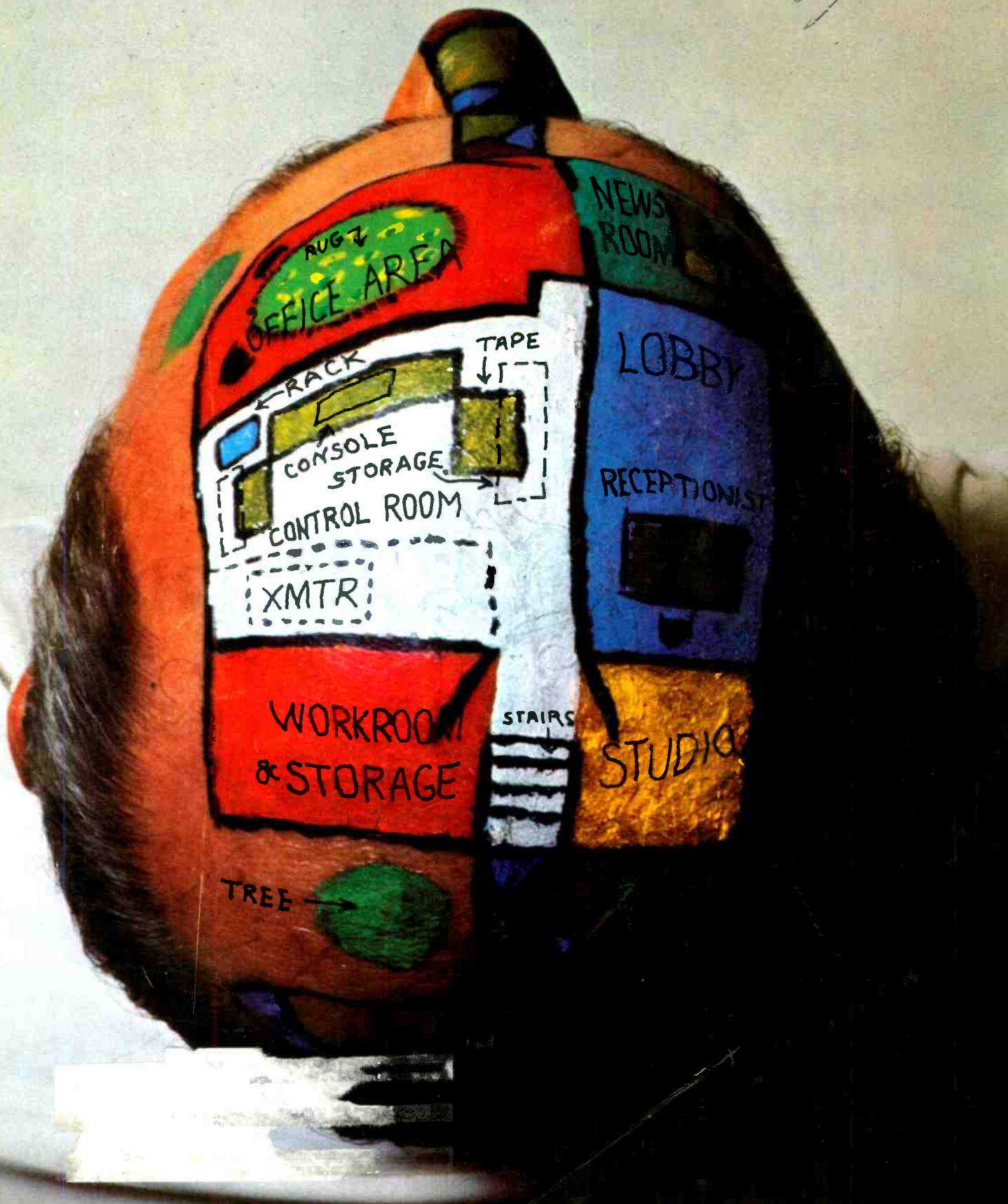


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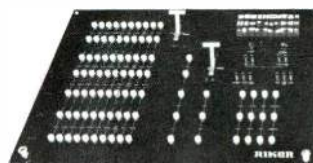
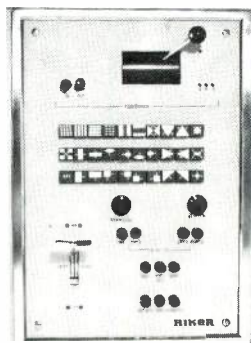
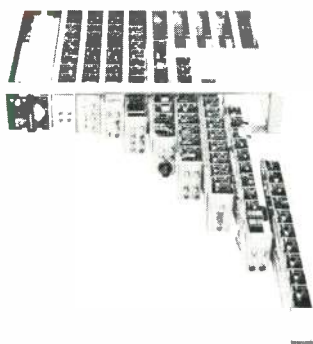


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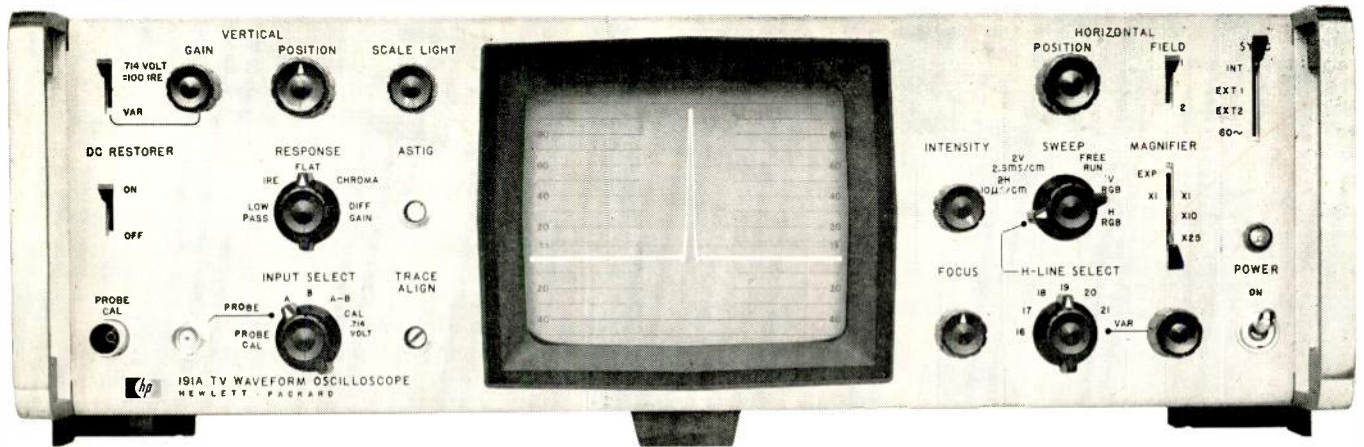
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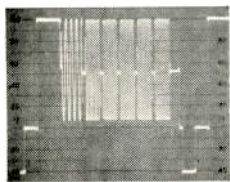


# All-Solid-State Scope Gives 1% Measurement Accuracy!

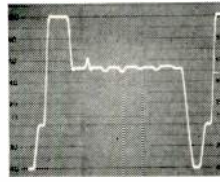


Sine-squared T/2 pulse in Flat Response position magnified X25.

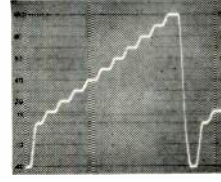
## IMPROVE BROADCAST QUALITY—MAKE ACCURATE, RELIABLE VITS AND COLOR SETUP MEASUREMENTS



Multiburst signal accurately displayed using Flat Response Position of vertical amplifier, gives frequency-gain characteristics.



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Stairstep levels shown in Low Pass Response position. Deviation from designated values indicates compression.

Continuous monitoring of your broadcast operation with 1% measurement accuracy; easier, faster, more precise setup of cameras and recorders; and high speed trouble-shooting are yours with the all-solid-state hp Model 191A TV Waveform Oscilloscope! Now you can update your system for color. This scope is designed to meet today's requirements and tomorrow's demands! It now is the standard of interstate transmissions—and will be your standard to measure incoming video signals.

### CHECK THESE FEATURES:

High tolerance filter design plus the parallax-free internal graticule CRT combine to give you 1% measurement accuracy. The 191A has a vertical amplifier with an extremely wide bandwidth to allow exact response shaping with five filters including Flat, Low Pass, IRE, Chrominance, and Differential Gain—without introducing any phase distortion into your signal. CRT is large 7 x 10 cm with a 20 kv post accelerator drive to provide bright, easy-to-see traces, including low duty cycle T/2 sine-squared signals—even in brightly-lighted control rooms.

You get the reliability of all-solid-state construction. All components, except the CRT, are solid-state, to allow low power consumption (only 70 watts) and convection cooling. *No ventilating fan is needed!* Solid-state components also means the 191A is rugged and can be used either in control rooms or for remote broadcasts. Model 191A maintains 1% measurement accuracy from +15° to +35°C (59°F to 95°F)—and still gives 3% accuracy at the ambient temperature extremes of -20°C and +65°C (-4°F to +149°F) for remote broadcasting accuracy.

Positive, digital Field-Select is insensitive to noise, and syncs to the right field every time without adjustment because of computer-type circuitry. You *know* which field you're examining! Line-Select system is discrete for lines 16 through 21 for quick, easy viewing of VITS. Variable-Select lets you manually select any line. Five sweep modes allow optimum examination of the entire composite TV signal, individual lines, video setup and color setup. Free Run and WRGB sweep modes facilitate signal level measurements and color setup.

You can switch rapidly from normal operating mode to check calibrated gain or to check VITS without resetting scope. With the 10' accessory probe connected to the front of the scope you get high-speed accurate trouble-shooting without interfering with the feed-through broadcast signals!

To see how the hp 191A TV Waveform Oscilloscope can improve your broadcast quality and to get full specifications, call your nearest hp field engineer. Or, write to Hewlett-Packard, Palo Alto, California 94304; Telephone (415) 326-7000; Europe: 54 Route des Acacias, Geneva. Price: hp Model 191A Oscilloscope, \$1475.00; hp Model 10009A Probe, \$50.00. This oscilloscope is also available as hp Model 193A for telco interstate television signal relayers. Price: hp Model 193A, \$1350.00.

106A R

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This month's cover: Body painting's the "in" thing; ergo a station floor plan on the scalp, which helps ideas sink in by osmosis. Floor plan was painted by Art Sudduth and photographed in Living Color by Greco White. The shooting was produced by Walt Mesaros and directed by Al Beckemeyer. For full-face view of the scalp, see the July 1967 *BM/E* cover. For more information on station planning and modernization, see pages 30-46.

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# BROADCAST INDUSTRY NEWS

## NAEB Shaping Up Big

"Educational Broadcasting and the Fifth Freedom" has been selected as the theme for the 44th annual convention of the National Association of Educational Broadcasters scheduled November 19-22 at the Sheraton Park Hotel in Washington, D.C. The "Fifth Freedom" was defined by President Johnson as freedom from ignorance in his Education Message to the Ninetieth Congress.

In that message, President Johnson stated that freedom from ignorance "means that every man, everywhere, should be free to develop his talents to their full potential, unhampered by arbitrary barriers of race or birth or income." NAEB President William G. Harley said that the role educational broadcasting can play in assuring the maximum development of the Fifth Freedom concept will be explored at the annual meeting.

Harley announced that the exhibit space for the convention, approximately 75 percent greater than the space used at the NAEB's Denver convention last year, is virtually sold out. At press time, 61 equipment manufacturers have contracted for space. At last year's meeting, 3500 broadcasters ogled

165 booths representing 66 exhibitors.

The formation of two committees to examine the role of educational broadcasting and employment practices concerned with minority groups also has been announced by Harley. Both committees will report on their findings and make recommendations to the NAEB Board of Directors, which, in turn, will report to the full NAEB membership.

## FCC Proposes Change of I-D Rules

A notice of Proposed Rule Making to simplify, clarify, and update the rules for station identification of standard and fm broadcast stations by amending Sections 73.117 and 73.287 has been adopted by the FCC. The proposals, advanced by CBS and Storer Broadcasting, would retain the present requirement for station identification at the beginning and ending of each time of operation, during operation, within two minutes of each hour and half-hour. They would eliminate the provision for quarter-hour identification now permitted in lieu of the half-hour announcement.

The proposed FCC action would

make corresponding changes where appropriate in the station identification rules of Section 73.587, governing noncommercial fm stations, Section 73.652, covering TV stations, and Section 73.787, covering international stations.

The FCC proposal includes reclassifying programs currently exempted from standard station identification requirements. These exempted programs presently are permitted to defer i-d announcements until regularly due, and at the end of the program. Under the proposal, the categories would include: a single, continuous public affairs, religious, or instructional program, concert, drama, or athletic event; or any other type of production whose interruption for station identification would objectionably break program continuity essential to the value of the program to the audience.

Interested parties may file comments by September 9, 1968, and reply comments by September 24, 1968.

## SMPTE Names Program Chairman

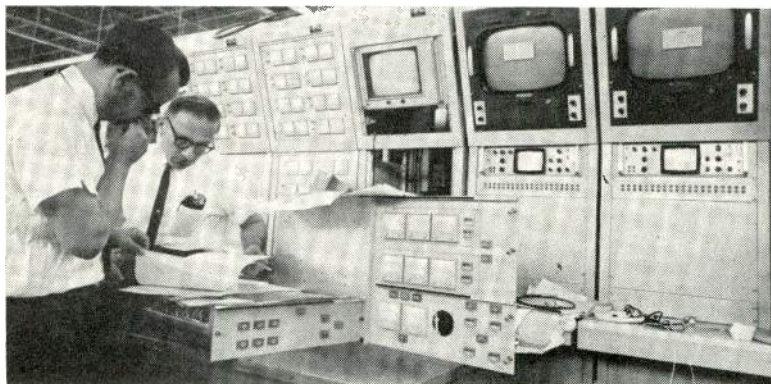
E.D. Llerena, Eastman Kodak Co., Washington, D.C., has been named program chairman for the 104th Technical Conference of the Society of Motion Picture and Television Engineers, according to an announcement by SMPTE Conference Vice President E.B. McGreal. The SMPTE Conference is set for the Washington Hilton, Washington, D.C., November 10-15, 1968.

## Half 890-942 MHz For Land Mobile Use

The Television Board of Directors of the National Association of Broadcasters recently urged the FCC to allocate for Land Mobile use 26 MHz of spectrum space which the U.S. Government recently made available.

The space, from 890 to 942 MHz, adjacent to the upper end of the uhf television frequencies, was released by the Office Telecommunications Management fol-

## W.Va. Satellite Station Gets Final Checks

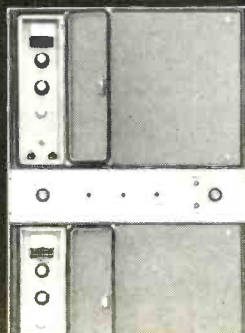


Final check of ground communications equipment (GCE) for Communications Satellite Corporation earth station at Etan, West Virginia, is made before shipment from Raytheon Company's Communications and Data Processing Operation, Norwood, Massachusetts. The GCE equipment, part of the Intelsat communications satellite network, will carry multichannel telephone, facsimile, telegraph and data transmission circuits as well as international television.



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Losing money on interrupted programming? Don't!  Switch to the ultra-reliability of dual STL microwave TV systems . . . total solid-state B-Line fixed links from Microwave Associates.  Performance like nothing you've seen or heard before. Superb color, sharp images, audiophile sound, unbeatable reliability. Plus double protection . . . from solid-state circuitry and highly dependable hot standbys.  Other bonuses too. Solid-state RF sources instead of klystrons . . . no tube replacement costs, no bulky power supplies, no heating problems, no harmful voltages.  Interested? B-Line dual STL's (and TSL's) are in volume production for 2, 7 and 13 GHz auxiliary broadcast bands. With options like multiple-channel audio, automatic hot-standby switching, accessories, and complete RF system engineering assistance. Write or phone for details. (617) 272-3000.  Have the last word!



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lowing a review of government spectrum needs. James D. O'Connell, OTM director, said half of the band—or 26 MHz—could be made available by the FCC for nongovernment use.

The Television Board said allocation of the 26 MHz could be used to relieve pressures being brought by land mobile users who claim there is a shortage of frequencies to meet their needs.

## Erp Announcements Should Be Accurate

Inquiries and comments have recently been received by the FCC indicating that some fm broadcasters are improperly announcing authorized effective radiated power (erp). While Commission rules do not require on-air announcements concerning station power, when such announcements are used they should be delivered as accurately as possible.

The problem usually arises when an fm station changes its antenna system to add vertical polarization. Expressions of authorized erp as the sum of the vertical and horizontal planes are misleading and, as such, contrary to Commission policy.

## Hartford Pay-TV Gets Extension

A request by RKO General, Inc., for a three-year extension of its authorization to conduct trial subscription television operations over station WHCT, Hartford, Conn., has been granted by the FCC, effective June 29.

If the Commission terminates the Subscription TV Rule Making Proceeding before the end of the three-year period, it may also act to terminate authorization at the same time.

The request was opposed by the Connecticut Committee Against Pay-TV, a group made up of theater owners and others.

At the request of a House Committee, the FCC is holding up action on its Fourth Report until November 16, 1968, or until the Communications Act is amended to make provision for subscription television. The Commission therefore stated, "In view of the matter it would appear to be in the public interest to continue the Hartford trial operation so that current information might be made available if needed."

## WNYC Granted Permission for Tests

The City of New York Municipal Broadcasting Service, licensee of WNYC-TV, channel 31, in New York City, has been granted a 90-day special temporary authorization by the FCC to conduct tests on channel 77, designed to examine the feasibility of using uhf translators to improve television reception in the New York City area during the World Trade Center construction.

Under the direction of Commissioner Robert E. Lee, a Commission investigation last summer revealed that interference, now estimated to extend over a period of eight months, would occur when the World Trade Center buildings reached a certain height—blocking, to some extent, transmission from the Empire State Building tower.

Seymour N. Siegel, director of Radio Communications for the City of New York, in making the request, said that engineering studies indicated that uhf service could be provided to most of the predicted interference areas through use of a single translator station for each transmission station. The translators with a power of 1 kW, would be mounted on the Empire State Building. For test purposes a spare WNYC-TV transmitter would be retuned to channel 77 and would transmit programs of WNYC-TV and other New York City stations. Field intensity measurements would be made in conjunction with the broadcasts to determine the engineering coverage of the transmissions.

## IBS Organizes Press 'Confrontation'

International Broadcasters Society is organizing Europe's first major interdisciplinary "confrontation" between radio, TV and press people . . . Scheduled for August 30 through September 1, the three-day "1968 Radio-TV-Press Exhibition is open to mass media professionals from all countries.

## IVC Markets NTSC Camera for \$18,500

A broadcast version of the IVC-100 color television camera, priced at \$18,500, one third the cost of any broadcast color camera now in use, has been placed on the market by International Video

Corporation.

Donald F. Eldridge, IVC president, said the color camera offers many of the features of the larger, more expensive cameras that cost from \$60,000 to \$80,000, produces an NTSC color signal, and meets all FCC requirements for color broadcasting.

The new version of the IVC-100 is designed for a wide range of applications in commercial, educational and community antenna broadcasting. All the equipment required to make the camera immediately broadcastable including external color encoder, cable, studio junction box, remote control and 6:1 zoom lens is included in the \$18,500 price. An EIA color sync generator, standard equipment in most television stations, is available for \$1500. Weighing 67 lb, the camera is easily carried by one person.

Chief factor in the substantial price differential is the use of three vidicon tubes, rather than Plumbicon or image orthicon tubes, and a simplified optical system. The camera's sensitivity is such that quality color pictures can be obtained in illumination levels of 300 ft candles. Camera has a resolution of 400 lines at the center and corners. The IVC-100 has only a maximum of 28 internal setup adjustments.

## Reeves Develops 24-Frame TV System

Video engineers at Reeves Sound Studios have developed a practical 24-frame per second color television film system. The system solved the problem of shooting television receivers with standard film cameras by eliminating the picture flicker and phase bar interference which has always plagued filmmakers. It enables unrestricted camera movement over the entire scene while pretaped sequences are being shown on the television receiver.

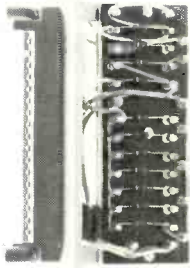
The system has a wide range of applications in both the television and feature film fields. It is particularly significant for producers of television receiver commercials. Producers can now shoot with standard film cameras and complete artistic freedom scenes previously possible only with videotape.

The system, developed by a team of engineers headed by Joe Kiss, is available from Reeves on a rental basis.

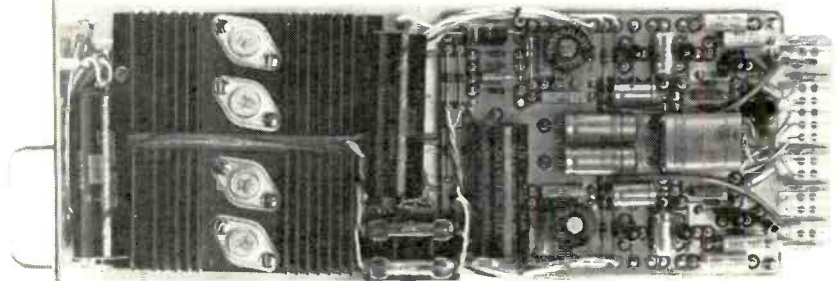


# audio DA

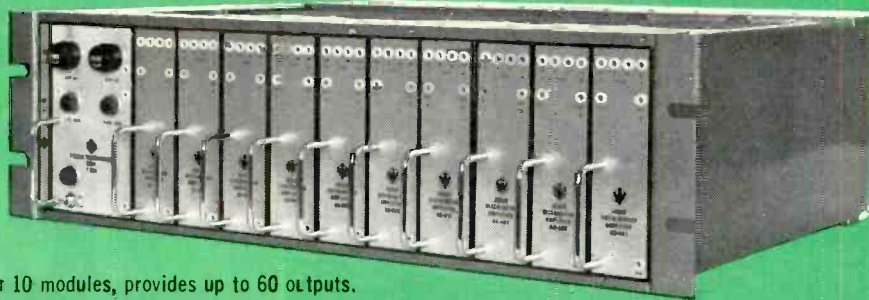
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Plug-in rear assembly contains all connections and pads for matching or bridging input and (6) outputs.



Solid-state AA-601 Audio Distribution Module provides 6 outputs at +24 dbm -600 ohms balanced, or other combinations, as required. Modules can be added to system as requirements grow.



5 1/4" x 19" Frame, with 10 modules, provides up to 60 outputs.

- Most compact audio distribution system—no external pads—no output transformers.
- Easily customized for individual requirements—easily installed by merely wiring input and output lines.
- High isolation between outputs minimizes crosstalk, 60 db or better across entire audio band width.
- Response  $\pm 0.25$  db 30-15,000 cycles — less than 0.5% harmonic distortion.
- Proven by continuous performance in a wide range of application in U.S. and overseas.



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**FCC's Jurisdiction Over CATV Affirmed, CATV Wins Copyright Case**

Decisions handed down on June 10 and June 17 have already gone down into CATV history. The Supreme Court's unanimous landmark decision on FCC jurisdiction, written by Justice John M. Harlan, indicated that: 1) the appeal of an FCC cease-and-desist order won by Southwestern Cable was overruled, 2) emphasized the necessity of regulating the cable industry for the protection of broadcasting, 3) cited a very high probability that CATVs are engaged in interstate distribution of signals, 4) iterated the history and interpretations of the Communications Act and the Commission's role thereunder with respect to CATV, and 5) affirmed the Commission's authority to limit further expansion of CATV in the San Diego area while it studies

CATV's affect on local broadcasting. Justice Byron White wrote a separate opinion, concurring with the majority decision, but stating his . . . route is somewhat different . . . Justice White cited provisions other than those cited by the other Justices to arrive at the same conclusion. He went on to say "the Commission should also be able to prevent a third party from disrupting Commission-licensed broadcasting in the San Diego market."

The Court cited the fact that the entire character of the cable industry has changed from providing a mere antenna service to bringing signals from hundreds of miles away into well-served areas. These changes, it said, require FCC regulation for the protection of broadcasting.

Dispelling the Commission's impression that its jurisdiction over CATV was limited by the Communications Act of 1934, the Supreme Court borrowed the phrases "broad power" and "single Government agency" with "unified authority" and "regulatory authority over all forms of electrical communication . . ." from President Roosevelt's 1934 messages to the Congress.

**Copyright Victory**

Balancing the somewhat restricting, though not unexpected, ruling on FCC jurisdiction, the Supreme Court gave cable TV a complete victory and a shot in the arm by absolving the industry of all responsibility for copyright infringement just a week after offering FCC jurisdiction of CATV. Mr. Justice Stewart delivered the 5-1 opinion of the Court. The word "performance" used in the case made by United Artists proved a hinge on which the issue turned. The Court reversed the lower U.S. Court of Appeals for the Second Circuit, ruling that since "CATV systems simply carry, without editing, whatever programs they receive," cable systems fall on the audience side of the 1909 Copyright Act. The majority opinion added that "it is clear that the petitioner's system did not 'perform' the respondent's copyrighted work in any conventional sense of that term or in any manner envisaged in the law in 1909."

The Court contrasted the roles of broadcasting and the cable industry and likened CATV's role to that of an individual with "the only difference in the case of



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ARE IN,  
IF'S  
ARE OUT!**

These 3 Important Accessories  
Help Make Your TR-66A More  
Useful





CATV is that the antenna system is erected not by its users, but by an entrepreneur."

### Reaction to the Court's Decision

In the wake of CATV's landmark Court decisions, General Instrument, TelePrompTer and Ameco registered substantial stock gains: General Instrument (owner of Jerrold) was up \$4 to \$57.63 a share, TelePrompTer was up \$4.25 to \$35 and Ameco gained \$1.13 to close at \$11.50.

See Report on Page 13 for complete industry reaction to the Court's decisions and NCTA convention coverage.

### FCC Requires Certificates of C&N for Leaseback Systems

Another important date in NCTA history is June 26. On that date the FCC decided that the Commission has complete authority over leaseback systems built by telephone companies. The Commission now requires telcos to obtain "certificates of public convenience

and necessity" to cover what they've already built, and to prove the public will be served before construction may be resumed.

NCTA immediately issued a statement lauding the Commission's decision: "The cable television industry applauds [the] action requiring telephone companies, under Section 214 of the Communications Act, to obtain certificates..."

"The Commission's action imposes a rein on phone company activities in CATV, the need for which was underscored by a recent decision of the New York Supreme Court. That decision, now being appealed, held that a leaseback operator utilizing underground telephone lines is not required to obtain a city franchise—at least not in New York City.

"It is gratifying to learn that the FCC has not allowed the pressing need for regulation in this area to go unmet," NCTA said.

Subsequent to the June 10 ruling by the Supreme Court, the FCC restricted San Diego CATV systems operating within Grade A contours of the San Diego market television stations against importation of Los Angeles television

signals. The Commission took the action on June 28 in a decision prepared under the supervision of Commissioner Robert E. Lee.

The Commission agreed with its hearings examiner, permitting the systems to originate programs on the grounds that CATV local affairs originations would not be harmful and would add to diversification of local viewpoints. It noted, however, that "extensive and widespread" origination raises questions as to the effect on TV broadcast service caused by siphoning off program material, loss of broadcast advertising, concentration of control of media, responsibilities under equal time, fairness and sponsorship identification requirements.

The Commission said that a test of unrestricted origination without commercials in the CATV market "would provide valuable information and insight as to its potential and would not unduly prejudice existing and potential broadcast service in the San Diego area." The prohibition against commercials was included in the decision to avoid the "adverse effect of CATV competition for available advertisers" on uhf stations.

## McMartin New TR-66A Multiplex Receiver has no tuned circuits

In the multiplex field McMartin was first with heterodyning, and solid-state . . . and is now first with solid-state IF's and integrated circuits—those tiny silicon wafers first developed for rocketry and computers. The jump from transistors to IC's is as big a leap as from tubes to transistors.

The solid-state IF strip is invulnerable. There

are no "moving parts," nothing to "diddle" with. Dropping or jarring won't damage it. Temperature changes cannot affect performance. With Field Effect Transistors used in the RF section, overloading is no longer a problem. Thus, there is no cross modulation.

Before ordering your TR-66A's, be sure to read about the valuable accessories below.



**A** The LT-20 is a compact modular transistor amplifier with 12 watts of clean audio power. It fits into the octal plug on the TR-66A chassis.

**B** The LT-10A transistor amplifier is about half the size of the LT-20 and delivers 5 watts of clean audio power. It also plugs into the receiver chassis.

**C** The MPA-20 microphone pre-amplifier is a very small, unique plug-in device which permits low impedance microphone to be driven through either plug-in amplifier or through a power amplifier.

Order your TR-66A's and accessories today!

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### FLEXIBILITY

- 4 switch-selectable inputs: hi-level/mike/equal phone cannon XL connector/barrier strip input
- External studio and local speaker.
- P. A. output (public address).
- Muting relay contacts on barrier strip

### ELECTRONICS

- Etched-epoxy circuit board
- Plug-in silicon transistors
- 4 preamplifiers (each normal on equal RIAA phono)
- 1 program amplifier
- 1 monitor amplifier
- Speaker muting relays for local and studio speakers.
- May be strapped to operate from any mixer.
- Two-speaker muting

### PORTABILITY

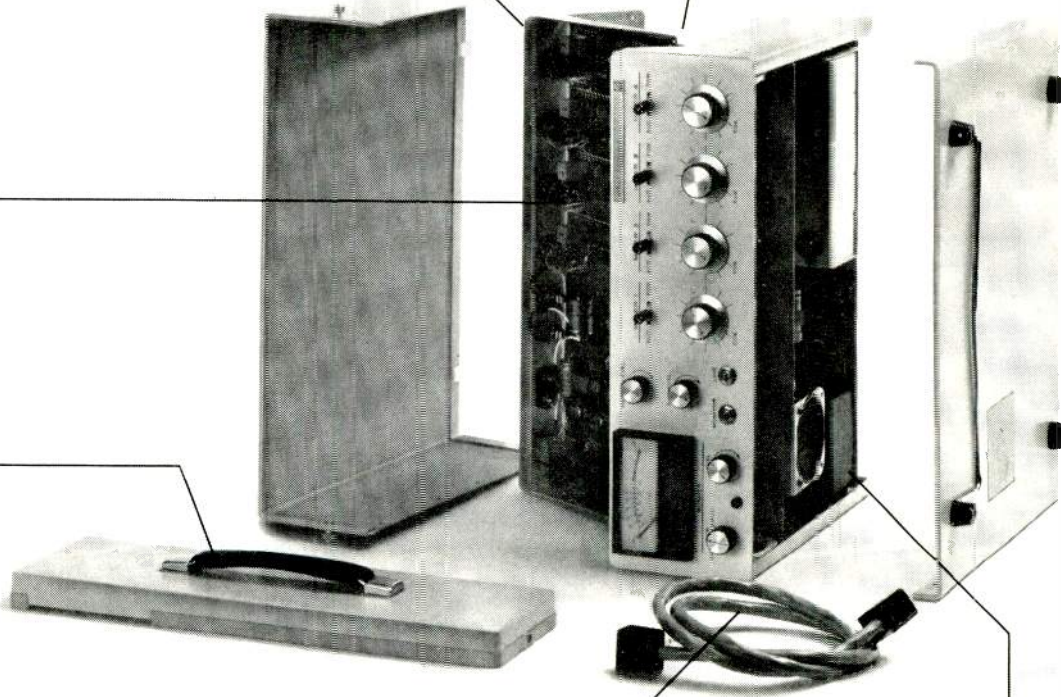
Weight: 28 pounds.  
Height: 5".  
Width: 14".  
Length: 17".

### PARALLEL OPERATION

Optional plug-in cable allows parallel operation of two 212J-1's. Arrangement provides 8 input channels (hi-level/mike/phono), two metered program output channels, and two switchable input monitor channels.

### ACCESSIBILITY

Top and bottom covers removed individually to expose all components. Circuit board hinged for easy access to reverse side and cables.



### OPTIONAL POWER SOURCE

Self-contained power supply that operates the unit on AC also serves as charger for optional internal nickel-cadmium 12-volt battery. Unit switches automatically to battery in the event of an AC power loss. Unit also operates on external 12-volt battery.

## *a studio production console and remote pickup amplifier in one unit*

*That's the combination you get in Collins' new 212J-1 Console.  
Produce spots, conduct remote pickups,  
or operate the control room in emergency situations.*

*Completely solid-state, the 212J-1 offers:*

- *Four input channels, each with selectable switches for hi-level, microphone, or phone (RIAA equalization).*
- *One program output channel.*
- *Switch-selectable monitor amplifier with internal speaker.*
- *Cue on all mixers overriding into monitor channel.*
- *Local and studio speaker muting.*
- *Public address system feed with level control.*



COMMUNICATION / COMPUTATION / CONTROL







New maturity in the CATV industry, born of Supreme Court decisions, will mark the coming year, according to newly elected NCTA chairman Robert Beisswenger, president of Jerrold. He feels Congress should clearly define jurisdiction over CATV.



Above—Bill Daniels: "Go big city, go underground."

## CATV Finds Polar Star

UNCERTAINTY THAT hazed the CATV sky these last 12 months has been partially cleared by the two recent Supreme Court decisions and the FCC landmark ruling on telephone leasebacks, Section 214. NCTA's Fred Ford now clearly sees the Polar Star and many cable leaders have already fixed a firm new course: it's cable communications for the big cities and lots of local origination.

The Court has spoken and declared cable television part of the nation's communications system. (U.S. et al v Southwestern Cable Co., June 10) In its second ruling, the Court declared cable television systems that pick up signals off the air are not liable for copyright. Threat of retroactive payment of millions of dollars for copyright infringements has thus been removed by the ruling on *Fortnightly v United Artists*. The most immediate effect of the copyright decision was the talk on the convention floor that investment bankers are already easier to talk to about financing.

The impact of the Court rulings and the FCC clamp-down on telephone company expansion into CATV, helped the Future of Cable TV panelists predict what's ahead:

- Cable consumer services will extend beyond cable TV. New services will be merchandising by wire, newspaper printing via cable and the right, on the part of subscribers, to decide what programs they want to see when they want to see them. Best name for such an industry would be cable communications—*Alfred Stern, president, TeleVision Communications Corp.*

- The FCC voluntarily, or through persuasion, will soon encourage healthy growth and development of cable television. What's needed is a system which will put local television outlets in many more communities than at present, and one that will provide multiple services whenever economically feasible. Cable communications is the route to the more complete television service. All groups must strive to perfect



Left—Lawyers testify (left to right): Schier (copyright), Matthews (PUC), Rivilin (Telco rule 214). Lovett directs questioning.

See next month's issue of BM/E for NCTA Convention product wrapup.

## Local Service is the Thing

Excerpts from address by **Rosel H. Hyde, Chairman, FCC** The Commission's decision in the San Diego hearing (June 26), finding that increased penetration of the San Diego area with Los Angeles television signals could jeopardize local San Diego uhf television service . . . shows a determination to protect local service rather than to hinder the valuable contribution which CATV can make. Thus, it particularly encourages CATV originations (whether local or other types of programs) without commercials.

The Commission fully intends to do a great deal of new thinking, and it will seek your assistance. The promise of communications today is brighter than ever. However, the problems we face are also greater than ever.

And they cut across industry lines as never before . . . The Commission has only one goal: to achieve the most effective communications' service to best serve this nation's needs. To accomplish this often calls for adjustment of competing industry efforts . . . not an anti-CATV policy. It is a policy whose sole purpose is to protect what the Commission believes to be the public's interest.

We ask you, as we ask every industry and every person concerned, to give us your honest, best thinking in a spirit of enlightened self-interest. We need to know what you want to do, what service you hope to bring to the public, how you and for related technologies and see the future for yourselves related industries.

## Management Panel: Legal Viewpoints

cable television in the public interest.—*J. Leonard Reinsch, president, Cox Broadcasting Corp.*

● Big city cable TV—where 95 percent of the people live—is the next epoch. The service will be 20 channels plus. All new systems should go underground for: 1) lower long-run costs, 2) escape from telco control and/or capriciousness, and 3) conformity with trend for all utilities to go underground. Prepare now for two-way communications by laying, with coax, four-wire communications cables.—*Bill Daniels, Daniels and Associates, Denver, Colo.*

● Home communications centers, data transferral and more local programs and services are the future—ace-in-the-hole is cablecasting. Eventually in local programming, cable television should reach down to a single neighborhood block. Industry shouldn't fight reasonable limits of cross-ownership and should now help Congress write useful copyright legislation—for the first time CATV is being understood by the lawmaker. It's only the staggering potential of the industry that has inspired the FCC to go slow. Industry must now demonstrate how highly specialized relay systems will serve the public interest.—*Irving Kahn, president, TelePrompTer*

### Cablecast for God, Country and the Supreme Court

The Supreme Court did more than legitimize CATV when it made the service part of the national communications family; it gave CATV new identity, purpose and worth. During its adolescence CATV justified itself by arguing it gave TV viewers a wide choice of programs. In its manhood, granted June 10 by the Supreme Court, CATV finds it must offer even deeper choices. It must bring to the community the public issues of the day so that intelligent choices can be made. Mass television as provided by broadcasters has failed to provide outlets for local expression. The Supreme Court saw, in its deliberations, the need for CATV to fill this void. The message was not lost on cable operators attending the convention. Time and again speakers, moderators and commentators from the floor stressed "we have to originate, we

"Freedom of speech means freedom of choice to view. Non-duplication protection and prohibition of CATV advertising will lose in the courts. Copyright holders will support commercials."—*Harry M. Plotkin, Arent, Fox, Kintner & Kahn.*

"Cable operators should make the FCC their friend. I can see NCTA joining with NAB and ASTM to fight direct satellite-to-home transmission . . . to free oneself of heavy regulation, pay copyright fee."—*John P. Cole, Cole, Zylstra & Raywid.*

"There are hookers in the Supreme Court decision on copyright. Those who originate must be considered outside of the case. Those who import distant signals were outside the review. The more a CATV operation is like a broadcaster, the more privileges he will lose, the more risks he will run."—*E.*

*Stratford Smith, Smith, Pepper, Shack & L'Heureux.*

### Here to Stay

"CATV, the copyright proprietors, the stations and the networks must accept the propositions that each is very much here to stay and that all of us can go forward in ways that will be beneficial to all . . . the best way is negotiation . . . CBS should go, not to court, but to the bargaining table to solve its copyright dispute with TelePrompTer."—*Walter Schier, Moselle & Schier.*

"The FCC 214 decision is a stunning ruling. All Bell systems that were 50 percent or more uncompleted as of October 21, 1966 must be reviewed by the FCC. Any competition to Bell for CATV rights should get a favorable hearing."—*Lewis A. Rivlin, O'Connor, Green, Thomas, Walters & Kelly.*

have to provide a public service." Indeed the FCC San Diego ruling on the Friday preceding the convention praised local origination—but still protected uhf stations by forbidding CATV systems to sell any commercial time.

The convention devoted its Sunday sessions to cablecasting—the technical session discussed hardware while the management sessions discussed software—type of programs.

Panelist Mort Berfield of Cohen and Berfield, Washington, D.C., expects the FCC to issue new rules and regulations that will permit use of microwave carrier and expanded program services, and predicts that new proposals for CATV programming on the top 100 will get favorable FCC attention. He predicts that the telephone company will be restrained from prohibiting local origination on leaseback deals. He sees any CATVers that do public service origination as being in a strong position. But, Berfield cautions, cablecasters should be prepared for broadcasters to fight commercial sponsorship.

Berfield warned that grave responsibilities went with public service cablecasting such as equal time to political candidates, equal time in case of editorial attack, etc. "Follow the NCTA Code of Ethics," Berfield said.

Cablecaster Dick Shively, Tele-sis Corp., questioned the fairness

of prohibiting advertising income. Local expression costs cablecasters money and local merchants ought to be able to sponsor worthwhile efforts. He cited that one of his systems videotaped a championship ballgame 100 miles away. Local businessmen paid \$160 to defray expenses in return for spot announcements. "Is this unreasonable," Shively asked? It's discriminatory not to permit local business to air local cable TV. "They can't afford commercial TV's rates," he said.

Shively and Greg Liptak, Cleveland Area TV, Inc., stressed that programming can cost a lot and that CATVers should never try competing with, or outdoing, commercial TV broadcasters. Keep it locally oriented, Shively said, and use more than one channel if necessary.

He cited a Nebraska system that carried 4 local channels in addition to three network stations and one ETV station. The services were 1) UPI news and stock market quotes, 2) local events and local variety, 3) weather, 4) movies three times a day (staggered for one week).

Liptak said uhf stations, despite their recent proliferation, are not programming for local communities. In the metro areas many cablecasting services are needed to win and hold subscribers. Running

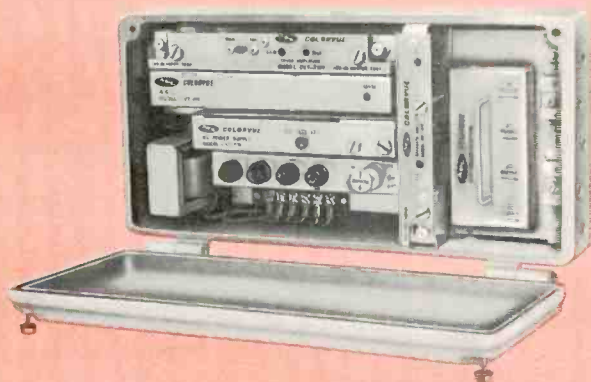
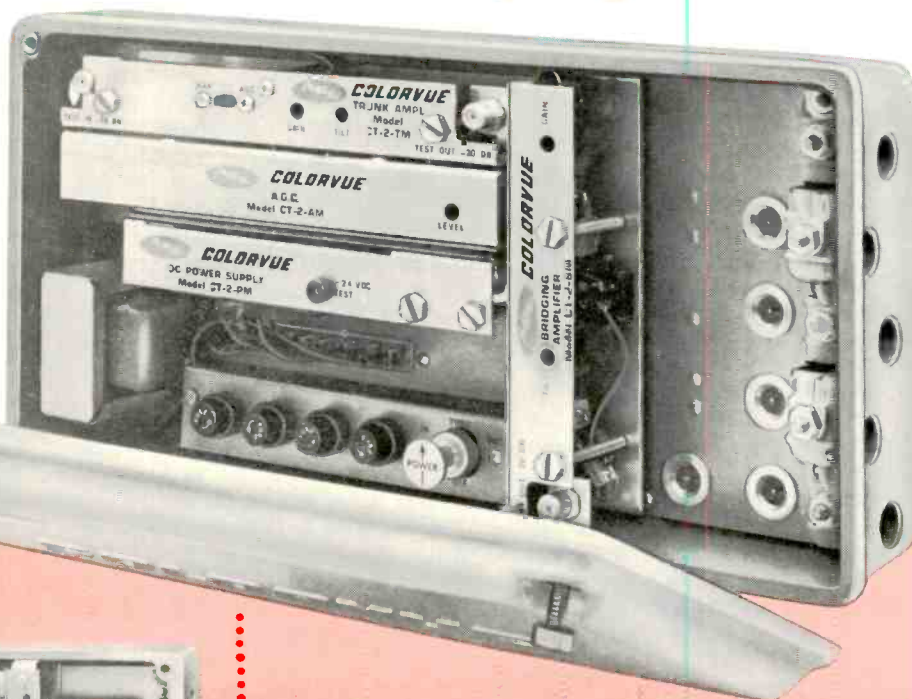
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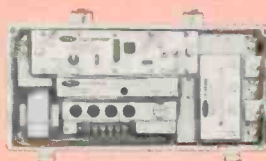
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*Continued from page 14*

a baby-sitting channel is important Liptak said. To see cablecasts succeed, Liptak urged the industry to settle on equipment standards (particularly VTRs) to simplify operations. Quality has to be good, he said, and trained people must be sought from broadcast stations. Idea exchange is vital, Liptak said, and he opined it wasn't a sin to sell time.

Ed Drake, GenCoE, Moab, Utah, urged cablecasters to work closely with schools. This is public service in its best sense.

Drake works cooperatively with schools, sharing equipment and facilities, thereby cutting everyone's costs and leaving money for expanded services.

Panelist Dick Garrett of ITT proposed cable operators join the war on crime by offering burglar and fire warning protection services. He declared the present was a propitious time since the burglar alarm industry was undergoing change and that digital, time multiplex equipment could outperform antiquated systems now used.

Where and how to get film for CATV use was outlined by four speakers. Gene Dodge of Modern Talking Picture Service said hundreds of films from sponsors like Chrysler, Union Carbide, etc. were available free. MTPS announced at NCTA that films were available on 1-inch videotape compatible for playback on Ampex equipment. Tapes for Sony and IVC formats would be forthcoming, he said.

John Brunson, Programming Corp. of America, Houston, Texas, offers good movies (late '50, early '60 vintage) as available from Warner Bros. Seven Arts, Inc. PCA distributes films on 2-inch videotape for playback on Sony PV 120U recorders. Price of service is 60 cents per subscriber per month on a three-year contract basis.

C.E. Feltner of Trans America Film Corp. owns films from a variety of sources. They go out in 16mm format. TAF rates are based on the number of subscribers and potential for new business. For a minimal system, the cost would be about \$15 per play and you get three plays in three years.

Bob Weisberg, TeleMation Program Services, acts as a broker in buying films. His rates vary, but for a 1000-subscriber system he gets a retainer of \$20 a week. Film fees vary depending on title and market, but ranges from \$15 to \$2000. Typical user having 2000

## We Have Arrived

**Excerpts from address by  
Fred Ford, president, NTCA**

**We are a business** that will operate consistent with "public interest, convenience and necessity" . . . The significance of public interest (historically) is that private interests are to be subordinated to those of the listening public.

I do not believe the First or Second Reports and Orders ruling CATV were written with the public interest and convenience foremost in the Commission's mind. The language of the reports . . . (show) a paternal protectionism for broadcasters, program suppliers, market delineation and other factors adverse to the viewer . . . The Supreme Court's statement "that the people of all zones are entitled to equality of radio broadcasting service, both transmission and reception" means there should be no

more second class television citizenship . . .

You have the potential to supply an infinite variety of auxiliary services for the public good . . . Local origination is one such service . . . The CATV operator's dedication is to a single community . . . imagine the benefits of a channel of television in each community in our country devoted to explaining in depth the problems, tensions, the hates, the poverty, the hopes, the plans and dreams of viewers . . .

Let us leave this convention with the high purpose that we will dedicate our technological success to serve the public and not attempt to make it the public's master . . . Together we will push ever forward with service to the viewer and public's interest, convenience and necessity as the polar star by which to set our course.

to 3000 subscribers pays \$25 to \$35 per film, which can be used several times within one year.

All panelists welcomed standards if they could be set by NCTA. Videotape formats now have the edge in cost since color VTR equipment is less expensive than 16mm film chains. However, for widest choice, film formats are the way to go.

### Looking in from the outside

After three days of imbibing the heady spirits of a promising future, conventioners got one glimpse on the last day of a more somber and sober tomorrow. Sol Schildhouse, chief, CATV Task Force, FCC, set the tone of the session on the "Broad Spectrum of CATV" when he said anything new has to be compatible with the old. Dr. Martin Seiden, looking at changes in local and federal regulations, saw much more local regulation with local ordinances demanding much more of a system. State regulations, through public utilities commissions, will give way to local and federal controls, in Seiden's opinion. At the federal level, he saw as a trend "a selective opening of the top 100 markets" with protection being given to uhf stations providing local services.

The wired city concept, Seiden said, is a sleeper, which when fully

explored by Congress, will alter traditional notions. More regulation dealing with CATV is in the offing. Wired cities, and direct-satellite-to-home transmissions, are envisioned. The fact that large computer manufacturing companies are moving into publishing and CATV is ample proof that distribution networks and control of them is important.

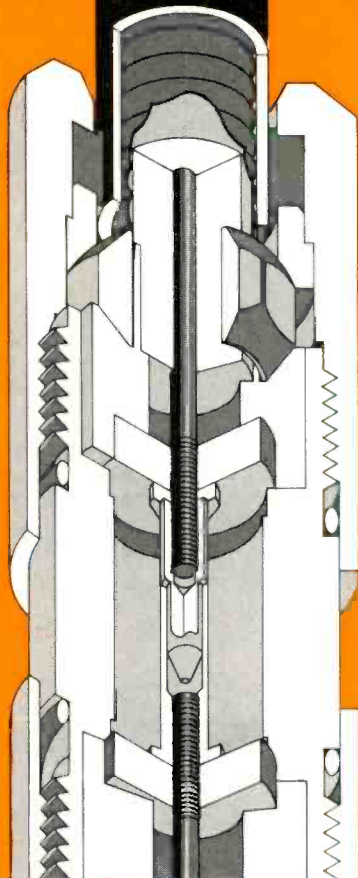
Cross-ownership and bigness were targets for Greg Potvin, counsel to the Select Committee on Small Business, House of Representatives. To buck inroads of larger companies into media ownership, Potvin says that Rep. John D. Dingell (D-Mich.), heretofore a foe of CATV, is reassessing his position. "Rep. Dingell wants to see CATV survive," Potvin said. Dingell will not support broadcasters who hold onto valuable spectrum space when there is urgent need for spectrum for police protection, according to Potvin.

Another champion against big business interests moving in is S. Jerry Cohen, staff director and chief counsel, Senate Subcommittee on Antitrust and monopolies. But Cohen warned "each of you, too, wants a privileged position." Cohen envisioned a future with cable as the new distribution system for the entire mass-media industry.

*Continued on page 18*



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Continued from page 16

The telcos, broadcasters, publishers, and broad electronic-publisher conglomerates want to control this new distribution system. They shouldn't, Cohen said.

Cohen envisioned as desirable a separate cable-distribution industry. To get Congressional support for such independent survival, Cohen advised cable operators to provide a true public service. Providing local origination is a great service, Cohen said, but don't become another local source of program material intended for masses and thereby become a broadcaster.

Don't take commercials, Cohen said. If you do, you are part broadcaster. "You can't have it both ways," Cohen insisted.

Congress and the FCC are committed to a free TV service, Cohen argued, and cable operators should offer a distribution source that would not impair free broadcast.

## 12 Plus Channels

It wouldn't be a cable convention if there weren't some discussion of carrying 20 channels or more. Most talk was still hypothetical, since few systems can handle more

## Common Enemy Binds CATVers

If there were any misgivings about heavy regulatory control, they weren't much in evidence. Instead, exhibitors and show visitors spoke more of a new-found common enemy—the Sheraton-Boston Hotel—with its inadequate air conditioning and an incredibly inept and tangle-footed staff. Conventioneers talked more about their own "unique" experiences with the hotel than about FCC or legislative decisions that would ultimately affect CATV.

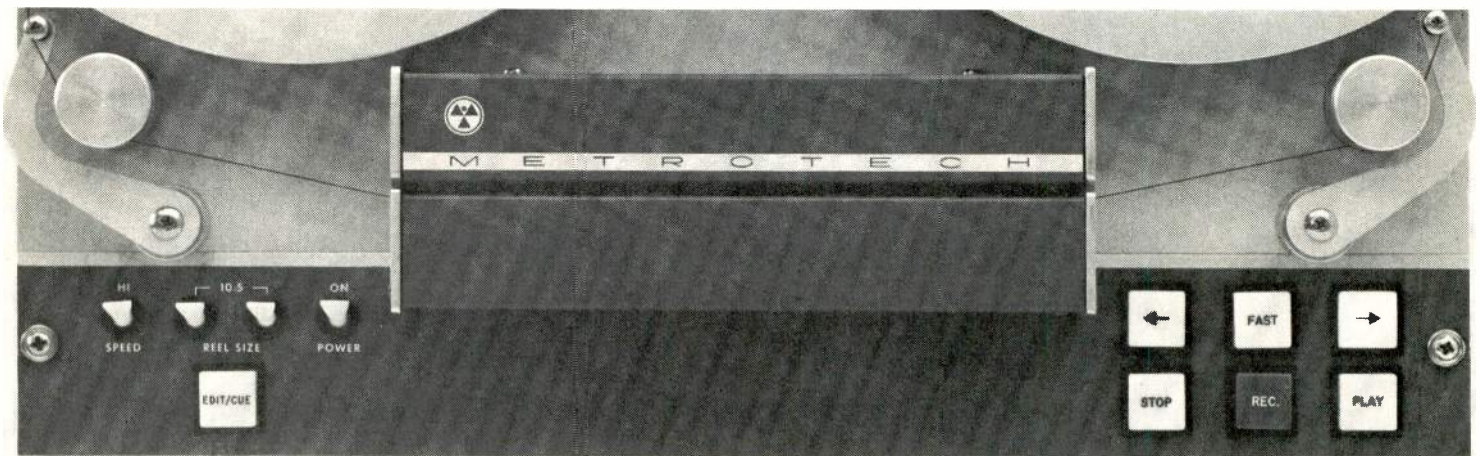
The hotel became the brunt of jokes and sarcasm. Bruce Lovett, NCTA's general counsel, quipped, "I'm so delighted over the 214 decision, I can't even get mad at the hotel." Later, Greg Potvin, counsel to the House of Representatives and ardent foe of big business, topped Lovett's remark by wryly commenting that if the Sheraton were an example of what happened to ITT acquisitions, he was doubly happy that the ABC deal wasn't consummated.

than 12 channels. One exception is the well publicized system operated by Philadelphia CATV Company in Bucks County, Pa. and Southern New Jersey. Although practical, this system is not sophisticated, since it uses dual cables. A key virtue is that no converter is needed. The customer has a slide switch that permits him to switch in the A or B cable system. Crosstalk at the switch is 55 dB down, affording a 6-dB tolerance. Crosstalk at the drop cables does not exceed -60 dB for a 300-ft run

at 216 MHz.

Since the dual cable is lashed to one messenger strand, costs are not double, but approximately 1½ times greater, than comparable figures for single-cable systems. However, since a converter isn't necessary, \$20 per installation is saved. Malcolm M. Ferguson, vp and chief engineer of Philadelphia CATV, calculates that the cost of a dual cable system and a converter system are about equal for a 50 percent penetration of a large

*Continued on page 21*



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# IVC-120 in action



Local election center at KMED-TV, in live operation with two IVC-120 cameras, adds color to the Medford (Oregon) scene.

# IVC-120 color quality



A



B



C

Off-the-monitor photos demonstrate excellent color quality and sensitivity of 3-vidicon design. Lighting levels above: (A) studio light at less than 150 ft. candles, (B) studio light at 300 ft. candles, (C) outdoor lighting at 4,000 ft. candles.

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## Encoded output signal:

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35% response at 400 lines with no aperture correction; limiting resolution is 500 lines center, 400 lines in corners

## Sensitivity:

color reproduction holds to 40 ft. candles, studio quality as low as 200 ft. candles

## Geometric distortion:

less than 1% within a circle having a diameter equal to the picture height, less than 2% elsewhere

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Continued from page 18

market. The dual cable systems are currently providing 18 channels of information. Because of strong local vhf stations, three channels from each cable are vacated.

The neatest approach to the multichannel problem would be to use a uhf cable transmission system and the TV set's uhf tuner but, unfortunately, cable losses are so high that only small systems—such as MATV—can go this way.

To get around such losses, the new experimental Hughes-TelePrompTer 18-GHz transmission system might be used for the "trunk" line. Numerous receiving antennas and down-converters to the uhf band could be used so cable runs would be short enough to permit uhf transmission. Such a system is still in the future.

The midband approach to expanded channel carriage got the most attention at the convention's formal session. Guy C. Kleykamp of Kaiser CATV Div. gave a "follow-up" report based on latest laboratory measurements.

Thirty-two trunk amplifiers (Phoenician Series) have carried 21 channels simultaneously. At the end of the line, a signal-plus-noise to noise ratio of 40.1 dB did not

perceptibly degrade color pictures. Cross-modulation and second-harmonic spurious frequencies were well below the visible threshold, though second order distortion was the most significant. Kleykamp stated that plus 1.75 MHz interfering beats into the video carrier are most objectionable, and that spurious beat interference must be measured with all channels operating.

Vikoa recommends push-pull amplifiers as a means of reducing second harmonics. Mike Rodriguez, chief engineer of Vikoa, reported that sub-low band, midband and expanded band operation is possible. A unique back-of-the-set converter has been developed by Vikoa. Nine midband channels are converted to uhf for reception on the TV set's uhf tuner. The converter is nontuneable. Low second-harmonic amplifiers can readily be used for 21-channel operation. Vikoa has a published price of \$30 for the converter. It would undoubtedly sell for less in quantity.

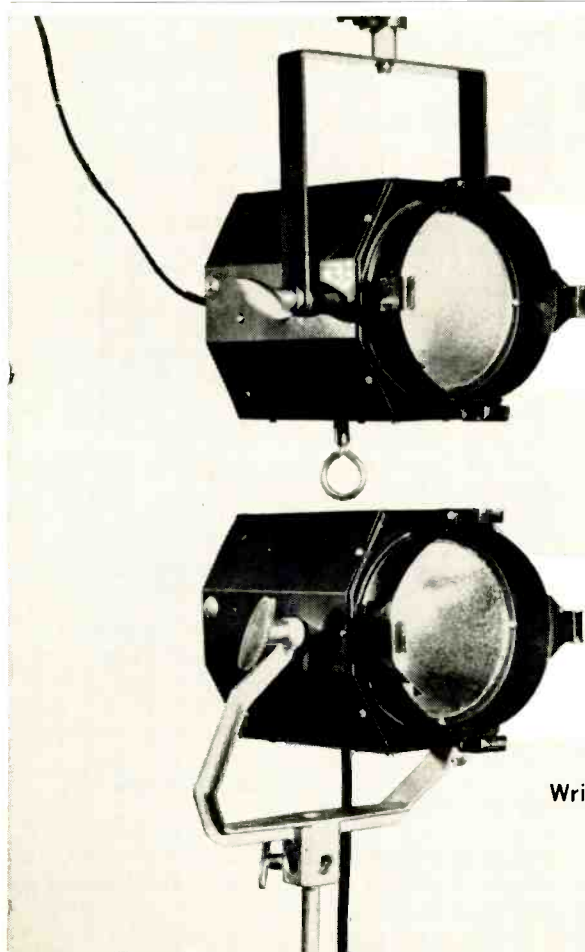
Jake Shekel of Spencer Kennedy Labs, Inc. reported that by juggling frequencies, 18 channels could be piped on standard single-ended amplifiers with no sum-or-difference second-harmonic frequencies

falling within a channel band. A converter would be needed for all channels. Low-level supplementary data could be sent on the guard bands.

Jerrold spokesman, Ken Simmons, showed concern for second harmonic problems. He indicated that push-pull amplifier modules could be added to the Starline series to reduce second-order distortions. Simmons said many approaches are possible and that the particular multichannel approach taken by an operator should be chosen for his system.

Jim Palmer of C-Cor viewed each system as having two aspects: 1) the amplifier/cable portion and 2) the portion between the end of the drop cord and the TV picture tube. Broadband amplifiers are no problem, but getting a device to handle multiple channels at the receiver is. Palmer urged large-systems operators to experiment with simplified TV sets, different modulation schemes, etc., so that experience could be obtained that might lead to a standard some time in the future.

Roger Wilson of TelePrompTer underscored the fact that the set-top converter as used today is not a good solution.



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# INTERPRETING THE **FCC** RULES & REGULATIONS

## New Rules Concerning Provisional Radio Operator Certificates

DURING THE PAST YEARS, the Commission became aware that there was a shortage of licensed commercial radio operators in small market broadcast areas. Part of the difficulty appeared to stem from the inability of prospective operators to travel to the nearest FCC field office to be examined. Although the Commission schedules examinations at places away from the field office, such examinations are given infrequently and may not coincide with the immediate needs of the broadcast station or the financial circumstances of the prospective operator.

The holder of a Provisional Certificate for a Radiotelephone Third Class Operator Permit endorsed for broadcast use may be responsible for routine operation of (1) standard broadcast station with authorized power of ten kilowatts or less, and employing a nondirectional antenna; (2) an fm broadcast station with a transmitter power output not in excess of 25 kilowatts; or (3) a non-commercial educational fm broadcast station of 25 kilowatts or less output power. Small business should benefit from the new procedure since licensed radio operators will be more readily available and local people may find employment in the broadcasting industry, as operators.

Accordingly, after its September 1967 Notice of Proposed Rule Making, on January 17, 1968, the Commission adopted a Report and Order (FCC 68-61) amending Parts 1 and 13 of the Rules.

The new rules provide for the issuance (by mail) of Provisional Radio Operator Certificates to applicants for Radiotelephone Third Class Operator Permits, endorsed for broadcast use, prior to the fulfillment of the examination requirements. The permit is to be valid for a period of twelve months only and will not be renewed. Before expiration of the permit, the holder is expected to appear at a regularly scheduled examination point and fulfill the examination requirements by successfully completing an examination before an authorized Commission employee.

The new rules were made effective as of March 15, 1968, and the amendments adopted were as follows:

1. In §1.1117, a new type of application is added at the end of paragraph (a) to read as follows:  
"§1.1117 Schedule of fees for commercial radio operator examinations and licensing.

(a) \* \* \*  
"Application for provisional certificate for a radiotelephone third-class operator permit endorsed for broadcast use . . .  
\* \* \* \* \*

2. §13.3 is amended to read as follows:  
"§13.3 Dual holding of licenses.

"(a) Except as provided by paragraph (b) of this section, a person may not hold more than one radiotelegraph operator license or permit and

one radiotelephone operator license or permit at the same time.

"(b) A person may at the same time hold (1) both a temporary limited radiotelegraph second-class operator license and a radiotelegraph third-class operator permit, (2) both a provisional certificate for radiotelephone third-class operator permit endorsed for broadcast use and a radiotelephone third-class operator permit not so endorsed, (3) both a provisional certificate for a radiotelephone third-class operator permit endorsed for broadcast use and a restricted radiotelephone operator permit.

3. §13.8 is amended to read as follows:

"13.8 Provisional Radio Operator Certificate.

"(a) In circumstances requiring immediate authority to operate a radio station pending submission of proof of eligibility or of qualifications or pending a determination by the Commission as to these matters, an applicant for a radio operator license may request a Provisional Radio Operator Certificate.

"(b) Except as provided by paragraph (3) of this section, a request for a Provisional Radio Operator Certificate may be in letter form and shall be in addition to the formal application.

"(c) Except as provided by paragraph (3) of this section, if the Commission finds that the public interest will be served, it may issue such certificates for a period not to exceed six months with such additional limitations as may be indicated.

"(d) Except as provided by paragraph (3) of this section, a Provisional Radio Operator Certificate will not be issued if the applicant has not fulfilled examination or service requirements, if any, for the license applied for.

"(e) A request for a Provisional Radio Operator Certificate for a radiotelephone third-class operator permit endorsed for broadcast use shall be made on FCC Form 756C, which provides for a certification by the holder of a radiotelephone first-class operator license that he is responsible for the technical maintenance of a radio broadcast station, and that he has instructed the applicant in the operation of a broadcast station and believes him to be capable of performing the duties expected of a person holding a radiotelephone third-class operator permit with broadcast endorsement. If the Commission finds that the public interest will be served, it may issue such certificates under the following conditions:

"(1) the certificate is valid for a period not to exceed twelve months.

(2) the certificate is not renewable.

(3) the certificate may be issued to a person only once.

(4) additional limitations may be specified, as necessary.

(5) the certificate may be issued prior to the fulfillment of examination requirements for the radiotelephone third-class operator permit endorsed for broadcast use.

4. In the Appendix to Part 13, in §1.1117, a new type of application is added at the end of paragraph (a) to read as follows:

"§1.1117 Schedule of fees for commercial radio operator examinations and licensing.

(a) \* \* \*

"Application for provisional certificate for a radiotelephone third-class operator permit endorsed for broadcast use . . ."

Clearly, the Commission relaxation of requirements for operator permits and experimental fm operation will prove beneficial to many operators and totally in the public interest. ●

This section, providing broad interpretation of FCC rules and policies, does not substitute for competent legal counsel. Legal advice on any given problem is predicated on the particular facts of each case. Therefore, when specific problems arise, you would be well advised to consult your own legal counsel.



## BBRC's New Mark 10 Video Processing and AGC Amplifier *Does What It Says*

Our Mark VIII AGC video amplifier was probably the best in the industry. But it didn't provide signal processing. So we've developed the Mark 10. And it does both. • The new Mark 10 automatically adjusts video level variations of  $\pm 6$  DB. • It adjusts the amplitude of peak-white to peak-black video and simultaneously adjusts video setup to maintain a uniform output signal. • It provides independent chroma amplitude adjustment of  $\pm 3$  DB.

- It provides remote burst phase control of  $\pm 12$  degrees and regulates amplitude by reshaping color burst. • It regenerates sync.
- It cleans up front and back porch by clipping blacks and undershoots.
  - It maintains sync in the event of input signal failure.
  - It does all these things with a color subcarrier differential gain of .8 percent and a differential phase of .5 degree.

After three years of development through field testing, we have another winner. If you want additional specifications on the new Mark 10, data sheets are available on request.



BALL BROTHERS RESEARCH CORPORATION • BOULDER, COLORADO 80302



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**DEPENDABLE WORKER** seeks radio/television employment. Will start on time every time, 24 hours a day, 7 days a week. As little as \$50 a month. Easy to maintain; with proper handling will work for your station indefinitely. Call your Ampex distributor or our world headquarters: (415) 367-4400. I could be earning money for you next week. Ampex AG-440. Photo and credentials attached.

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**Front mounted electronics are easy to service** Plug-in modules help you keep down-time to a minimum with instant replacement from the front. Maintenance is fast and simple. All setup adjustments are made from the front.

**Accessible transport components cut down-time** The AG-440's time-proven, trouble-free transport is 100% accessible for easy servicing whether rack mounted or in console. Components can be removed and remounted with exact alignment for proper tracking. The precision milled, rigid die-cast top-plate maintains precise long term alignment of the tape path.

**Quick-change heads align easily** The AG-440 head assembly and individual head stacks plug into place quickly. No struggle. No time lost. Registration dowel pins bring heads into perfect alignment. And for cleaning, degaussing, editing, the head gate opens wide.

**Extra features, extra versatility** The AG-440 has more of the features engineers ask for than any recorder: Ferrite erase heads, with their increased efficiency; triple mumetal head shielding against hum from stray RF fields; three edit modes for fast, easy production; low profile console designed for convenient sit-down operation; low impedance heads that let you separate transport from electronics without affecting S/N or losing high frequencies; and a security cover on the electronics that discourages unauthorized fiddling.

**Expandable to grow with your needs**

You can start with one channel, then add a second, third or fourth for local production of commercials and the like, to make off-the-air time profitable. Modular electronics make it simple.

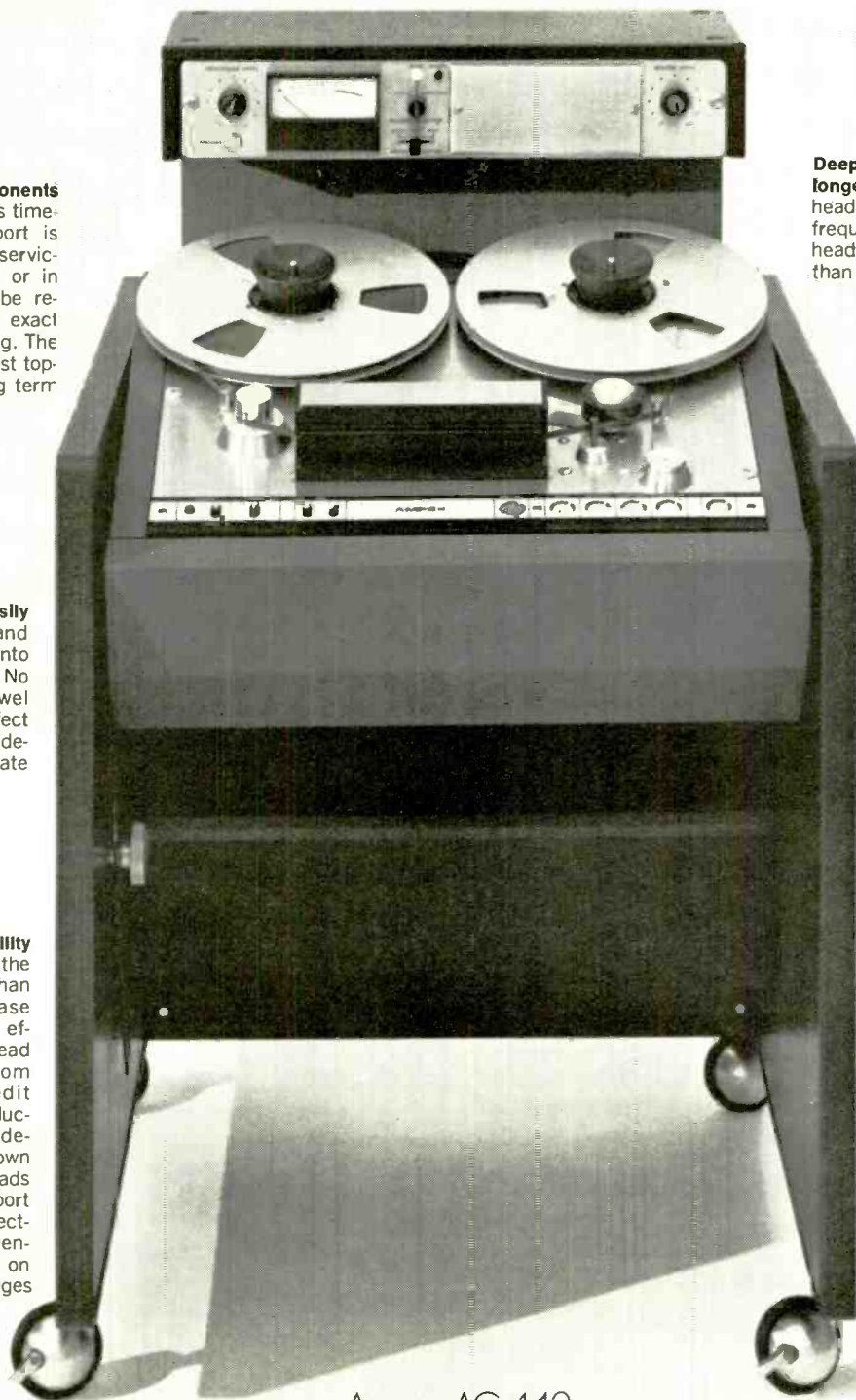
**Plug-in relays save time, trouble** Down-time for relay replacement is held to a minimum because all relays are plug-in. And, since only one type of relay is used throughout, spares requirement is greatly reduced.

**Deep-gap heads keep signal bright longer** Our advanced "deep-gap" head design keeps delivering full frequency response even as the head wears—many times longer than conventional heads.

**Trouble-free operation comes from quality components** The AG-440 was designed and built with the best components available. Because the broadcaster's product depends on this recorder, every possible step is taken to insure that the AG-440 is the most dependable recorder made.

**Your AG-440 can pay its own way** Ampex offers a unique choice of lease or extended payment plans. Order your AG-440 now; for as little as \$50 a month you can put it to work for you right away and pay for it out of current earnings. Ampex AG-440 is the most popular professional recorder in broadcasting . . . you can depend on it!

Ampex Corporation, Professional Audio Products Division, 401 Broadway, Redwood City, California 94063



Ampex AG-440  
...the dependable one

**AMPEX**



NBC's mini camera is demonstrated by lightweight gal and newsman Frank McGee, who will be on floor.

Convention City '68

# Networks Cover Biggest Remote Ever

By Richard Ocko



**Henry Adams dubbed the political convention the "Dance of Democracy." This year's doings will keep broadcasters "dancing" with a monumental communications and logistics complex that includes fleets of tractor-trailers, motorcycles, speedboats, helicopters and probably a new crop of ulcers.**

AT LEAST ONE HUNDRED color cameras, more than 2000 technical and program personnel and a general expense tab of \$23 million—that's the scorecard for the upcoming presidential nominating conventions, to be staged first in Miami (the Republicans) and then in Chicago (the Democrats). The networks and independents will foot a massive moving bill and face logistic and technical problems of incredible proportions. And when it's all over, there'll be a monstrous cleanup and the move back to flagship and local station sites.

With such large-scale equipment and personnel concentrations in the convention cities, the ultimate price could be skeleton crews and meager equipment supplies at home base for some—especially for the small independents who'll do their own taping. Part of the equipment and manpower squeeze will be alleviated by general resource pooling. Widespread use of color movie film with magnetic sound stripping will help ease the squeeze. The movies will be used for wrapup programs later in the broadcast day, but even here, complex arrangements are being made for film processing and delivery.

#### **New Equipment to Get a Workout**

New on the Convention Hall floor will be three portable rf color cameras—from Ampex, RCA and CBS Labs. Also on the scene will be the Norelco "Little Shaver" in a cabled version. Innovations will be rampant among broadcasters as they simultaneously cooperate and do battle to give their viewers the best possible coverage. One eye glued on the ratings will preoccupy NBC and CBS. Both NBC and CBS will be televising concurrent live coverage. ABC is abandoning live coverage, but will tape and film for a daily

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**Richard Ocko** is a consulting engineer with Basic Information Technology Services, Inc., Bryn Mawr, Pa.

wrapup program to run from 9:30 to 11 each evening. And the independents will be doing their own wrapups and Convention summaries each day. ABC will have facilities to switch to the Convention floor for live coverage when special fast-breaking events call for it, but for the most part, the net will stick to its evening broadcast format.

#### **1968: Demise of Live Coverage?**

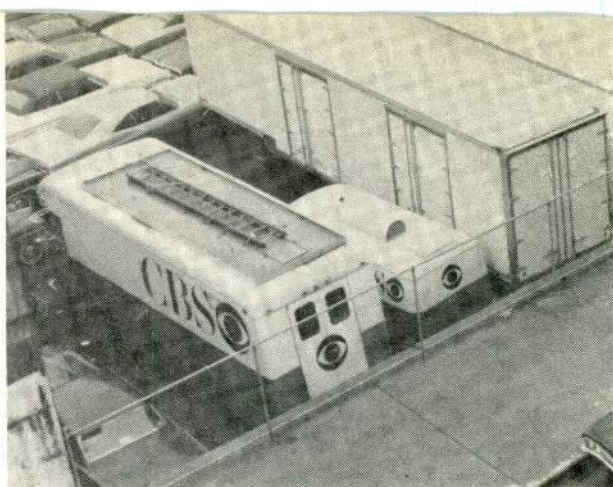
It's very possible that this year's dances of democracy will be the last political conventions ever to have live coverage. Doing an adequate job has become so incredibly expensive and unprofitable, that both NBC and CBS are seriously considering using the ABC approach next time around.

Doing a remote broadcast of this magnitude demands a vast amount of advance planning. There are the "ordinary" massive technical and engineering problems of producing high-quality video and audio. The production's sheer magnitude becomes staggering with the addition of large numbers of extra personnel (who must be highly mobile), travel and living accommodations, equipment mobility, telephone lines, plumbing, heating and air-conditioning, water supply, sanitary facilities, food, spare parts, communications and storage. The air conditioning alone was a major problem; the much hotter lights needed for color TV demanded much greater cooling capacity in the convention halls.

Each network has been striving for the best possible video and audio operations for the Conventions while trying to keep costs in line. One of the Convention's unusual highlights is the degree of cooperation among the nets to avoid duplication and stumbling. The result: vastly improved overall coverage effectiveness. Convention committees of network representatives have been holding their own caucus to solve such problems as communications, space, power, lighting, and air conditioning. The fruits of their efforts are embodied, for example, in the new air conditioning plant in the Miami Convention Hall, adequate to handle the excessive lighting-equipment heat, since lighting is specified at 350 foot-candles on the floor.

#### **Uncrowding the Cameras**

The camera pool will eliminate the chaotic crowds of cameras in front of the speaker's rostrum that were so troublesome at previous



Technicians fill up CBS technical vans (left) with equipment that will be needed at both conventions. Some of the technical vans (above) that will be used in live coverage.

## Mini Cameras Set the Pace

The conventions will mark the first time that all three major rf color cameras will vie with one another at the same event. Wireless portable cameras from Ampex, RCA and CBS Labs will be in use. Also on the floor will be a cabled version of Norelco's "Little Shaver."

The ABC Ampex entry, nicknamed the "Scrambler," uses two Philips Plumbicon imaging tubes and an rf backpack by Microwave Associates. This camera was first used in its cabled version to televise football games last fall. It later saw service in ABC's coverage of the Winter Olympics in Grenoble, and is scheduled to serve in this year's Mexico City Olympics. The camera head weighs 20 pounds, and the backpack another 15, in the cable version. The rf pack adds another 15 pounds to the backpack total.

Ampex's early introduction of this camera gave ABC an edge on the other networks, since it was the first such hand-held color camera to be used successfully in commercial broadcasting. The microwave link between camera and base station also transmits control information to the camera for remote iris, sync and other functions as well as intercom.

Rf transmission is frequency-modulated, eliminating interference problems inherent in a-m links. The video transmission is in the 13-GHz band.

Since the camera uses just two Plumbicons, a special color matrixing system is used. One imaging tube carries luminance and green signals. The other tube receives the red/blue signals in field-sequential form. Early versions used a videodisc recorder at the base station to provide a needed 1/2-frame delay. An improved model now uses all solid-state delay, and this has slimmed base station equipment down to a single rack from the two formerly needed.

RCA's entry for NBC—the "man-pack" portable—has a total weight of 56 pounds, including battery power supply and rf equipment. The

camera uses three 1-inch hybrid vidicons, and transmits to the base station at 13 GHz. Control from the base station to camera for sync, voice and remote iris is transmitted at 950 MHz. The camera can also work in a cabled version.

CBS Labs' "Minicam Mark VI" is newest in the portable color race. Developed primarily for this convention coverage, the camera was field-tested in May at the Kentucky Derby. Unusual among TV cameras is its use of digital remote control from the base station. Digital pulses control focus, color registration and centering—in addition to the usual remotely controlled iris, black level and channel gain. The camera also sports an rf-controlled tally light triggered by the digital system. Color lock and sync lock are also tied to master control by digital pulses, along with telemetered field-strength indication as received at the base station. These features make split-screen and other special effects possible.

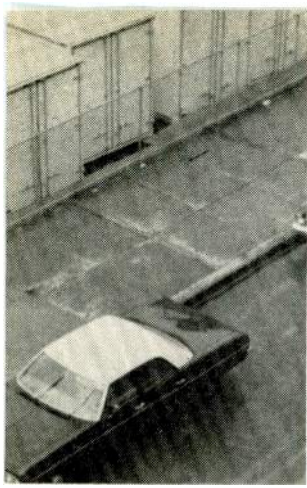
This single digital system can control up to 10 cameras simultaneously; four CBS rf cameras will be in actual use on the Convention floor.

The camera head weighs 18 pounds, and the backpack another 32. Link to base is via microwave.

A new breed of interference-free wireless microphones will bow on the Convention floor. Operating at microwave frequencies, the first of these units—made by Microwave Associates—was announced at the NAB Convention earlier this year. This unit, with intercom receiver as part of the package, will be used by CBS newsmen. They'll be the first to operate this new rf unit, since it was built by MA to the network's design.

Another rf microphone entry—by Airborne Instruments Laboratory—is slated for use by ABC and NBC. Operating in the 950 MHz range, frequency can be changed instantly by replacing the control crystal. Duplex operation is built in, with transmitter and receiver frequencies spaced about 6 MHz apart.





Minicam Mark VI gets running field test at Kentucky Derby on CBS newsmen's back in right photo.



#### Color Camera Headcount at Press Time

Minis: 4 RCA; 3 Ampex Scramblers; 4 CBS; 9 Norelco Little Shavers. Total convention color camera count: 125; of these, 92 will be Norelcos.

ABC plans to use just 13 trailers and two mobile units. Much of their equipment will be carried from the vans with forklift trucks into special facilities in the old hall.

#### How ABC Will Do It

ABC's election task force leader Bob Sammon—officially the network's director of TV news operations—has been handling big remotes for 20 years. He's head of a task force that includes such network officials as the Executive TV and Executive Radio News Producer for the Convention, the Manager of the Political Unit and Engineering Manager.

Basic ground rules for ABC this year will be governed by the network's one-and-a-half hours of daily wrapup coverage from 9:30 to 11:00 p.m., with occasional live news programs during the day. This is a major departure from previous years' convention reporting and is widely different from the gavel-to-gavel approach to be provided by the other nets. This new approach calls for editorializing and integrating the news from many locations. Instead of using 50 to 60 cameras as will NBC and CBS, ABC will use about 20, backstopped by film coverage.

Jack Bush, manager of ABC News Film Operations, will direct the movie film work. To produce the huge amount of footage that will be needed, ABC is installing a complete color lab in rented space across the street from the Miami Beach Convention Hall. Two 16mm Pako color processing systems will be installed and used for the convention's duration. For the Chicago coverage, a color lab is reserving part of its processing capacity for ABC.

ABC will load 12 Auricon 16mm sound cameras with high-speed Ektachrome 7242 EF with magnetic sound stripe. News photogs expect to shoot between 150,000 and 200,000 feet of film at the convention.

ABC film crews will total more than 60 men. Each crew will have a cameraman, sound man, power man and a uniformed motorcycle courier to rush exposed film to the processing lab. In Miami, speedboats will be available on Indian Creek to carry the film in case of traffic jams or when a causeway bridge is up. In Chicago, helicopters will ferry film in time for airing 45 minutes after the shooting.

Two-way communications for ABC will use a General Electric base station (in the 144-MHz to 174-MHz band) with an antenna on the WLBW tower in Miami. Seventy-five 10-Watt mobile and hand-carried transceivers will provide communica-

*Continued on page 46*

conventions. This pool will also vastly reduce the problem of integrating facilities needed by ABC, NBC, CBS, MBS, PBL, Eurovision, BBC, and the independents. Network committees have evolved this table of responsibilities:

- Mutual Broadcasting will provide pooled audio from each state's position and from the speaker's platform.
  - ABC will coordinate and integrate rf communication.
  - CBS will provide the pool video from Chicago.
  - NBC will provide the pool video in Miami.
- Even the pooled facilities will be manned by mixed crews of operators and technicians from the various networks working side by side.

#### Master Sync System

The pool camera van will handle five cabled cameras for video from the speaker's platform and from the floor itself. Since the nets will be adding their own color inputs to video received from the pool, almost every sync generator in the system will be timed by Tracor-Sulzer rubidium frequency standards, accurate to 5 parts in  $10^{11}$  per year.

The temporary space originally planned for the convention site by former mayor Elliot Roosevelt, eventually blossomed into a brand new convention hall. The building's old section is slated for use by the radio, TV and press equipment. Also in Miami Beach, a large outdoor area will sprout equipment trailers and a temporary building.

All the networks plan to operate from trailers. At one extreme, CBS is mounting just about everything in some 60 trailers, vans and mobile units. They'll plug these trailers together like so many modules in a control console, and the technical vans will be operational almost immediately. The walls of some of the CBS trailers will be dropped, providing a continuous, level platform among the vehicles. For other units, external platforms will interconnect the trailers.



Alternating absorbent and reflecting wall panels "tune" Petrucci & Atwell recording studio in Boston.



Absorbent panels on wheels used in studios at WGBH-FM in Cambridge, Mass., can be moved to best location for room tuning.

# Planning Broadcast Station Acoustics

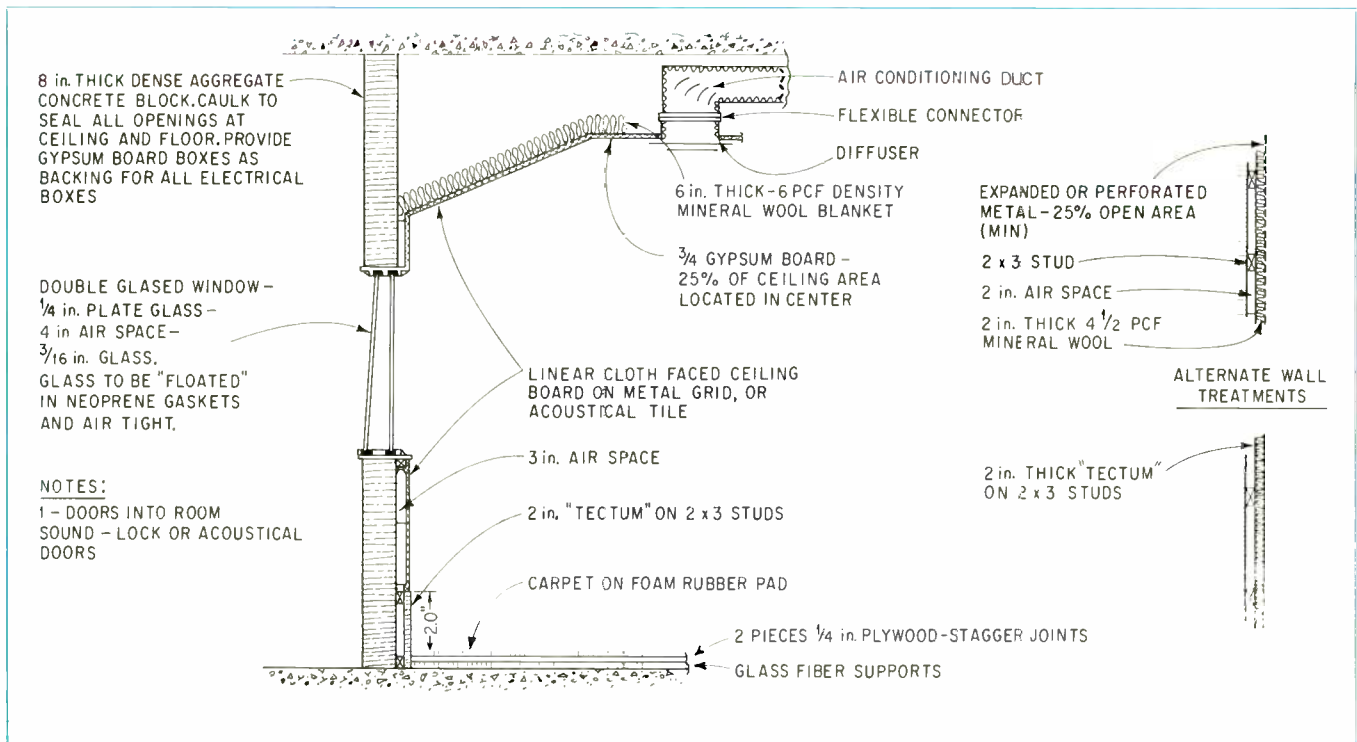
By Allan M. Teplitzky

**Acoustical planning starts before the first spadeful of earth is turned for a studio site. By following the "plan ahead" motto any broadcaster can have top-notch acoustical design for minimal cost.**



Bob Petrucci points out room-within-a-room construction used in his studio. Double layers of sound-absorbing material help isolate room from street noises.





Cross-section detail of acoustic materials and construction methods needed for studio isolation from external environmental noise. Inside finishing materials and details are important for room acoustics.

GOOD ACOUSTICAL DESIGN starts from the moment a broadcaster selects a possible building site for his new station. Very often ground has already been broken by the time the broadcaster thinks to call in acoustical consultants, and this could well be a serious error.

Potential studio owners should investigate the outdoor noise environment surrounding the potential site. A site that seems excellent for many other reasons can actually be very poor from a noise standpoint. It's in this initial assessment of the external acoustical environment that expert advice is very important—often more important than in the later phases of design and construction.

#### Pile Drivers a Hazard

In one case, a studio site was planned in an urban renewal area. Acoustical tests showed that ground vibration and noise from pile driving would make the location acoustically undesirable for a number of years due to protracted construction around the site.

The pile driver was an obvious problem. In a not-so-obvious environmental noise case, a studio owner selected a quiet suburban area. This would have been fine, except for one factor—there was a police helicopter that flew over the site as it patrolled traffic on a nearby highway. Building

**Allan Teplitzky** is a senior consultant with Bolt Beranek and Newman, Inc., consultants in acoustics, illumination and theatre.

on this site would have called for many special construction features—especially in the roof—to attenuate the intermittent noise from the helicopter flyover.

It's less expensive to start with a quiet location than to have to add many special building features to attenuate external environmental noise. In operation, any problem can be overcome if an owner is willing to spend enough money. Since economics is an important part of any building design, this preselection phase is a very important one.

There are the natural tradeoffs between feasible cost and convenience of the location. The most convenient site location selected may often be the worst one possible acoustically. It would be extremely expensive to provide the necessary sound isolation to locate a studio beneath the flight path of a busy jet airport. Yet, with sufficient funding and planning, a studio can be located in a bustling urban area. This is partly involved with the studio orientation and its relation to the station's auxiliary spaces. This means surrounding the studio itself with dressing rooms and other office-type space to act as a sound-insulating layer. This layer acts as an inexpensive acoustical buffer between the studio and external noises.

#### Other Noise Sources

Once you've eliminated the problem of external noise, there are other potential noise sources that need careful control. These include noises generated by people in adjacent studios, control

rooms and offices, and the noise and vibration of the building's heating, ventilating and air-conditioning equipment.

### Design Priorities

There are different levels of acoustical design criteria. The most critical are those for audio recording. Recording studios cannot tolerate the noise levels that are often acceptable in a broadcast station. By the same token, a TV studio can tolerate higher noise levels than a radio broadcast facility. Even then, the acoustical design factors depend on the TV studio's ultimate use. If the program material is mainly drama or musical comedy where close miking can't be used, the acoustical environment must be fairly well controlled. If the studio is used for news or interview programs where microphones are visible on tables or lavaliers, then the acoustical environment is not as critical.

Even though close miking is generally possible in radio studios, background studio noise levels can be a difficult problem. This is due to the high quality of audio reception possible on fm radio and the focus of attention, which is purely on the audio reception.

### Using Existing Buildings

When a broadcaster plans to locate in an already existing structure, an initial acoustical evaluation is advisable. The evaluation will determine the ambient noise and vibration levels from external and internal sources. The initial visit will let the consultant find out what acoustical modifi-

## Planning Tips, Floor Plans Available

Brochures describing station planning, equipment and possible layouts are being offered to **BM/E** readers by RCA and Gates Radio. These publications include station floor plans and numerous pointers that might jog a few ideas into place for your own setup. Write on your station letterhead to the addresses below for these publications. Indicate whether you're interested in TV, a-m or fm radio operations.

For the RCA brochures, write to: Paul A. Greenmeyer, Editor, **Broadcast News**, Building 15-5, Radio Corp. of America, Camden, N.J. 08102.

The Gates booklets are available from: Ed Gagnon, Gates Radio Co., 123 Hampshire St., Quincy, Ill. 62301.

cations are necessary, if any. Cost estimates can be established by the potential owner's architect. The owner will then be able to evaluate a site before committing himself to an expensive lease.

Acoustical improvements for existing facilities may involve a top-to-bottom remodeling of a studio. Because of finances, modifications may be limited to solutions for the most serious acoustical problems.

Many of the older studios have reverberation time characteristics that are not flat with frequency. In the studio's original design, the "room acoustics" may have consisted simply of installing glass fiber blankets on the walls. The result is high sound absorption at high frequencies and very little at low frequencies. Net effect: a "boomy" studio that accentuates low frequencies.

In a redesign, low-frequency sound absorption may be added to overcome these low frequency deficiencies to produce a flat frequency vs. reverberation time response. Low frequency absorption can be obtained by having an air space between a glass fiber sound absorbing blanket and the studio wall. It's also helped by installing panel resonators, slit resonators, or Helmholtz resonators. The type of low frequency absorption which is used should be balanced with the studio's space requirements and the budget.

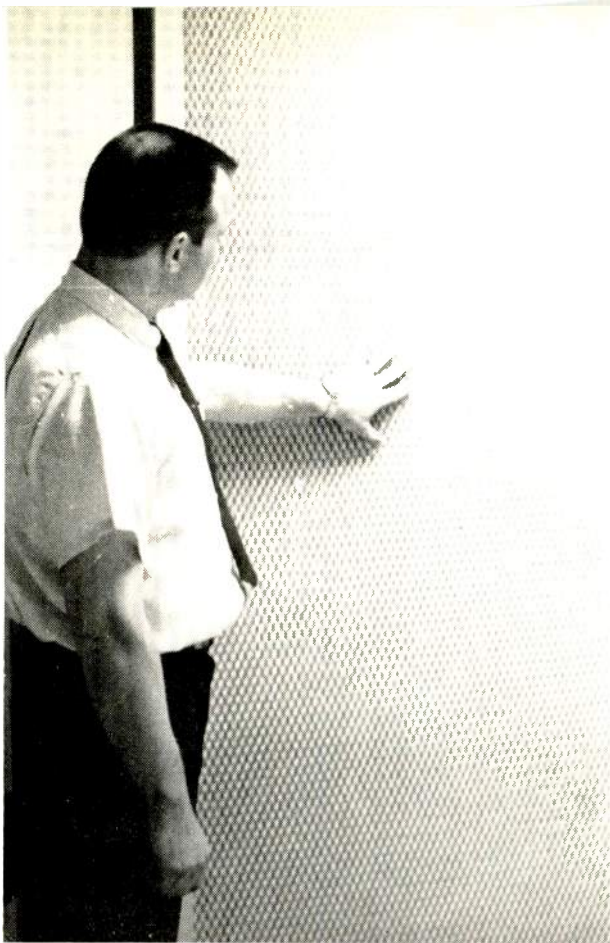
### Small Station on a Budget

One of the first things to consider in a small station renovation is the elimination of external intruding noise and noises from the air conditioning system. Airborne noise in the duct system can be attenuated by installing glass fiber-lined ductwork and packaged duct silencers. Air-conditioner silencing elements should be installed during the original ductwork installation. An existing fan noise problem may be cured by installing a duct silencer in the air conditioning system. Acoustical preplanning is the economical way to approach air conditioning noise.

A basic studio design may incorporate masonry block walls, which provide a certain amount of noise reduction from surrounding environmental noise sources. The specific type of wall selected depends on whether you're going to have a machine shop or a quiet dressing room for a next-door neighbor. If this adjacent area is part of the station's property, then it becomes easier to control the activities there and the designer can surround the acoustically critical studio areas with rooms and areas that have low noise levels.

If the next-door neighbor is quiet, the wall can consist of a 6- to 8-inch concrete block painted on both sides during construction. Studio windows should be double-glazed for sound isolation. In a typical configuration, one pane is 1/4-in. thick





Rounding the corners is done in this WGBH-FM studio by installing a corner storage closet with a door made of heavy-duty sound-absorbent material.

plate glass and the other  $\frac{3}{8}$ -in. thick plate glass with a 4-in. air space between them. A sound-absorbing material should line the inside perimeter between the two glass panes. Each pane should be installed in a rubber gasket to act as a vibration isolator.

The studio entrance door should open into a "sound lock" (a stub corridor with two or more doors). If this isn't possible, the single door should be a fully gasketed solid core door.

#### Floors and Ceilings

The floor treatment in and around studios should be a truly resilient material such as carpet, if there's going to be heavy pedestrian traffic. There are any number of commercial resilient materials that can be used to overcome footfall noise. These resilient materials aren't suitable for floors that are going to have camera dollies rolling over them. In such cases, obviously a smooth level, long-wearing floor is essential.

The acoustical treatment for the wall can be handled many ways. Wall sound absorbing treatments include: "Tectum," a wood fiber material with a cement binder; glass fiber bolts covered with an acoustically transparent facing in the form of perforated metal, expanded metal mesh or grille cloth material.

The ceiling treatment can also be one of these combinations. An economical method of obtaining

low-frequency absorption is to install acoustic tile with a very thick, dense glass fiber blanket over it.

#### Room Shape a Factor

The shape of the room is an important factor. Non-parallel walls and splayed walls are often used to obtain sound diffusion. Variations in the use of materials on the walls is also a useful technique for obtaining sound diffusion. In small studios, diffusion is obtained by having some surfaces sound-reflecting and others sound-absorbing.

One problem that can crop up is overzealousness in the application of sound-absorbing treatment, resulting in a studio having *too much* sound absorption. This condition is just as difficult as a studio's having too little absorption.

#### Quick-Change Studio Walls

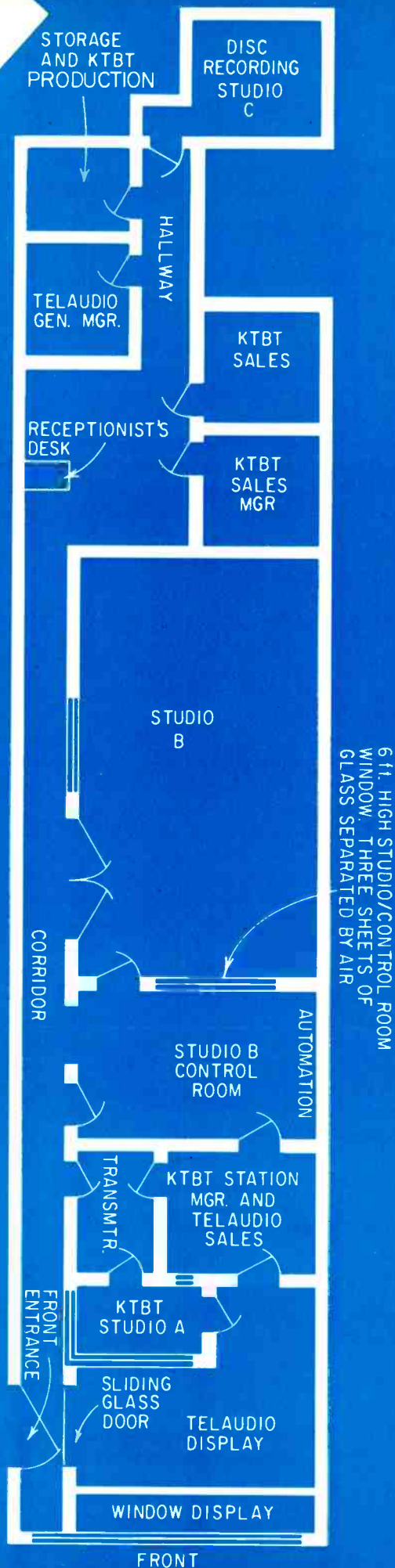
Some studios are called on to accommodate a wide variety of program types which demand widely differing acoustical treatment. Moving wall and hung draperies, for example, can change the reverberation characteristics from concert music to musical comedy to speech. In a large broadcast studio with large amounts of built-in absorption, draperies have a minimal effect on changing the reverberation time. Other techniques have been developed which are far more effective. These include movable wall panels. The panels have reflective surfaces on one side, and the other sides are highly absorptive. By rotating or sliding these wall elements, it's possible to "tune" a studio acoustically.

One method of "tuning" is with a rotating drum which has one half made of highly reflective plaster and the other half of a sound-absorbent material such as glass fiber. By rotating the drum in its cavity, all or part of either surface can be exposed to the studio for the desired effect. A wall can be made of several of these drums. Another method of adjustment uses sliding doors to cover or reveal sound-absorbing surfaces. The doors themselves are highly reflective.

#### Acoustical Elements Are Interdependent

Virtually all acoustical design considerations are closely interdependent. Proper design involves selection of many elements to make up a complete system. It's not very economical to invest heavily in a studio's room acoustics if programs are constantly interrupted by noise from overflying aircraft, truck traffic or construction noises. On the other hand, too much acoustic isolation can be prohibitively expensive, so site selection becomes an important factor in preplanning. The station owner should strive for an acoustical balance for his studio design. ●

# IDEA PORTFOLIO: Station Floor Plans that Work



## WDRG, Hartford, Conn. ➡➡

Unusual "D" shaped studio layout at combined a-m/fm station places main control at hub of operations for both outlets. Control and studio areas are surrounded by offices, storage and other ancillary rooms to provide extra sound "insulation" from external environmental noise. Large glass areas provide excellent view for control engineers and performing personnel.

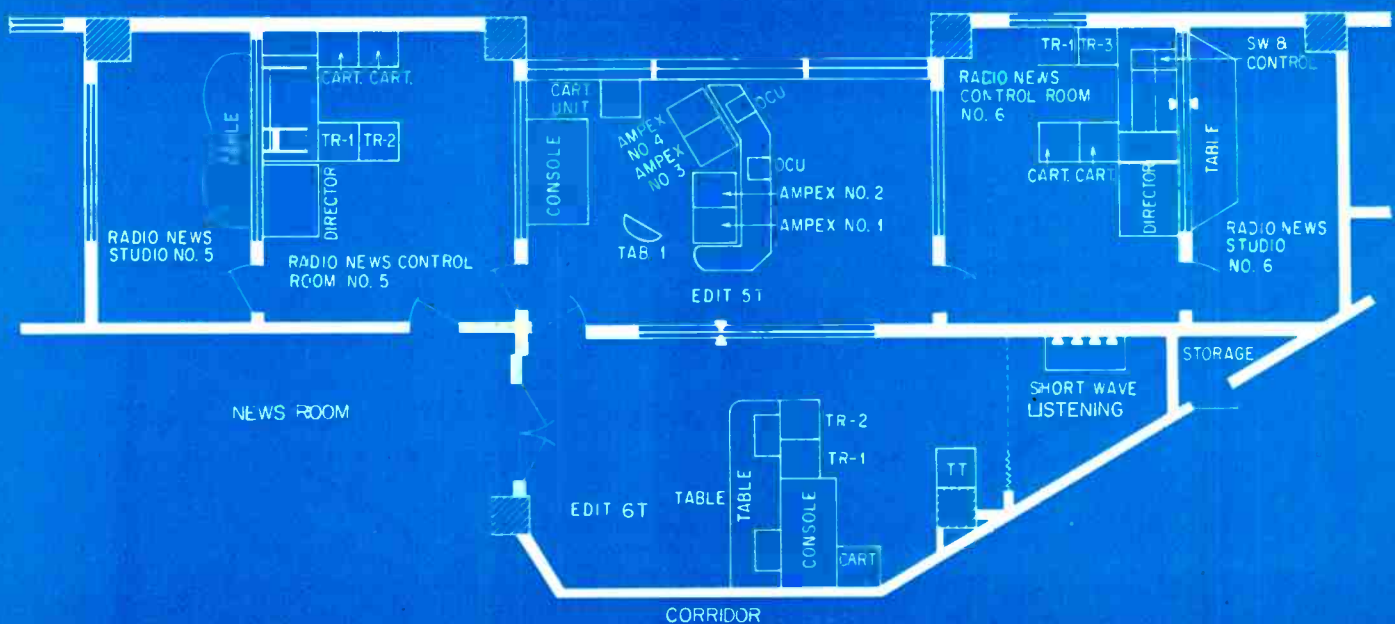
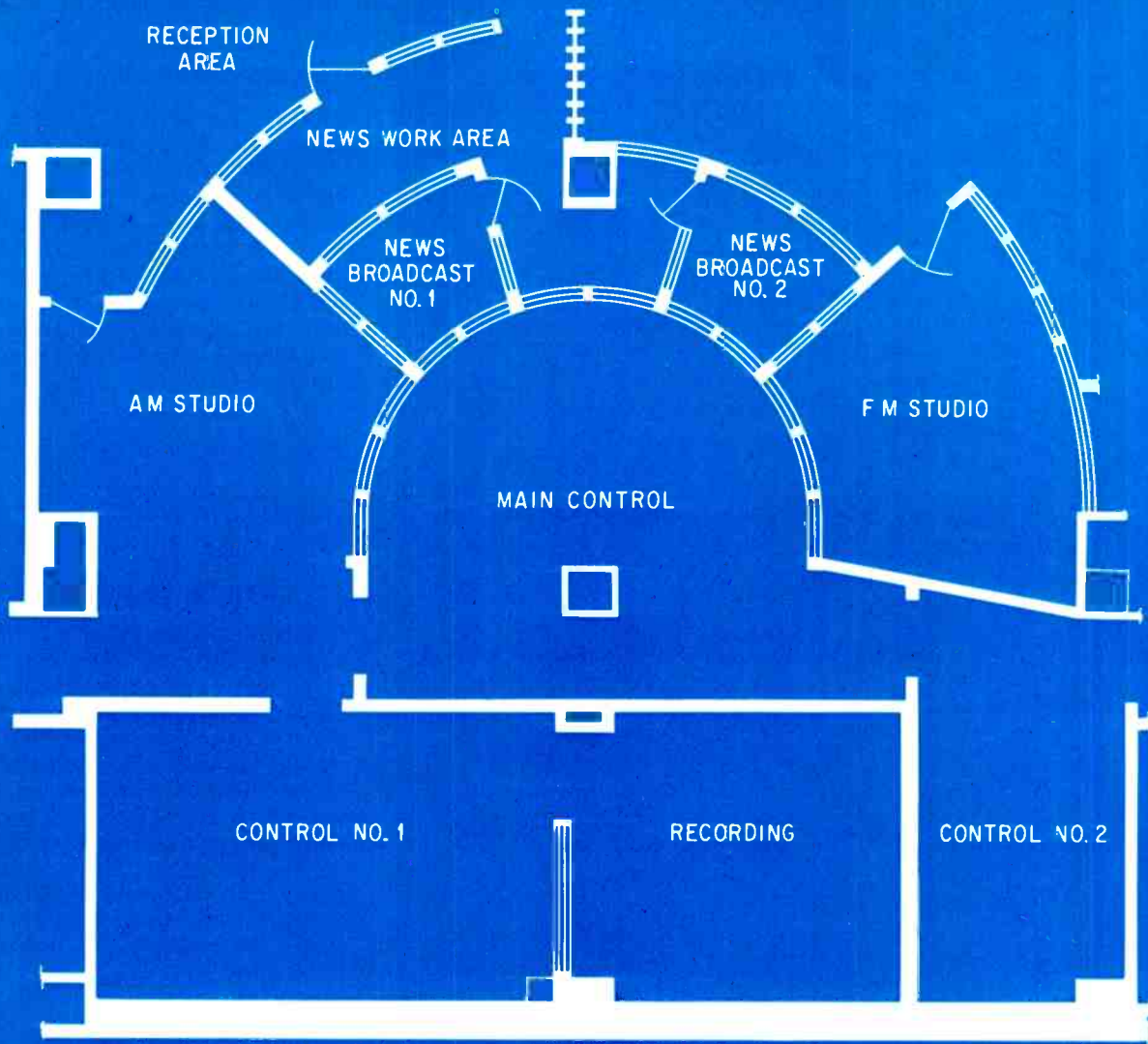
## ← KTBT/Telaudio, Garden Grove, Calif.

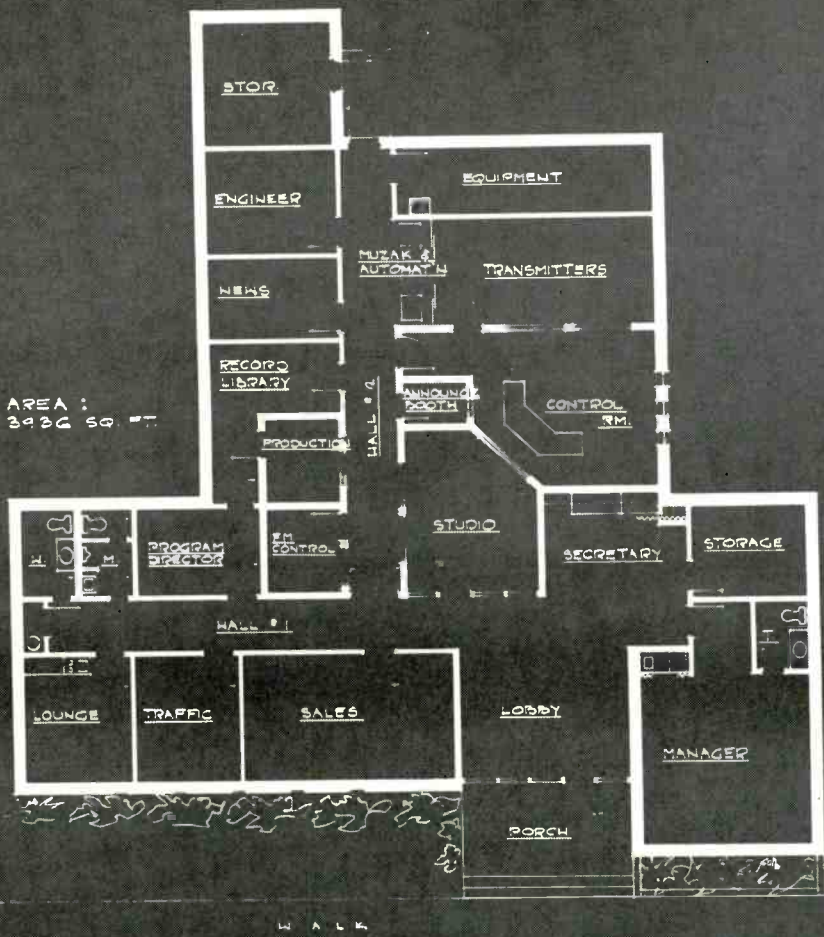
A combined operation in a shopping center, Telaudio merchandise is displayed in window and showroom floor at front of "store." KTBT broadcasts stereo fm around the clock, and is fully automated. Parked outdoors is a mobile TV van for rental purposes. Station also provides TV air-check service and a recording studio operation that originates many radio commercials. Lots of glass in display area lets visitors see radio gear closeup.

## ABC Network, New York, N.Y. ➡➡

Housed in an old, odd-shaped building, new home for ABC radio network's multi-faceted operations has news facilities as focal point. Several other studios and control rooms not shown are similarly arranged. Designed for 24-hour-a-day operation, editing facilities outnumber studios, since engineers must handle mountainous quantities of news tapes every day. Four network services originate in this studio. (See story on page 39.)





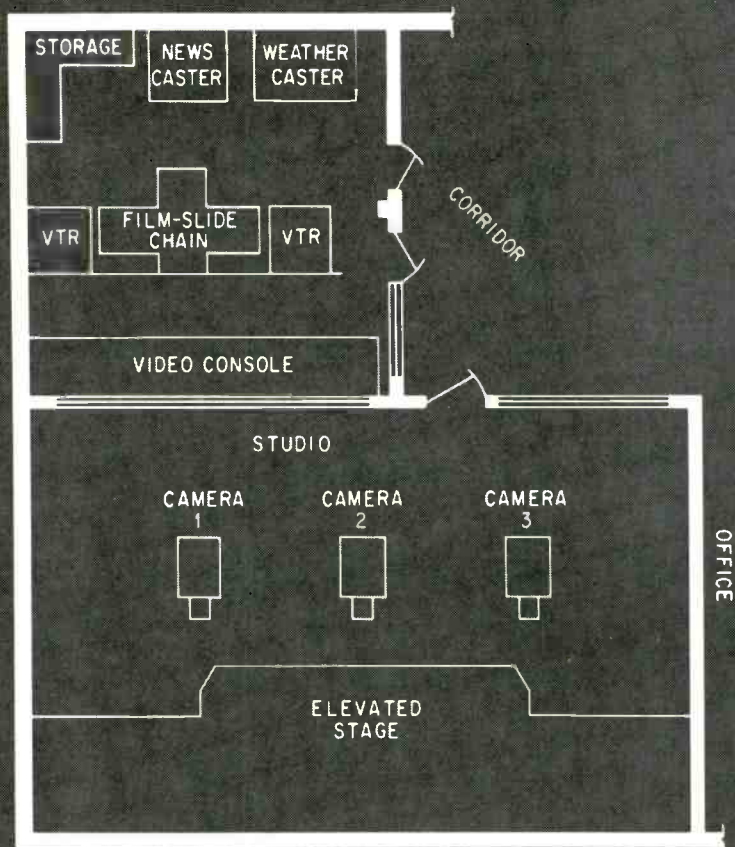


← KDMS/KRIL, Eldorado, Ark.

Multipurpose station includes a-m, fm and Muzak services in well laid-out plant. Separate heating and cooling systems operate for control and studio areas when rest of station is closed at night. Transmitter heat is used for general building heating in the winter, needing no extra heating until the mercury dips below 20°. Equipment includes low-power standby a-m xmtr.

WNEW-TV, New York, N.Y. →

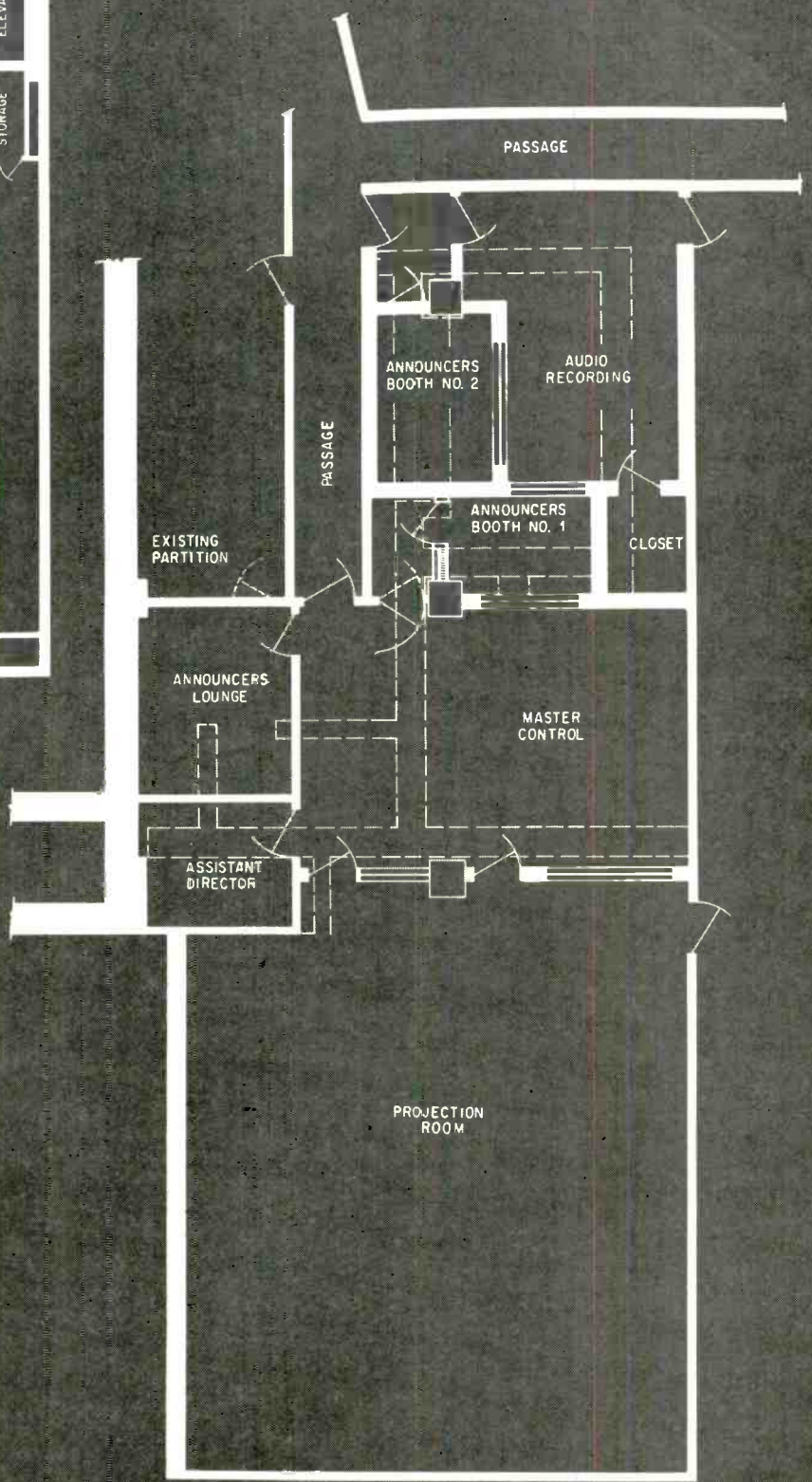
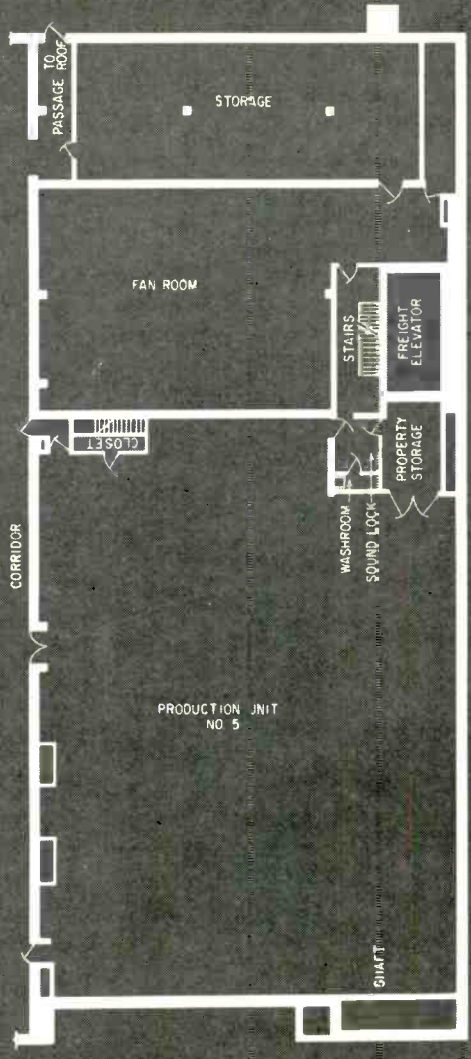
Giant-size Studio 5 (right, above) measures 75 x 110 feet, has sponsor's room and production control above "fan room" area. Studio is three stories high, runs from fourth through seventh floors. Master control and film room are on building's second floor and include sophisticated automation equipment. Announce booths and audio recording studio add to area's flexibility for multitude of special-purpose programs. For details on this unusual TV station, see page 42.



← CATV, Oak Ridge, Tenn.

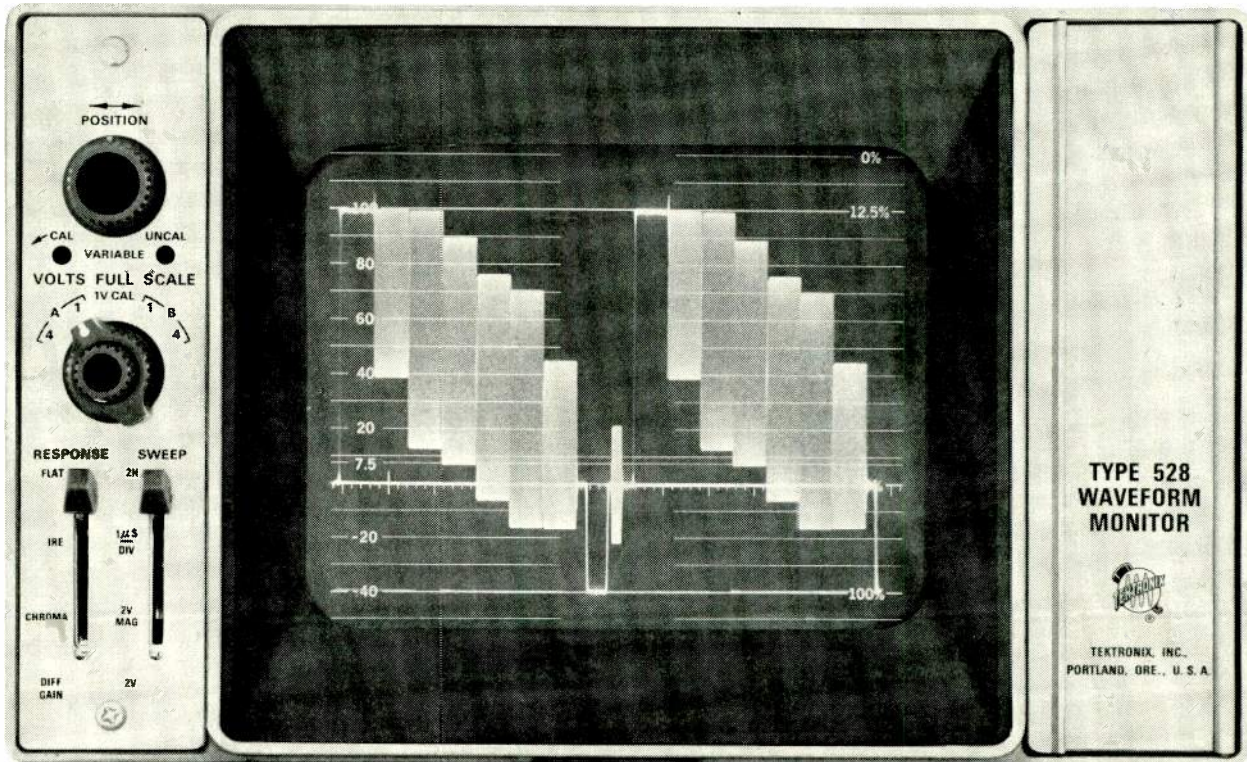
Local origination studio and control setup by Vikoa uses basic format applicable to both small broadcast stations and CATV operations. Video console is backed up by variety of origination equipment, and single engineer can run the whole show, if necessary. Variation could include small announce studio in "corridor" area for more flexibility.







# NEW television waveform monitor



3/4 Actual Size

- compact size with large 8 x 10-cm display area
- picture monitor output
- YRGB and RGB inputs
- 1-volt and 4-volt full scale deflection factors

The new Tektronix Type 528 solid-state Waveform Monitor is ideally suited for monitoring waveforms from camera outputs, video system output lines, transmitter video input lines, closed-circuit TV systems and educational TV systems. This compact instrument requires only 5 1/4-inches vertical and 8 1/2-inches horizontal mounting space.

Either of two video inputs, selectable from the front panel, may be viewed on the 8 x 10-cm screen. The video signal being displayed is provided at a rear-panel connector for viewing on a picture monitor.

Calibrated, 1-volt and 4-volt full scale deflection factors provide convenient displays of typical video and sync signal levels. A variable control provides uncalibrated full scale deflection factors from 0.25 volts to 4.0 volts. FLAT, IRE, CHROMA and DIFF GAIN vertical amplifier response positions permit rapid observation and measurement of waveform characteristics. A slow-acting DC Restorer maintains a constant back porch level despite changes in signal amplitude, APL or color burst and may be turned off when not needed.

Sweep modes are: 2 V SWEEP (two field), 2 V MAG SWEEP (expanded two field), 2 H SWEEP (two line) and 1  $\mu$ s/div SWEEP (calibrated sweep with accuracy within 3%). Internal or external sync is selectable. Provision is made for YRGB and RGB displays.

This lightweight waveform monitor converts to a portable unit for field service applications by simply adding an optional protective cabinet. An optional Rack Adapter permits side-by-side mounting of 2 Type 528's.

Your Tektronix Field Engineer will be happy to demonstrate this new solid-state waveform monitor on your premises at your convenience. Please call him, or write: Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97005.

Type 528 Waveform Monitor .....	\$800
Rack Adapter for mounting 2 Type 528's side-by-side (016-0115-00) .....	\$ 85
Cabinet, provides protection for out-of-rack applications (390-0018-00) .....	\$ 30

U.S. Sales Prices FOB Beaverton, Oregon



**Tektronix, Inc.**  
committed to progress in waveform measurement

Circle 14 on Reader Service Card



Newsman (facing camera) and engineer edit news tapes for network distribution. New ABC network plant has several such facilities for program editing, all busy around the clock.



See page 35  
for floor plan

# New Plant Handles ABC Radio's Four Nets

By Joe Shapiro

**Everything's new at ABC Radio's flagship plant. Space-age design plus studio and equipment flexibility smooth this round-the-clock operation. Even the time-honored patch panel has disappeared!**

SERVICING FOUR DIFFERENT NETWORK operations from a single flagship location isn't the easiest job in the industry. Doing it from outmoded patchwork and makeshift quarters had become a major problem for ABC radio's New York operations. In its old quarters, the network was handicapped in several ways. The facilities were spread over six floors and yet there was a growing shortage of space. In the early fifties, when the studios were constructed, soap operas and other live programming ruled the roost; the tape recorder still played second fiddle to the transcription turntable, and the tape cartridge and other technical innovations were years away. As these newer techniques came into use, equipment was modified and added to existing units on a piece-by-piece basis.

During this same period, the network's news functions rose to greater prominence. Studios were converted into news and technical operations areas to meet the need for extra newsroom

space and to house new technical equipment. Results of this patchwork expansion program were often far from ideal. Several busy control rooms were so cramped, that they had standing room only.

## Mixed Bag of Equipment

From a technical standpoint, one of the greatest problems was the lack of standardization among the various studios. Almost no two units were alike. Some were twenty-year-old vacuum-tube units, others were of more recent vintage, and a few were solid-state. Several different manufacturers were represented. This made instruction for new engineers difficult. Each board operated differently, and even network veterans might forget that one board required keys thrown to the left while others operated exactly in reverse. Even maintenance was difficult, since there was so little interchangeability among equipment pieces.

Locating around the corner instead of remodeling existing facilities had some big advantages. The main one was that in the new location, all operations could be grouped on one floor. After eleven months of design work and bid submissions, McCurdy Radio Industries, Inc. of Toronto, Canada was signed by ABC as the prime contractor. Construction and installation took four-

teen months and the new facilities started operating in May, 1968.

### Standardization Dominates

McCurdy blue is the dominant color of the equipment in the eleven control areas of the installation. But a short tour reveals that much more than the color of the equipment has been standardized.

The basic unit in all but two of the areas is McCurdy's series 4900 console, modified to meet ABC's special requirements. The solid-state console is modularized. Power supplies, amplifiers, input switchers and other console functions are quickly removable for service; a spare module can be plugged in to replace a defective unit for on-the-spot servicing. This holds down time to a minimum. Gone are days when the failure of one piece of equipment could close down an entire studio for repairs. The cartridge and reel tape machines are also terminated in easily-removed plugs, designed for rapid equipment interchange when needed.

For maximum flexibility and minimum crosstalk, all audio input switching is done by low-voltage dc control circuits. The system uses stepping relays and an input switcher and readout developed by Automatic Electric. Sammie Aed, Director of Technical Operations for the ABC radio network explains that the A-E steppers had been used by ABC in remote transmitter switching applications. ABC found them to be extremely reliable. All the stepping relays are located in a separate switching room with a controlled environment—temperature and humidity are maintained at a constant level.

Controlling the stepping relays are 108 input switcher-readouts located throughout the plant. Each audio console has at least two input channels controlled by these units; some consoles have three. Also, every cartridge tape deck and every reel-to-reel recorder has an individual input switcher readout. These switcher-readouts are mounted in the overbridge on each tape machine. Several are also used for comprehensive monitoring in the news area, letting the editor hear exactly what material is being processed at any time.

### No More Patch Panels

A closer look at the console reveals a matrix of 50 possible inputs arranged in ten rows of five. The selector uses a pushbutton matrix with a letter designation ("A" through "E") over each of the vertical rows; there are ten numbered pushbuttons opposite the ten horizontal rows. Selecting an input is simply a matter of pushing the letter and then the number button—like a juke box record selector. When a selection is

made, the appropriate designation lights up on the readout panel. These legends are printed on a photographic negative which can be replaced easily if any of the 50 available inputs are changed. These readouts, connected by low-voltage dc to the stepping relay bank, eliminate that old broadcasting bugaboo—the patchcord. The switcher-readout's flexibility, with its 50 separate inputs, is equal to the most elaborate patch fields—and all this in a panel space of only 4 x 8 inches. ABC engineers are enthusiastic about this unit, believed to be the first of its kind in broadcasting.

### Output Routing is Automatic

Another innovation at the studios is the automatic output routing system. All studios, except those intended strictly for editing and production, can feed out on any of four program routes. Normally, route 1 is used for feeding on-the-air shows, while the other routes are used for backup, program transmission from one studio to another, and other special purposes.

Each studio is provided with *air* and *preset* buttons for each of the four routes. The buttons are backlighted in a color code which shows if a line is available for use or if it's being used, by another studio. Assuming the line is not in use, pushing the *air* button for any route will allow that route to be fed by the studio. If the route is in use, pressing the *preset* button will set up that studio to get the line automatically as soon as it's relinquished by its last user. In practice,



Crossbar switching shown close up above, has eliminated patch cords once and for all. Crossbars are duplicated throughout studios, even on newsdesk (right) for "patching" in phone calls.



the studio doing the air show feeds route 1, while the next studio scheduled to go on the air presets his output router for route 1. Then, as soon as a program is completed, the output line will automatically drop to the next studio which has preset for it. An override permits one studio to break in on another if a program in progress must be interrupted, such as for a news bulletin.

Another series of eight buttons in the air studios lets the engineer transmit tone pulses of various frequencies down the network line. Three of these pulses are for control of automation equipment used by some FM affiliates of the ABC radio network.

Two of the most important studios in the entire operation never actually go on the air. These are studios 5T and 6T, which handle the basic news operations. Into these rooms come overseas reports, tape and line reports from correspondents, inputs from affiliates, and telephone feeds. Tapes and reports are processed and edited, and then made into tape cartridges for use on upcoming newscasts.

With the expansion of the ABC radio network into four separate program services, these studios are called on to provide fresh tape for four newscasts each hour, so these studios must be manned around the clock. Each of them is manned by a news writer and an engineer. The news writer has a switcher-readout unit that lets him monitor any feed that the engineer is working on.

Studios 5T and 6T also have overseas control

units, and through these, the newsmen can hold two-way conversations with foreign correspondents on overseas line. The output of these units can be punched up on the input switcher readout for recording the feed.

### Flexible Tape Equipment

All tape machines and cartridge recorders are remotored to the console in their studio. Some of the reel machines can also be remotored to other rooms. Flipping the switch on the recorder's overbridge to the *delegate* position does the trick. In these cases, remote is limited to *start* and *stop* functions, since the operator can't see these machines when he is in another studio. Fast forward or rewind by remote would have to be guesswork at best. The delegate remote provides extra operating flexibility, especially if a studio engineer needs more tape recorders than he has available in his studio.

A built-in safety feature eliminates the possibility of tape being rewound on the air. All reel-type tape machines are wired so they will not supply any output to the console unless they are in *play* position. Each tape recorder, and for that matter, all audio sources, have their own cue monitors. This means that monitoring doesn't tie up the main console, and several different sources can be monitored at the same time. Another feature is the telephone dial audio monitor system in most of the offices in the building with this, any of 99 different sources can be monitored.

The master clock system at the 1926 Broadway studios made by Simplex, with all clocks linked to a master clock which is locked to wv. The system resets itself every minute on the half minute—a great improvement in accuracy over the Western Union system previously used. Because the master clock operates mechanically, the system can operate accurately with no pulses at all for a month or more.

The ABC technical operations department is pleased with the new plant and feels that it has met design objectives. As Vice President for Engineering Julius Barnathan explains it "The new ABC radio plant was conceived and designed with our main objectives being standardization and reliability to handle modern network radio." Evidence of the versatility of the installation was proven by the fact that the layout and design were completed eleven months before the advent of ABC radio's four network concept. The new plant was easily adapted. The design is completely compatible with this new programming concept, and we envision that this installation is well equipped to keep pace with the future expansion of the ABC Radio Networks." ●



# Channel 5's Renovation: Second Time Around for 82-Year-Old Building



Master control uses IBM-card-controlled automation with manual override at any time. All program sources are available here for instant changes.

**Built in 1886 to house a physical culture society, WNEW-TV's home first became a TV station in 1951. Now it's being done over again, and it's business as usual while studio engineers and building contractors try not to trip over each other.**

THE MIDST OF A BUSTLING urban area isn't always the best possible location for a major TV station—especially in an 82-year-old building—but that's where Metromedia's WNEW-TV (channel 5) has its New York studios. The octogenarian building on Manhattan's East Side started life in 1886 housing the Central Turnverein—a physical culture society made up mostly of German-Americans living in the area.

In 1894, part of the hall—a full-size theater—was taken over by New York brewery king Jacob Ruppert, who used it to present a mélange of vaudeville programs. The rest of the facilities for swimming, fencing, bowling, the gymnasium, school rooms, library and the city's largest ballroom (at the time) went their various ways.

The building's had a lot of uses over the years until in 1951 the DuMont Television Network bought the property. They ripped out the building's insides—leaving only the load-bearing walls—and built a complete TV broadcast station from the ground up.

## Second Time Around

Now Granddaddy Turnverein is getting its insides worked on once again—this time to modernize and upgrade the 17-year-old broadcast facilities. Metromedia, which bought the station from DuMont in 1955 (it was WABD in those days), decided on a complete plant updating along with a brand-new interior and a 7-story-high face-lifting on the outside. The new façade is in keeping with the well-appointed (lavish in some areas) interior and the attention to detail that are mak-

See page 37  
for floor plan





Technicians keep busy in Studio 5, giving it many faces in a broadcast day. Here, they adjust positions of quartz lights on their overhead pipe battens.

ing this facility one of the most modern in the world. But the process has been agonizingly slow. In progress for about 3½ years now, all this work has been done while the station carried on its usual programming. Of the five major studios, three are out of commission, and behind those locked doors, building contractors are hard at work even while Alan Burke, David Susskind and the ten o'clock news hold forth for the cameras.

Part of the secret of this business-as-usual stance has been to complete the two most useful studios first. Medium-size Studio 1 and gargantuan Studio 5 are beehives of activity as they flesh out the broadcast day. Those two studios and their control rooms contain some of the most modern and sophisticated TV broadcast equipment available, which makes them more versatile for doing double and triple duty if needed.

#### Lots of Headroom in Studio 5

A tour through newly renovated Studio 5 reveals a cavernous chamber with a floor that measures 75 × 110 feet and sports a three-story-high (about 35 feet) ceiling. As Assistant Chief Engineer Ken Reichenbach points out, "It's completely possible to fly scenery entirely out of the way and drop it in as you need it." About 15 feet above the studio floor is a layer of wall-to-wall lights. These are mostly adjustable ColorTran quartz lamps installed in multiples on bars that can be raised or lowered to make adjustments. The studio has over 230 individual lighting pig-tails on counterweighted pipe battens—individually patchable, and individually or group dimmable through the solid-state dimmer system. All the studio lights are controlled by brand-new ColorTran solid-state dimmers, light control console, preset panels—all handled from a single control point at the edge of the studio floor.

Hanging from a suspended track, a 400-ft-plus long cyclorama curtain can completely surround the studio, or cover just selected portions of the

wall. The curtain is completely motorized for remotely controlled height adjustments. The curtain's neutral oyster-white color can become any color that's needed by slipping gels into the right spotlights.

While the plant's physical layout is essentially the same as the one laid out by DuMont, virtually everything within the four walls is brand new. Doing yeoman service in Studio 5 are three Norelco PC-70 color cameras which can scurry from one set to another on the huge floor. Up a flight of steel stairs is the sponsor's room, topped by the studio's production control.

Along with general colorization of the studio, the video switching and mixing equipment was completely replaced. In both Studios 1 and 5, Central Dynamics video switchers handle the program material. A separate, modernized audio control room for Studio 5 has a new McCurdy solid-state console. The unit has built-in reverb and filtering, over 100 inputs, pushbutton selection of all functions and inputs, and slider pots. A ten-spot Spotmaster audio cartridge unit and a record turntable sit at the audio engineer's left hand.

#### Videotape Center Upgraded

A frenetic beehive of activity, WNEW's videotape room is likewise in the midst of a modernization program. Three newly installed Ampex VR-2000 high-band color recorders are carrying the station's load while the rest of the tape equipment is pulled and replaced. Plans call for a total of six Ampex's. The tape room has feeds from all studios, from film chains, remotes, out-of-city feeds and lines running between tape machines—all available on a pushbutton selector into each recorder. The machines have custom hoods which house 17-in. color monitors and monitor speakers. The hoods hold down background noise and ambient light when the machine's being used. The tape gear also includes complete electronic editing facilities, and auto-

matic velocity compensators are being added.

One central location houses color video and terminal equipment and contains all camera controls. From here, feeds are handled from the six Norelco PC-70's in the two operational studios, and the station's three General Electric 4-V color film and slide chains. This room also has all of the station's audio distribution facilities, video distribution, sync generators—virtually all the terminal equipment.

The Grass Valley audio gear is entirely solid-state, with automatic fades, dissolves and under-and-over mixes. The sync generators and live color camera encoders are all made by Cohu. Selection is provided from the three generators into 21 loads with the presently used pulse distribution facilities. Audio racks also include a patchboard, intercom and outside telephone feeds. The intercom system is home-built, and makes it a snap for operating personnel to speak to anyone, anywhere in the building or at a remote site.

Of the total of 71 full-time station technicians, eight of them are involved with maintenance, and do some design and construction work when home-brew equipment is needed. The in-house-designed intercom system itself is a marvel of simplicity, using two racks of plug-in relays.

On the second floor, right next to master control, is a healthy-size projection room. It has no less than seven film chain/islands; there are four RCA TP-15 multiplexers for seven 16mm projectors and six RCA TP-7 slide projectors; the film projectors are a mixture of TP-6's and TP-66's—all shooting into automatic Sarkes Tarzian monochrome vidicon cameras.

One of the TP-15 multiplexers, in addition to its monochrome camera and projectors, has a 16mm and a TP-7 slide projector shooting into a GE 4-V color camera. Reichenbach makes no bones about the fact that the multiplexers are not being used the way they were designed to be. They're set up to accommodate two 16mm and two slide projectors at a time—multiplexed into two mono vidicons—all on one multiplexer.

Also on the floor are two Eastman pneumatic multiplexers. One of them has two TP-66 16mm projectors and one TP-7 slide projector into a GE 4-vidicon color camera. The other Eastman island is the same except that it has just one 16mm movie camera, one 35mm movie projector and one slide projector. The grand total is seven mono vidicon cameras and three color chains.

#### **Automation Master Control**

Through a door from the projection room is WNEW-TV's automation master control—the central control point for the entire station. This room determines what source of program material will be on the air at any particular mo-

ment. Central is where the studios are selected when they're due to go on the air. When studios aren't on the air, the station is using film, slide or videotape sources—with all programming controlled from master control through a Visual 6000 automation system. The 6000 prerolls VTRs and film projectors on a time basis, stopping them when they're finished; programs fades, dissolves and supers; programs mixes over and under; handles a total of 10 effects among audio fades between sources; audio segues calls up slide projectors; changes slides; puts out the lamp when the projector's finished, and other automated functions.

This automatic equipment was one of the station's first steps in their modernization program about three years ago. Complete manual override (both audio and video) is possible at any time on an instant's notice. The man who sits at the console can also make changes at any time in what the automation gear has done or what it's been told to do. The system gets its instructions from IBM cards, but even when these data are in storage, they can still be changed, if a late-breaking program change calls for it.

Through another door, a sound lock, and we're in a telephone-booth-size announce studio with a window into master control. The announcer seldom uses this window—automation has seen to that. Hanging on the wall in number one visibility position is a repeater of the Visual automation gear's on-air line. This is made up of several groups of Nixie tubes that tell the announcer what video and audio sources are on the air and how much time remains until the transition to the next source. The next source may well be his own microphone, and he can see all this information without diverting his eyes very far from his script.

The station also has its own master clock system, with slaves throughout the building operated from a Favag super-accurate pendulum clock that hangs in master control. The system is completely self-contained, and WNEW-TV maintains it within one second of accuracy against wv standards at all times. Even though the clock is checked against wv on a daily basis, it usually requires no more than a one-second correction about once a month.

#### **Smaller Active Studio**

Studio 1 is the smaller of the two active studios now in operation at channel 5. It's used for audience participation shows, and is located on the ground floor which makes it easier to handle audience flow into and out of the area. It's two stories high, with client viewing rooms on the second floor and production control on the first. Like Studio 5, its upper area is covered with clusters of ColorTran quartz lamps, and three Norelco color cameras are active floor participants.





Studio 1 gets ready for a live show and studio audience. Norelco color cameras (at left) are used for final stage setups.



Terminal equipment room contains station's audio and video distribution facilities, sync generators and camera controls.



Solid-state studio lighting control board by ColorTran lets one lighting specialist handle Studio 5's 200-plus quartz lamps.



Announce studio next to Master Control contains video monitor and repeater of Visual numerical readout as it appears in control room.

Another special feature in the building: color monitors in the offices, clients' booths, major control points and other critical areas, can be "dialed up" for any video/audio signal on line in the building—whether it's going out on the air or not. This house-dial monitoring system selects the appropriate viewing fare with a telephone dial selector. "Dial-a-program" is available in about 20-odd locations in the building, and can select among any of the video sources available at the terminal facilities in master control. This would include on-camera rehearsals, remotes, on-the-air programs, camera channels not on the air, color bar generator and grating signal. These last two channels permit technicians to maintain monitors in proper convergence and color balance without any extra manpower needed to provide test signals. The house dial monitoring system is made by Sarkes Tarzian.

#### Theater Holding Area

An extremely unusual feature of the building is its new theaterlike holding area for audiences who arrive well in advance of show time. As Reichenbach points out, "We never had, prior to this, a really adequate area for accommodating an audience between the time they arrived and the time that we're able to admit them to a studio . . . (the holding area has) six rows of nine permanently fastened theater-type fiberglass seats, two 21-in. color monitors and dual speaker systems served by the house dial system. If there's nothing going on in the adjacent studio, any other programming that exists can be fed to this room while the audience is waiting. In the past, we've always had the problem . . . couldn't leave them out in the rain; you can't have them clogging the front hall . . . what do you do with them?" The theater holding area seems to be an ideal solution to this problem. It seats 54 adults, has its own rest rooms, coat closets, and a direct-access door to Studio 1, so no one has to go back out into the hall when the studio's ready.

This kind of forward-looking thinking reflects all of the planning at WNEW-TV's old/new quarters. From the ultraplush executive reception room to the "small" details of caring for waiting studio audiences, Metromedia's TV station shows careful and thorough planning throughout. It's an independent that competes successfully in the big time, in a city with 10 TV stations that include three network flagships. It's in a building with a weird history that's intertwined with the very fabric of New York's fabulous history—not far from the Jacob Ruppert Brewery—and is on the edge of the German-American community that first made the Turnverein hall possible. But the old DuMont Network boys were spoilsports—they went and took out that swimming pool back in '51! ●



## Convention City '68

*Continued from page 29*

tions among flash-truck crews, motorcycle couriers and camera crews. Pocket-paging units will call operating personnel back from the beach. Rf microphones will provide instant movie audio with full lip synchronization and will avoid the need for later dubbing.

### Control Center for CBS

At CBS, Bob Wussler has been making convention preparations for over a year. His problems are common to all broadcasters who must move equipment from one city to another. During the planning phase, CBS started with a budget comparable to the one it had in 1964. Though CBS spokesmen haven't revealed this year's figure, reports indicate that costs have skyrocketed to about \$8 million.

The CBS coverage is divided into four control areas. First is central control, followed by three sub-control rooms: a floor control room for wireless mics and rf TV cameras; a perimeter control room for corridors, hallways and demonstrations; a remote control room for remotes from airports, ships, boats and helicopters. The famous Miami blimp won't be used.

One CBS helicopter has been equipped with a gyro platform to steady an airborne camera. The picture will be relayed to the ground via microwave. Fixed remotes will feed from the Hilton-Plaza, Americana and Deauville—Miami campaign headquarters for Nixon, Rockefeller and Reagan. Three mobile units, each containing two cameras, will have self-contained microwave and communications systems. CBS labs will be supplying its brand-new remote unit housed in a bread truck. This unit will have two color cameras (expandable to four) and a video tape recorder.

CBS has its entire caravan on wheels. Of its 60 trailers, the network will use nineteen as technical vans housing: control rooms, 12 VTRs, master control, camera controls and lighting control centers. CBS officials feel that they'll save about \$1 to \$2 million by using these trailers.

The 60-odd CBS cameras—will include G.E. cameras, four portables from CBS laboratories, plus several dozen Norelco PC-70's. They plan to show tabulated vote results on a Videograph character generator.

### NBC to Have 50 Cameras

This year's NBC coverage will resemble 1964's with one big exception—the program will be almost entirely in color. In Miami, NBC will use 25,000 feet of floor space and fifty color cameras. Numbered among these cameras will be four RCA man-pack wireless portables and six



Lightweight wireless microphone system by Airborne Instruments will provide duplex operation for newsmen.

cabled Norelco PCP-70 "Little Shavers." These will be backed up by 40 standard color cameras. The cameras will be dispersed among the Convention Hall and six area hotels.

NBC's video tape room will house eight color tape recorders for the net's own use, and two VTR's (on NTSC standards) for use by the BBC and EBU. Six prefab trailers plus thirteen pre-cabled origination points will add to remote pickup capability.

NBC will have several fixed microwave positions for routing video signals to the Convention Hall. One mobile "cherry picker" with a color camera will be able to see over crowds. Nothing is definite on helicopter-borne cameras, but at least one chopper will be available.

The network will bring its own color film processor to the conventions and will have three film chains on hand. Roving newsmen will be using fifteen microwave wireless mics from Airborne Instruments Labs. ABC will likewise be using AIL wireless mics. ●



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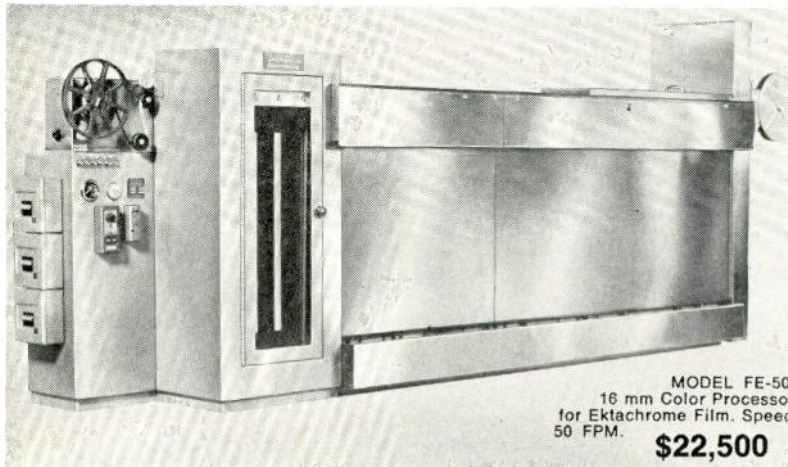
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- **"TORQUE MOTOR TAKE-UP"** gives you constant film take-up and does not impose any stress or strain on the film itself. Completely independent of the film transport system. This FILMLINE feature is usually found in professional commercial processors but is incorporated on the FE-30 and

FE-50 models as standard equipment. Don't settle for less!

- **"TEMP-GUARD"** positive temperature control system. Completely transistorized circuitry insures temperature control to well within processing tolerances. Temp-Guard controls temperatures accurately and without the problems of other systems of lesser sophistication.
- **"TURBO-FLOW"** impingement dryer. Shortens dry-to-dry time, improves film results, and carefully controls humidity content of your valuable (and sometimes rare) originals. Immediate projection capability is assured because the film dries flat without the usual curl associated with other film processors.
- **"ZERO DOWN TIME"** The reputation of any film processor is only as good as its reliability. The

combination of the exclusive and special added Filmline features guarantees trouble-free operation with absolute minimum down-time and without continual operator adjustments. Recapture your original investment in 2 years on maintenance savings alone. Filmline's "Push the button and walk-away processing" allows inexperienced operators to turn out highest quality film.

- **"MATERIALS, CONSTRUCTION AND DESIGN"** All Filmline machines are constructed entirely of metal and tanks are type 316 stainless steel, heliarc welded to government specifications. The finest components available are used and rigid quality control standards are maintained. Compare Filmline features to other processors costing more money. Feature-by-feature, a careful evaluation will convince you that Filmline offers you more for your investment.

### Additional Features included in price of machine (Not as extras).

Magazine load, daylight operation ■ Feed-in time delay elevator (completely accessible) ■ Take-up time delay elevator (completely accessible) ■ Red brass bleach tank, shafts, etc. Prehardener solution filter ■ Precision Filmline Venturi air squeegee prior to drybox entry ■ Air vent on prehardener ■ Solid state variable speed D.C. drive main motor ■ Bottom drains and valves on all tanks ■ Extended development time up to two additional camera stops at 50 FPM ■ Pump recirculation of all eight solutions thru spray bars ■ Temperature is sensed in the recirculation line ■ All solutions temperature controlled, no chilled water required ■ Built-in air compressor ■ Captive bottom assemblies assure you constant footage in each solution ■ Change over from standard developing to extended developing can be accomplished in a matter of seconds ■ Impingement dryer allows shorter put through time.

**Partial listing of Filmline Color Installations:** — NBC- New York, NBC- Washington, NBC- Cleveland, NBC- Chicago, CBS & ABC Networks, Eastman Kodak, Rochester.

**Laboratories:** De Luxe Labs, General Film Labs (Hollywood), Pathe-Labs, Precision Labs, Mecca Labs, Color Service Co., Capital Film Labs, Byron Film Labs, MGM, Movie Lab, Lab-TV, Technical Film Labs, Telecolor Film Labs, Guffanti Film Labs, A-One Labs, All-service Labs, NASA Cape Kennedy, Ford Motion Picture Labs.

**TV Stations:** WAPI-TV, KTVI-TV, WXYZ-TV, WTPA-TV, WBTV-TV, WEAT-TV, WMAL-TV, WSYR-TV, WDSU-TV, WVUE-TV, WJXT-TV, WTOP-TV, WAVY-TV, KTAR-TV, WTVR-TV, WFBC-TV, WMAR-TV, WCKT-TV, WAVE-TV, WCPO-TV, WAPA-TV, WCIV-TV, WJIM-TV, WWL-TV, KYW-TV, KETV-TV, WNBQ-TV, KSLA-TV, WSAZ-TV, WHP-TV, WHCT-TV, WTOV-TV.



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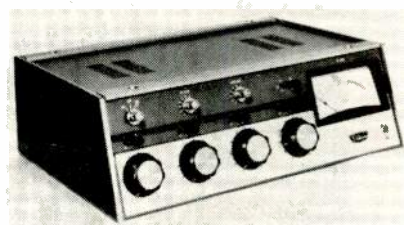
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# BROADCAST EQUIPMENT

## Remote Console Takes 8 Inputs, Mixes 4

A high performance audio console designed for use in remote locations or in studios where capabilities of larger consoles are not required is available from McCurdy Radio Industries, Danvers, Mass. The PE-

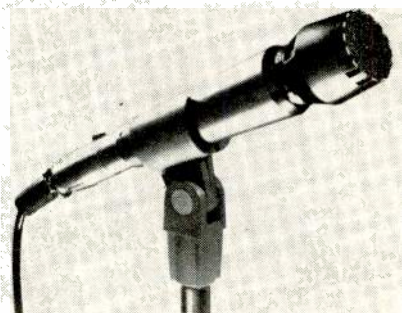


2400 portable audio console is a solid-state unit which accommodates eight (8) low-level inputs or four (4) high- and four low-level inputs selectable to four mixing channels. Gain capability from microphone input to program output is 110 dB (plus 18 dBm output after a 6-dB pad). All active component modules are plug-in type. The PE-2400 console operates from ac line current or from an external battery pack (optional) that provides for 40 hr of program operation. PE-2400 includes a built-in 1-kHz oscillator for setting line level. A fiberglass shipping case and leather carrying case are available.

Circle 100 on Reader Service Card

## Rock Mic Takes Audio Beating

AKG of Vienna, Austria, recently introduced a microphone designed particularly for bandstands, rock 'n' roll, soul music and folk rock applications, requiring a mic capable of handling tremendous sound pressures generated by contemporary music. The D-1000E comes in a rugged housing capable of with-

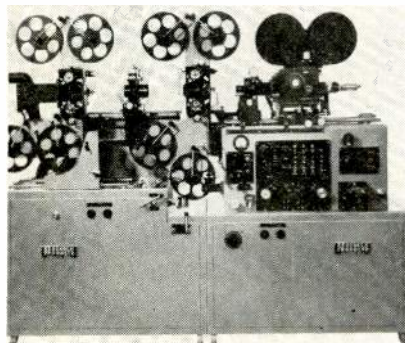


standing uncommonly rough treatment. A mode selection switch attenuates in sharp, medium and bass positions. D-1000E is priced at \$60, \$75 with transformer and silent on-off switch.

Circle 101 on Reader Service Card

## Image Optical Printer

Model 1002 Aerial Image Optical Printer, capable of the complete range of optical effects required in theatrical, commercial, or instrumentation work in 35mm and/or 16mm for color or black-and-white, is announced by Research Products, Inc., Hollywood, Calif. The system utilizes automatic skip-frame programming to projector heads for independent or simultaneous combinations of skip-frame or multiple-frame printing. Other features include:

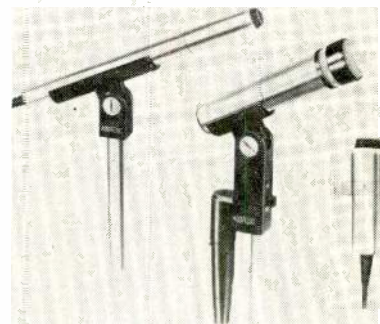


high-performance, motor-driven, mechanically operated modular drive of interlocks, clutches, etc.; simple mechanical leverage system for automatic zoom. Tilting camera with a movement of 15 degrees plus or minus from center is optional.

Circle 102 on Reader Service Card

## Twelve-Mic Dynamic Series

Twelve new dynamic microphones have been introduced by the Astatic Corporation, Conneaut, Ohio. In three series, the 810 Ultra Cardioid, the 820 Omnidirectional Probe, and the 840 Lavalier, they are designed for public address and broadcast applications. The microphones are said to be pop and blast proof and have built-in filters. Each of the mics is available with or without switches, and with either of two finishes. Model 810 is said to have the most positive antifeedback characteristics of any dynamic cardioid

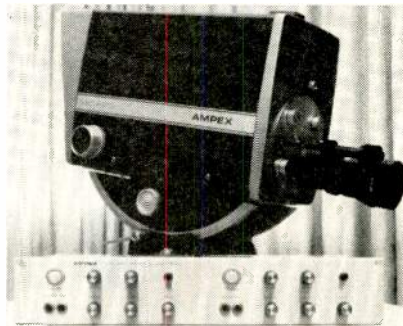


mic. Its 25-dB front-to-back ratio is the greatest in the industry. The Ultra Cardioid has a frequency response of 40 to 15,000 Hz, and impedance can be changed to high or low values. Model 520 features omnidirectional sensitivity, and a response of 40 to 18,000 Hz. Impedance is also convertible. The Model 840 Lavalier is a low-impedance mic with a response curve designed to compensate for chest cavity resonance. Response is 50 to 12,000 Hz.

Circle 103 on Reader Service Card

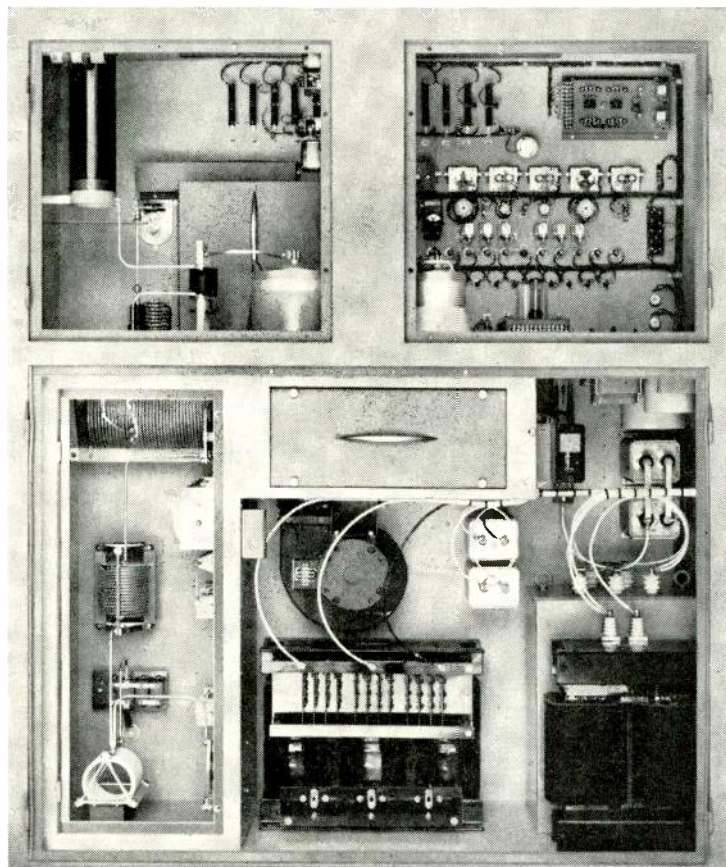
## CCTV Studio Camera

A closed-circuit studio television camera designed for local or remote control in multicamera operations has been placed on the market by Ampex Corp., Park Ridge, Ill. Model CC-327 is intended for single or multicamera use in education, industry, business, military and medical closed circuit television applications. An optional remote control unit operates system power, beam current, target voltage, pedestal and video gain. It is available on a single rack panel as a one- or two-camera remote control. Unit comes ready for mounting in a standard 19-in. relay rack. A switch on rear of camera is used to select local or remote control. Camera also features a two-way communications system





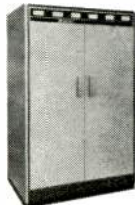
# Bauer AM Transmitter. Aft view.



## Clean.

**This is the aft end of the all-new Bauer AM Transmitter from Granger. The 5 Kw Model FB-5V.**

Look at its well-engineered mechanical layout. Clean. All components are arranged within easy reach for quick inspection and servicing.  Model FB-5V is compact. Measures only 75"H x 60"W x 30½"D. In fact, it's the most compact 5 Kw AM transmitter on the market.  Around in front, full metering shows all functions simultaneously. Tally-light system provides instant warning of any malfunction or momentary overload, permits fast reset to back-on-the-air status, and pinpoints the cause for later servicing.  Compare its performance. Low distortion, wide frequency response and 6,000-watt power-plus capability. Excellent modulation capability—boosts signal in fringe areas and provides "clean" sound.  Consider the cost-savings. The output tube's operating level has a service capability of more than 20,000 hours, proved in actual use. Save hundreds of dollars per year in operating costs.  Need a higher kilowatt model? Ask us about the all-new 10 Kw Model FB-10J. It has the same clean, compact features as the FB-5V, with 12,000-watt power-plus capability.  Write for complete data.



**Granger Associates** / **Bauer**  
BROADCAST PRODUCTS DIVISION

1601 California Avenue, Palo Alto, California 94304

Circle 17 on Reader Service Card

for dialogue between cameramen and remote unit operator. CC-327 camera sells for \$2700. Single camera control unit is \$300; double unit, \$550. Camera measures 25½ in. long (without lenses) × 11⅜ in. wide and 14½ in. high, and weighs 67 lb.

Circle 104 on Reader Service Card

## Vector/Oscilloscope

Sencore, Inc., Addison, Illinois, recently announced a new combination wideband scope and Vectorscope. According to the company, the PS148 is the only scope on the market that can convert from a conventional wideband scope to a profes-



sional Vectorscope with the flick of a switch. The scope is designed to permit viewing pattern at TV receiver chroma detectors and to align the chroma section. It can be used also to touch up bandpass alignment with the use of any standard ten-color bar generation. Vertical amplifier frequency response is flat to nearly 6 MHz. Scope is priced at \$219.50.

Circle 105 on Reader Service Card

## Broadcast Remote Mixer-Amplifier

A single-channel, portable amplifier for mixing and amplifying broadcast quality material with both high- and low-level inputs, has been designed by McCurdy Radio Industries, Inc., Danvers, Mass., to permit remote pickups without need for constant attendance. The McCurdy Model PE-2100 agc remote amplifier incorporates an automatic gain circuit. In automatic gain mode, a feedback control amplifier varies the impedance of an electronic attenuator circuit to compensate for any ex-







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Ⓔ There are plenty of good, functional reasons behind the new look of Electro-Voice professional microphones. Reasons dramatically proved by the rapid success of the Model 635A and the RE15. Now we've added the RE55 to this handsome group.

The RE55, like its predecessor the 655C, is an extremely wide-range omnidirectional dynamic. And in most electrical particulars it is not greatly different. RE55 frequency response is a bit wider, and perhaps a trifle flatter. An impressive achievement when you consider that the 655C has been extensively used as a secondary frequency response standard. Output level is 2 db hotter, and the exclusive E-V Acoustalloy® diaphragm of the RE55 can provide undistorted output in sound fields so intense as to cause ear damage.

The biggest changes in the RE55 are mechanical. For this microphone is even more rugged than the 655... long known as one of the toughest in the business. There's a solid steel case and new, improved internal shock mounting for the RE55. Plus a satin nickel finish that looks great on TV long after most microphones have been scarred and scratched almost beyond recognition.

For convenience we've made the barrel of the RE55 just 3/4" in diameter. It fits modern 3/4" accessories. It also fits the hand (and its length makes the RE55 perfect for hand-held interviews). We also provide XLR-3 Cannon-type connectors to help you standardize your audio wiring. Detail refinements that make the RE55 more dependable, easier to use.

Finally, the RE55 has the exclusive Electro-Voice 2-year *unconditional* guarantee. No matter what happens, if an RE55 fails to perform during the first two years — for any reason — we'll repair it at no charge.

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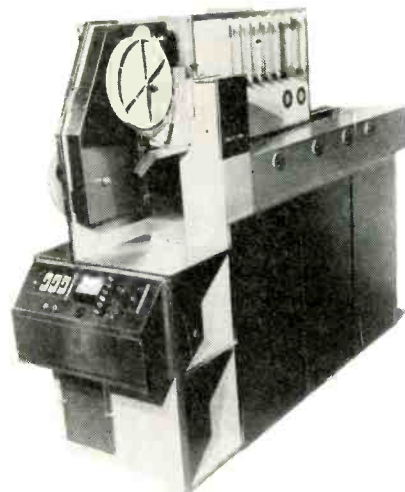
Circle 19 on Reader Service Card

cessive input signals. In manual operation, a front panel control permits adjustment of gain over a 50-dB range. The solid-state circuitry operates from ac power and has provision for automatic switchover to battery in event of power failure. A front panel vu meter and selector switch indicates both program output level and also power supply condition. Outputs consist of headset feed and one balanced output at program level.

Circle 106 on Reader Service Card

## Smaller Color Film Processor

A new motion picture film processor for 16mm and Super 8mm Ektachrome film recently was introduced by Houston Photo Products, Inc., Yuma, Ariz. Designated Model E-16-8-30, the new machine is one of the smallest fully automatic proces-

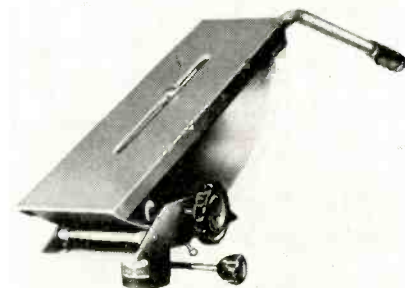


sors ever built for color cine film. Only eight ft long, it requires minimum space and can be operated in a fully lighted room. In less than ½ hr, it processes 100 ft of Ektachrome film. From 15 to 18 100-ft reels can be processed per hr.

Circle 108 on Reader Service Card

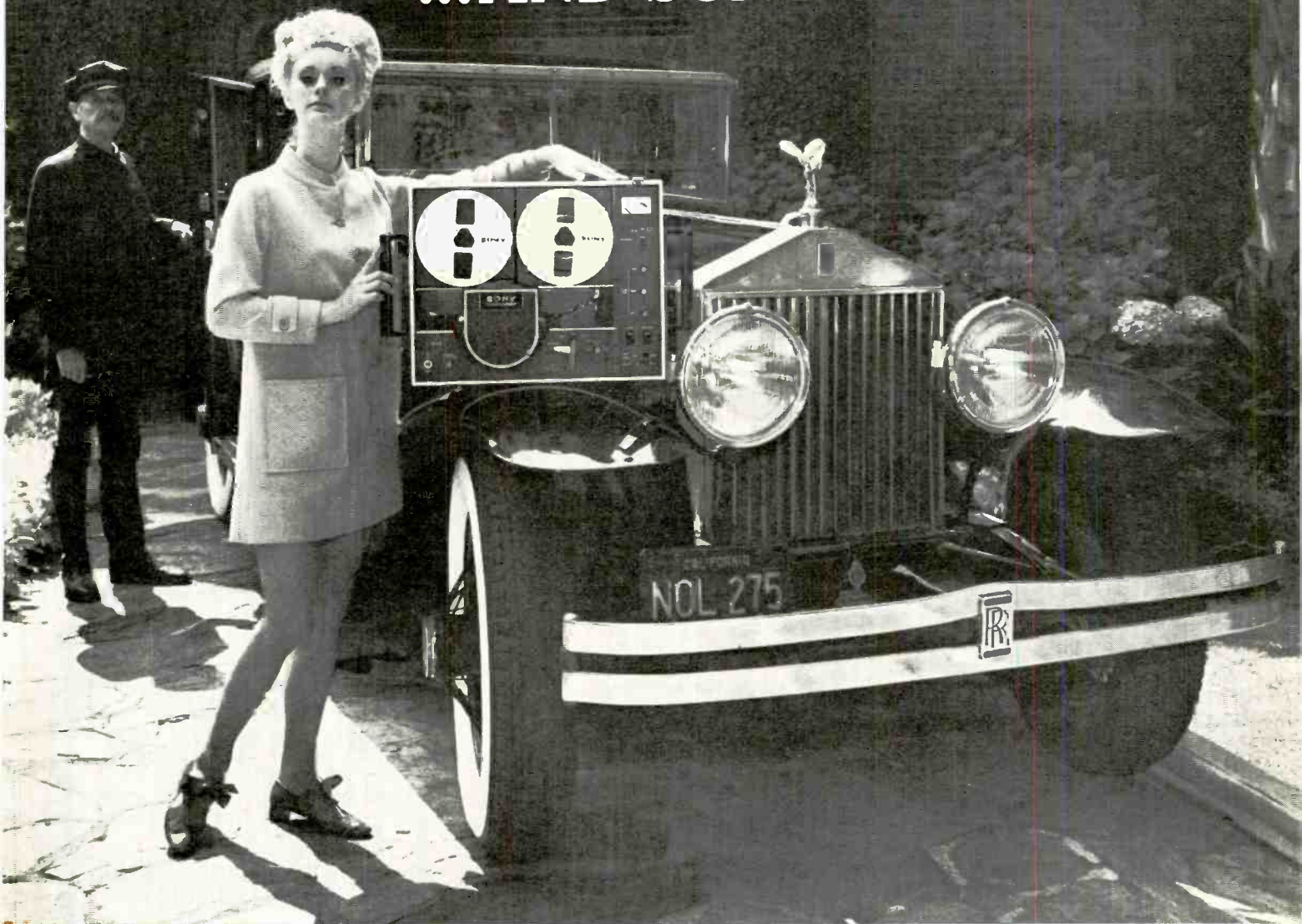
## CCTV Cradle Head

Designed specifically for CCTV cameras up to 100 lb, the Davis & Sanford (New Rochelle, N.Y.) cradle head incorporates features





# RELIABILITY IS THE ONLY STANDARD ...AND SONY SET IT



We're all for VTR standardization. In fact, we're in constant discussion with other manufacturers to achieve this end. But until everyone can get together, the only **true** standard for video tape recorders is optimum, field-proved reliability.

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Ruggedness and versatility are traditional traits of this latest model... the Sony EV-210. Beyond these built-in features, the new EV-210 offers either color or monochrome recording on one machine. That's right. Full NTSC color recording and instant playback are provided with Sony's CLP-1A Color Adaptor.

Other features of the EV-210 are slow- and full stop-motion in both color and monochrome; dual audio channels; electronic tracking control; guaranteed tape interchangeability; and optional remote control and electronic editing.

The hue and cry about standardization of VTRs goes on and on and on.

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### MICRO-TRAK® SPECIFICATIONS 303 12" PROFESSIONAL TONE ARM

Dimensions: 12½" overall (317.5 MM); 8½/16" spindle to pivot (211.1 MM); 2¾" from pivot to back of arm (73 MM)  
Weight: 1 lb. (.454 kg)  
Overhang: 06.82" spindle center to stylus  
Resonance: Less than 10 HZ ½ Gram at 30 x 10<sup>-6</sup>; CM/DYNE Compliance

Tracking Error: 3.0 in radius 0° 0'; 3.75 in radius 1° 28'; 4.75 in radius 0° 0'; 5.5 in radius 2° 0'.

Micro-Trak is also available in a longer version for 16" turntables, for EMT turntables, and in special lengths for custom table sizes.

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found in more expensive heads. Cradle head has pan handle adjustment to any angle, cradle slides on walls of Teflon, easy-to-lock cradle motion by side knobs, micro adjustment of tilt similar to gear action, needle bearing slides. Head embodies all functional features of cradle action and is well suited for viewfinder camera. Head tilts 30°, swings 180°, and is made of anodized aluminum. Circle 109 on Reader Service Card

## Vidicon Sensitive To Infrared

Vidicon Tube Type 2000, available from Epic, Inc., New York, N.Y., is a television camera tube sensitive to light waves in the 3500 to 18,000-Angstrom range. The tube is suitable both for television camera op-

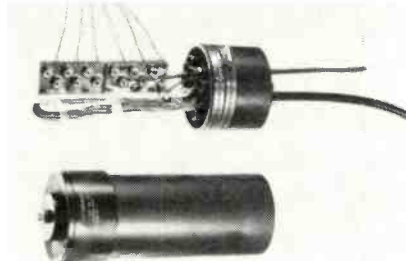


eration in infrared light and for observing hot bodies at temperatures over 250°C. The tube has a very low photoelectric lag and a high sensitivity to infrared illumination. The electron gun is provided with a separate mesh. Type 2000 can be used on almost any television camera commercially available in place of standard 1-in. vidicon. The tube is marketed under the name Resistor.

Circle 110 on Reader Service Card

## Sealed Ready- Access Terminals

A new series of Sealed Ready-Access Terminals for all-buried or other underground applications is available from the Smith Co., Division of Preformed Line Products Co., Cleveland, Ohio. Completely water and moisture proof, terminals are easily opened for service additions or rearrangements. All wire and cable entrances into the molded neoprene base are sealed quickly in the field with fast-setting polyurethane resin. Each Sealed Ready-Access Terminal has a capacity of three cables to a maximum diameter of ¾ in. each and six, two-pair service wires. Cable ends or uncut loops are easily field



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The RCA-4536 Image Orthicon in the luminance channel of your TK-42 and TK-43 color cameras is the perfect companion tube for the RCA-4493, -4494 and -4495 Vidicons... designed specifically for RCA cameras and carefully quality-tested in the actual camera components.

The RCA-4536 gives a signal-to-noise-ratio 25% greater than the previous standard, 4492 Image Orthicon. The electronically-conducting glass target assures non-stick and anti-burn operation over a long operating life.

The RCA-4536 Image Orthicon assures the best color... the best in-studio service. Ask your RCA Broadcast Tube Representative about the RCA 4½" I.O. for TK-42 and TK-43 cameras.

*Available from your RCA Broadcast Tube Distributor.*  
RCA Electronic Components, Harrison, N.J. 07029.

# RCA

## AN OPEN LETTER TO THE SMALL STATION OWNER REGARDING AUTOMATION

Actually, it seems that those most in need of automation are, in reality, the small station owners. It is indeed unfortunate that up until now, the new advancements in automation have, because of the high cost, been limited to the larger stations.

We have been repeatedly told, "if automation of a station was in the ten to twelve thousand dollar range as opposed to forty or forty-five thousand, our station would have been automated years ago. When will the breakthrough come?"

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installed, or terminals may be ordered with 25- or 50-pair stubs. Brackets for mounting on poles or in manholes are also available.

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## Focusing-Nonfocusing Fill Scoop Lights

Berkey-ColorTran, Inc., 1015 Chestnut St., Burbank, Calif., announces the introduction of the 1000 and 2000 Tungsten-Halogen "Quartz" focusing and nonfocusing scoops which provide high-intensity, wide-angle illumination for many base or fill applications in television and still photographic studios. They are also suitable for clustering when



lighting large surfaces such as cycloramas and drops. A family of long-life "quartz" lamps is available operating directly from 120 or 230 V ac/dc. Focusing is accomplished by a pole-operated steel ring at the bottom of the housing. During focusing, the diffusion lens moves while the "quartz" lamp maintains a fixed relationship to the lamp at all times. At 10 ft, LQC-18 fixed-focus scoop produces 213 foot candles. The LQCS-18F focusing scoop is continuously variable from wide to medium focus positions producing 186 to 799 foot candles at 10 ft with diffusion lens in place. Prices for the nonfocusing and focusing fixtures range from \$75 to \$125. The diffusion lens assembly is offered as an accessory for the nonfocusing model only and is priced at \$18. Write on Company Letterhead Stationery

## Precision Time Comparison Aids

The GR 1124 from General Radio Co., West Concord, Mass., is a time-signal receiver for Loran-C, wvw, and chu transmissions. It includes a storage oscilloscope with rf and time-base plug-ins for quick, visual comparisons between time signals

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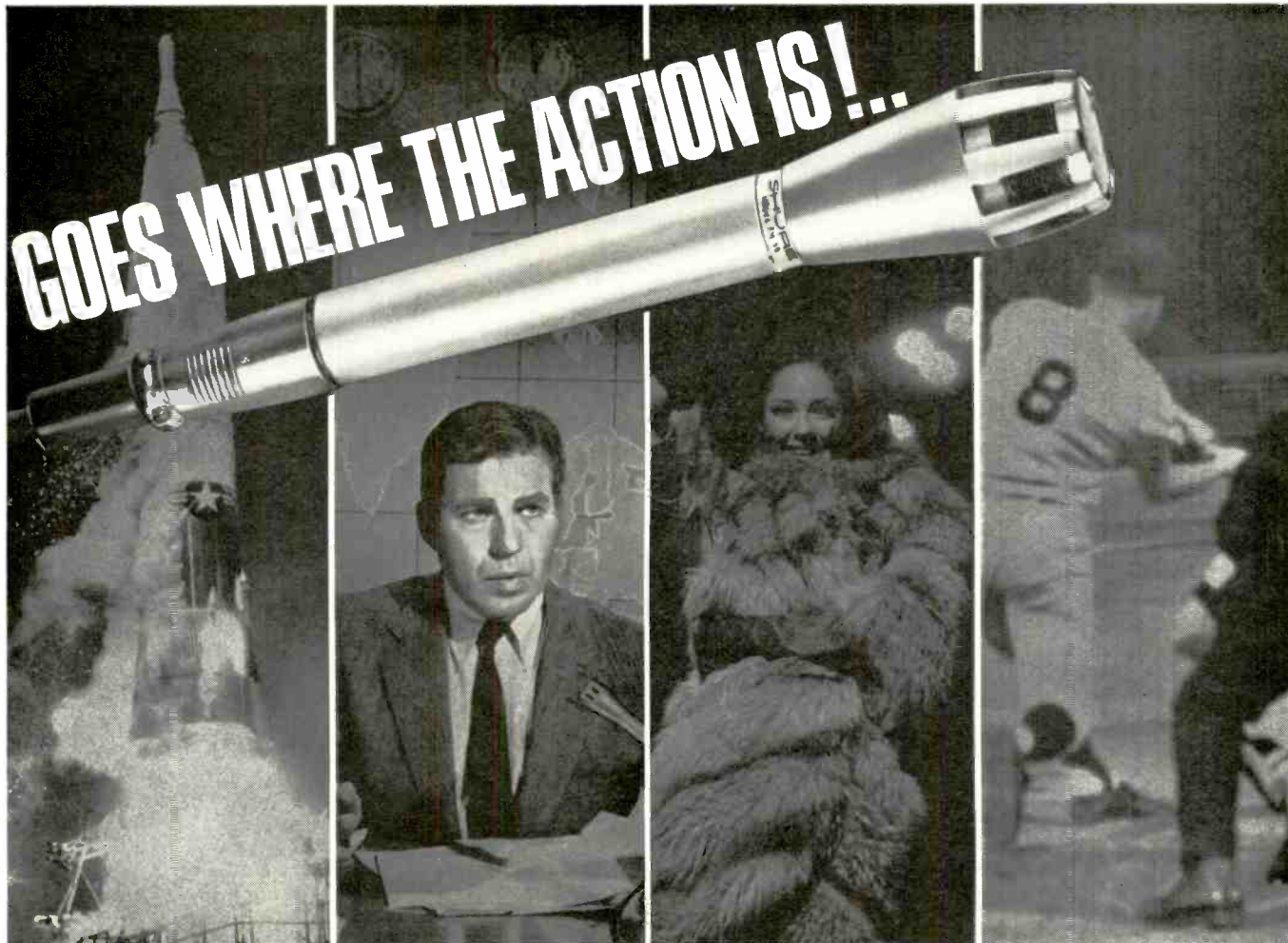
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The SM60 cannot be stereotyped—is equally at home in the studio or in the field—stand-mounted or hand-held—in uses as diverse as outdoor sporting events and elaborate variety shows. Small wonder that audio engineers have called it one of the most versatile omnidirectional dynamics they've ever encountered, for the SM60 is a unique combination of good-looks, strength, performance and economy.

The smooth, wide-range response provides cleanest, natural reproduction of both speech and music. A very effective built-in wind and "pop" filter protects against undesirable effects of close-talking.

Lustrous, non-glare metallic finish and tailored-to-the-

hand dimensions provide striking on-camera appearance and superior handability. Specially reinforced machined-steel case front is designed to take abuse that would ruin other microphones—you can drop it on its nose without damage to the internal structure! Efficient windscreen and front end are *quickly* and *easily* removable for cleaning.

Best of all, it is priced competitively with conventional "workhorse" microphones. Why not check out an SM60 now? See your Shure Professional Products Distributor, or contact Mr. Robert Carr, Manager of Professional Products Division, Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Ill. 60204—Phone 312 - 328-9000.

## SHURE SM60

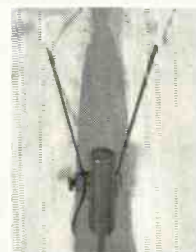
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Specifically designed for radio, TV, motion pictures . . . matches well in sound with stand or desk mounted units. Smoothly-contoured, machined-steel case and recessed grille for minimum clothing noise. Exclusive snap-in mounting of microphone for greater convenience, security. "Positive Lock" lavalier goes on in an instant—provides simple, noiseless position adjustment. Extra-flexible, kink-free rubber cable is easily replaceable.

#### MODEL SM51 DYNAMIC LAVALIER

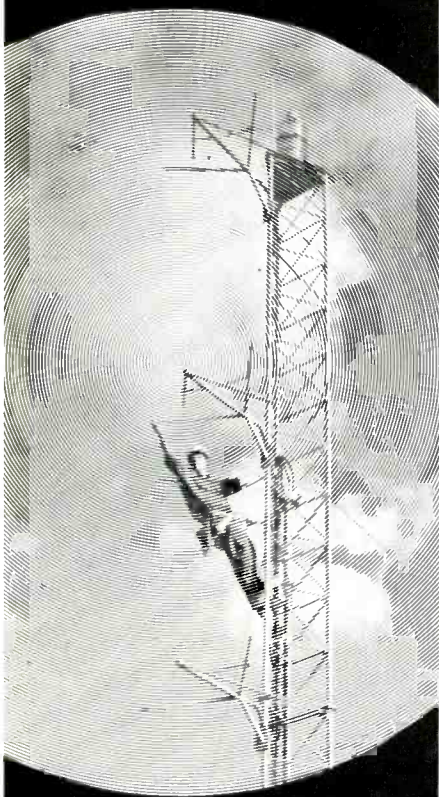


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FOR BETTER RECEPTION**



JAMPRO advanced technology has developed another industry "first"! A circularly polarized FM Antenna with variable horizontal to vertical gain ratios! Jampro will adjust the ratio to your exacting specifications for the best possible reception performance available—Reception to the outer fringes, and to more auto FM receivers, too.

**EXCLUSIVE DIGITAL TUNING END STUBS** allow lower VSWR on your tower (GUARANTEED under 1.1 to 1), and field trimming to 1.08 to 1,  $\pm$  200 KC.

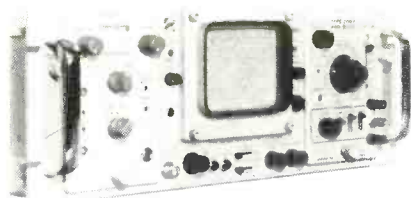
**AVAILABLE IN EITHER PARALLEL OR SHUNT FEED SYSTEMS.**

Write for full specifications or make a circular motion on your phone dial—Call Jampro today. (916) 383-1177.

# JAMPRO

**ANTENNA COMPANY**  
A DIVISION OF COMPUTER EQUIPMENT CORP.  
6939 Power Inn Road  
Sacramento, California 95828

Circle 27 on Reader Service Card

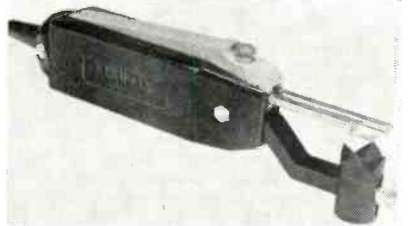


from frequency standards and transmitted time signals. The GR 1125 Parallel Storage Unit accepts on command up to 11 digits of time-of-day information in 2  $\mu$ s, stores and displays the information, and transfers it to such slow-speed devices as card and tape punches or printers. The 1125 also can serve in systems with a jam-transfer requirement. Stored time data can be read to the nearest 10  $\mu$ s. Both data and output are in 4-line BCD, 1-2-4-8 format. The unit is fully compatible with 1-2-4-8 versions of the GR 1123 Time Comparator. Price of the 1124 Receiver with antenna is \$3250; 1125 Parallel Storage Unit, \$2600.

Circle 111 on Reader Service Card

## Thermal Coax Strippers

Two new versions of the Kinetics Stripall Thermal Wire Stripper are now available from Kinetics, Solana Beach, Calif. They remove all types of insulation and outer coverings from single or multiple-conductor cable as well as coaxial cable up to 1-in. dia. Operating with a blade



temperature of 1700° F, Model TW-6 Stripall is especially useful for removal of Teflon, Kapton and Kel-F. Temperature of blade is adjustable from 100° to 1700° F on Model TWC-6. TW-6 Stripall is priced at \$69.95; Model TWC-6, \$99.95.

Circle 112 on Reader Service Card

## Cloth Cleans Critical Areas

Manufactured by Texwipe Co. of Hillsdale, N.J., Texwipe cloth is said to clean such critical areas as recorder-heads and drives without lint contamination. Cloth is available in 9 x 9 in. squares in boxes of 300. Price is \$17.00. Texwipe is also available in 12 x 12 in. bias cut and 18 x 14 in. hemmed.

Circle 122 on Reader Service Card



**PROFESSIONAL QUALITY Broadcast Turntables**



**Heavy Duty, Quiet!**

- Single lever controls 33, 45, speeds
- Plays 45 RPM's without adapter
- Illuminated speed indicators
- Sold with or without arm (GREY or REK-O-KUT)
- Instant acceleration
- Competitive low price
- Call or write for folder



SEPARATE TONE ARM MOUNTING PLATE—EASY TO INSTALL

PRICED FROM \$149.50 to \$179.50      SOLD DIRECT —OR TO DEALERS

**RUSSCO Electronics Mfg.**  
6879 N. SUNNYSIDE, CLOVIS, CALIF.  
PH. 299-4692

Circle 28 on Reader Service Card



**INSTANT REVERBERATION**  
only with **FAIRCHILD REVERBERTRONS**

Reproduce the thrilling sounds of the Grand Canyon or the colorful reverberation qualities inherent only in good acoustical chambers. And because reverberated sound is apparently louder than the same non-reverberated signal, by utilizing the FAIRCHILD REVERBERTRON in motion picture, radio, television, or your own recording studio, you can create attention holding and realistic sound effects.

In addition to low cost the advantages of a FAIRCHILD REVERBERTRON are virtually unlimited for creating wide audience impact and literally hundreds of "ear appealing" sounds.

The next time you want to "glue" your audience's ears to the sound you're making be sure to use a FAIRCHILD REVERBERTRON.

### SPECIFICATIONS OF MODEL 658B (Pictured above)

Compact, reverberation system for the 'big' sound in a small space. Contains reverb equalization in mid and low frequency range; level control; solid state design. Size: 5 1/4" x 3 x 10" deep.



### PROFESSIONAL MODEL 658A ALSO AVAILABLE:

The 658A is a complete solid state reverberation system with electronically controlled reverb time adjustments up to 5 seconds; mixing control for adjustment of reverberated to non-reverberated signal ratios; reverb equalization at 2, 3, and 5 KHZ. Size: 24 1/2" x 19".

Write to FAIRCHILD—the pacemaker in professional audio products—for complete details.

**FAIRCHILD**  
RECORDING EQUIPMENT CORPORATION  
10-40 45th Ave., Long Island City 1, N. Y.

Circle 29 on Reader Service Card



# NEW IN DYN AIR'S MINI-SERIES

## CCTV Equipment

The Leader In . . . **ECONOMY • COMPACTNESS  
EASE OF INSTALLATION • PROFESSIONAL  
PERFORMANCE • EASE OF MAINTENANCE**



**MINI-SERIES**

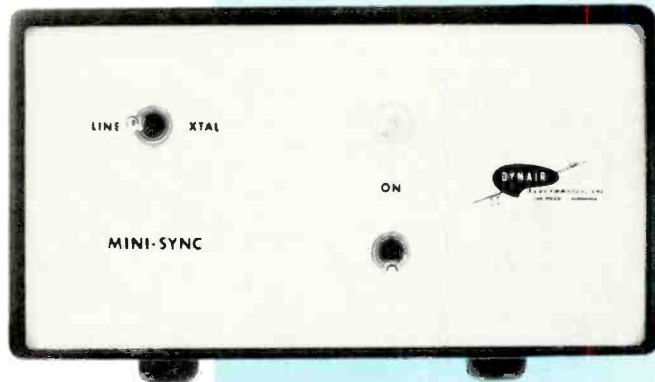
Audio-video modulators for operation on lowband, highband or IF frequencies. Video and pulse distribution amplifiers, audio preamplifiers and power amplifiers, video equalizers, RF bandpass amplifiers . . . just about anything required for the low-budget system. And all in the same package. That's *DYN AIR'S MINI-Series*.

Yes, the *MINI-Series* is a truly significant size and cost breakthrough in CCTV equipment! A video fader which allows the operator to easily fade from one video program to another. Solid-state and small enough to hold in your hand, yet costs only \$220.00! Or a video switcher in the same attractive package for just \$60.00!

The *MINI-Series* is versatile in mounting, too. Actually, you don't even have to mount a *MINI* unit! You can set it on a desk or shelf. Or install it under a desk, on a wall, or on any flat surface. A rack-mount panel holding up to three of the units is also available.

What does all of this mean to you? It means lower-cost, simpler systems, especially in applications involving class-room origination of television. It makes practical the use of standard television receivers, without rework, in CCTV systems. And it allows clean, uncluttered CCTV systems because of the unique mounting capabilities of the *MINI-Series*.

Look to *DYN AIR* for your video switching and distribution equipment needs. See an authorized *DYN AIR* systems contractor or write direct for information on our broad line of television products.



*New* **MINI-SYNC**  
EIA RS-170  
TV SYNC GENERATOR \$650

Just added to the already comprehensive *MINI-Series* of CCTV units is the *MINI-SYNC* . . . a Television Synchronizing Generator which meets RS-170 and provides four output synchronizing signals for standard 525-line operation. All solid-state, the *MINI-SYNC* incorporates the latest digital logic techniques and is completely self-contained, including a regulated power supply. It is the ideal synchronizing generator for closed-circuit educational and broadcast applications. Its small size and high reliability are priced at just \$650.00.



Send today for the latest Catalog and Price List of the *MINI-Series*

**DYN AIR ELECTRONICS, INC.**  
6360 FEDERAL BOULEVARD, SAN DIEGO  
CALIFORNIA 92114 (714) 582-9211

# BROADCASTERS SPEAK

Sirs:

While reading your June issue of *BM/E* I ran across a letter in "Broadcasters Speak" which interested me. It concerned the conversion of CB radio equipment for operation in the 26-MHz remote pickup band. You noted that the article had appeared in the May 1965 *BM/E*.

We here at WEGN Radio are in the designing stages in the preparation of a remote van, and we would sincerely appreciate either the issue or a reprint of the article if possible.

The guys here at the station fight over the new *BM/E* when it comes in. You have a really fine magazine. Keep up the good work.

Many thanks again for your help. If we can be of any help to you folks at any time, do not hesitate to call on us.

J. Barry Williams  
Sales Representative  
WEGN Radio  
Bowling Green, Ky.

*Copy's on the way, J.W. We realize you're in feudin' country, but try not to fight over BM/E; you'd make us go around with guilty consciences. Thanks for the offer of help. We may take you up on it some time.*

Sirs:

Your magazine seems to be getting more technical articles, which is excellent. But the photos on page 46 of your June issue are mislabeled.

Sincerely,  
I. Robertson  
Supervisor, Technical Operations  
CBC-TV  
Edmonton, Alberta, Canada

*Pardon us a moment while we wipe the egg off our face. You're quite right, I.R.—in the lower group of pix on page 46, the upper left photo should have been labeled: "Degraded differential gain signal." The lower right photo should read: "Degraded sine-squared window signal showing streaking." As a reward for your sharp eyes, we're sending you your own personal BM/E lapel button.*

Sirs:

Television and education are going to have a common problem soon. The use of TV in education is expanding rapidly as is the use of data processing in education. In the near future there will be regional media centers handling TV taped courses for secondary schools, micro-filmed libraries transmitted over telephone circuits, teacher-made tests scored remotely and returned to the classroom by phone, etc.

My project is developing a segment of this regional concept. I find nobody else working toward or communicating about multimedia re-

gional centers on the secondary (or other) level. That is why I want to keep in touch via *BM/E* with the TV industry. I hope eventually I will get a dialogue going with someone in TV who is working toward a similar regional concept.

The above are the reasons why I asked for a subscription to *BM/E*. If there are other sources of information which could further the regional concept I would appreciate a letter from you.

George E. Roehm  
Associate Director  
Intermediate School District  
Warren, Mich.

Sirs:

Please send a copy of "How Two Schools Use TV Equipment," April 1968 issue, as listed in *ETV Reporter* on page 79.

Joan N. Staub  
Allstate Communications  
Union, N.J.

*On the way, J.S.*

Sirs:

Issues were fine! Please discontinue sending them. We are off the air definitely. Thank you.

L. F. Jenkin  
WFMK  
Mt. Horeb, Wis.

*Wha'd he say? Sorry 'bout that, L.J.*

## Oxide dust is more costly than gold dust... but who wants it?

Loose oxide shortens the life of magnetic tape heads. It degrades tape. And it breeds still more dust as it is ground into fast-running tape. MS-200 Magnetic Tape Head Cleaner sprays oxide dust away. MS-200 is recommended by leading tape head manufacturers, prescribed by a major broadcasting network, used at hundreds of data processing installations. So, don't lose your head; use MS-200 Magnetic Tape Head Cleaner.



**miller-stephenson  
chemical co., inc.**

Route 7, Danbury, Conn. 06813

Price: \$2.75/can in cartons of 12 16-oz. cans.  
Trial order: 4 cans @ \$3.60/can.  
Prices f. o. b. Los Angeles, Chicago or Danbury, Conn.



U. S. and foreign patents pending.



# New Gates TV Audio Console



## can be expanded as your station grows.

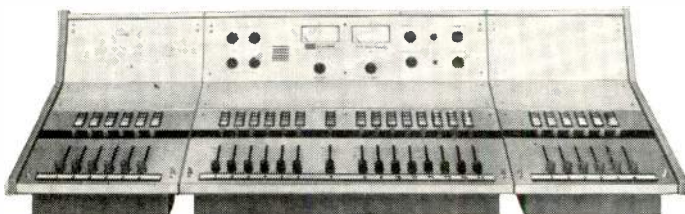
Gates new dual-channel TV-15 audio control console is a big-facility board in a space-saving size. Compact, yet capable of providing complete audio control with proven solid-state reliability for your entire television operation.

The TV-15 features 15 mixing channels – six studio microphone channels, an announce booth channel, and eight medium-level channels. Each channel has a four-station interlocked push-button selector to expand the total number of inputs to 60. All channels are provided with a jumper card or preamp board for hi or low level inputs.

Easy-to-operate vertical attenuators provide precise audio control – and a cue position on each feeds the inbuilt cue amplifier. Audio follow video may be added by plugging in the remote controlled relays.

As your station grows, the TV-15 can be expanded to 21 mixing channels, or 27, or more.

Write for complete information.



*Gates TV-15 with two TVS-6's added  
for a total of 27 mixing channels and 108 inputs.*

# **GATES**

GATES RADIO COMPANY  
QUINCY, ILLINOIS 62301, U.S.A.  
A subsidiary of Harris-Intertype Corporation



Circle 32 on Reader Service Card

# NAMES

## IN THE NEWS

The Audio/Video Communications Division of Ampex Corporation announces the following appointments: **Lawrence Weiland** has been appointed general manager of the new Video Products Division. Appointed general manager of the Professional Audio Products Division is **A.A. Sroka**. **Jerome J. Dover** has been named general manager of the Special Products Division. The Consumer and Educational Products Di-

vision announces the appointments of **Charles S. Dolk** and **Oral Evans** to top posts on the industrial and educational products marketing staff and the naming of **M. Carlos Kennedy** as manager of Camera and Systems Engineering.

**Arnold Starr** has joined Radio Advertising Bureau's National Sales Department as senior account executive, **Robert H. Alter**, RAB executive vice president, announced recently.

WFBM Station's Newswoman **Evie Birge** has been named recipient of a first place award in the National

Federation of Press Women's annual competition.



**Alex Ushakoff, Jr.**      **Thomas E. Wilbur**

**Alex Ushakoff, Jr.**, has been elected president of Center for Communications, Inc., a newly organized company formed to plan and produce communications and training programs for science and technology, medicine, business and education. Also named was **Thomas E. Wilber** as vice president.

**Theodore R. Broida** was recently elected president of Spindletop Research, Inc., by the board of directors of the nonprofit, applied research institute.

**Charles M. Nowell** has been appointed chief engineer for Cor-Plex International Corp., according to **Murray W. Pattinson, Jr.**, vice president, operations.



**Leonard N. Sable**      **Fred W. Morris, Jr.**

**Leonard N. Sable**, general manager of KCBQ Radio, San Diego, has been elected a vice president and director of KCBQ, Inc., a division of Bartell Media Corp.

**Fred W. Morris, Jr.**, has been appointed technical consultant to the President's Task Force on Communications Policy, **Eugene V. Rostow** announced recently.

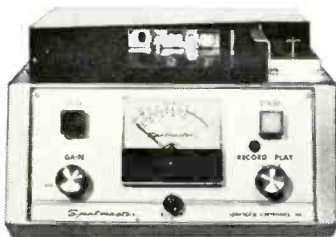
**Richard W. Calfee** recently joined the Display Division of Data Disc, Inc., Palo Alto, California, as manager of their Video Systems Department.

International Video Corporation announces the following series of seven appointments: **John D. Rockwell** as national sales manager, **Richard J. Reilly** as Western regional sales manager, **William A. Fink** as director of market development and product

The Spotlight Is on

# Spotmaster

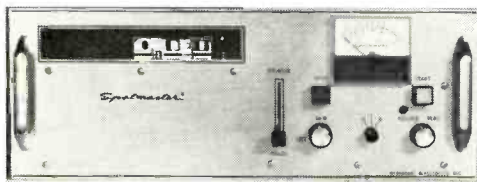
## Superior Tape Cartridge Recording and Playback Equipment



Model 500 Super B



Model 400-A



Model 500-BR

**COMPACT 500 SUPER B SERIES**—Completely solid state, handsome Super B equipment features functional styling and ease of operation, modular design, choice of 1, 2, or 3 automatic electronic cueing tones, separate record and play heads, A-B monitoring, biased cue recording, triple zener controlled power supply, transformer output . . . adding up to pushbutton broadcasting at its finest. Super B specs and performance equal or exceed NAB standards. Record-play and playback-only models are available.

**RACK-MOUNTED SUPER B MODELS**—The 500-BR rack models offer the same Super B design and performance features and are equipped with chassis slides ready to mount in your rack. Each unit slides out for easy head and capstan cleaning and other routine maintenance.

All Super B models carry iron-clad full-year guarantees.

**ECONOMICAL 400-A SERIES**—Now even the smallest stations can enjoy Spotmaster dependability with the low-cost, all solid state 400-A series, available in compact record-play and playback-only models. Performance and specifications are second only to the Super B series.

For complete details about these and other Spotmaster cartridge units (stereo, delayed-programming and multiple-cartridge models, too), write, wire or call today. Remember, Broadcast Electronics is the No. 1 designer/producer of broadcast quality cartridge tape equipment . . . worldwide!

### BROADCAST ELECTRONICS, INC.

8810 Brookville Road, Silver Spring, Maryland 20910; Area Code 301, 588-4983





# If you like Audiopaks our lubricated Audiotape will really be your cup of tea.

Broadcast engineers all over the country like our Audiopak® cartridges so much, we've been using their comments in our advertising. And, we've been giving each one an inscribed cup as a token of our appreciation.

Now, with our Audiotape Formula 17 Lubricated tape designed especially for continuous loop cartridges, their cup will really runneth over.

Here's why:

It provides excellent high end response and signal-to-noise ratio. The long wear, high temperature binder won't soften or gum up heads.

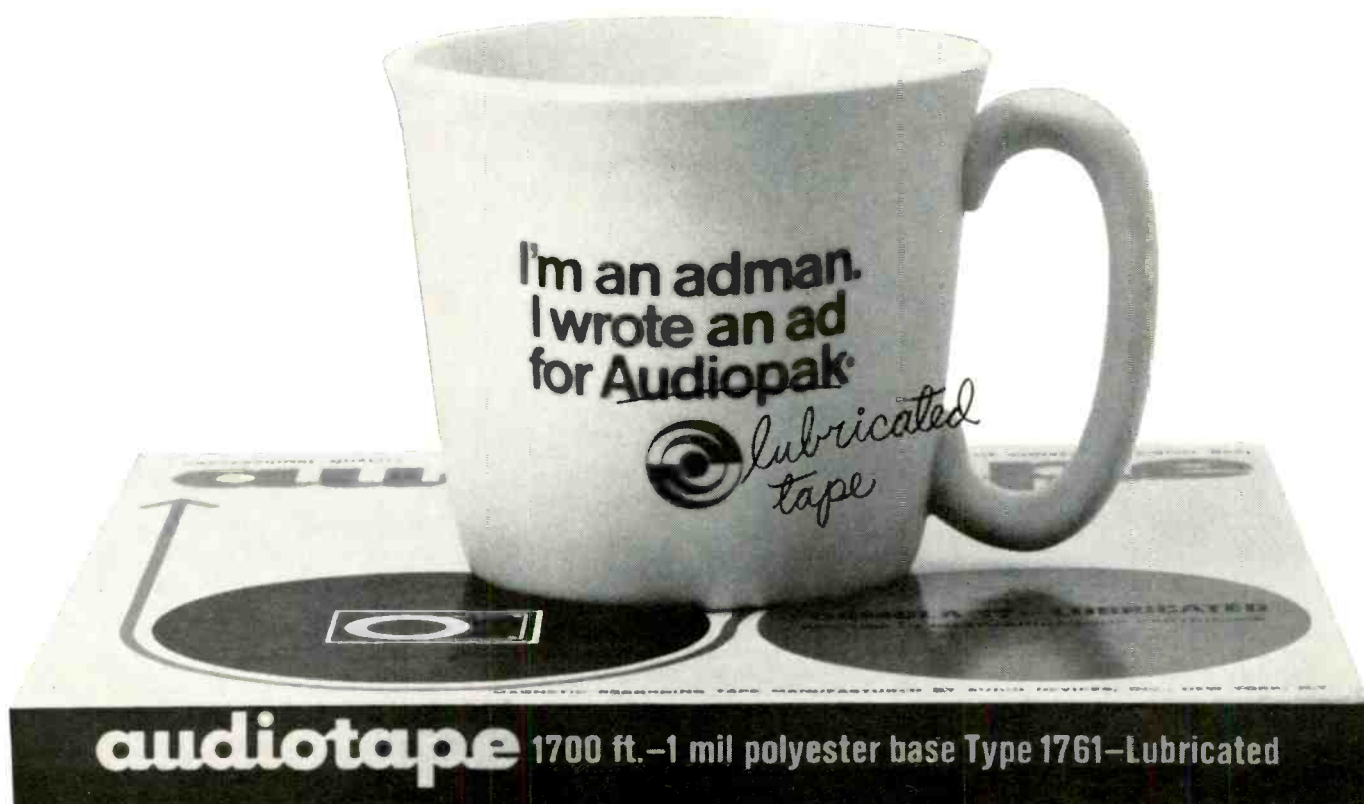
The lubricated coating is permanently bonded to the base. Can't wear off and cause jamming; won't dirty heads and capstans.

Very low abrasion properties reduce head wear and premature failure, assures smooth tape motion with negligible wow and flutter.

Audio is the only cartridge manufacturer who also makes tape. (We are the largest supplier in the world.) So, you can be sure our cartridges and our tape match each other perfectly. But regardless of cartridge make, Formula 17 is the best tape you can use.

Why not find out about Audiotape Formula 17 for yourself.

Audio Devices, Inc.  
A SUBSIDIARY OF CAPITOL INDUSTRIES, INC.  
235 E. 42nd St., New York 10017



planning. **Paul W. Jantzen** as manager of sales and service administration, **Frederick J. Haines** as manager of applications engineering and **Jerry Kraus** as district manager for Southern California.

**Lee E. Franks** has become executive director of the Educational Communications Division of the State of Wisconsin.

**Robert Andrade** has been appointed manager of WNRI, Woonsocket, R.I.

The appointment of **Gail Blanke** as press representative for WCBS/News-

radio 88 was announced by David Martin, director of information services.

**Dr. Peter C. Goldmark**, president and director of Research of CBS Laboratories, has received an honorary doctorate of science degree from Fairfield University. Dr. Goldmark has announced the appointment of **Edmund R. Auer** as vice president for administration at CBS Laboratories.

The Niagara Frontier Communications Association announces that **Frank Maser**, chief engineer of

WBEN-TV, was elected chairman of the association; **Leroy Fiedler**, chief engineer of WKBW-AM, vice chairman and **Duane W. Fischer**, secretary-treasurer.



Steve Gibson



Dennis E. Horsford

**Steve Gibson** recently was named director of engineering of KPRO by the Board of Directors.

The appointment of **Dennis E. Horsford** as marketing manager of the 3M Company Division has been announced by Roy J. Gavin, Division vice president.

**Herbert S. Dolgoff**, vice president of Storz Broadcasting and general manager of WQAM Radio has announced the appointment of **Raymond Ference** as public service director.



John A. Leonard



John Coon

**John A. Leonard** has been named contract administrator for Philips Broadcast Equipment Corp.

Announcement has been made by Richard C. Landsman, president and general manager of WOKR, Rochester, N.Y., of the appointment of **John Coon** as assistant engineering manager.

The appointment of **Robert Mott** as executive director of the National Educational Radio Division of the NAEB has been announced by NAEB President William G. Harley.

**Jack Summerfield**, general manager, WRVR-FM New York, N.Y., has been elected to the Executive Board of Directors of the NAEB.

**Daniel T. Sullivan, Jr.**, has been named local sales manager of WWLP, Springfield, Mass., by William L. Putnam, president of Springfield Television Broadcasting Corporation.

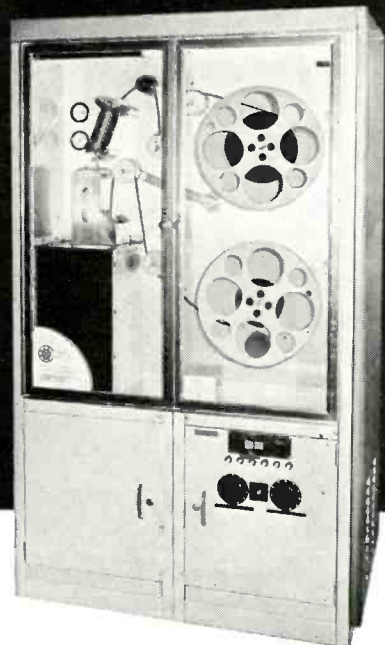
# CF<sub>2</sub> ULTRASONIC CLEANER for MOTION PICTURE FILM

*Presented The Academy of Motion Picture Arts and Sciences Award of Merit for Outstanding Technical Achievement.*



Ultrasonic energy is the most effective and economical way to thoroughly and rapidly clean motion picture film without mechanical scrubbing and wiping. The cold boiling effect (cavitation) of ultrasonic energy performs the entire operation. Only the solvent touches the film and a forced air, flash dry-off removes all solvent and residue.

- Restores clarity and sound to maximum quality.
- Enhances the entertainment value of motion picture film and improves commercials.
- Assures static free film with color balance undisturbed.
- Cuts projector maintenance costs . . . no dirt or dust carried into gates and orifices . . . less breakdowns.
- Completely automatic . . . requires only loading and unloading.
- Costs only 1/20 of a penny per running foot to operate.
- Used by every major motion picture lab in the world.



DESCRIPTIVE BROCHURE WILL BE SENT ON REQUEST.

#### Patents

USA—2,967,119 Luxembourg—37,634  
Belgium—582,469 Great Britain—909,421  
France—1,238,523 Other World Pats. Pend.

## LIPSNER-SMITH CORPORATION

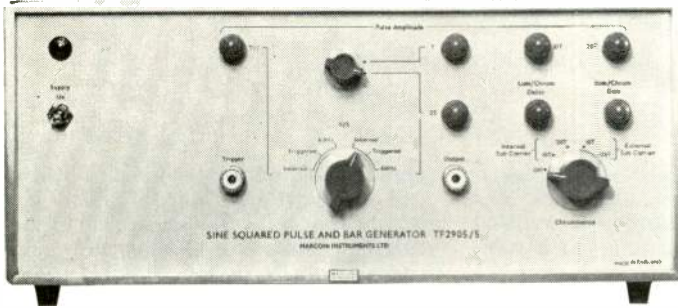
7334 No. Clark St., Chicago, Ill. 60626  
Telephone: 312—338-3040

7427

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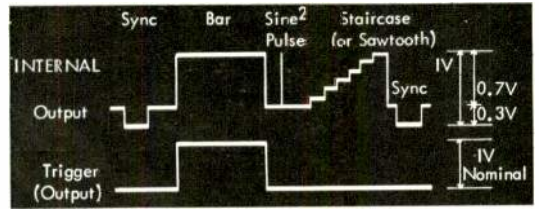


## SINE-SQUARED-PULSE AND BAR GENERATOR

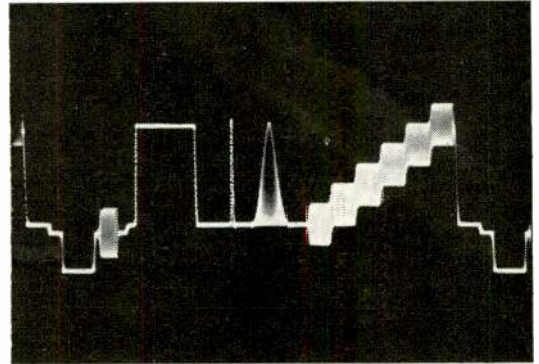


Model TF 2905/5

- Sine<sup>2</sup> pulse stairstep and bar
- T/2, T, 2T, 10T and 20T pulse
- Subcarrier internal 3.57954 MHz or external
- Color burst, color sine<sup>2</sup> pulse and color stairstep



Waveform for K factor assessment. (internal trigger)



Bar, 2T pulse, 20T pulse, and staircase (combined luminance and chrominance).

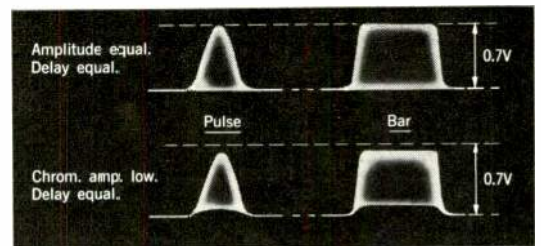
# NEW FROM MARCONI INSTRUMENTS

## LUMINANCE/CHROMINANCE GAIN AND DELAY EQUALIZATION

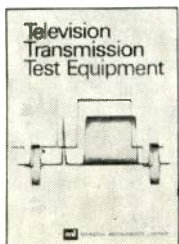
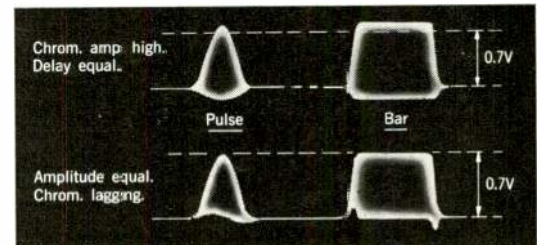


Model TF 2904/1

- Measures gain and delay inequality
- Gain discrimination 0.5dB
- Delay discrimination 2 nanoseconds
- Visible display of misalignment with scope



Gain inequality can be measured over the range  $\pm 3\text{dB}$ , and delay inequality over the range 110 nsec lag to 110 nsec lead.



*Available Upon Request*

Television Transmission Test Equipment which details methods of TV measurements, and presents a new range of TV transmission measuring equipment available from Marconi Instruments.

**mi MARCONI INSTRUMENTS**  
DIVISION OF ENGLISH ELECTRIC CORPORATION

111 CEDAR LANE □ ENGLEWOOD, NEW JERSEY 07631  
TELEPHONE: (201) 567-0607

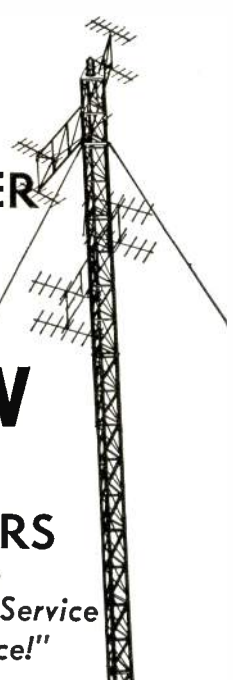
SEE US AT WESCON—BOOTH NO. 1906-7 & 8

Circle 36 on Reader Service Card

# LITERATURE of INTEREST

For additional data, circle number shown on Reader Service Card.

Spark gaps, for protection against overvoltage damage, are presented in brochure from ITT Electron Tube Div. **171**  
**Transmitter logger ADP-101** is the topic of 4-page Bulletin 221A from Moseley Associates. **172**



**THE  
LEADER  
IN  
CATV  
TOWERS**

*"Quality—Service  
and Price!"*

Yes, quality, service and price on CATV systems are the reasons for Fort Worth Tower's position as the industry's leading supplier. Experience gained as a pioneer supplier of CATV enables Fort Worth Tower to provide you with a quality product at a price that is reasonable and attractive.

Take advantage of our experience. For assistance in systems planning, engineering and complete systems quotations . . .

CALL OR WRITE TODAY  
**Fort Worth Tower**  
 COMPANY, INCORPORATED  
 P. O. Box 8597, Fort Worth, Texas  
 (817) JE 6-5676  
 — Associated Companies —  
 Tommy Moore, Inc.  
 Big State Engineering, Inc.  
 Tower Construction Finance, Inc.

Circle 37 on Reader Service Card

**NET's Public Television Network** is described in a 10-page factbook. **173**  
**NET's affiliated stations** are listed and illustrated on a map in a fold-out brochure. **174**

**10,000 items**, ranging from transistor radios to studio equipment, available through Mars Merchandise, are listed in a 250-page catalog. **175**

**Miniature, canned relays** are illustrated and described in 60-page catalog from Electronic Specialty. **176**

**Antenna performance monitoring system**, including antenna monitor, precision monitor adaptor, digital display adaptor, remote metering panel and remote switching adaptor, is described in data sheet from Potomac Instruments. **177**

**Lighting handbook** (90 pages) for TV, theater, motion picture and professional photography is available from Sylvania. **178**

**Advanced recording techniques** developed at Lansdowne Recording Studios in London are outlined in Bulletin 6275 from Ampex. **179**

**Intercommunications system** handling up to 10 or 20 stations in an office or plant, allowing two simultaneous channels of communication, is described in a brochure on the Altecom 100 from Altec Lansing. **180**

**Testing services** for cable and cable hardware are the topic of a 26-page brochure from Preformed Line Products. **181**

**Truck signs** made of pressure sensitive, weather-proof vinyl or mylar are illustrated in Catalog 6-A from Seton. **182**

**Audio accessories**—headsets, handsets, carbon and dynamic mics, earphone units, booms, switches, etc.—are presented in 11-page illustrated catalog from Audiosears. **183**

**Shielding materials** for electromagnetic and radio frequency interference are the topic of 11-page Catalog No. 70 from Russell Industries. **184**

**"Intelsat"** is the title of a brochure describing four fm communications units made by Radio Engineering Laboratories for satellite communications. **185**

**"Convention and Election Handbook"** contains 48 pages of facts and information about the presidency, party histories, campaign promises, voting information, as well as pictures, maps and drawings to illustrate important points. Handbook is available for 25 cents from National Research Bureau. **188**

**Optical multiplexer**—Model TMM-211—is illustrated and described in brochure from TeleMation. **190**

**"Design Ideas for Engineers"** (23 pages) from Sealectro contains case histories of program boards used in nine major areas, including broadcasting. **191**

**"Video Talk,"** vol. 1 no. 1, inaugurates quarterly series from 3M with discussion of performance and maintenance factors of VTRs operated at 7½ and 15 in./s. **192**

**Test equipment** and instrumentation useful to vhf/uhf-TV broadcasters and CATV operators are illustrated and described in 68-page catalog from Texscan. **193**

**Indicator light rfi/emi shielding** whys and hows are answered in illustrated bulletin from Electrodyne Div. **194**

**Film and tape** technical information and news, views and personality interviews of interest to broadcasters are presented monthly in *Monitor*—a new monthly publication from Acme Film & Videotape Laboratories. **195**

**Continuous loop cartridge** data sheet from Audio Devices illustrates features of Model A cartridge, and lists loading, maintenance and best-performance tips. **196**

**Video sheet recorder** features, applications and specifications are presented in DATA Sheet USR-2 from Matsushita Electric. **197**

**Engineering**, installation, management and consultation services are presented in illustrated brochure from National Television Systems. **198**

**Lenses** for the GE PE-350, RCA's TK-44A and the Philips PC-70 are described and illustrated in data sheets from Albion. **199**

**ETV lens** data for technical and non-technical personnel are presented in attractive brochure from Albion. **200**

**"Monital Zoom Lenses and Their Control Systems for Closed-Circuit Television"** is the title of a 38-page catalog available from Albion. **201**

**"Telecommunication Instrumentation"** (11 pages) covers laboratory and production instrumentation for frequency selective measurement, transmission measurement, noise loading measurement, delay distortion measurement, etc. A free copy is available from Tel-Com Instruments. **202**

**CRT displays** are the topic of four articles contained in a 12-page booklet from Data Disc. **204**



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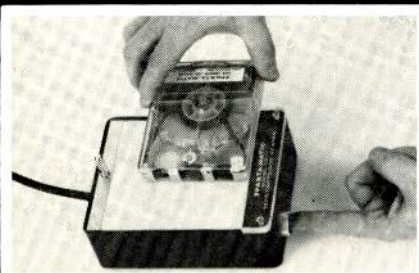
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**MINIMUM DISTORTION** Wow, flutter and other signal distortions should be imperceptible at 7½ ips for professional quality tapes. Crown guarantees a minimum of 0.09% wow and flutter at 7½ ips.

**FLEXIBILITY** Look for a recorder with a full range of professional refinements. More than with any other professional recorder, you can "do anything" with a Crown—record sound-on-sound, create special equalization and echo effects, A-B monitor while recording, mix four microphones and much more.

**INVESTMENT** Professional electronic equipment is a good secure investment, with a slow rate of depreciation. A Crown is insured against obsolescence with a design acclaimed by professionals "years ahead of the industry." With only ten moving parts, normal care and routine service will assure like-new performance for ten years. In 1978, you'll be glad you purchased the very best—a Crown.

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## FROM THE **EDITOR**

### **Contending with Contending Forces**

Where does CATV fit in? In the not too distant past, motion picture producers and distributors were against television. So were radio broadcasters. As Walter Schier pointed out at the NCTA Convention, television emerged—with an assist from the Justice Department breaking up the motion picture trusts.

Today television and movies are doing a good business together and so are a-m, fm, records, books, hi-fi, Broadway and sports—all once marked for destruction, Schier points out, by television and movies.

CATV, if it to thrive, needs the good will, health and strength of broadcasters and copyright proprietors. Schier hopes that all can go forward in ways beneficial to all, and at the same time leave room for further entrants. Negotiation, rather than court fights, is the answer, says Schier.

John Cole predicts that since CATV is now part of the nation's communications system, as ruled by the Supreme Court, NAB, ASTM and NCTA will be cooperating to keep out direct-to-home satellite broadcasting such as proposed by McCalls magazine. (None of this nonsense about leaving room for a new entrant.) Others point out that the clientism that the FCC will now bestow on CATV will nurture it, protect it from outsiders. The FCC, however, doesn't have ultimate power. The various competing committees in Congress will establish much of the pattern. Power and commerce committees, judicial committees, small business and antitrust committees, all represent different viewpoints, many divergent. The President's telecommunication committee will have its recommendations.

Despite the advice to cooperate, the industries within the FCC family will vie for legislative favors that curb the FCC parental power. One thing is certain: all existing industries will have most supporters. New entrants will make headway primarily to the extent that they can show that their particular industry will contribute more to the public good than some others. And regardless of the value of the new service, the old will not be dislocated. At best, the new will be accommodated, but rarely favored.

So what does all of this mean? Do new forces such as CATV play down broadening multiple ownership to win friends on this count? Should CATV accept passively the concept of no commercials, so as to win the support of free TV advocates, or does it fight for maximum rights? The answer lies in deciding what truly appears best for the public.

**James A. Lipke**



## TDA2D VIDEO/PULSE DISTRIBUTION AMPLIFIER



The now-famous TDA2 Distribution Amplifier, in use at most television stations and networks, has a recently added feature. The "D" stands for Differential Input, which we added to the TDA2. And not only did we add a differential input, we subtracted \$33.00 from the price. Instead of \$325.00, we're selling the new improved TDA2D for \$295.00 F.O.B. Nashville, Tennessee. The compact TDA2D fits neatly into 1 3/4 inches of panel space and produces virtually no heat. For complete information, write to:



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## TDA5 BALANCED/UNBALANCED VIDEO/PULSE DISTRIBUTION AMPLIFIER



For the many occasions when signals must be transmitted balanced, yet must be fed to other equipment unbalanced, International Nuclear offers the TDA5. Two inputs are provided, selection of which is accomplished by a front panel switch. The balanced input is the bridging type and may be terminated in 124 ohms. The unbalanced input is high impedance and may be terminated in 75 ohms. The TDA5 serves both video and pulse functions at the flip of a switch. The TDA5 sells for \$400.00 F.O.B. Nashville. For additional benefits of this system and complete information, write to:

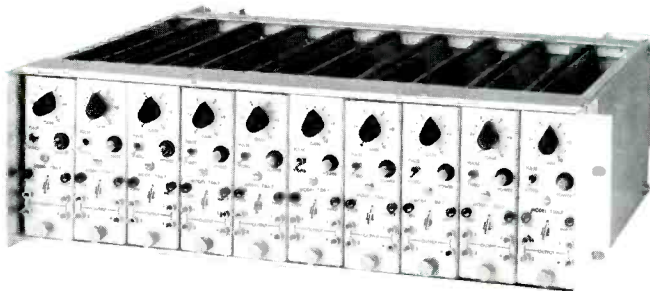


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## TDA7 VIDEO/PULSE DISTRIBUTION AMPLIFIER



The TDA7 is a completely transistorized distribution amplifier constructed as a plug-in module. The rack will hold 10 TDA7's and occupies only 5 1/4 inches of panel space. Each plug-in unit provides the video and pulse functions with the flip of a switch. Provision is made to add a sync-adding circuit directly to the TDA7. This is specified as TDA9. The individual TDA7 plug-in units are \$295.00 each F.O.B. Nashville, Tennessee . . . with sync-add feature \$320.00. The mounting frame accommodates up to 10 units and sells for \$270.00. For complete specifications and information on other accessories, write to:

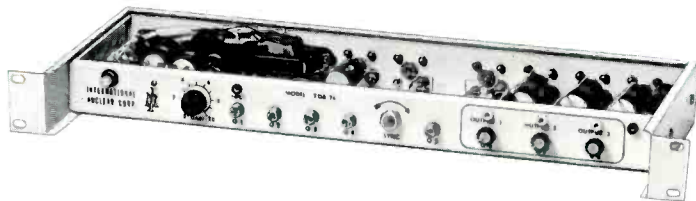


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## TDA26 HIGH GAIN VIDEO AMPLIFIER



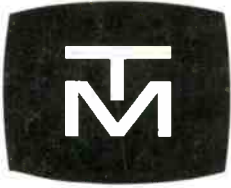
The TDA26 is a compact, completely transistorized Pulse Distribution Amplifier designed to be used at the output of camera branching pads or in any application where 28 DB gain is required. The TDA26 mounts in a standard 19-inch rack, using type 83 connectors throughout. It has 3 signal outputs, weighs less than 4 pounds, mounts in 1 3/4 inches of panel space. The TDA26 sells for \$400.00 F.O.B. Nashville, Tennessee. For complete information, write to:



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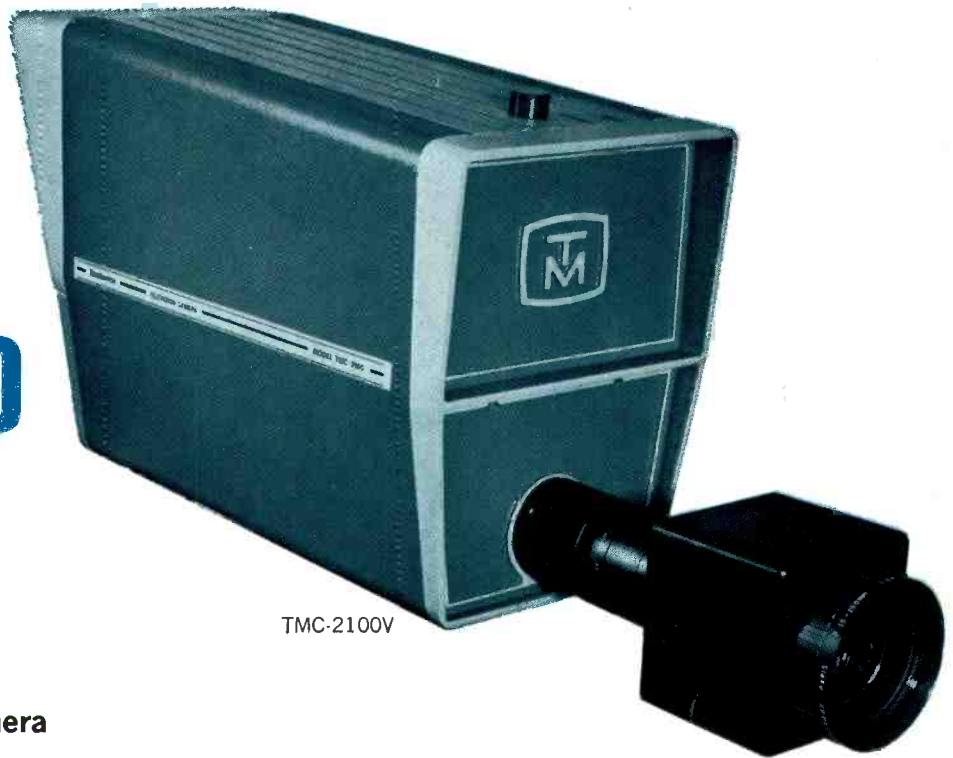
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Designed to be the most versatile camera  
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## FEATURES:

- Camera may be operated self-contained or driven — All modes of operation are "switch selectable." Internal sync options are Crystal/Drive, 2:1 Interlace, and EIA.
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- Extruded side panels hinge upward for easy access to camera circuitry and vidicon assembly.
- All circuit boards are made of high-quality glass epoxy materials and "plug-in" for easy field replacement.
- Addition of 7" transistorized viewfinder is simple but permanent. "Piggyback" look is avoided by use of full-length side panels and front casting.
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