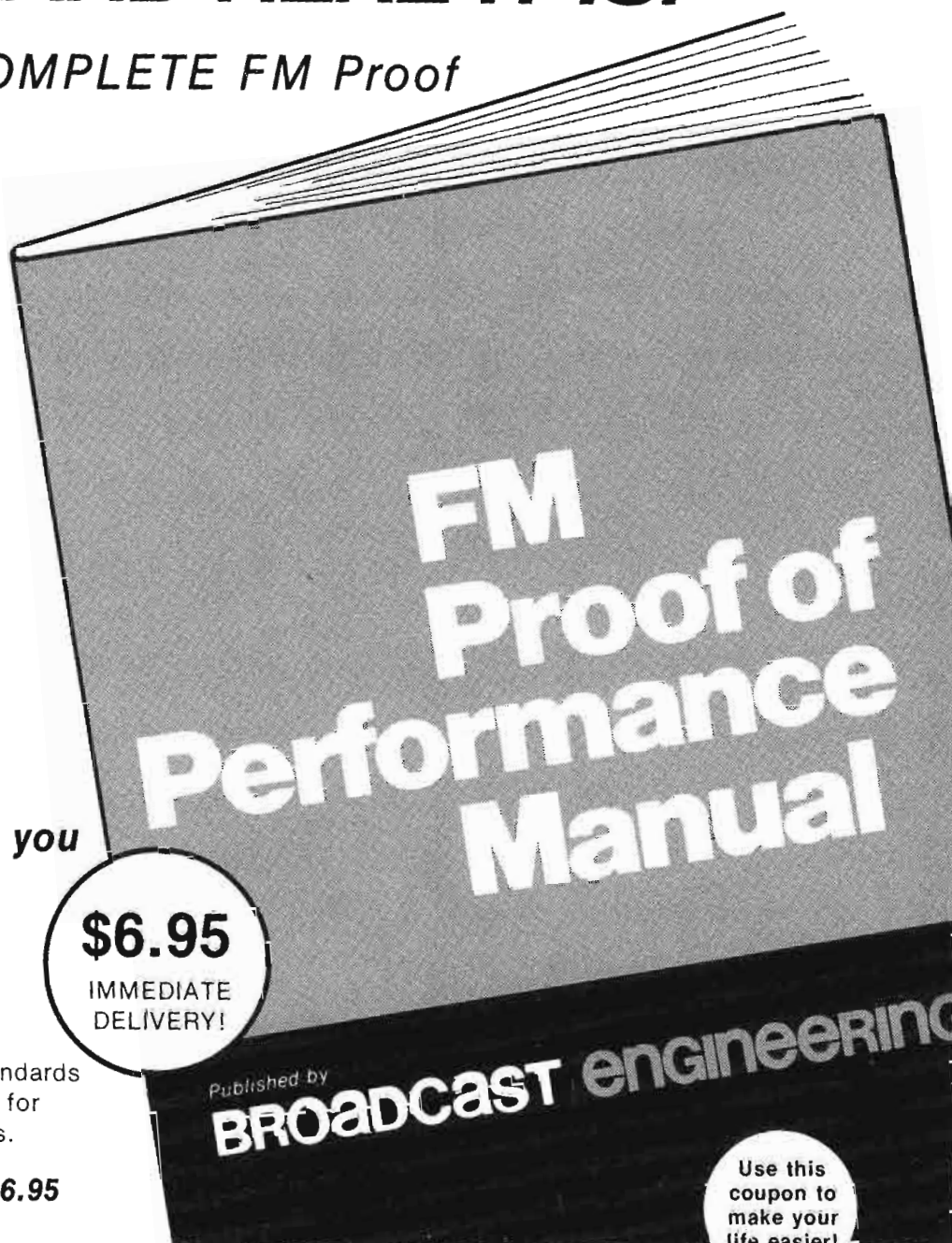
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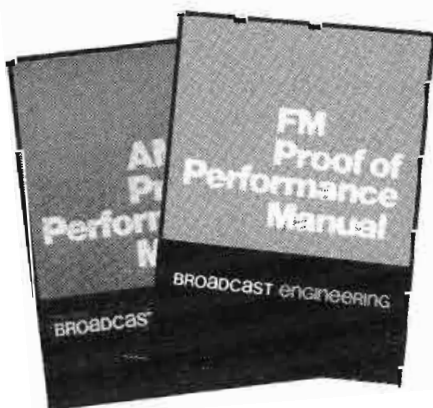
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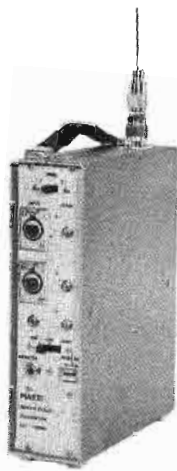
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The 50 kW transmitter and its three 700-foot directional towers and ground system are built on a garbage filled meadowland adjacent to the Hackensack River. The elevation is 6 feet above average mean sea level.

The original ground system, installed in 1967, consisted of one hundred and twenty 350-foot radials for each tower connected to a 40 square foot ground screen. Because of the chemicals in the garbage fill, hard drawn polyethylene insulated #8 copper wire was used. The insulated radials resulted in a very stable antenna array, with no noticeable change in impedance or radiation characteristics with changes in soil conditions—wet or dry, summer or winter. Several inches of sand and silt from the Hackensack River were pumped over the ground system after installation. However there were several acres which were not covered because of slightly higher elevation. Nevertheless tall Marsh grass soon grew over the area so the exposed radials were concealed.

In October of 1973 a grass fire burned over the entire ground system, exposing the radials which had not been covered.

During the following winter there was a change in antenna parameters, monitoring point readings and radiation pattern. Inspection revealed that thieves had stolen approximately 20,000 ft. of the exposed radials, thereby upsetting the antenna system. The theft had apparently taken place at nights or on weekends when there was no one at the transmitter.

It was impossible to bury new radials because of the impenetrable

decomposed garbage fill over most of the area. It was obvious that new copper radials laid on the ground would be promptly stolen again since the area is isolated and difficult to patrol. It would be several months before the marsh grass grew tall enough to hide the radials, and another grass fire would uncover them again.

A New Approach

The possibility of installing a good grade of galvanized barbed wire was investigated. It was agreed that no one would be tempted to steal the barbed wire because of the difficulty in handling it, and because of its low salvage value. Also the presence of loose barbed wire would tend to discourage trespassers. While the resistance of steel wire is higher than that of copper, the current in each radial is not excessive, and the capacity is comparable since the sizes of the wire are about the same.

The engineering firm of Silliman, Moffet and Kowalski in Washington was contacted and they could see no reason why barbed wire could not be used. The engineering department of the FCC was then approached and they approved of the idea on a trial basis, provided that common point impedance measurements and partial field strength measurements were made following the installation so that comparisons could be made with the original values. They also requested that FCC Form 302 be filed showing the changes made and the results of the tests.

20,000 feet of Class 3 (the best grade) of galvanized steel barbed wire was laid on the ground to replace what was stolen. The wires were laid loosely, since wire off a reel coils naturally and the loose wire discourages trespassing and has fewer contacts with the soil, thus reducing corrosion. Each new

section of a radial was silver-soldered to the remaining portion of the copper radial, or to the ground screen when the entire radial was missing. The juncture was then coated with galvanizing paint to prevent rust. Signs were erected around the property "WARNING - BARBED WIRE - PRIVATE PROPERTY - NO TRESPASSING".

There has been no further problem with theft or trespassing.

Following the installation, common point impedance measurements were taken over a 40 kHz band and the results were almost identical with former proof of performance measurements. Partial radiation measurements were made and the results were comparable to previous proofs with the same values of antenna phases and current ratios.

All indications are that barbed wire laid on the ground can be used successfully in place of copper wire radials. Its use would be advantageous where theft of copper wire is a problem and where it is not possible to bury the radials because of soil conditions. It will also discourage trespassing and vandalism. Barbed wire is also considerably cheaper than copper: approximately 3 cents per foot for the best grade compared with 25 cents per foot for #10 bare copper wire or 30

cents per foot for #10 insulated copper wire. Barbed wire cannot be expected to last as long as copper, especially if the copper wire is insulated, but the lower cost should make it more economical, even if it has to be replaced every few years.

Some Precautions

Several precautions should be taken before barbed wire is used. Make certain that there are no legal restrictions on its use in this manner, and that the station's insurance company will approve in the event of any lawsuits resulting from injury to trespassers. Signs should be erected warning of the danger. Make certain that Class C, the best grade, is used. Lower grade wire will lose its galvanized coating sooner and will rust more quickly. Its use of course should be avoided in areas where children play, where there is unrestricted vehicle or foot traffic or in pastures where animals graze.

In locations where theft of copper radials from an AM station is a problem, or where cost is an important factor, the use of barbed wire radials may be a practical solution.

Orville J. Sather
Consultant
New York, NY

Radio Workshop Safety Tips

Too often in the excitement of the moment we put safety in the background. The April and May installments of Radio Workshop included several emergency transmitter fixes that expose the engineer to dangerous potentials. The techniques are useful, but must be employed with the greatest caution. Safety is a full-time responsibility for all of us. Don't let the pressures of getting back on the air interfere with your personal safety. Here are some **musts** for transmitter work.

1. **Always** disconnect the primary power and apply the shorting stick before putting your hand in the transmitter.

2. Keep one hand in your pocket.

3. Don't work on high-voltage equipment alone.

4. Anything that is jury-rigged should be tagged and carefully protected from accidental contact.

As a further precaution, everyone that has occasion to work on the transmitter should take at least a basic first aid course.

In addition to personnel safety, consider the safety of the transmitter. If you're using a temporary cure for something, make sure that the total supply current is at a safe level. There's no need to compound your problems by burning out the power supply.

Peter Burk

In My Opinion Changes Are Needed

It is my general opinion that today's radio industry needs a good overhaul in its technical practices.

(Continued on page 67)



Chuck Ealston DJ, on the air at WKLS.

WKLS, Atlanta, broadcasts 100% disc- to-air. That's why it uses Stanton's 681 series...exclusively

Top notch broadcasters who capture a large share of the listening audience, are critically aware of the necessity to achieve a superior quality of sound. Station WKLS is just such a station.

As Bob Helbush, chief engineer, states: "We broadcast 100% disc-to-air except for some commercials. So, for maximum quality sound and phase stability, we use the Stanton 681 SE for on-the-air use. We consider it the ideal answer for that application. And our program director uses Stanton's 681 Triple-E for auditioning new releases before we air them".

And Don Waterman, General Manager, added: "Today, every station in the SJR Communications group . . . all eight of them, all in Major Markets . . . use Stanton 681 cartridges on every turntable".

There are good reasons for this vast acceptance. Stanton's 681 Calibration Series cartridges offer improved tracking at all frequencies. They achieve perfectly, flat frequency response to beyond 20 Kc. And the top-of-the-line, superb 681 Triple-E has an ultra miniaturized stylus assembly with substantially less mass than previously, yet it possesses even greater durability than had been thought possible to achieve.

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

Whether your usage involves recording, broadcasting or home entertainment, your choice should be the choice of the professionals . . . the STANTON 681.

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



For More Details Circle (43) on Reply Card

Scheduling

(Continued from page 37)

While most departments schedule their own people even for multi-departmental projects (of which there are many), each should cooperate so that all personnel required are scheduled to be on site at the same time. Otherwise, it is possible that many people are idly waiting around for the rest to show up!

When special projects are to be done within a department, others often need to know about it. For example, engineering schedules a tape machine to be torn down and overhauled. At a point when the machine is strewn about the place

(now a basket case), in troops production with a special client to record a spot or something (they failed also to inform engineering of their plans). Such incidents do happen, and they are simply a case of failing to inform.

Employees may engage in some practices that can run afoul of the Wage-Hour Law and cost the company premium wages. For example, two employees trade a day off. There is no problem so long as this trade is worked out in the **same work week**. But one may work a day for the other, and will want the favor returned at a later date. Thus, the one works 48 hours, and the other works 32 hours. The employee who works the 48 hours

must be paid time and one half for the 8 additional hours in that week. The week the second employee returns the favor, he must be paid premium for those additional 8 hours he works in that week.

In another type of situation, an employee comes in earlier than scheduled, but rather than loaf around, goes to work. At normal schedule time, he goes and rings in his time card. At the end of his scheduled hours, the project is not finished, and perhaps another half hour of work will do it. He goes and rings out his card and goes back to work and finishes up the project. He must be paid for both of those out of schedule periods, for he must be paid when working, whether scheduled or not.

One employee using another's time card is a very strict no-no. This can occur in the days off trade situation. In all these situations, it is up to Management to exert proper supervision on the job, and especially concerning the time cards or slips.

A scheduling problem can occur when work is scheduled over the 'break point' in the work week, that is, the actual hour the new work week starts. If this happens, the work before that hour must be figured in one work week, and past the hour, in the new work week.

When an employee works for the same employer, he must be paid time and one-half for hours past 40 in a work week, regardless of what departments gets his time. For example, an engineer may work his regular 40 hours in the Engineering Department, but on the weekends, he does a few part time hours announcing for the Program Department. Those weekend hours in this case, must be paid at premium wages.

The scheduler must be objective when assigning overtime, and should try to distribute it throughout the schedule to as many as possible. At least, try to accomplish this over a period of time. If you're not careful in this matter, you can unwittingly be giving one or more individuals an effective raise in pay through overtime. It will not go undetected. This will create hard feelings and unhappy employees. Unhappy employees do not work efficiently and may soon leave for other employment! □

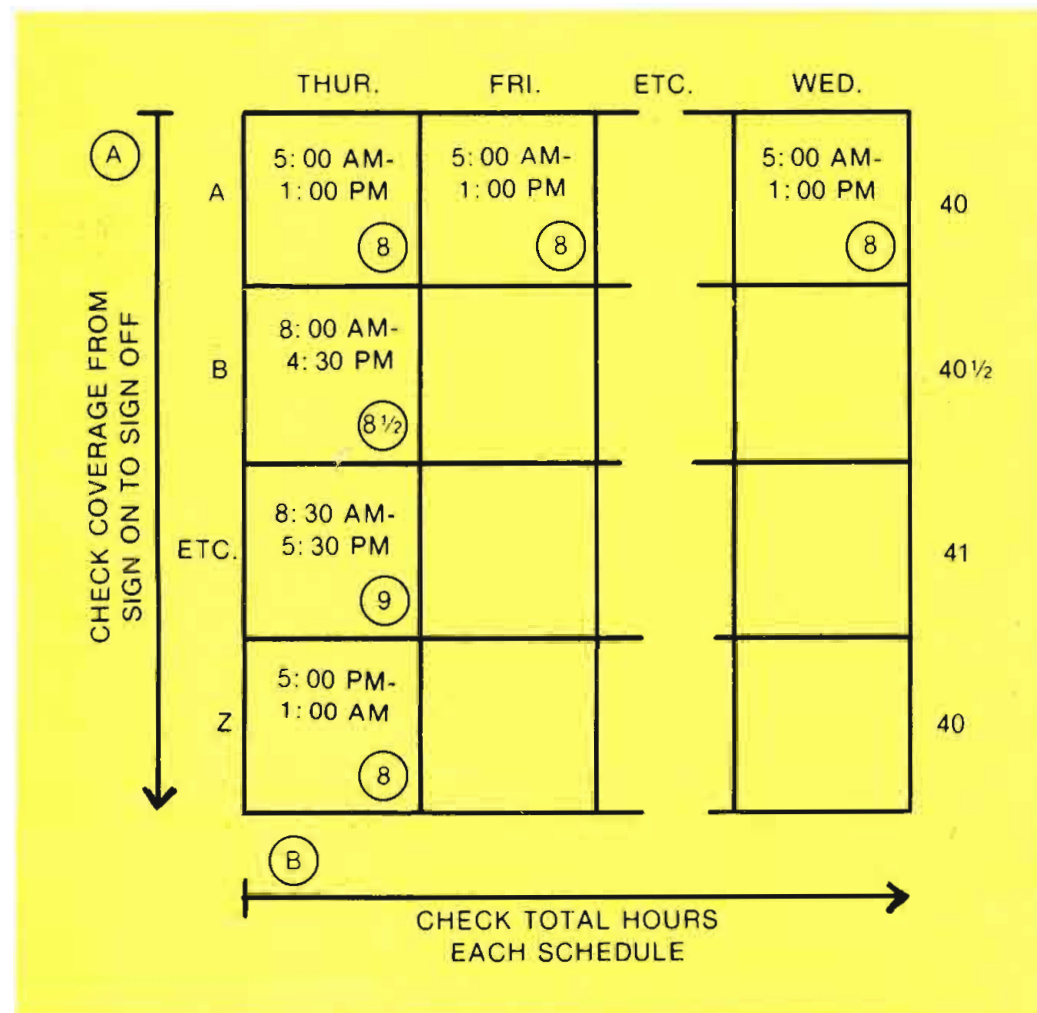


Fig. 6 Check completed schedule both horizontally and vertically for full coverage and total hours.

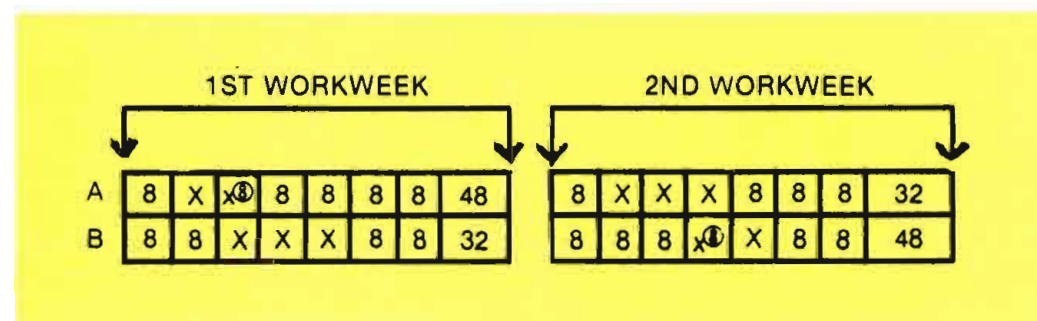


Fig. 7 If employees trade days off and both are not in the same company pay week, the additional hours must be paid at overtime rates.

Station-To-Station

(Continued from page 65)

Is anyone aware of the fact that some stations don't even own proper test gear? Yes, ask them, and they'll tell you they borrow the gear when it comes proof time. Maybe! But even if they do, what about all the other months going by open to the opportunity for distortion to exist? How about the station who relies only on the outside frequency monitoring service? Is it realized that for possibly 30 days that station could have drifted out of frequency tolerance? Again the argument arises that the newer gear is more stable...does every station own and operate this newer gear? The answer is NO!

While the FCC is occupying itself with Quad-FM and Stereo AM, it is over-looking malpractice in radio today. It is my feeling that today's Chief Engineer should be just what the title implies...a person who is well trained for his position. What is the problem today is the sheer fact that to become well-trained, one begins as a "Chief" and uses the hit-and-miss method of learning how to do things right. If a station is so poor it cannot pay for a full-time qualified engineer to be on the staff, then that station should not be on the air. Let's open the field to assistant-chief engineers, so a greenhorn has the opportunity to learn the right way of taking care of a radio station. Throwing a Five-Week wonder in charge of the station is not the answer gentlemen, and combo-men as the Chief is not the answer either. Have a qualified chief on the staff, and use the combo-man as the assistant.

Granted, we are only hearing one man's opinion, but until someone convinces me that every station on the air is operating, not just "legally", but operating properly and to the fullest possible efficiency, I will hold on to my opinions. In the past twelve years in radio, I have witnessed too many "just-get-by" situations to sit back and say "with today's modern equipment".

John Crawford
WLQA
Cincinnati, Ohio

PERFECT TIMING

ESE 12 and 24 Hour Digital Clocks

THE ES 112 and ES 124 twelve and twenty-four hour, solid state, six digit clocks. Silent seven segment incandescent displays. Three easy to operate controls: Fast Advance, Slow Advance, and Hold. Built to deliver a lifetime of service. Available with the following options to provide an even wider range of applications. BCD Output; Crystal Timebase; Remote Connector with or without Six Foot Cable and Pushbutton set; 220V AC, 50Hz; Nine or Nineteen inch Anodized Aluminum Front Panel; Slave; Three Wire Cord with Molded Plug. Also available in Kit form. **Price \$130.00**



THE ES 142 and ES 144 twelve and twenty-four hour, MOS, solid state digital clock/thermometers. Display simultaneously: 6 digits of time (hours, minutes, seconds) and 3 digits of temperature (-50°F to +150°F) in planar, gas discharge displays .55" high. Units come equipped with Temperature Probe and six foot cord. With the exception of the Nine inch Front Panel the ES 142 and ES 144 are available with the same options as the ES 112 and ES 124. **Price \$225.00**



THE ES 132 and ES 134 twelve and twenty-four hour 12V D.C., MOS, solid state six digit clocks. LED display. Black anodized aluminum case. Available with same options as ES 112/124 plus A.C. operation with Crystal or Line Frequency Timebase. **\$200.00**



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Eliminate Off-Mike Problems With The Sportscaster Headset



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Ask for literature on practically unbreakable headphones.

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Sportscaster headset with integral dynamic mike from Television Equipment Associates gives you complete freedom of movement and simultaneous monitoring of two sources.

The headset has a

Dynamic boom microphone: 400 ohms, frequency range 50-15,000 Hz. Sensitivity 2mV (loaded) for close speech.

Double headphones: independently wired, 200 ohms each 50-15,000 Hz. Single 'phone version available.

Ventilated foam cushions eliminate perspiration and let you hear ambient sound and are interchangeable with ear-enveloping cushions.

Weight: 8 ounces. Practically unbreakable components. Optional cough switch.

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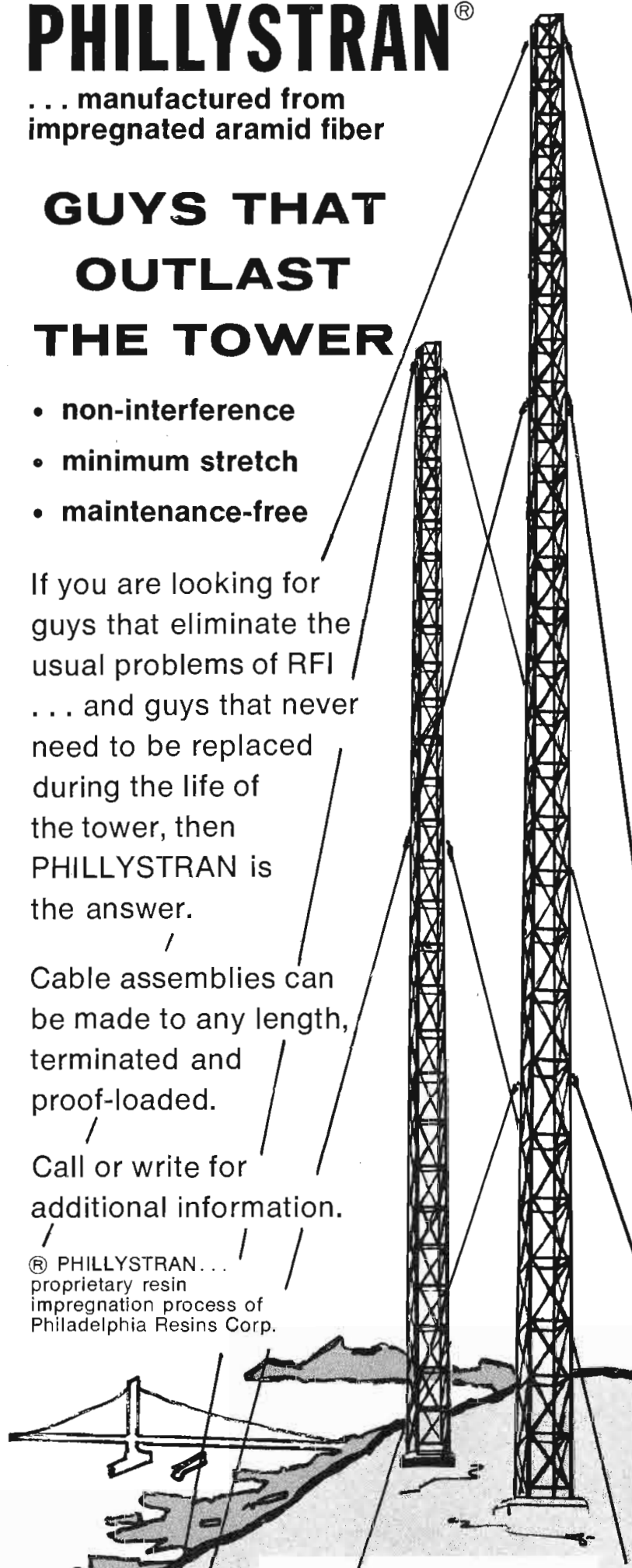
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PEOPLE IN THE NEWS

This month's announcements of moves within the broadcast industry begin with Telemation making **R. Dennis Fraser** their national broadcast marketing manager. Fraser moved up from the position of midwestern regional sales manager and will re-locate in Salt Lake City to head the company's nationwide sales effort. Also at Telemation, **Marshall A. Ruehrdanz** is now in charge of the national distribution OEM sales program and **Donald E. Rhodes** becomes the new national government relations manager.

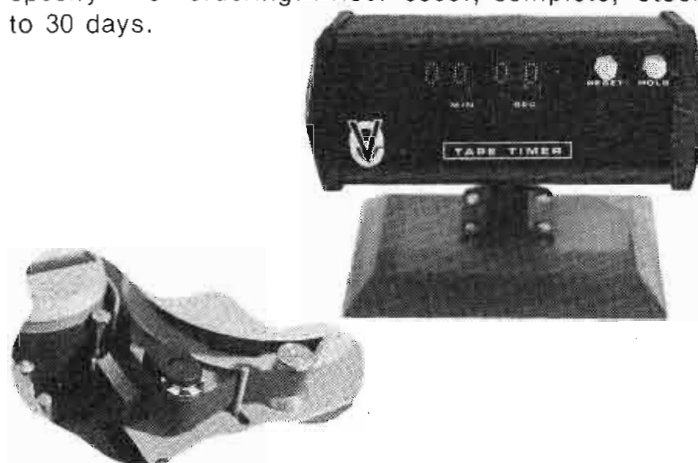
International Tapetronics announces that **Bob Tria** has been promoted to sales manager and **Mark Wasserman** has joined ITC as their advertising and market research manager....In the position of vice-president, operations, at CCA Electronics Corp. is **Juan C. Chiabrando**....**Gary B. Clark** becomes communications manager at Conrac Division....Joining Akai Video is **Lee Koval** as eastern regional sales manager.

Dynair appoints **Doug Brown** eastern regional manager....JVC names **Henry C. Hermes** vice-president, of the company, **Herman Schloss** national sales administration manager, and **George Hawthorne** national sales manager.

NOW DIGITAL - IVC

YES—the leader in digital tape timing devices now introduces another **FIRST**. Replace the old, poor-resolution, mechanical counter in your IVC transport with the **NEW VAMCO Model 759 DIGITAL TAPE TIMER**.

Timer mounts in minutes with two attaching screws. Display format is in minutes and seconds coming in two versions: rack-mounted or desk-mounted. Please specify when ordering. Price: \$595., complete; stock to 30 days.



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For More Details Circle (47) on Reply Card

The new project manager from video products of 3M Company's Mincom Division is **Frank D'Ascenzo****Eugene A. Reich** assumes the job of manager of international technical services at International Video Corp....Superscope, Inc. makes **Ted Inahara** national sales manager....**James S. Bruce** and **Anthony Frothingham** have been elected vice-presidents of Eastman Kodak Co.

Responsibility for general sales at GTE Lenkurt Inc. goes to **R. Don Webster**....Nortronics Co. Inc. announces the appointments of **Richard Dean Associates**, as its representative in New England, and **Roussil Associates Inc.**, as its representative for recorder care products in the Mid-Atlantic states....**Chester Syp** has been named account executive for the Major Multi-national System Operator Accounts for Magnavox CATV.

Leaving the sales and manufacturing part of the industry, the president of the National Association of Broadcasters, **Vincent T. Wasilewski**, has announced the appointment of the new Radio and TV Code Board members. Their terms were effective Spring, 1976.

A member of the TV Code Board, **Robert J. Rich**, president and general manager, KBJR TV, Duluth, Minn., replaces **Wayne Kearl**, president and general manager, KENS TV, San Antonio, Tex., as chairman. **James Conley**, president and general manager, Meredith Broadcasting Group, New York, N.Y. replaces Rich as a member of the TV Code Board.

Who Has The Time?

Skotel time code readers and generators. High performance timekeeping for greater flexibility in programming and commercial production. Models feature full user data facilities, high visibility LED display, low power consumption and cool reliable operation. Skotel is



compatible with all other SMPTE code equipment and options plug in with no special tests or tools required. Our reader reads 80 bit SMPTE code from any source at speeds from hand turn to 40X. Self-contained character generator gives precise, single frame accuracy.

Like to see more? We've got the time.

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Wilkinson Self Testing Silicon Rectifiers Replace Directly Mercury Vapor Tubes

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Russco turntables are so dependable that the need for service is practically forgotten! Our Russco engineers have designed solid-state monaural and stereo mixers, amplifiers and preamps that operate so smoothly and are so trouble-free, you forget they are there! Russco delivers a fine quality product at such a remarkably low price that your expenditure is soon forgotten! We hope that you will remember us when you want to update your equipment and improve your performance.



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For More Details Circle (49) on Reply Card

SMPTE Has Booth Space Available Now

Booth Space for the Equipment Exhibit of the 118th Conference of the Society of Motion Picture and Television Engineers (SMPTE) is now available, it was announced by Exhibit Chairman Charles Ahto, Tape-Films, Inc.

The SMPTE Conference and Exhibit are set for the American Hotel in New York, October 17-22, 1976.

According to Charles Ahto, exhibit chairman, this equipment exhibit is likely to be the largest and most impressive exhibit of professional motion picture and television equipment that SMPTE has ever had. Last year's SMPTE exhibit in Los Angeles broke all records for company participation and attendance. There is every reason for this one to be even better, Ahto said. Prior to last year's L.A. record breaker, the previous record holder for conference attendance was the last SMPTE New York Exhibit that was held at the Americana in 1973.

Ahto said because of the large number of exhibitors expected at this show, he has appointed two exhibit co-chairman, one to assist him in the field of motion pictures and the other to assist in the field of television. Dominick J. Capano, Cinecraft International, Inc., has been appointed Exhibit Co-chairman for motion pictures, and Frank Gallagher, 3M Company, as Exhibit Co-chairman for television.

Beau. The only quality replacement motor for cartridge and reel-to-reel tape machines.



Ever wonder why the unique Beau, inside-out, hysteresis synchronous tape drive motor is specified in just about every major piece of cartridge tape equipment? Or why so many Ampex and Scully machines are equipped with Beau replacement motors? The answer is simple: Quality. Beau offers unbeatable operating specs, outstanding reliability, long life, quiet operation, compact size, and unconditional factory support. No import can beat Beau, the original broadcast tape drive motor.

To order Ampex and Scully replacements, specify tape speed and model number from the table below:

Type and Models	Beau Prices
Ampex — Model 440	\$210.00
Ampex — Models 350, 351, 354	\$225.00
Scully — Models 270, 275, 280, 282	\$210.00

For fast delivery of cartridge drive motors for ITC, ATC, Gates, Spotmaster, Ampro, and Sparta machines, call (203) 288-7731. Or write for our free Beau motor bulletin.

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460 Sackett Point Rd. North Haven, CT 06473

For More Details Circle (58) on Reply Card

BROADCAST ENGINEERING

NEW PRODUCTS

Color Camera

CEI (Commercial Electronics Inc.) has introduced its CEI-287 professional color television camera.

The 287 features a tiltable 7" viewfinder, an advanced optical system that reduces lag, and an extremely high signal-to-noise ratio.

The 287 is part of the CEI 200 Series which also includes the 280 studio camera and the 290 portable production camera. All use common operating and camera control units. CEI claims that this results in substantial cost savings.

At only 52 pounds, the 287 can be handled by one man. It's therefore convenient to use on remote location as well as in the studio.

Other 287 features include three 1" lead oxide tubes, 10:1 zoom lens plus a variety of optional lenses, servo controlled lens iris, built-in filter wheel, simple camera head controls, fast warmup, long-term stability, preset shading for all three channels, black stretch, variable paint controls, lightweight camera cable, modular camera control unit, masking amplifier, white pulse automatic gain control, two intercom channels, and video monitoring at camera head.

For More Details Circle (81) on Reply Card

Recorder Replacement Head

Saki Magnetics, of Santa Monica, California, is now offering the first hot-pressed, glass-bonded ferrite head for Mincom studio recorders, available in all track formats.

The new Saki head is manufactured in hot-pressed ferrite with glass-bonded gaps. The head is plug-to-plug compatible with the original metal head used in the Mincom recorder. The company claims a reasonable life expectancy for this Saki ferrite head at 10 times that of the original metal head. For price and delivery information, contact Saki Magnetics Inc. through the reader service number below.

For More Details Circle (82) on Reply Card

Infrared Sound System

This year, a number of German television manufacturers have shown television sets with built-in infrared transmitters. For televisions not so equipped, **Beyer Dynamic** offer transmitter which contains (visible on the front plate) ten transmitter diodes in line, specially equipped with back reflectors. This system is being marketed by **Revox**.

With the aid of a special output control unit, the transmitter can be adapted to a variety of outputs, an

LED being used as a peak indicator.

The receiver has been developed for use with existing headphones. The IE76 receiver is a small pocket size device that can either be worn, using the attached neck cord, or can simply be placed by the listener's chair.

The receiver includes a headphone socket, on/off switch and volume control and is fitted with two diodes with special lenses to accept the light waves from the



CART MACHINES

THE RUGGED ONES

SERIES 3000

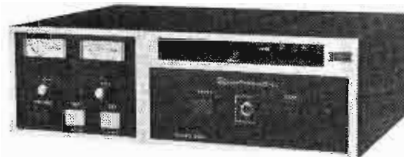
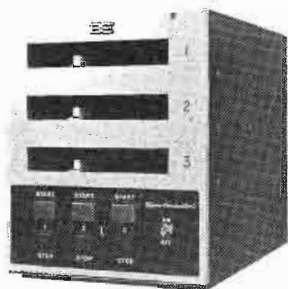
- Auto release deck — massive, quiet operating air damped solenoid.
- Low power consumption — less than 45 watts.
- PHASE-LOK III head bracket — minimizes stereo phasing problems.
- Full range of mono and stereo models for A, B and C size carts.

SERIES 4000

- All the same solid features as the SERIES 3000 with added standard features — microphone inputs, dummy head in record position (on playback models) and many others.
- New styling for the discriminating broadcaster.
- Additional optional features include internal fault/splice detector.

SERIES 5000

- Modular design with fold down front panel and slide out direct drive decks.
- Auto release decks — massive, quiet operating air damped solenoids.
- PHASE-LOK III head brackets — minimize stereo phasing problems.
- Separate electronics for each deck on 2 PC cards.

OVER 40 CART MACHINE MODELS. ALSO AUDIO CONSOLES, AUDIO PROCESSORS, AND STUDIO ACCESSORIES.

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For More Details Circle (50) on Reply Card

transmitter together with indirect (reflected) light waves which are then transmitted to the demodulator circuitry. The IE76 can be used with the Beyer transmitter IS76 or with infrared transmitters of other manufacture.

In addition to these new infrared components being used for television and wireless sound transmission, many other applications are envisaged in the industrial, scholas-

tic and studio fields including musician monitoring.

The IS76 transmitter, in fact, allows connection of various auxiliary transmitters so that even large film studios, etc. can be covered with infrared rays, with less interference problems than with conventional inductive loop systems. Infrared transmission of sound opens the door to many new exciting possibilities.

For More Details Circle (83) on Reply Card

We can help solve your audio cart handling problems.



Five ways.

With the introduction of our new Beaucart audio cartridge tape machines and 2-year warranty, we've solved many of your most common cartridge processing complaints. The models and features you want are available now. Here's how we do it:

1. A breakthrough for multi-slot users, Our Model 4D. Individual motor and power supply for each slot mean continued machine operation when one unit is down for service or adjustment.

2. Our type 10 reproducer is the basic studio machine. For A-size cartridges only, it measures a trim 3½" x 5¾" x 15¾". All models in mono or stereo. It's our most popular cart machine.

3. Companion to the Type 10 reproducer, our compact recorder is optionally available with secondary and tertiary cue. Meter switching for peak and normal levels. Slide-out chassis for easy maintenance. Rack or desk mounting.

4. To handle A, B, and C-size carts, the full-featured Type 20 reproducer is only 3½" x 10½" x 13½". Same features

as the Type 10. High performance, patented Beau pancake drive motor. Silent solenoid and precision head assembly. Unbeatable.

5. To go with our Type 20 reproducer is our Type 20 recorder. It allows manual application of the 1 kHz. cue tone when required for special production formats. A defeat pushbutton prevents application of the cue tone during recording. Plus meter switching, Beau pancake motor, and Beau heads, of course.

Now you've met the whole Beaucart family. And not to take a close look at these competitively priced performers has got to be a mistake. Write or call us for further information. You won't be sorry!

UMC

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For More Details Circle (51) on Reply Card

Audio Monitor/Amplifier

Di-Tech, Inc. has released for production their Audio Monitor/Amplifier, featuring four switchable inputs, VU meter, 10 watt amplifier, internal speaker and an input range from -30 to +30 dBm.

The Model 7001 offers a complete package for the user. In most cases when the audio is monitored, the customer must purchase separate components and then assemble. With the 7001, this build-up is no longer required. As an option, Di-Tech can provide up to seven inputs.

For More Details Circle (84) on Reply Card

ENG Lens

At the recent NAB in Chicago, **Angenieux** introduced the latest in lenses for ⅓" Electronic News Gathering cameras. The 15 x 9.5, 9.5mm-143mm, f/1.8 provides the ENG industry with a lens of maximum capability in a very compact package (approx. 7 inches long and only 2 lbs.). Offering both a long zoom range (15x) and the highest magnification of any ENG zoom lens now on the market, regardless of close focusing distance, the 15 x 9.5 promises to be the standard of the Electronic News Gathering industry.

The 15 x 9.5 zoom lens offers a very wide angle at the minimum focal length of 9.5mm with a 15x zoom range to provide a maximum focal length of 143mm. Of special interest is the ability of this lens to focus down to 24" while still retaining zoom capability. Now, for the first time, it is possible to zoom down to cover a field size as small as 1.02" x 1.42" (26mm x 36mm) while leaving a reasonable working distance of 24" (60cm) between the front lens and the object for proper lighting and camera manipulation.

For More Details Circle (85) on Reply Card

TV Production Audio Console

Cetec Audio has announced its Series 20A Audio Console. The design incorporates systems innovations that allow it to meet the real-time demands of television production, sound reinforcement, and

(Continued from page 74)

N.J., provide all the basic measurement information for consistently meeting performance standards for color and B/W TV systems.

Among the test patterns included in the set are the color registration slide TM-105 and TM-304, the custom high-resolution pattern TM-116 and TM-316, the linear gray scale slide TM-117 and TM-317, and the color fleshtone pattern TM-202 and TM-402. The 100 and 200 series slides are for use with 2" x 2" film chains, slide projectors and direct-coupled equipment. The 300 and 400 series cover the 8" x 10" size employed with Tele-Pat test pattern illuminators II-RS and IV-C.

These test patterns may be obtained on 18" x 24" paper charts for use under normal scene lighting. Also available from Tele-Measurements are test film loops in 20-foot lengths. Model TM-16F is for 16 mm film, TM-36F for 35 mm film. Station identification slides with call letters, channel number and location may be supplied on special order.

For More Details Circle (106) on Reply Card

Modular Multi-Deck Cart Machines

Broadcast Electronics is introducing their Spotmaster Series 5000 multi-deck tape cartridge machines. This series, available in 3 and 5-deck models, features completely modular construction, hinged front panel, slide-out decks, plug-in electronics and ribbon cable for increased reliability, versatility and maintenance accessibility.

According to the company, these machines are designed to withstand the abuse and rigors of continual 24-hour operation and incorporate one-half inch thick slide-out decks, massive air-damped solenoids and a direct drive hysteresis synchronous motor. Both mono and stereo decks have the Spotmaster Phase-Lok III head bracket which assures accurate head adjustment. A standard feature on all models is an audio muting circuit that turns off the audio from any idle deck, keeping unnecessary noise to a minimum.

All decks may operate simultaneously to provide separate outputs, or if desired outputs may be joined together through an audio

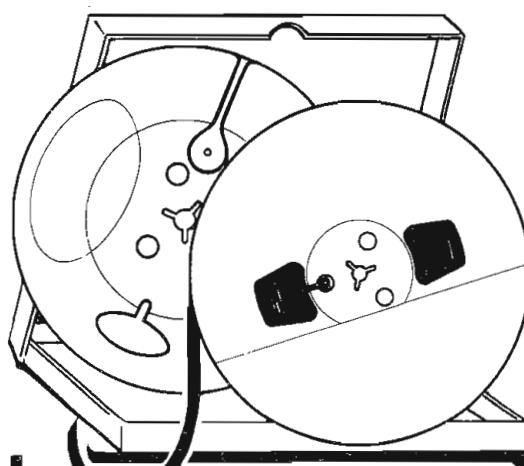
mixer or switcher. A mixer allows for overlap of audio from one deck to the next; a switcher selects an output from only one deck at a time and automatically selects the output from the last deck to be started. Thus, if an operator starts a wrong deck he can immediately start the correct deck and the first deck will automatically re-cue.

An optional recording amplifier available for the 3-deck model allows recording on deck 3 only. This enables a single machine to provide one record/playback deck and two playback decks. Secondary and tertiary cue tones with front panel indicators are also available.

For More Details Circle (113) on Reply Card

FM Peak Maximizer

QEI Corporation has just released technical details of the newest component in their growing line of FM broadcast station equipment. Known as the QEI FM Peak Maximizer, Model 1071, it is an all solid-state peak limiter designed for the prevention of overmodulation. The unit is state-of-the-art, using



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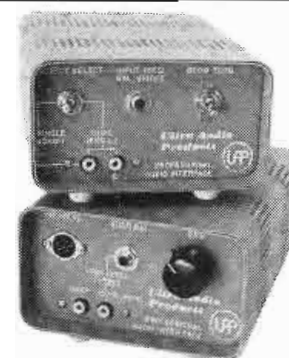
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with the AI-12 Input Interface . . . connects 600Ω balanced lines to hi-z VTR input; and the AO-12 Output Interface . . . converts low-level VTR output to high-level 600Ω broadcast-type line. The PROs provide the right connectors in each part of the circuit; facilitate tape duplicating; permit simultaneous feed to multiple loads; prevent shorting of active audio circuits.



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- AC/DC With Battery Test Meter
- Built In Telephone Dial
- Options In Addition to Those Noted Include: Carrying Case, Microphones, Headsets, Test Tone Generator, Aux Inputs, Phono Cartridge Input and Three Pin Connectors



STATION END CONSOLE

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For More Details Circle (74) on Reply Card

NPN and PNP silicon transistors and diodes.

The front panel is characterized by a minimum of operating controls and indicators: a LED to show when the unit is ready for operation; a pair of input controls for adjusting the depth of limiting as displayed on a front panel meter; a pair of output controls; a release time constant control for varying the release time constant from approximately 3 to 8 seconds, and a pre-emphasis switch for 'actuating' the pre-emphasis circuit. The release time constant control is set for compatibility with the program material. A short time constant is used for top 40 material; a long time constant for classical.

The audio signal is attenuated by the input control to the proper level as observed on the control level meter, a level that represents 10 dB into limiting. Left channel operation and right channel operation are the same. For stereo, the left channel and right channel boards are interconnected to maintain proper channel balance.

For More Details Circle (114) on Reply Card

Wireless Microphone

Thomson-CSF Laboratories introduces a new wireless microphone system that combines unique system and circuit design techniques. The wallet-sized, 14 ounce transmitter can be hidden on the body to provide complete freedom of movement. Design sophistication makes this added dimension feasible for any voice or music application.

The design techniques of this system assure that the amplified sound will be high fidelity without any signs of fading, interference, or channel crosstalk. Fade-free reception is obtained by the automatic diversity switching of two antenna systems for optimum signal selection. Interference-free reception is provided by operation in the relatively wide and unused 947-952 MHz frequency band. Channel crosstalk is virtually eliminated by a combination of high transmitter frequency stability and receiver selectivity.

For More Details Circle (130) on Reply Card

Image-Enhancer

Corning has developed a modular in-line television image enhancer that improves the signal before encoding, thus is well-suited for film chain cameras.

The Series 6200 RGB (red-green-blue) unit improves the apparent resolution, or sharpness, of a TV picture by generating a contour signal from the green channel and adding it to all three channels. The green channel contains the most video information.

Like other Corning image enhancers, the new unit has pluggable modules accessible from the front panel and is easily serviced. They may be removed or serviced while the unit is on-line because of a service bypass mode.

The image enhancer may be used with television signals from any high-quality RGB cameras that lack built-in image enhancement.

Corning claimed that the unit's signal-to-noise ratio of -65dB is the best available in the industry, and is a guaranteed minimum. The image enhancer offers independent control of horizontal detail, allowing precise balance of horizontal and vertical contours. It is rack-mountable, has its own power supply and may be operated by remote control.

Image enhancement restores television picture sharpness lost due to the finite size of the scanning electron beam of the pickup tube. The loss of sharpness appears as a blurring of the horizontal and vertical edges.

A version for use with four-tube (RGB-y) cameras has been designated the Series 6300. In this unit the contour is generated from and returned to the "y" channel. It is identical in all other respects to

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BROADCAST ENGINEERING

ANTENNA IMPEDANCE MEASUREMENTS WITH INTERFERENCE IMMUNITY

The Model SD-31 Synthesizer/Detector Is...

NEW

... designed for antenna impedance measurements in presence of strong interference ■ High-level oscillator compatible with General Radio 916 Series, 1606 Series, and Delta OIB-1 Impedance Bridges ■ Special coherent detector circuit rejects interfering signals during measurements ■ Crystal controlled frequency, variable in 500 Hz steps from 100.0 kHz to 1999.5 kHz

■ Receiver for detector can be external or optional built-in RX-31

■ Powered by rechargeable batteries

■ Self-contained portable package ■ Field proven

■ Versatile — can use as an RF signal generator for troubleshooting antenna systems; as a variable frequency oscillator for antenna site survey; or other applications requiring a precise frequency source ■ Price: \$1250 complete with RX-31 Receiver — \$995 without Receiver.



CONTACT US FOR DETAILS.

POTOMAC INSTRUMENTS

932 PHILADELPHIA AVE.
SILVER SPRING, MD. 20910
(301) 589-3125

For More Details Circle (52) on Reply Card

not provide balanced 600 ohm audio outputs and standard XLR connectors. The TRI unit takes existing high impedance audio outputs from the VTR and converts them to three 600 ohm XLR type outputs. In addition the BAA-1 provides a monitor speaker, VU meter with gain control, plus switchable 10:1 audio compression for overmodulated recordings.

Another feature of the unit is input selector switching for Chan One, Chan Two and "MIX" positions. The design of the BAA-1 is transformerless. Circuits are active direct-coupled both in and out. The price of the BAA-1 is \$675.00.

TRI is a manufacturer of videotape Editing Control Systems, television Time Code Systems and other broadcast production and operating equipment.

For More Details Circle (87) on Reply Card

Tape Timer

As a complement to their extensive Tape Timer line, VAMCO ENGINEERING announces the new Model 771 ENG Cassette Tape

theatre effects—together or separately.

The Series 20A is modular, with four chassis/enclosure sizes available: 2½' with 21 module positions, 4' with 31, 5' with 39, and 6' with 47 positions. The modularity goes beyond the benefits of serviceability or expandability. The operator may plug modules into any position to customize the arrangement for a particular show without affecting their function.

The emphasis is on human engineering and ability to predetermine program content and distribution in order to simplify real-time operation.

For More Details Circle (86) on Reply Card

Balanced Audio For ENG VTR's

Television Research International, Inc. has announced the introduction of Model BAA-1, an audio accessory to work in conjunction with helical VTR's used in Electronic News Gathering.

The Model BAA-1 is designed for use with the Sony VO-2850 Recorder and similar VTR's that do



Jack Hansen, WFMD, Frederick, Md.

Directional Antenna Monitoring Simplified

With the Model AM-19D (210) Digital Antenna Monitor, accuracy is assured and operating cost savings are realized. Now antenna phase angle and loop current ratio readings can be taken by lesser grade operators. The easy-to-read numeric readout provides exact readings and eliminates interpretation errors common with conventional meters. Resolution is 0.1° for phase angle and 0.1% for current ratio.

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For More Details Circle (53) on Reply Card

Timer for the VO-2850/2850A machine types. This timer is designed for the ENG editing stations and includes precise time display, "slow-search" mode and "recue" controls.

An optional edit mode can be provided which automatically performs edits in synchronization with the displayed time. The timer plug-connects into the remote control socket of the machine without modification. VAMCO's Tape Timer line includes types for all quads as well as units for the IVC types.

For More Details Circle (88) on Reply Card

Dual-Channel Spring Reverb

Orban/Parasound announces the availability of its new dual-channel Model 111B Spring Reverb. Featuring the same basic electrical design as its popular single-channel predecessor, the new 111B offers a new bass control and "quasi-parametric" midrange control which permits stepless adjustment of its ± 12 dB equalization range, as well as continuously variable control over center-frequency and bandwidth.

Included in the new 111B is the

unique "floating threshold limiter" which minimizes "spring twang" and provides absolute protection from overload. Also retained from the previous model are line-level balanced outputs and smooth four-spring (per channel) sound.

The Model 111B comes in a standard 19" rack mount and is 3½" high.

For More Details Circle (89) on Reply Card

TV Transmitter Carrier Analyzer

Tektronix announces its new sideband adapter for the analysis of TV transmitter frequency response. This compact, lightweight unit, when used with a 7L12 or 7L13 spectrum analyzer, allows analysis of television transmitter carrier frequencies of up to 1 GHz.

Connected to the 7L12 or 7L13, the 1405 generates a composite video signal, the picture portion of which is a constant amplitude sine wave signal that sweeps from 15-0-15 MHz. When this signal is used to modulate the TV transmitter, the sideband response of the transmitter will be displayed on the spectrum analyzer.

The 1405/Spectrum Analyzer combination can be used to display the frequency response characteristics of RF and IF stages of any VHF or UHF transmitter used today in the world. Six crystal marker positions are provided.

In addition to sideband testing, typically done in a TV station once a week, the 1405/Spectrum Analyzer combination can perform the following tests: log amplitude display of sideband response, in-service testing, spectrum analysis of the transmitter, differential gain measurements, aural transmitter deviation, antenna VSWR (with directional coupler), baseband response, and complete loop testing including STL.

For More Details Circle (90) on Reply Card

Camera Test Pattern Slides

Tele-Measurements, Inc. is marketing a set of Tele-Pat precision test slides for setting up and adjusting television cameras. The slides, designed and manufactured by Tele-Measurements, Inc. of Clifton,

(Continued on page 83)

Reel-to-reel... for real



Exciting things are happening in the reel-to-reel market. And it's all caused by a new machine called the ITC 850 Series. Here is the result of a long series of consultations with broadcasters to determine what they most desired in a reel-to-reel machine. Then we added a few innovations of our own. Truly, the 850 Series is equipment designed specifically with the professional broadcaster in mind. Some 850 features: motion sensing, multi-function edit mode, super quiet operation, automatic tape lifters, TTL logic circuitry, capability of handling dissimilar size reels... and more too numerous to mention here. If you're in the market for something new and vastly improved in reel-to-reel, a **collect** call to us will reveal an interesting story that you may have been waiting to hear. Make the real move to reel-to-reel... ITC. Collect number 309-828-1381.



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For More Details Circle (54) on Reply Card

Commission Continues To Change The Rules

As part of its continuing reregulation of broadcasting, the Commission has made changes in a number of its rules.

In adopting its 11th Reregulation Order, the FCC:

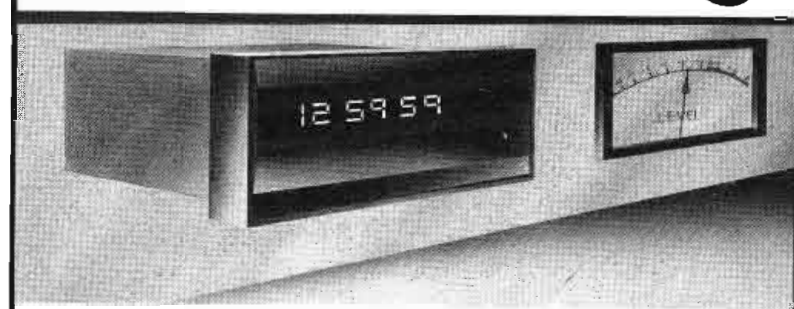
- Corrected its rules concerning AM stations to indicate clearly that static electricity drain and tower lighting components may be installed across the antenna terminals following the point of antenna resistance measurement. Because of changes in procedures for licensing of antenna input power, there is no longer a valid reason for requiring power dissipating elements, when used, to be inserted at a specific point in the antenna circuit.

- Deleted the requirement that AM stations operating by remote control using an approved antenna sampling system and type-approved antenna monitor must make antenna monitor readings at the transmitter site every second day for each directional antenna pattern. (On February 4, 1976, the Commission adopted a new rule Section 73.68 which established standards for the design, installation, and approval of sampling systems for antenna monitors used by AM broadcast stations with directional antennas.) Since stations operated by remote control, using an approved sampling system with a type-approved antenna monitor, would have reliable indications of the antenna parameters at the control location, there appeared to be no need to continue to take antenna monitor readings at the transmitter site every other day.

- Clarified rules to specify that AM stations, using directional antennas, operating when the antenna monitors are out of service for repairs, must read and log base currents of remote base

currents once each day for each mode of directional operation. (This clarification conforms Section 73.69 to the newly adopted Section 73.68.) Section 73.69 was also clarified to specify that new measurements are to be compared to the last complete proof of performance taken not to the last adjustments of

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console mount clocks and timers

Reliable ESE clocks and timers are now available in compact (2" x 3.7" x 3.6") console mount enclosures with bright easy to read .33" red LED's. Provided with rear solder pins for connection to your own switching or the optional remote connector, 6' cable and pushbutton set. Other options include: BCD Output; Crystal Timebase; 220V-AC-50Hz; and Kit Form. In addition the ES-370 is available with Stop and/or Relay Contact Closure at Zero.

ES-172 12 Hour Clock	\$125.
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ES-370 100 Min. Up/Down Timer	\$180.
ES-570 60 Minute Timer	\$125.
ES-572 12 Hour Clock/Timer	\$150.
ES-574 24 Hour Clock/Timer	\$150.



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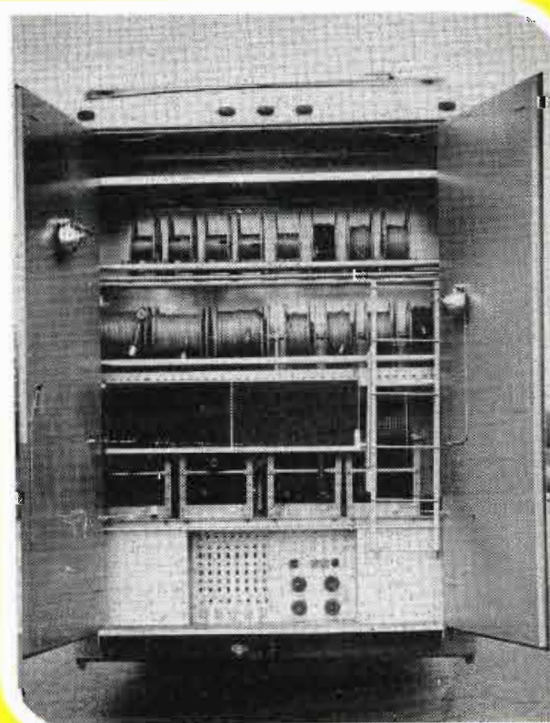
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the antenna, since such adjustments can be made at any time without requiring full proof measurements.

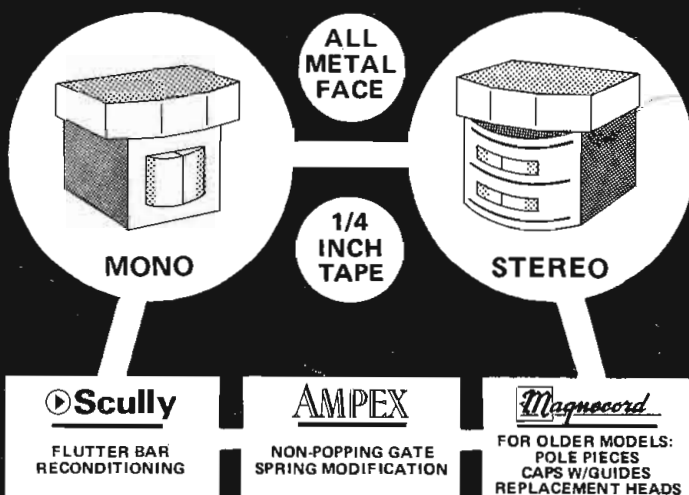
- Permitted station licenses to be kept in binders or in file folders at the control point as an alternative to affixing them to the wall. (Since 1974, the rules have permitted operators' licenses to be kept in this manner.)

- Removed anomaly in the maintenance log rule which requires that direct controlled stations using type-accepted antenna monitors must make more frequent base current measurements than remotely controlled stations.

- Refined the rules regarding skeleton and partial proofs of performance and added a new section to the rules describing the requirements. (The terms "skeleton proof of performance" and "partial proof of performance" were originally coined by the Commission staff to describe the procedure to be

The changes, which amend Part 73 of the rules, become effective July 8.

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BROADCAST ENGINEERING

the Series 6200 RGB enhancer. Both units will be available in production quantities in September. The Series 6200 RGB enhancer is priced at \$3650, the Series 6300 unit, \$3700. Additional information is available from the Memory Products Department, Corning Glass Works, 3900 Electronics Drive, Raleigh, N.C. 27602.

For More Details Circle (115) on Reply Card

Color TV Projector

A new, versatile color television unit able to project images of up to 40 x 53 feet with minimal distortion is now available from **Conrac Corporation's** Datex Division.

Known as the Multi-Standard Color Eidophor®, the Swiss-made projector is available in two configurations. The Model 5170 has a light output of 3600 lumens, while the high intensity Model 5171 features 7000 lumens, permitting the projection of more than 2100 sq. ft. of TV picture.

Using integrated circuitry, the projector can process videosegments

originating from PAL, NTSC or SECAM color systems, as well as signals from higher line rate systems. The 5170 and 5171 can process signals of up to 1029 lines, 50 fields/second; or 945 lines, 60 fields/second.

Eidophor projectors have found wide use in such applications as education, sports, entertainment, command and control, conventions and meetings, or wherever real time information must be presented to larger groups. Eidophor projectors are the only units capable of projecting TV pictures of theater screen size.

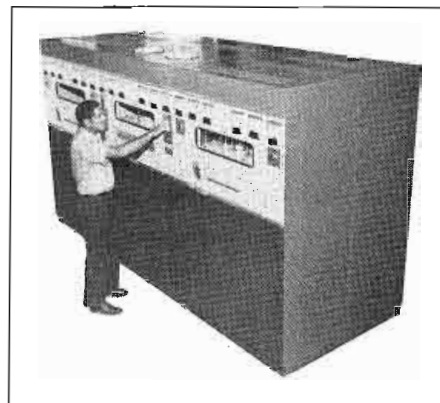
The 5170 series is equipped with a comprehensive, easily operated, remote alignment and control panel. Projector and electronics cabinet can be positioned separately, increasing installation flexibility.

A selection of projection lenses permits varying the ratio of picture width to projection distance within a range of from 1:2 to 1:10. This makes possible the optimum picture size and projector positioning.

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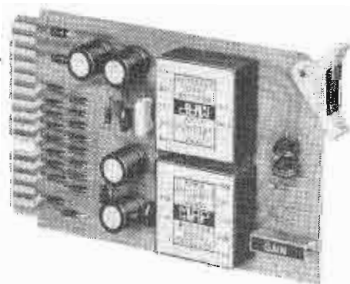
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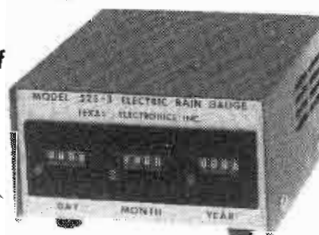
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Electric Rain Gauge

Model 525

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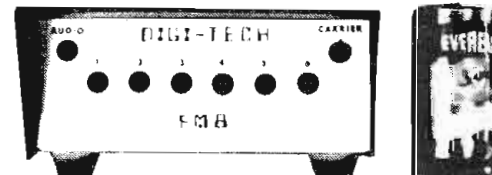


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Monitors automation from control room or traffic desk. LED's indicate end of music tape, carrier failure, and audio failure. Connects easily to any existing automation system. Eliminates lost air time . . . Eliminates human error. Low current consumption. 12 volts D.C. 6 function indicators, with both audio and carrier indication. Easily modified if you need additional functions.



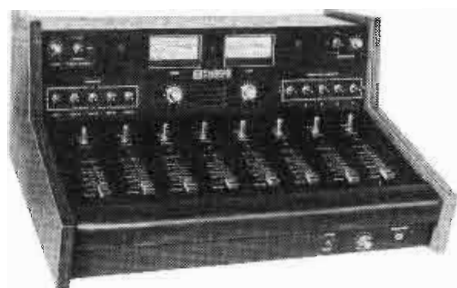
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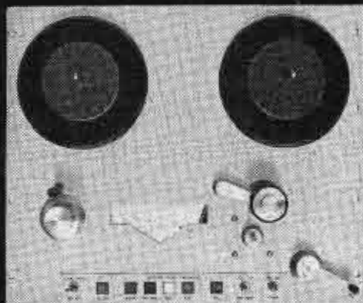
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86 For More Details Circle (69) on Reply Card

(Continued from page 16)

1100 R Receiver. (Lance Raygor, Chairman, Route 1, Box 337, Chisago City, Minnesota 55013, (612) 373-4807).

Chapter 18: Philadelphia, Penn.

The April meeting of Chapter 18 featured a presentation and demonstration on a "Synthesized Animation Unit for Television" by Ralph Weidner of BJA Systems, Inc. (Larry Will, Chairman, New Jersey Public Broadcasting Authority, 1573 Parkside Avenue, Trenton, New Jersey 08638, (609) TV2-5252).

Chapter 20: Pittsburgh, Penn.

Chapter 20 of the Society is sponsoring a Regional Convention and is promoting attendance from Western Pennsylvania, West Virginia and the eastern half of Ohio. All radio and TV broadcasters, school officials, close-circuit, cable, and people from allied fields who are interested in radio and TV equipment are invited to attend—free of charge. Last year's SBE Convention was declared a huge success by all that attended. The exhibit area will

contain displays from many of the same manufacturers who were at the NAB in Chicago.

The Convention will be held on October 22, 1976 from 11 a.m. until 9 p.m. at the Howard Johnson's Motor Lodge, Monroeville, Pennsylvania (adjacent to Pittsburgh). For information call Roy Hoover, KDKA, 412-391-3000 Ext. 209 or Paul Stewart, KDKA, 412-391-3000 Ext. 303. (James Hurley, Chairman, WTAE-TV, 400 Ardmore Boulevard, Pittsburgh, Pennsylvania, 15230, (412) 242-4300).

Chapter 21: Spokane, Wash.

On May 24th, Chapter 21 held its meeting at the studios of station KWSU-TV in Pullman, Washington. After a pre-meeting dinner the chapter toured the radio and television facilities of the station. A short television tape, furnished by RCA, was shown comparing the TK76 to the TKP45 color camera. Also discussed were the problems KWSU-TV had with the environmentalists when it was decided to move its television transmitter facility to Kamiak Butte. (T. O. Jorgenson, Chairman KXLY-TV, West 500 Boone Avenue, Spokane, Washington 99201, (509) 328-9084).

Chapter 22: Central New York

Chapter 22 met on May 20th at the Northway Inn to hear Randy McCallister and John Shipley of RCA explain and demonstrate the AM stereo system developed by RCA.

The June meeting consisted of a demonstration of the Harris automation system 90 in use at WSYR-AM/FM/TV. After summer vacation, General Electric will be the

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host in September for a program on precise frequency measurement and calibration at the Electronics Laboratory. (Gary Hartman, Chairman, 3285 Genesee St., Syracuse, New York 13214, (315) 446-8667).

Chapter 25: Indianapolis, In.

The chapter met on May 13th at the WRTV studios to hear Bob Winn of RCA give a very interesting talk about TV transmitters and other new developments from RCA.

The June meeting was held at the Indiana University School of Nursing on June 3rd. The program was "PLATO"—Computer Controlled Graphics and Computer Assisted Instruction. (Dwight MacPherson, Chairman, c/o IU School of Dentistry (Room 506), 1121 West Michigan Street, Indianapolis, Indiana 46202, (317) 264-7133).

Chapter 34: Albuquerque, New Mexico

Election results were tabulated at the April 23rd meeting and the officers elected to lead the chapter were Chairman: Mike Langner, Chief Engineer, KRKE; Vice Chairman: Dan Martin, Chief Engineer, KDEF; Secretary/Treasurer: Don Flaig, Engineer, KOB.

On May 11th the chapter met to hear Pat Ward of MITS, Inc. speak on "Micro-computers and How They Apply In The Radio Field." The subject was timely since many broadcasters are turning to automation for economy, consistency in programming, improved efficiency and accuracy through automatic logging and billing. (Mike Langner, Chairman, KRKE, 1410 Coal Street SW, Albuquerque, New Mexico, (505) 765-5600).

Chapter 36: San Diego, Calif.

On April 28th microwave equipment for STL's and Electronic News Gathering Systems was demonstrated by Bruce Jennings, Marketing Manager for Terracom, a local manufacturing company of microwave equipment.

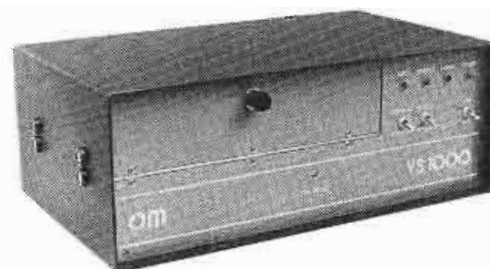
The nominating committee placed the following names before the chapter: Chairman: Chris Rager; Vice Chairman: Dick Warren; Secretary/Treasurer: Mary Zoller; Board of Directors: Bob Boullo and Jack Williams. (Bill Montgomery, SBE, 6841 Convoy Court, San Diego, California 92111, (714) 566-8080).

Kansas State Chapter

On April 13th Sherwood Parks, manager of KINA, Salina Kansas, showed and gave his presentation on the history of Kansas Broadcasting and the technical aspects of XER and XER-A in the 30's. Parks had just returned from giving his presentation before the FCC's Commissioner's meeting in Washington, D.C. He received promises of donations of antique mikes from several engineers present.

Oren Turrentine, Communications Officer for the Kansas Department of Emergency Preparedness, spoke on the past, present, and future needs of the viable Emergency Broadcast System plan for the state of Kansas.

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KBWD's Jim Laird explains what Precision Monitoring can add to broadcast capability



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On Selecting TFT

"... when you've got an opportunity to buy the best, why not go for it. I've been reading the broadcast books for a long time, and it seems that TFT gear is a cut above the rest. You get what you pay for, and they (TFT) just put a lot more into the system."

On Coverage

"... TFT gives us the extra edge we need so we can use our transmitter to its maximum ability without worrying."

On Accuracy

"... very darn good when it comes to proof of performance. If I have an error, I look at the transmitter, not the TFT monitor ... I have the utmost confidence my TFT is telling the truth."

On Design

"... they seem to be more easily operated as far as the way you set the thing up. And the fact that they can be located right here at the studio is one thing we really like."

On The Frequency and Modulation Monitor

"... FM was a new adventure for us, and I needed good readout of our pilot. The TFT 723 was right on the money then and we're using it all the time now."

On The FM Stereo Monitor

"... It does have the extra human engineering to make it easier to operate. I feel the thing is considerably more stable than others too."

On Confidence

"... well, we got our FM gear based on our experience with the TFT AM monitor. Now, after checking out the FM, I envision having TFT at all the stations we own."

On Price

"... sure it costs more, but even if I'd been on a tight budget, I wouldn't have scrimped on the TFT monitors ... it's the only way I can keep my transmitter honest ... do everything I want it to do and get a little bit more out of it."

On Engineering

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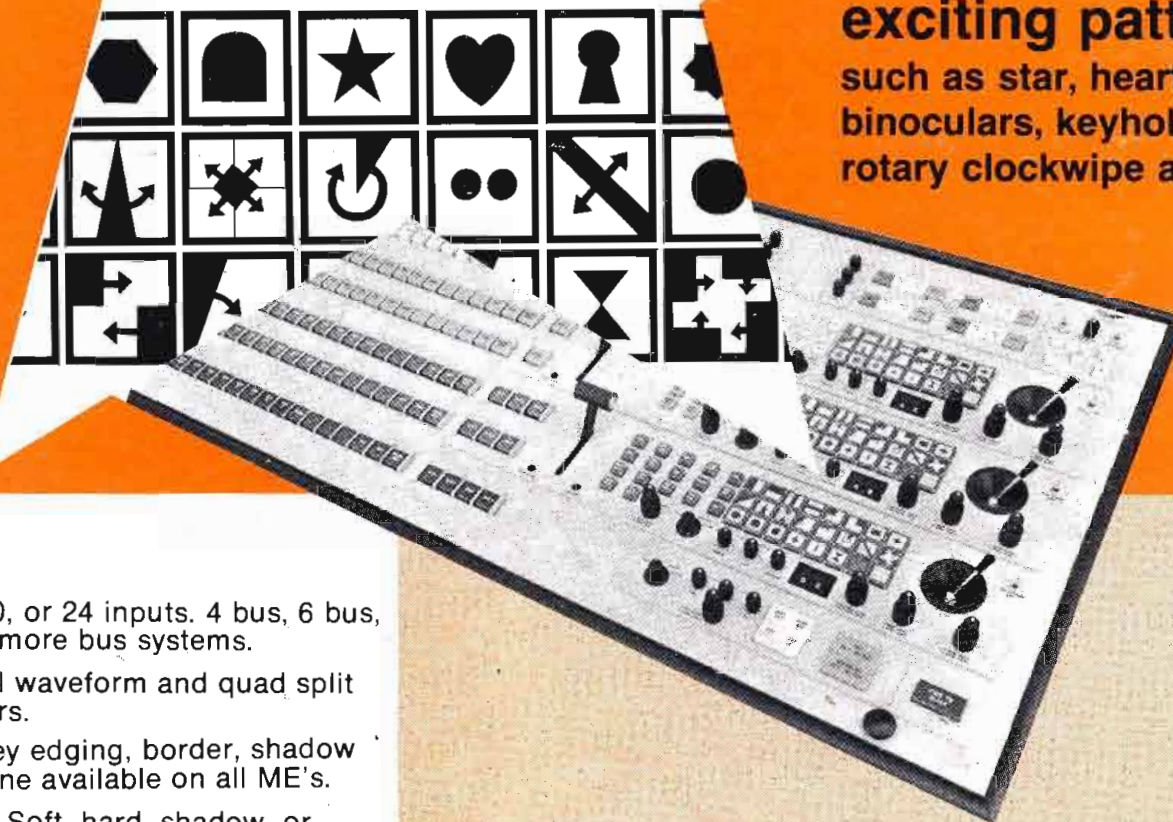
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