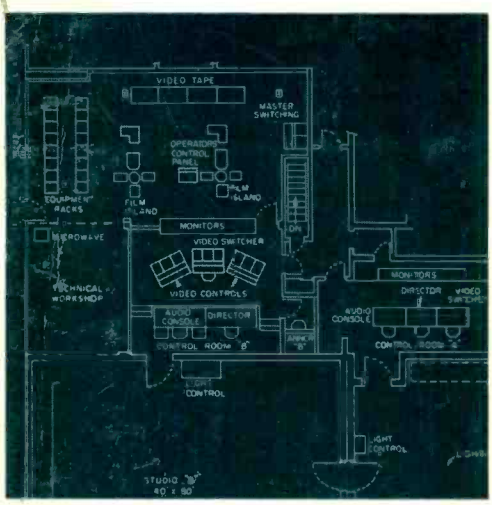
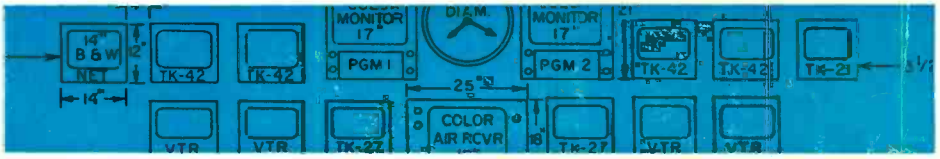
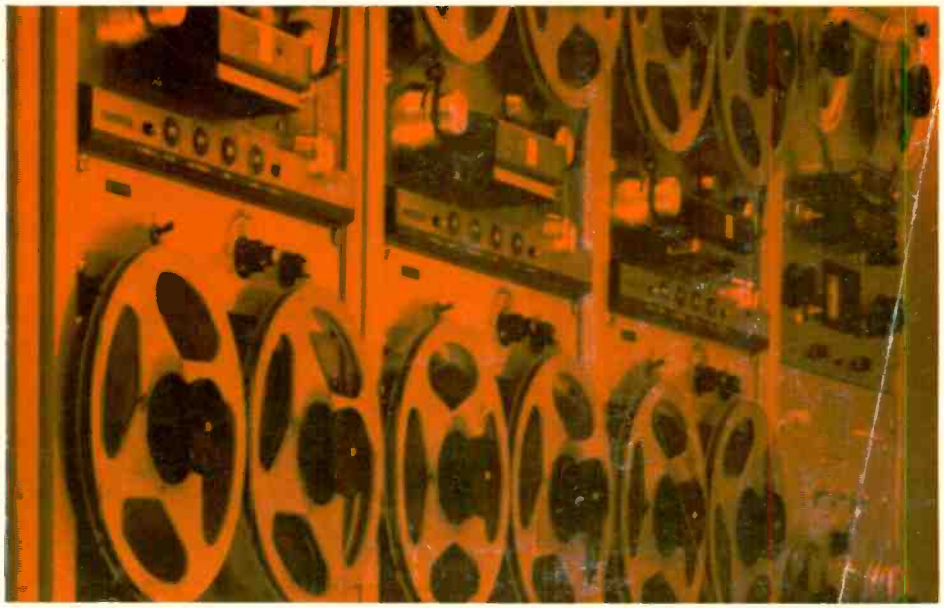
A MACTIER PUBLICATION / NOVEMBER 1966

BM/E

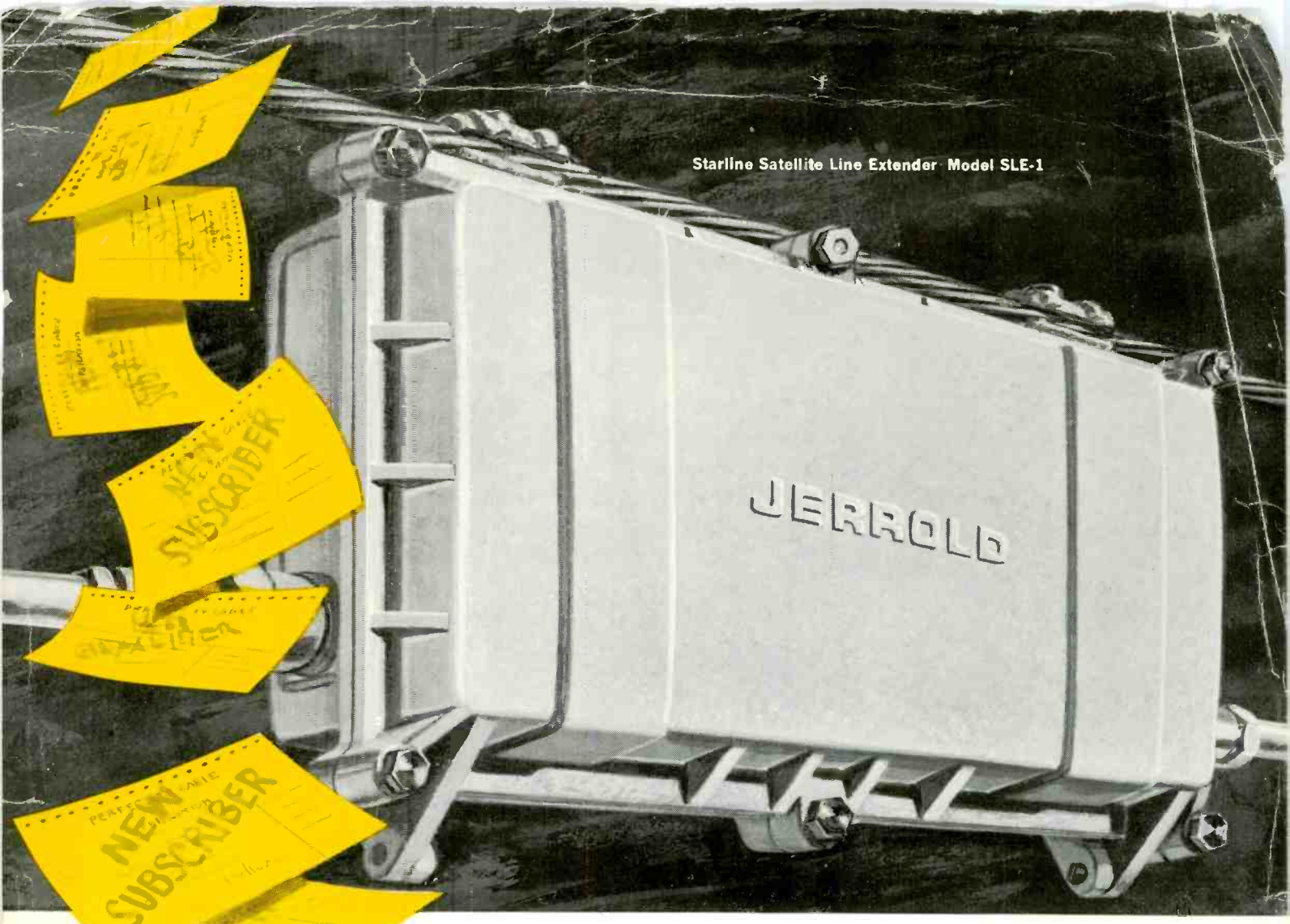
THE MAGAZINE OF BROADCAST MANAGEMENT/ENGINEERING







STATION PLANNING AND MODERNIZATION



Reach more subscribers with new Starline Satellite™

Jerrold's new solid-state, cable-powered Starline Satellite line extender is the economical way to deliver **quality color pictures** to more subscribers. It features a regulated power supply, plug-in amplifier module with variable tilt and gain controls plus plug-in pad facilities, external rf test points, and the Starline air-tight, radiation-proof, multi-mount housing.

The Satellite is a valuable adjunct to the **total solid-state capability** of a complete Starline system. It's compatible with any system providing 20 to 30 volts ac via the feeder cable. For complete details on the Satellite or other Starline system equipment phone 215-925-9870, or write

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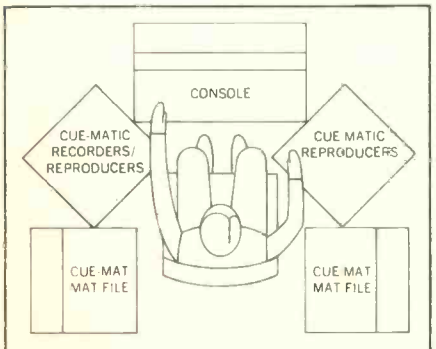
FIRST IN CATV The nation's largest and most experienced manufacturer/supplier of CATV equipment and services.

Circle 2 on Reader Service Card

"No Other System Makes Back-To-Back Cueing So Sure-Fire"



More than 1500 selections, commercials, etc., are at fingertips of KYA, San Francisco, engineer. Rapid-fire hit programming (60 cues/hour) is handled with easy fingertip filing and ready access to mats.

KYA REPORTS ON CUE-MATIC* RECORDERS:

"For tight cueing, and instant rotation sequence changes without redubbing, CUE-MATIC recorders can't be beat," says Paul M. Beck, KYA, San Francisco. "They make our sound the surest and cleanest on the air. All of our music, news, commercials, and ID's are individually converted to mats and filed right here—so the operator has the entire library at his fingertips. Because the mats are tough, flexible, virtually damage-proof sheets, they end mishaps of cartridges or reels. They cue-up automatically in the AG-100 recorder. Because mats are a magnetic medium, our sound stays "first-play" fresh. They file easily in minimum space. Label easily. After two years with the CUE-MATIC recorder system maintenance has been very low, and we are 100% sold on it." Ask your distributor for details, or mail the coupon.

Circle 5 on Reader Service Card

To: Ampex, Redwood City, Calif. 94063
SHOW ME SURE-FIRE PROGRAMMING.

☐ Send me Mr. Beck's recent A.E.S. engineering paper about KYA's radio programming on CUE-MAT* mats.

☐ Arrange an AG-100 CUE-MATIC Recorder demonstration.

NAME_____

TITLE_____

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AMPEX

*T.M. AMPEX CORP.

NOVEMBER 1966/VOLUME 2/NUMBER 11

BM/E

THE MAGAZINE OF
BROADCAST
MANAGEMENT/
ENGINEERING

Broadcasting is curently undergoing the familiar "growing pains" of a rapidly expanding industry. In many cases, stations are faced with the need for new equipment and a lot more space. Often the best solution is a completely new building, designed to suit the special needs of today's broadcasting business. Special considerations must be given to space for studio and transmitter gear, such as heating and air conditioning, acoustics, lighting, wiring, etc. Thus, in this issue, we've concentrated on planning and modernizing, with features based on just-completed facilities. We hope they help you with plans for updating your plant.

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"...CBS Volumax performs flawlessly. Please do not invent any more until we wear these out. At the present rate of deterioration, we will need to replace them by 2015 A.D."

This is what station WRNC in Raleigh, North Carolina, said about our equipment. They own both the Audimax Automatic Level Control and the Volumax Automatic Peak Controller. Station WIGS in Gouverneur, New York, wrote, "Enclosed find check for Volumax 400. You couldn't get it back from us for twice the price . . ." KLIN in Lincoln, Nebraska, purchased Audimax. They told us, "It is an engineer's dream for absolute level control". WAYB in Waynesboro, Virginia, tells us, "Purchased a Volumax and we are tickled to 99 and 44/100% modulation with it . . . Congratulations on a fine product". Station KHOW in Denver, Colorado, said, "It was surprising to receive equipment that exceeded specifications".

There isn't enough space here to include all the letters we've received praising Audimax and Volumax. But judge for yourself. Like all CBS Laboratories equipment, they're available for a 30-day free trial. Audimax $665. Volumax $665. FM Volumax $695. Write to us, or better yet call The Professional Products Dept. directly — Collect. Telephone (203) 327-2000. Maybe you'll be in our next ad.

CBS LABORATORIES
Stamford, Connecticut. A Division of
Columbia Broadcasting System, Inc.

Circle 6 on Reader Service Card

BROADCAST INDUSTRY NEWS

CATV Program Origination

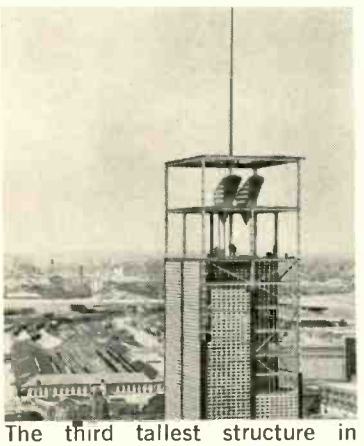
Several CATV systems have initiated plans to originate local TV programming. Valley Vision, Inc., Placerville, Cal., also serving four other systems in northern Cal., recently added an Ampex VR-6000 to its origination system. Robert B. Cooper, Pres., uses the combined facilities of two CATV studios in Placerville and a mobile van. Periodically, the van travels from Placerville to Jackson, Sutter Creek, Angel's Camp, and Sonora to record shows for playback on any or all of the 5 systems. With the two studios, plus the VTR, as many as 3 different programs can be fed simultaneously.

In Perryton, Tex., James Crouse, manager of the VTR-equipped Great Plains Community TV Co., offers its subscribers a variety of locally-originated programs by selling local advertising. Downtown merchants recently purchased time and tapes to promote "Crazy Days"; locally sponsored high school football games have been taped for playback the next day; and two local churches have contracted one hour each on alternate Sundays for live pickup of the 11 AM Service.

McAllen Cable TV Corp., McAllen, Tex., has used its Ampex VR-6000 to tape high school dances. C.E. Sharp, manager, said that the use of the tapes will eventually extend local programming to 6 hours a week.

A proposed cooperative arrangement between CATV and ETV facilities will require extensive use of the Ampex VTR purchased by Time-Life for the Newburgh, N.Y. CATV system. Selected instructional and informational programs produced by the ETV system will be taped and presented to CATV subscribers. According to Dick Lubick, detailed arrangements are now being worked out.

TeleMation, Inc., demonstrated the VR-6000 ($1495) at the NCTA Miami Beach Convention last June and has begun shipping units to CATV systems; recently, the firm ordered 300 G-E vidicon cameras to meet the growing demand for CATV public service programming and ETV systems.



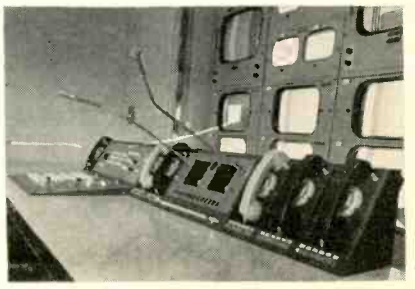
The third tallest structure in downtown Columbus, O., this microwave tower rises 220′ above the 8th floor of the Ohio Bell building, (340′ above the street). To beautify the structure, framework is covered with Sculpture Aluminum Panels made by Construction Specialties, Inc. Vertical framing members, also of aluminum, accent the tower's height and are finished in bronze.

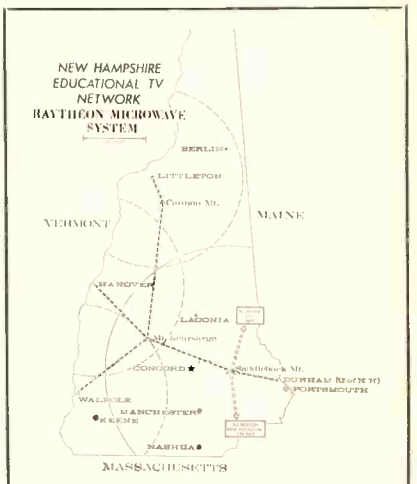
CBS Gets New Mobile Vans

CBS-TV's recently-delivered color mobile unit, designed by CBS Labs, functions as a 2-van unit. One van, with expandable sides

(up to 13′) is 28′ long and houses the operations control room, a video and audio operating area, and a video and audio system components and communications system. The second van is 24′ long and serves as maintenance and storage headquarters; it contains a viewing room, and can accept portable film and tape origination facilities. Both units are air conditioned and heated for all-weather operation and can be joined back-to-back and sealed. The self-powered vans are capable of simultaneously operating 6 color cameras with a potential of 8; control switching capability can be expanded to 23 cameras. The operations van staff consists of a director, assistant director, technical director, lighting director, audio operator, two video operators, plus one or two maintenance technicians in addition to the normal field crews of cameramen, lighting, and audio technicians.

The second van contains 3 maintenance benches and stores

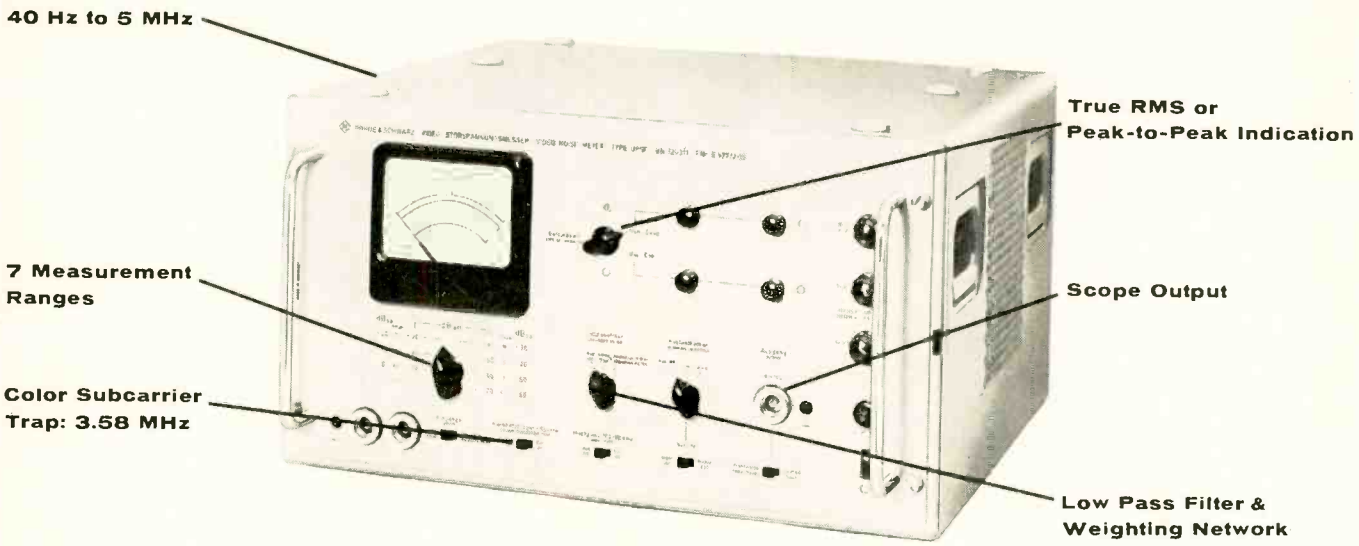




A web of microwave paths fanning out from the Univ. of New Hampshire will cover the entire state with ETV programming. Raytheon has been awarded the contract to link Saddleback Mountain with Walpole, Hanover, and Littleton. Educational and cultural programs of the national ETV network, or those originating at WENH (Ch 11) at Durham, may be carried across state to the 3 UHF transmitters.

NEW!

IMMEDIATE DELIVERY
FROM STOCK
$3,995



TYPE UPSF

VIDEO NOISE METER

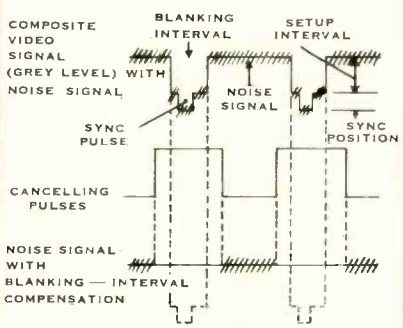
FEATURES

- Meets requirements of all U.S. black and white and NTS color systems
- Measures noise voltage in the presence of sync and blanking pulses
- 7 Measurement Ranges: 1/3/10/30/100/300/1000mV
- Input impedance: 1MΩ shunted by 30 pF, or 75Ω bridging

APPLICATIONS

MEASURE VIDEO NOISE VOLTAGE ON:

- TV Cameras
- Film Scanners
- Video Tape Recorders
- Radio Links
- Coaxial Lines
- TV Transmitters
- TV Receivers
- TV Transposers



Principle of noise-voltage measurement with H or V internal blanking

Type UPSF Video Noise Meter is designed to measure the unweighted and weighted noise voltages of TV transmission systems. It has the unique advantage of measuring low level components in the presence of high level horizontal or vertical sync and blanking pulses (see line drawing). The UPSF meets the requirements of all U.S.A. black and white and NTS color systems. A bandstop filter adjusted to the color subcarrier frequency (3.58MHz) prevents any residual color subcarrier in the test signal to be picked up. In addition to supplying true RMS value 0.3 mV to 0.3V (full scale deflection) it also can provide peak-to-peak value of 1 mVpp to 1Vpp (full scale deflection). The UPSF can also be used as a conventional throat band VTVM.

Get The Extra Capability, Greater Reliability, and Longer Useful Life Of . . .

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Circle 7 on Reader Service Card

almost 3 miles of camera cable, cameras, tripods, dollies, amplifiers, mics and booms, in addition to other equipment. The vans ride on a heavy-duty air suspension system and utilize large V-8 engines allowing complete mobility anywhere in the country. Complete telephone and shortwave communications facilities are provided. Designed to plug into existing telephone lines, the unit incorporates special phones in the control console to give operations personnel 5 private and 5 business lines connected through normal hookups. Two more units are scheduled for delivery to the network next year.

NAB Asks Modern Transmitter Metering

NAB has asked the FCC to amend its rules to permit the use of "more accurate and sophisticated methods of measuring" in broadcast transmitter metering. NAB wants the Commission to recognize digital read-out devices and numerical recorders using a decimal system of numbers.

TV Industry Data

The 1966 edition of TvB's annual tracking of TV industry dimensions is available from all TvB Offices. "Tv Basics #9" illustrates the size and scope of the medium and includes media investments of the top 100 buyers, plus recognition of the media's stake in public service.

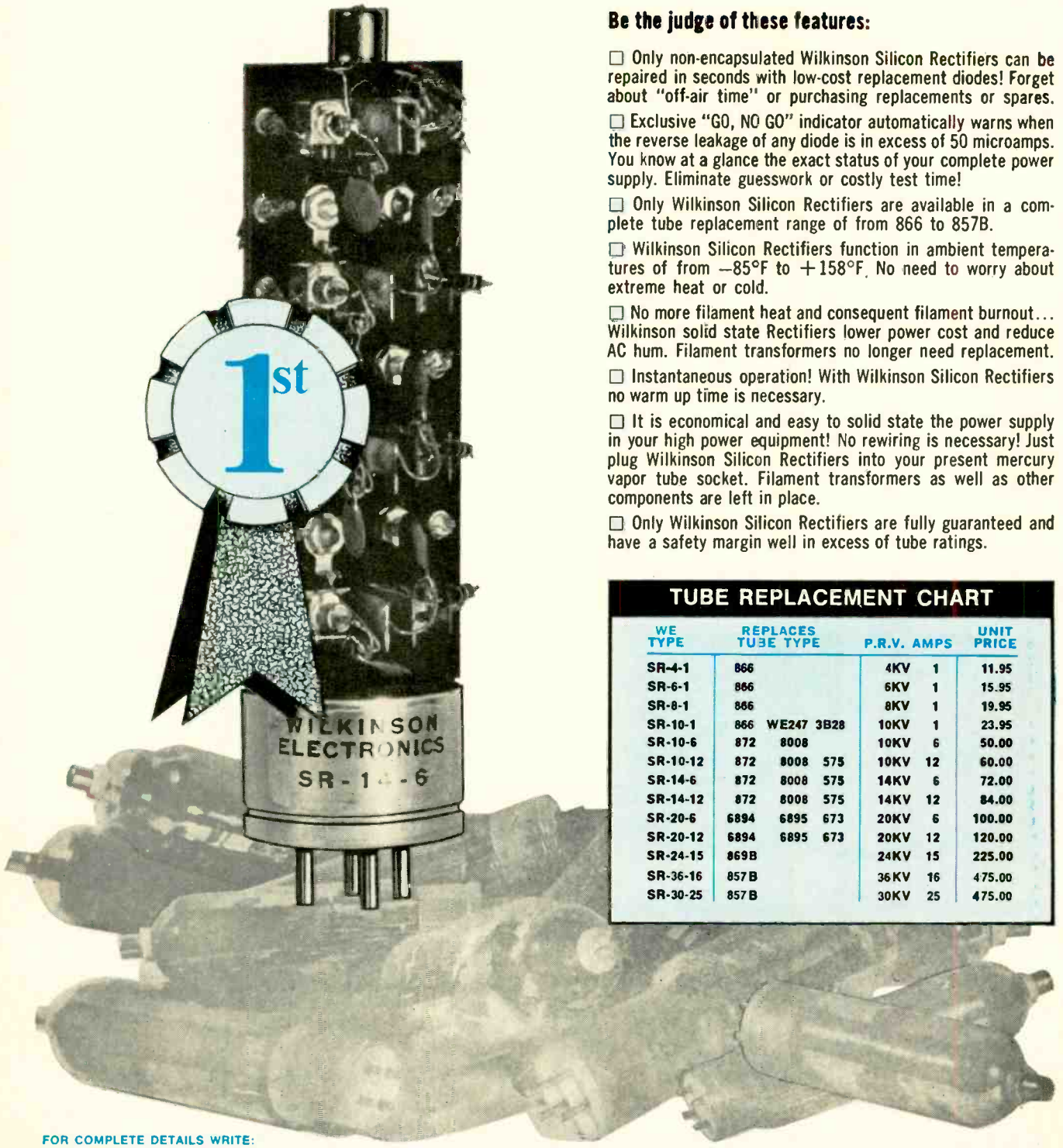
TV Homes Estimate Ready

ARB has published its TV homes estimates for use during the 1966-67 season. The booklet contains Total Homes and TV penetration for every county in the country (excluding Alaska), as well as totals by state and by 9 census regions.

TV's Role in Education

The Fund for Advancement of Education has just published a 96-page book entitled "Learning by Television." Authored by Judith Murphy and Ronald Gross, both of the Academy for Educational Development, Inc., chapters include: The Unfinished

Wilkinson Direct Replacement Silicon Rectifiers... Stand Out In A Crowd ...and Stand Up Forever!



Be the judge of these features:

☐ Only non-encapsulated Wilkinson Silicon Rectifiers can be repaired in seconds with low-cost replacement diodes! Forget about "off-air time" or purchasing replacements or spares.

☐ Exclusive "GO, NO GO" indicator automatically warns when the reverse leakage of any diode is in excess of 50 microamps. You know at a glance the exact status of your complete power supply. Eliminate guesswork or costly test time!

☐ Only Wilkinson Silicon Rectifiers are available in a complete tube replacement range of from 866 to 857B.

☐ Wilkinson Silicon Rectifiers function in ambient temperatures of from −85°F to +158°F. No need to worry about extreme heat or cold.

☐ No more filament heat and consequent filament burnout... Wilkinson solid state Rectifiers lower power cost and reduce AC hum. Filament transformers no longer need replacement.

☐ Instantaneous operation! With Wilkinson Silicon Rectifiers no warm up time is necessary.

☐ It is economical and easy to solid state the power supply in your high power equipment! No rewiring is necessary! Just plug Wilkinson Silicon Rectifiers into your present mercury vapor tube socket. Filament transformers as well as other components are left in place.

☐ Only Wilkinson Silicon Rectifiers are fully guaranteed and have a safety margin well in excess of tube ratings.

TUBE REPLACEMENT CHART

WE TYPE	REPLACES TUBE TYPE	P.R.V.	AMPS	UNIT PRICE
SR-4-1	866	4KV	1	11.95
SR-6-1	866	6KV	1	15.95
SR-8-1	866	8KV	1	19.95
SR-10-1	866 WE247 3B28	10KV	1	23.95
SR-10-6	872 8008	10KV	6	50.00
SR-10-12	872 8008 575	10KV	12	60.00
SR-14-6	872 8008 575	14KV	6	72.00
SR-14-12	872 8008 575	14KV	12	84.00
SR-20-6	6894 6895 673	20KV	6	100.00
SR-20-12	6894 6895 673	20KV	12	120.00
SR-24-15	869B	24KV	15	225.00
SR-36-16	857B	36KV	16	475.00
SR-30-25	857B	30KV	25	475.00

FOR COMPLETE DETAILS WRITE:

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TELEPHONE (AREA CODE 215) 874-5236 874-5237

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Experiment, The ITV Enterprise, The Impact of Televised Instruction, The Question of Quality, ITV At the Crossroads, ITV and the Future of American Education. Copies are available without charge from the publisher's offices at 477 Madison Ave., New York, N.Y. 10022.

Revised Propagation Report

The FCC has announced that a revised engineering report, "Development of VHF and UHF Propagation Curves for Television and FM Broadcasting," has been made part of the record in the proceeding on Sections 73.333 and 73.699 (Docket 16004). The report contains basic information upon which the new curves were drawn. Copies are available from the Office of the Chief Engineer, Room 802, Building 521. Time for filing comments was extended to Nov. 21, with replies due Dec. 6.

"Sell Like Your Sponsors"

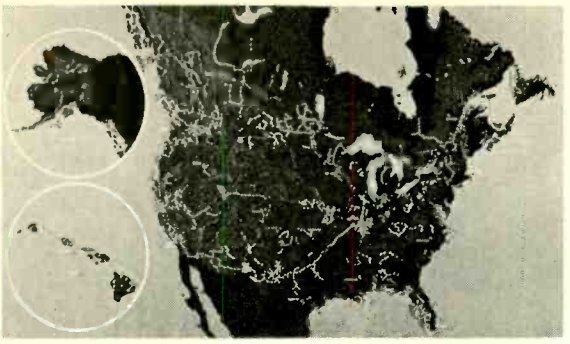
In an address at the Institute of Broadcasting Financial Management, held recently in Denver, C. A. Kellner, ARB v.p. of Station Services, pointed out that from within a marketing orientation, "television is no longer a mass medium. Advertisers are using the TV medium selectively and can choose and buy those people who are the best prospects." Mr. Kellner suggested that it is in broadcasters' interests to take a similar selective marketing approach. Through expanded audience composition data, the broadcaster can pin-point his station's audience advantages and limitations through product usage categories. Every station must compete for advertising dollars on three levels: TV must compete with radio, magazines, newspapers, and outdoor advertising; there are over 230 TV markets in which an advertiser might wish to invest, and within each of these markets are one or more stations through which an advertiser might reach a desired target market.

"New" Radio and the Advertiser

The "select audience" trend in broadcasting is to tailor programming 100% to the tastes of a given group. When trying to reach the total audience, or mass audience, concentrating on a single select group won't do it, according to the WCLV (Cleveland) Newsletter. Affluential adults cannot be reached with either classical or sweet pops alone; certain adults like one, others the other. Advertisers wanting to reach potential purchasers of their products cannot distinguish between AM and FM unless they also prepare to distinguish between AM and FM listeners. Better that he think in terms of the listener. It becomes imperative to first determine the type audience you want; then pick the station or stations reaching that audience. If it's mass, you need multiple formats. You'll not catch the classical listener on rock or sweet pops, and vice versa, nor on AM when FM is his preference.

Experimental Pay TV

The FCC has granted International Telemeter Corp. permission to increase the power of experimental station KM2XOG Los Angeles from 20w to 1kw for the purpose of developing and testing a subscription TV system. The operation is on Chan-



Close to a quarter million radio path miles of microwave communications links have been equipped by Lenkurt Electric Co. The map shows the more than 500 systems equipped by the company in the U.S. and Canada.

nel 83 and there is no public participation. The firm also operates experimental KM2XMR with 100w on Channel 5 as part of the project.

Convention Registration Limited

NAB's Convention Committee, faced with a continually growing affair, has approved registration changes intended to enable more people to hear luncheon speeches, and to limit the amount of exhibition space to that used by associate members at the '66 Annual Convention. Two types of advance registration will be offered: full registration, including one ticket to each of three luncheons, for $30 per person; registration good for all meetings and exhibits, but not including luncheon tickets, for $15 per person. Extra luncheon ticket sales during advance registration will be eliminated. Equipment exhibits will be limited to the four areas used at the Chicago Hilton in '66; exhibitors will be limited to the same amount of space occupied last year. Convention dates are April 2-5, 1967.

Most CATVs Carry Distant Signals

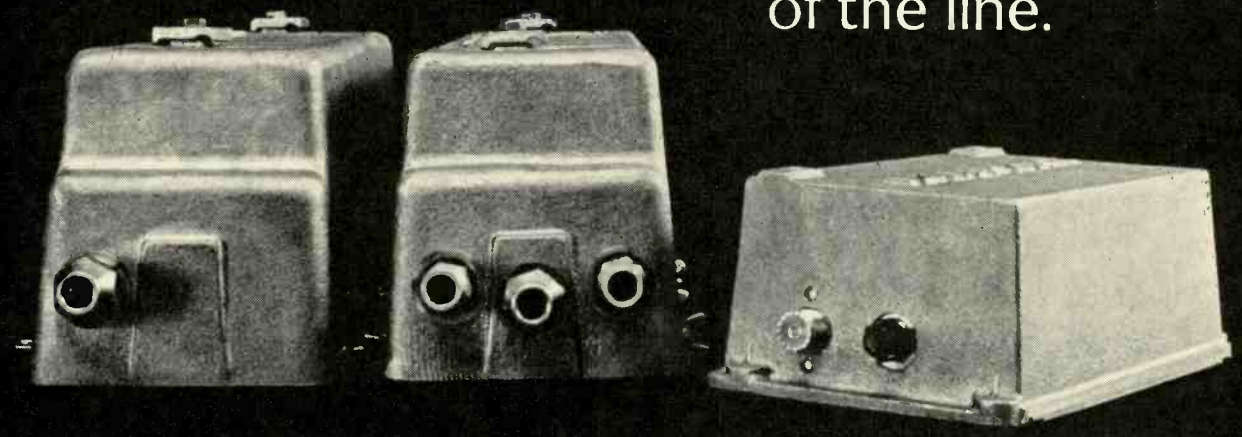
Over 90% of the nation's CATV systems receive at least one distant signal, according to NCTA research. Data shows that 0.9% of the systems receive only local stations (not including N.Y.C.); 1% receive only Grade A signals; 2% receive only Grade B signals; 4% receive a combination of Grade A and B signals; 25% receive no signals of Grade A or B quality; and 67% receive an assortment of signals including at least one of less than Grade B and at least one Grade B or better. NCTA conducted the study in response to a request by Sen. Quentin Burdick (D.-N.D.) acting chairman of the Copyright Subcommittee.

Video Equipment School

A school offering complete instruction in all phases of video tape recording has been established by Ampex at its consumer and educational products div., Elk Grove Village, Ill. The Ampex Video Institute will train Ampex users and service personnel, although enrollment by those not already using video equipment is also invited. Specialized training categories include video recording systems and accessories (tuition $100) and service personnel (tuition $100).

Their names: Courier, Dispatcher, Transporter.

Their job: carry the signal sharp and clear right to the end of the line.



Courier solid-state pilot carrier AGC-controlled trunkline amplifier.

Low noise, high output broadband trunkline amplifier has variable gain and tilt controls for accommodation of all commonly used types and lengths of cables. The pilot carrier system enables accurate control of system's gain, despite wide temperature variations. Internal jumpers permit duplexed powering of the unit from either end, as well as power feed-thru or stop. A zener-referenced permits transistor supply powering by 18-30 VAC. Test jacks (—30db) provided for monitoring. Rugged, cast-aluminum weatherproof case.

Dispatcher I and Dispatcher II solid-state broadband bridging amplifiers

Dispatcher I is for use relatively close to the output of a trunkline amplifier and provides a minimum of 16db gain. Dispatcher II is for use between trunkline amplifiers, gain is 26db minimum. Each model has 4 outputs with individual AC fuse for safety. Fuse removal cuts off AC power to its output, while leaving the RF path undisturbed. Internal jumpers provide the option in powering the unit from either end, and of allowing power feed-through for cascading units. Variable gain and tilt controls permit exact adjustment of output characteristics, Zener-referenced power supply permits use of duplexed 18-30 VAC. A —30db input monitor jack for testing. Rugged, cast-aluminum case ideal for messenger mounting.

Transporter solid-state trunkline amplifier full bandwidth (50-220 MHz)

Response is tilted to follow cable slope. Designed for cable powering by a wide range of AC voltages for flexibility in new systems or in extending existing systems. Rugged, weatherproof, cast-aluminum case, strand or pole mounting. Low cross modulation, low noise output. An external output monitor jack provided.

Lab-Line series test equipment designed especially for 75 ohm cable distribution

UHF/VHF sweep generator, Model 4122

Finest all solid-state, all-channel sweep generator has two switch-selected electronically swept ranges: entire UHF TV spectrum (470 to 890 MHz); entire VHF TV spectrum incl. subchannels (20-240 MHz).

Sweep widths are continuously variable from 5 MHz to the entire VHF or UHF range in one sweep. Center frequency can be tuned across the complete band on each range regardless of the sweep width setting. An output level attenuator is adjustable over 60db range. Automatic Level Control (ALC) on both ranges assures constant output. Fully regulated power supply.

The sweep oscillator is varacter tuned (no moving parts) for silent operation and long life. For VHF output the UHF sweep is mixed with a fixed oscillator signal at 900 MHz and the resultant difference signal is amplified and level controlled to cover the complete VHF TV spectrum.

The horizontal sweep rate of 60 cps, derived from the power line is available as a sine wave at the front panel for connection to the oscilloscope. Use of the sine-wave horizontal permits oscilloscopes to be fed by available local line voltage for summation sweeps of large systems.

UHF sweep generator, model 4114

Same quality features as the 4122 but covers range of 470 to 890 MHz only.

UHF/VHF field strength meter, Model FSM-2

Only all-channel field strength meter in a single unit, solid-state superheterodyne circuitry. Accurate enough for the lab. Portable enough for field work. Instantly convertible from VHF to UHF with the flip of a switch. Measures RF signals at 75 ohm impedance (VHF/UHF balun supplied for 300 ohm measurements) in two ranges: VHF (52 to 216 MHz) and UHF (470 to 890 MHz. Sensitivity variable from 100uv. to 3v. for full scale meter deflection. Reads both average and peak level. AC line or battery operation. Fully regulated power supply.

VHF return loss bridge, Model 2124

Enables fast, accurate wide band measurement of return loss (VSWR). Especially useful when the return loss is high (LOW VSWR). Covers frequency range 30 to 216 MHz. Balance better than 40db.

For further details, write:

BLONDER-TONGUE

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home TV accessories • closed circuit TV • community TV • UHF converters • master TV

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INTERPRETING THE FCC RULES & REGULATIONS

Comparative Criteria for Choosing Applicants

DURING THE past few years, we have witnessed a tremendous upsurge in the volume of standard, FM, and TV applications for construction permits. In many instances, there were two or more applicants for the same facilities, thereby necessitating a Commission hearing to determine the best qualified applicant. In 1965, the Commission issued a policy statement as a future guide to be followed in the comparison of applicants in a hearing.

This discussion does not deal with the issues of basic legal, financial, and technical qualifications to become a licensee; it is more particularly directed toward the areas explored and criteria employed by the Commission, as set forth in the policy statement, in comparing each applicant. These are commonly referred to as the *Comparative Issues.*

The Commission has set forth two primary objectives toward which the comparative portion of a hearing should be directed. They are (1) the best practicable service to the public, and (2) a maximum diversity of control of mass communications media.

The first objective is so obvious that it requires little further comment. The *raison d'etre* of the Commission is to insure that the broadcaster *will* serve the public interest. Desirability of the second objective has been discussed previously. To wit: (1) "The Commission believes that the better method of creating a diversity of viewpoints in an area, through the broadcast medium, is to grant broadcast authorizations to as many separate owners as possible." (2) "The Commission was guided by the Congressional policy against monopoly in the communications field (e.g., as expressed in Section 313 of the Communications Act), and the concept (recognized by the courts) that the broadcasting business is, and should be, one of free competition."

The Commission has decided that the two primary goals stated above are quite compatible. Service by a broadcaster to an area implies the ability and flexibility to meet the changing local tastes, needs, and interests. Since independence and individuality of approach are elements of rendering good program service, *the primary goals of good service and diversification of control complement each other.*

Diversification of Control

Diversification *is a factor of primary significance since*, as set forth above, *it constitutes a primary objective in the licensing scheme.* As in the past, the Commission will consider both common control and less than controlling interest in other broadcast stations and other media of mass communications. Control of large interests elsewhere in the same state or region may well be more significant than control of a small medium of expression in the same community. The number of other mass communication outlets of the same type, in the community proposed to be served, will also affect, to some extent, the importance of this factor in the general comparative scale.

It is not possible, of course, to spell out in advance the relationships between any significant number of the various factual situations which may be presented in actual hearings. It is possible, however, to set forth the elements which the Commission believes significant. It will consider interests in existing media of mass communications to be more significant in the degree that they: (1) are larger (i.e., go towards complete ownership and control); (2) are in (or close to) the community being applied for; (3) are significant in terms of numbers and size (i.e., the area covered, circulation, size of audience, etc.); (4) are significant in terms of regional or national coverage; and (5) are significant with respect to other media in their respective localities.

Full-Time Participation

The integration of ownership and management is, frequently, of *decisional importance.* It is inherently desirable that those with the legal responsibility oversee day-to-day operation of the station. In addition, with such integration, there is a likelihood of greater sensitivity to (1) an area's changing needs and (2) programming designed to serve these needs. This factor is of vital importance in securing the best service. It also frequently complements the objective of diversification, since concentrations of control are necessarily achieved at the expense of integrated ownership.

The Commission is *primarily interested in full-time participation* by owners in management. To the extent that the time spent is less than full time, the comparative credit given will drop sharply, and no credit will be given to the participation of any person who will not devote substantial amounts of time to the station on a *daily* basis. In assessing proposals, in order to determine the extent of their policy functions and the likelihood of their playing important roles in management, the Commission also looks to the positions which the participating owners

This section, providing broad interpretations 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.

propose to occupy. Also, it accords particular weight to staff positions held by the owners, such as general manager, station manager, program director, business manager, director of news, sports or public service broadcasting, and sales manager. Thus, although positions of less responsibility are considered, especially if there will be full-time integration by those holding those positions, they cannot be given the decisional significance attributed to the integration of stockholders exercising policy functions. *Purely consulting positions will be given no weight.*

Attributes of participating owners, such as their experience and local residence, will also be considered in weighing integration of ownership and management. While, for the reasons given above, integration of ownership and management is important *per se*, its value is increased if the participating owners are local residents and if they have experience in the field. Participation in station affairs by a local resident indicates a likelihood of continuing knowledge of changing local interests and needs. The importance of this is demonstrated by the Commission's great emphasis on program surveys in renewal and other applications.

Past participation in civic affairs will be considered as a part of a participating owner's local residence background, as will any other local activities indicating a knowledge of and interest in the welfare of the community. Mere diversity of business interests will not be considered. Generally speaking, residence in the principal community to be served will be of primary importance, closely followed by residence outside the community, but within the proposed service area. Proposed future local residence (which is expected to accompany meaningful participation) will be accorded much less weight than present residence of several years' duration.

Previous broadcast experience, while not so significant as local residence, also has rapidly diminishing value when put to use through integration of ownership and management. Also, previous broadcasting experience includes activity which would not qualify as a past broadcast record, (i.e., where there was not ownership responsibility for a station's performance). Since emphasis upon this element could discourage qualified newcomers to broadcasting, and since experience generally confers only an initial advantage, it will be deemed of *minor* significance. It may be examined qualitatively, upon an offer of proof of particularly poor or good previous accomplishment.

The discussion above has assumed full-time, or almost full-time, participation in station operation by those with ownership interests. The Commission recognizes that station ownership by those who have broadcasting experience may still be of some value even where there is not the substantial participation to which it will accord weight under this heading. Therefore, a slight credit will be given for the local residence of those persons with ownership interests who will devote *some time* to station affairs. Similarly, a very slight credit will be given for experience not accompanied by full-time participation. *Both of these factors, it should be emphasized, are of minor significance. No credit will be given either*

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Circle 16 on Reader Service Card

the local residence or experience of any person who will not put his knowledge of the community or experience to any use in the operation of the station.

Proposed Program Service

The United States Court of Appeals for the District of Columbia Circuit has stated that ". . . in a comparative consideration, it is well recognized that comparative service to the listening public is the vital element, and programs are the essence of that service." (*Johnson Broadcasting Co.* v. *FCC*, 85 U.S. App. D.C. 40, 48, 175 F. 2d 351, 359.) The importance of program service is obvious. The feasibility of making a comparative evaluation is not so obvious. Hearings take considerable time, and precisely formulated program plans may have to be changed not only in details but in substance—to take account of new conditions existing at the time a successful applicant commences operation. Thus, minor differences among applicants are apt to be of no significance.

The basic elements of an adequate service have been set forth in the Commission's July 27, 1960 "Report and Statement of Policy Re: Commission en banc Programming Inquiry." The applicant has the responsibility for a reasonable knowledge of the community and area, based on surveys or background, which will show that the program proposals are designed to meet the needs and interests of the public in that area. Contacts with local civic and other groups and individuals are also an important means of formulating proposals to meet an area's needs and interests. *Failure to make them will be considered a serious deficiency, whether or not the applicant is familiar with the area.*

Decisional significance will be accorded only to material and substantial differences between applicants' proposed program plans. Minor differences in the proportions of time allocated to different types of programs will not be considered. Substantial differences will be considered to the extent that they go beyond ordinary differences in judgment and show a superior devotion to public service. For example, an unusual attention to local community matters for which there is a demonstrated need, may still be urged.

In light of the considerations set forth above, and experience with the similarity of the program plans of competing applicants, taken with the desirability of keeping records free of immaterial clutter, no comparative issue will ordinarily be designated on program plans and policies, or on staffing plans or other program planning elements, and evidence on these matters will *not* be taken under the standard issues. The Commission will designate an issue where examination of the applications and other information before it makes such action appropriate, and applicants who believe they can demonstrate significant differences, upon which the reception of evidence will be useful, may petition to amend the issues.

Past Broadcast Record

This factor includes past ownership interest and significant participation in a broadcast sta-

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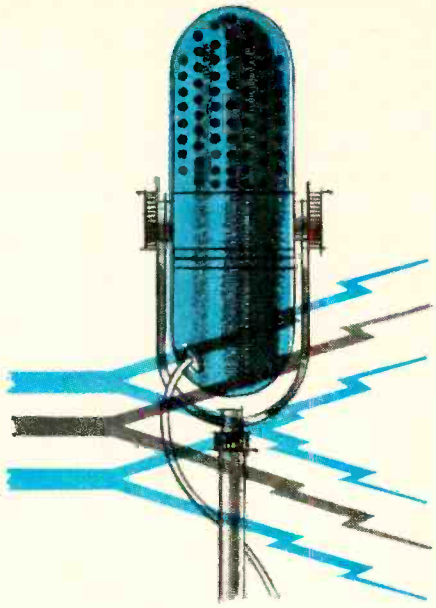

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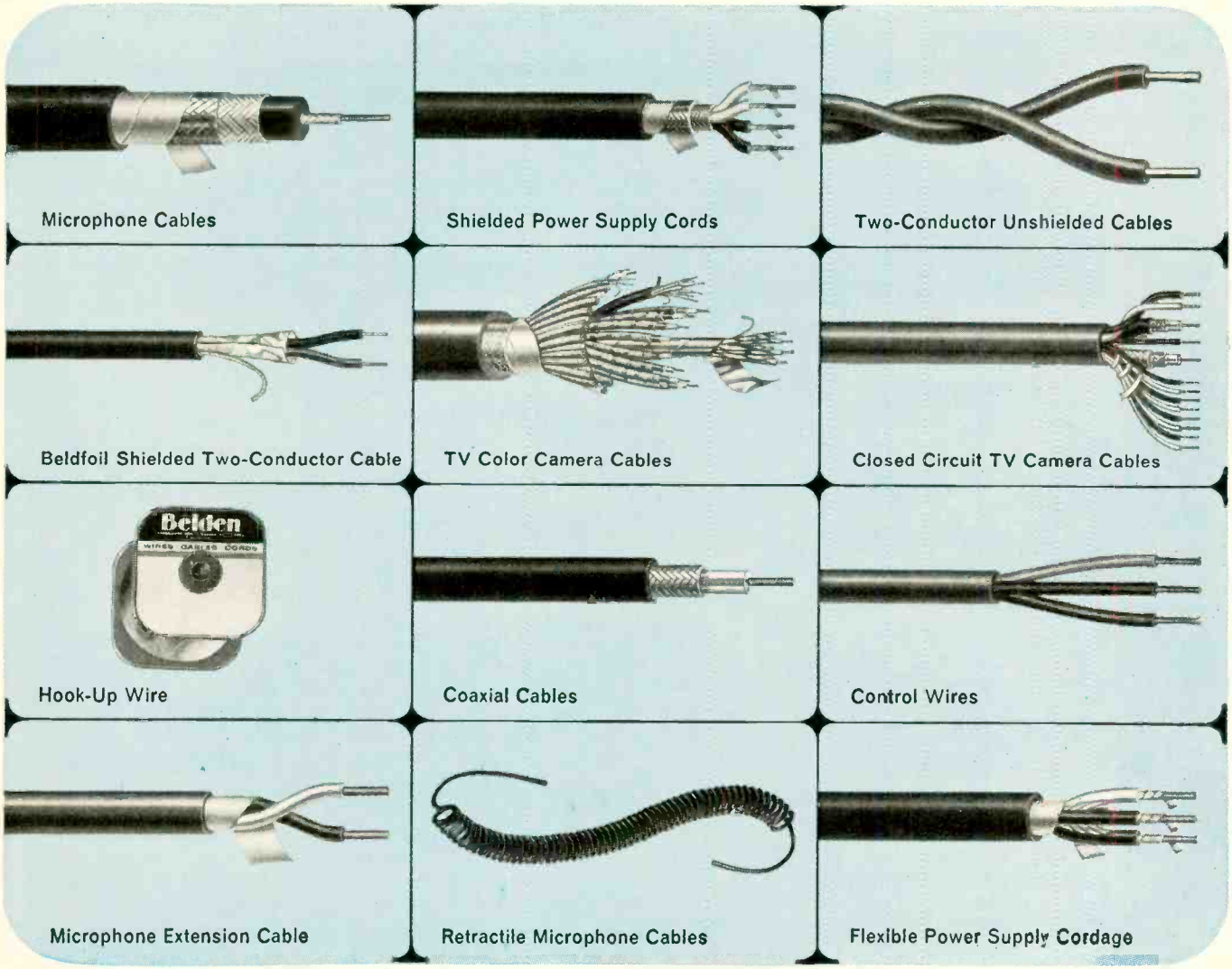

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tion by one with an ownership interest in the applicant. *It is rarely a factor of substantial importance.* A past record within the bounds of average performance will be disregarded, since average future performance is expected. Therefore, the Commission is not interested in the fact of past ownership *per se*, and will not give a preference because one applicant has owned stations in the past and another has not.

The Commission is interested in records which, because either unusually good or unusually poor, give some indication of unusual performance in the future. Thus, it will consider past records to determine whether the record shows (1) unusual attention to the public's needs and interests, such as special sensitivity to an area's changing needs through flexibility of local programs designed to meet those needs, or (2) either a failure to meet the public's needs and interests or a significant failure to carry out representations made to the Commission.

Character

The Communications Act makes character a relevant consideration in the issuance of a license. Significant character deficiencies may warrant disqualification, and an issue will be designated where appropriate. Since substantial demerits may be appropriate in some cases where disqualification is not warranted, petitions to add an issue on conduct relating to character will be entertained. In the absence of a designated issue, character evidence will not be taken. The intention here is not only to avoid unduly prolonging the hearing process, but also to avoid those situations where an applicant converts the hearing into a search for his opponent's minor blemishes, no matter how remote in the past or how insignificant.

Other Factors

As the Commission has stated, its interest in the consistency and clarity of decision and in expedition of the hearing process is not intended to preclude the full examination of any relevant and substantial factor. Thus, it will favorably consider petitions to add issues when, but only when, they demonstrate that significant evidence will be presented.

Past experience has shown that hearings have run for long periods of time because of the number of areas of comparison. The Commission's new guidelines of July 28, 1965, "Policy Statement On Comparative Broadcast Hearings," is an attempt to (1) formulate a higher degree of consistency of decision and (2) prevent undue delay in the disposition of comparative hearings. As is evident from the foregoing discussion, the various factors cannot be assigned absolute values; some factors may be present in some cases and not in others, and the differences between applicants with respect to each factor are nearly countless. Nevertheless, it behooves all parties who are interested in applying for new broadcast facilities to keep these comparative criteria in mind. Additionally, consultation with an attorney well versed in the practice of communications law is essential to obtain a realistic appraisal of one's chances in a given case.

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1. Livelier, truer colors: Colors appear brighter, clearer, life-like. Up to 5db better signal-to-noise ratio for multiple generation copies. New oxide, new binder, new coating technique make this possible.

2. Stronger black & whites: Compatible high fidelity resolution with startling presence. Minimal background interference or blur. It's a picture that's truly *alive!*

3. Longer life: Capable of 2,000 passes with no oxide rub-off or increase in dropouts; no visible indication of head to tape contact. Almost impossible to wear out. Virtually unlimited shelf life.

4. Improved sound: Dynamic range is substantially improved across the sound spectrum. Tape background noise is significantly reduced. New No. 399 gives you living sound to match the picture!

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6. Perfect copies: Create up to 4th generation duplicates that only the most experienced eye can distinguish from the master tape.

7. Total versatility: Can be used for both high-band and low-band recording. Recorders need no special adjustments or setups.

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Planning a 100-kw FM

By L.D. Ewy

Here's how KOFM planned its programming around both automated and live operation.

ON OCTOBER 4, 1965, KOFM radio began equipment installation in a new modern building, housing offices, studio and transmitter. Proof - of - performance measurements were completed 40 days later. On November 15, 1965, the station received program test authorization and began regularly scheduled programming. Responsibility for the relative speed in which the 20-kw transmitter, 32-bay antenna (1425′ high on TV tower) 10-channel stereo console, SCA background music service and program automation system was installed must be attributed to careful planning.

Planning Motives

The building, designed to encompass the entire KOFM broadcast operation plus space for the Sonax Corp. (background music leasee), is constructed of insulated concrete blocks, poured concrete floors and a flat insulated tar paper roof. During the initial planning stage, tentative equipment locations were blocked-in on a floor plan layout, thereby allowing each individual to visualize the working relationship of each integral part of the operation. In so doing, possible layout errors were eliminated on paper and a flexible and efficient overall installation was achieved.

Offices, control room, and studio are carpeted and remaining areas are tiled. The rather large proportion of partition window area simplifies routine operation and saves a lot of steps. The studio area is visible from the control room, enabling close operator-talent contact. The studio is equipped with mike outlets, monitor speakers, intercom, and a large table and chairs.

The transmitter is visible from the engineer's office/working area, allowing transmitter observation during the time this office is occupied. The automation system, transmitter, and rack equipment are visible from the audio console position. Because we wanted to create a good impression with a visiting client or a casual visitor, the reception area received special attention with lounges, floral decor, and contemporary lighting.

Construction Procedure

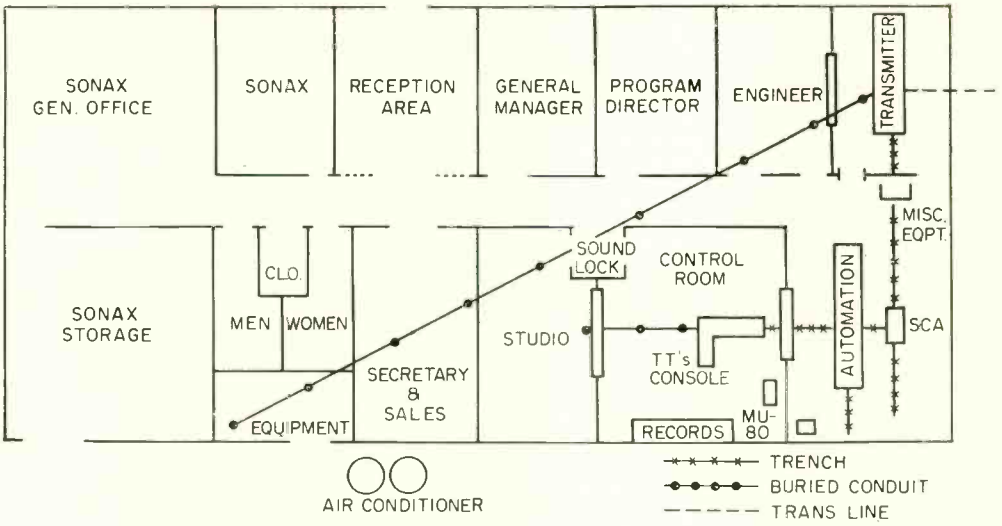
Work on the control room was started first. The audio console and recording facilities had to be completed so music tape library production could be started. All audio wires and RF cables were labeled and logged as to origin and termination as work progressed. Needless to say, left and right audio channels must be distinguished and polarities observed. Also, high, low and medium level audio circuits were carefully isolated.

We decided to eliminate the typical studio patch panel and tie all audio inputs directly to the console. This was done to minimize operational errors. However, all major equipment inputs and outputs and those convenient for proof-of-performance measurements are normalled through a patch panel. Before rack installation, the patch panel and associated terminal block was assembled on a jig. This method proved very convenient and error-free.

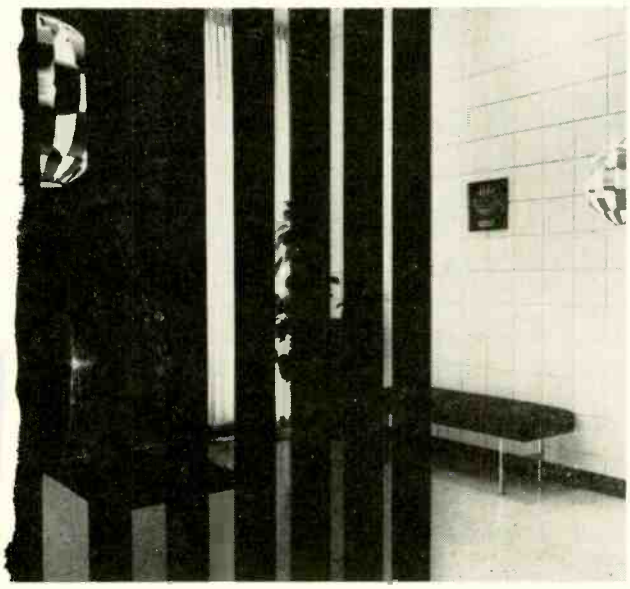
Due to the cost of running primary cable, AC power to the transmitter runs through a 3″ conduit buried beneath the floor and terminates in the trench beneath the transmitter (see floor plan). A ¾″ conduit is imbedded in the floor between the control room and studio to allow for further expansion. A ¾″ conduit also runs from the trench near the console to the control room ceiling and is used for audio distribution to monitors, cue speakers, intercoms and on-air lights. Conventional trenching accommodates cabling between the transmitter, automation system, subcarrier operator and console.

The automation system with its accompanying pre-cut and labeled audio and control cables was easily assembled. It was squared away over the trench, and AC was run to complete this portion of the installation. The transmitter is also installed over the wiring trench and is cooled by filtered air brought in through a 24″ inlet cut in the outside wall to the rear of the

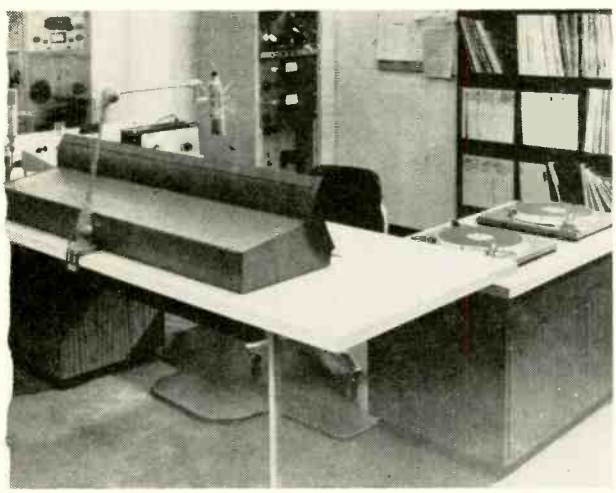
Mr. Ewy is Chief Engineer, KOFM, Oklahoma City, Okla.



Floor plan provides step-saving efficiency and room-to-room equipment visibility.



Modernistic reception area greets the KOFM visitor.



Uncluttered control room environment advocates efficient production from record and tape sources as well as live pickup from the adjacent studio.

The Management Viewpoint

by G. B. (Bill) Harrison, General Manager

Can technical excellence bring success to an FM station in the Southwest? Without question, technical superiority in the areas of sound and signal strength is a major factor in KOFM's success. From the moment of KOFM's conception, the overall objective was to present to the radio audience of Oklahoma City and the State of Oklahoma the finest music available. How would this be achieved? We felt that automation was the key. Automation allows the station to control the style of music presented to the listener. This program control centers itself around the proper blending of musical styles and specialized musical programs such as classical music, folk music and jazz. At this time KOFM is the only station in Oklahoma City that has regularly programmed classical music. After 9 months of operation KOFM is one of two FM stations shown on the ratings. We would assume from the rapid growth in our audience that KOFM's decision to use automation has been the right one.

Any station management must face two real problems: operating costs and sales. KOFM—because of its technical superiority—had tangible advantages to offer The Sonax Co., a background music service. In addition, Sonax operates as a wired communications distributor and system engineering entity. Therefore, in planning our building, we incorporated additional space to house the Sonax general offices and equipment. With this company providing collateral revenue for space and use of our subcarrier, KOFM had an initial fixed income that lowered operating costs.

While KOFM receives applause from the communications industry for its sound quality and signal strength, this applause does not guarantee sales. A sales story must be developed in order to answer such questions as: Who is your audience? Where do they live? What's their income? What is your coverage area? What is your rating? How many homes have FM receivers? These are some of the typical questions asked of FM. We set out to get answers to these questions by our own promotions and research, talking with the Chamber of Commerce, joining the National Association of FM Broadcasters (which is a major source of information), by joining the rating service and other means. Along with gathering this material we began to advertise KOFM. The advertising was designed to create a personality for the station, not the individuals.

Technical superiority, sound programming, advertising and a selling proposition has created talk within the market. Talk creates momentum and momentum creates sales.

Automation vs Live Programming

by Dick Wilkinson
Program Director

The KOFM plant is built around our automation system which, in addition to simplifying maintenance procedures, aids in maintaining a better on-the-air sound. We chose automation over live programming because we felt it would provide more efficient program control and enable us to use air personnel more effectively. A popular thought is that automation is used to save money by eliminating air personnel. On the contrary, at least at KOFM, just as many men are needed, but we save money by utilizing our announcers more effectively. On-air work such as selecting records, time checks, selecting commercials and staying at the console has been eliminated. The time is spent preparing mistake-proof material for the automator.

Program control is accomplished by having correct on-the-air music 24 hours a day and regulating the amount of commercial and announcer interruptions. Once we became used to our automation system, this control was simple to accomplish and we did not have what automation critics would call "canned" sound. Automation is our answer to the old problem of controlling program material and to introducing rapid change if and when necessary. The result is that ingredient we call "Program Integrity."

KOFM Equipment

Collins 830 H 1A 20-kw transmitter
LTV multideck tape transport
Collins antennas
Schafer automation system including:
—Schafer CU-8S control unit with remote control
—6 Ampex PB-351-2 decks
—Audio clock and 2 Ampex PB-351 (time announcer)
—SA 100 commercial spotter with M-50 memory unit, remote controls and Ampex 354 deck.
—MU 80 make-up unit with remote controls and Ampex 351-2 decks.
—2 Crown Series SS 800 program recorders with monitor alarm unit.
Moseley Model SCG-4 SCA generator
Gates Executive audio console mounted on 36" by 84" desk top with double and single turntable pedestals.
2 Gates turntables equipped with Shure SME Series 11 pickup arms.
Shure M 44-7 cartridges
McIntosh C22 preamps
Gates Playback Cartritape
Gates Playback and Record Cartritape with remote controls
Sony Model 77-4 tape deck with remote controls
Sony Model C-37A condenser microphone
Neumann U-67 condenser microphone
Gates Top Level limiter
Collins 26U1 limiter
Collins 26U2 limiter
McMartin TBM 3000 frequency meter
Collins 900 C-1 modulation monitor
Miratel E.B.S. monitor
Horizontal—37M-16 with .6° beam tilt and null fill
Vertical—300-16 with .6° beam tilt and null fill

transmitter. A metal hood, with an exhaust fan, was fabricated and placed over the transmitter. A ground buss, terminated at the water well, provides a common ground for equipment.

Antenna Mounting

It was decided to sidemount the KOFM antenna on KOCO-TV's tower with the very top of the antenna at or near the top of the supporting structure. However, design analysis by the tower manufacturer showed that excessive loading would result unless the added torque was eliminated. Consulting Engineer Robert Silliman came to the rescue with a solution of mounting the antenna in a manner creating 0 torque.

We anticipated some trouble in mounting the power divider to these specifications, due to the existing elevator cables, transmission lines and tower members. By careful measurements and plotting at ground level we determined the least trouble-free method of mounting the power divider and routing the feed line. The top of the horizontal antenna is mounted at 1425'. The transmission line is 3" heliax, wrap-locked to a tower leg every 6 feet. The VSWR is down to a low 1.02, due to the absence of sharp bends in the line and a short 30-ft. horizontal run with a sweeping 90° turn up the tower.

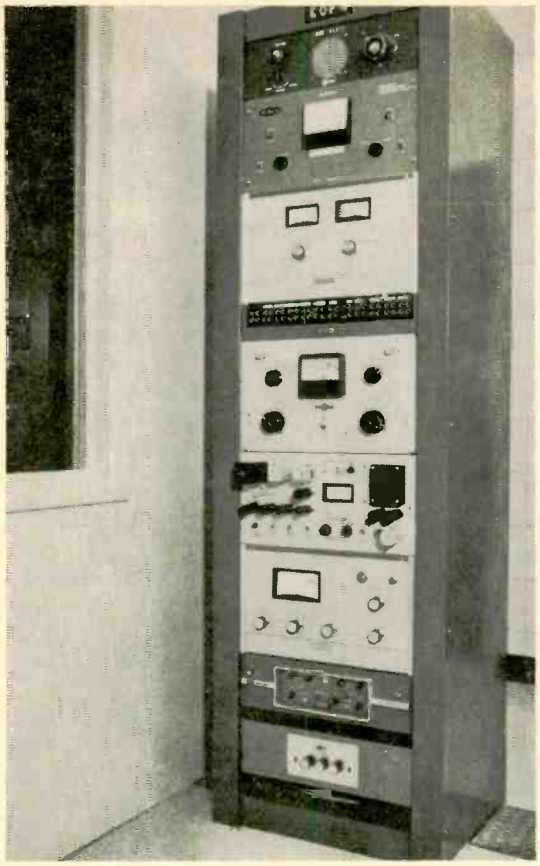
The antenna's 16 horizontal and 16 vertical bays are interspaced and modified for 6° beam tilt and null fill. 100 kw ERP is radiated in both horizontal and vertical polar planes. We have not yet completed field strength measurements, but we have had consistent omnidirectional reports from 120 to 180 miles. Skips to Calgary (Canada), Omaha, and Sioux City have been reported.

Programming & Operation

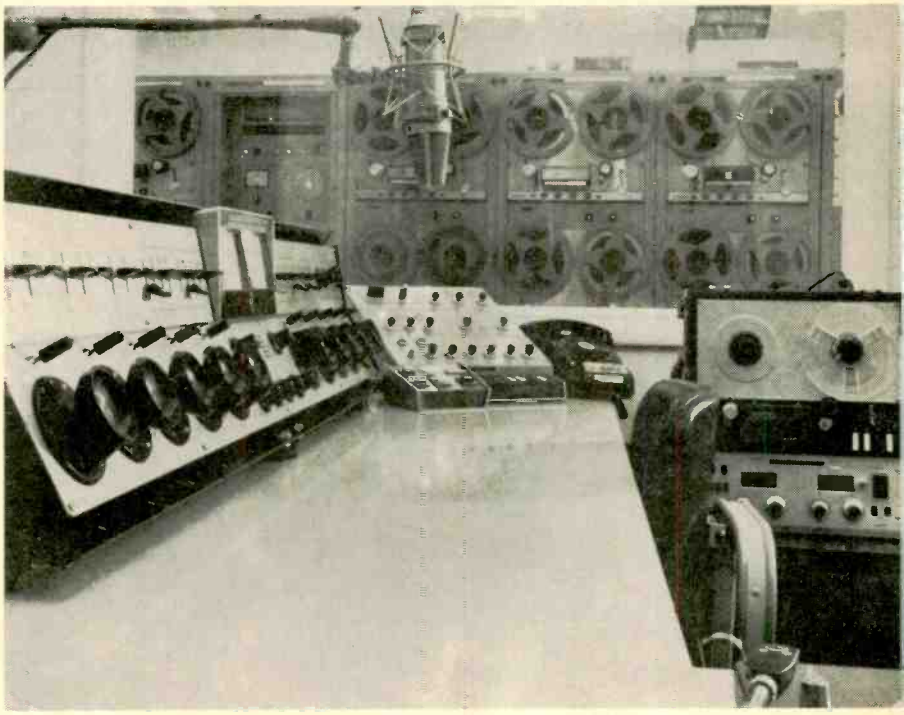
Upon completion of the installation of control room equipment, the program director began recording music for our tape library so that a sufficient number of tapes would be on hand at sign-on. The MU 80 portion of the Automator was utilized for this purpose. On tapes intended to program the bulk of our day, various musical styles are blended in accordance with our format. Highlighting our program schedule are specialized programs catering to the tastes of classical, folk, and jazz devotees.

Several innovations, designed to increase operational flexibility, were incorporated into our installation. A high impedance audio bridge was installed at the audio output of the Automator and fed to a separate pot on the console. This enables us to fade and integrate certain program elements from the Automator during live periods. A bridge was placed on the remote-controlled spotter, allowing any announcement on the spotter tape to be played back through the console during live operation. Also, spots recorded from the console can be auditioned. The same bridging technique was applied to the MU 80 make-up unit and #5 playback deck to assist in dubbing.

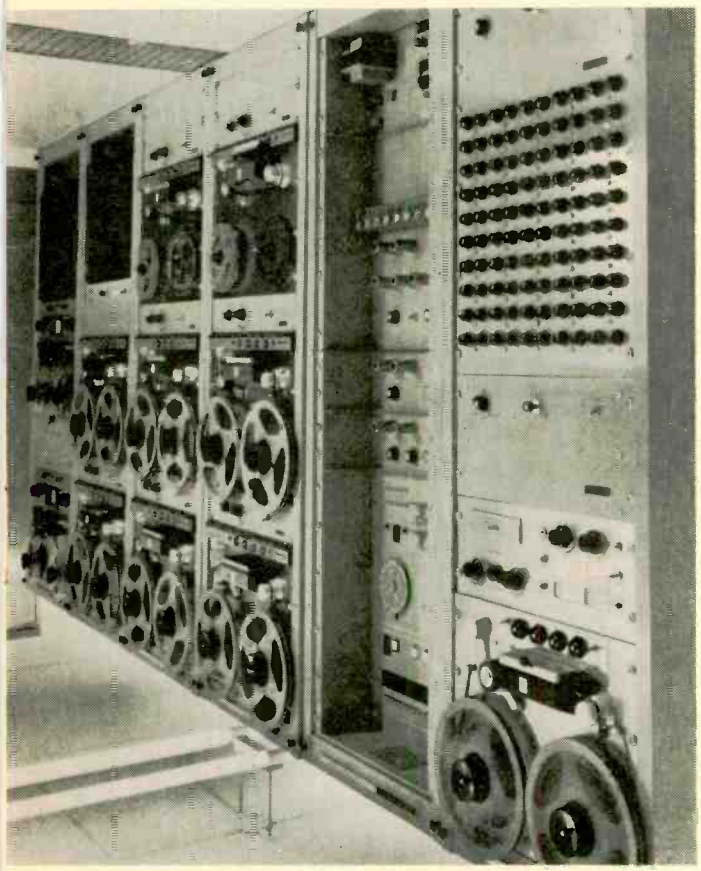
Since we wanted to be able to go live from the console at a moment's notice, an audio relay was installed to interrupt the Automator's normal feed to the transmitter. By the simple flip



Audio processing, monitoring, and accessory equipment rack is located adjacent to transmitter room door over wiring trench.



Convenient automation system, turntable, and tape recorder remote controls on the operator's right simplify periods of live programming as well as production.



The Schafer automation system is used for major program segments but may be immediately interrupted for live operation. SCA generator is located directly behind the automation gear.

of a switch at the console position, live or automated feeds can be selected. The audio console and automator were both adjusted for equal output of 8 VU. The spotter containing commercials and promos, the complete Automator, the MU 8, are all remote controlled with audio appearing at console inputs, and can be used during live operation.

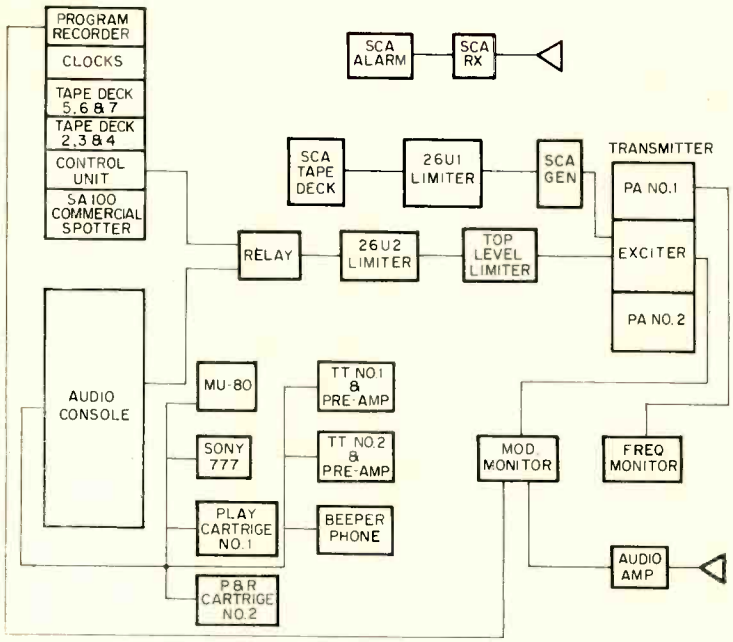
To provide a positive off-the-air alarm, a system utilizing the modulation monitor, program logger, and the monitor alarm was designed. The program logger is fed a mono signal from the modulation monitor. The audio output of the program logger controls the monitor alarm. In this manner any audio interruption of 40 seconds duration anywhere in the entire system will activate the alarm.

Turntable start and stop functions are remote controlled from the console by a momentary contact switch which energizes a latching relay. Our operators like this convenience.

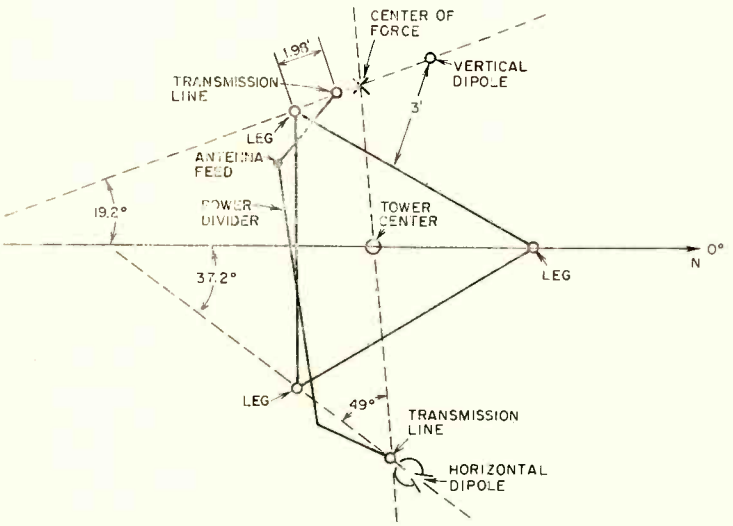
A left- and right-channel audio feed is taken from the modulation monitor and fed to a spare position on the audio console monitor. This enables the operator to monitor the off-air signal. Stereo audio feed for building monitors is provided by an inexpensive stereo amplifier with an added isolation transformer bridged at the modulation monitor output. Three pilot lights, mounted in a small "mini box" near the console, notify the operator of an EBS alert, overmodulation and an off-the-air condition.

Eliminating the "Bugs"

There was the usual run of equipment malfunctions: noisy resistors, temperature-sensitive



Block diagram shows inter-equipment wiring.



TV tower cross-section shows FM antenna and feed line mounting.

tape transport capstan speed, two transposed black wires, loose and unsoldered connections and miscellaneous problems. A prompt call to the equipment manufacturer proved to be a great asset with unfamiliar equipment. Often, they have had the complaint before and the cure is on the tip of their tongue.

Main-channel modulation was a source of trouble initially. Due to FCC required 75 usec pre-emphasis in the transmitter the high audio frequency content created objectionable crosstalk at high modulation levels. This was remedied by lowering the main channel modulation. Later, in order to raise the modulation level, a frequency sensitive 2-channel limiter was installed ahead of the transmitter at the output of the conventional stereo limiter. This minimized our crosstalk problems and normal modulation levels were obtained. However, since variable equalized turntable preamps were used, we have to be very careful to not add any excess treble boost during live recording (our decks are flat within 2 db to 15 kc) or the purpose of the frequency-sensitive limiter is defeated.

To achieve the "best in town" audio fidelity in the SCA system, we encountered and solved numerous problems. There is an audio pause of approximately 10 to 15 seconds between music selections on the SCA music tape. It was decided to mute the subcarrier generator during these pauses to completely eliminate all traces of crosstalk. Muting the SCA system created two more problems:

1. If the squelch control on client receivers was advanced too far, a very objectionable "splat" occurred as the RF carrier was cut off. To correct the problem, the squelch was adjusted to the very edge of carrier reception and then advanced about 10°. This eliminated the splat and carrier cutoff can not be detected.

2. The line feeding the generator must be absolutely quiet. The preamps in the tape deck must be hum-free and correspondingly quiet, otherwise the SCA generator muting circuit would interpret this as audio, resulting in erratic muting.

After a few SCA equipment failures an alarm was constructed and installed. It is bridged across the output of the SCA receiver normally used for monitor feed, and is designed so that it takes about a 6-minute loss of audio before it rings. This delay was necessitated by the long leader tape at the beginning and end of each reel and the accompanying loss of audio.

The pre-emphasis circuit in the generator was clipped out for better modulation control. This did not lower the fidelity and supresses out-of-band emission. These steps remedied our SCA problems, and as a result, many customers are now enjoying a low cost background music service. Reception up to 175 miles is reported by Sonax Corp.'s Bob Sherwood.

The construction of KOFM reaffirmed the importance of careful planning. We not only completed the job in a minimum of time, but continue to benefit in daily operating efficiency and convenience. By adhering to the manufacturer's recommendations, our program automation system produces the "live" sound we desire and also affords an instantaneous live operation capability. ●

Cincinnati TV's "New World of Tomorrow"

By Bill Dawes

Anyone planning new or expanded TV facilities will get some good ideas from this report on a forward-thinking station.

THIS WINTER, WCPO-TV will move into a $3 million residence which will provide Cincinnati with a modern color TV production facility. Called the "New World of Tomorrow," the newly equipped WCPO-TV home will provide production and operational capabilities second only to network origination centers.

Building Design

Scheduled for occupancy sometime next February, the new edifice is designed to complement the image and spirit of the new Cincinnati. The 2-story structure is located between 5th and 6th Streets and Central Avenue on a half city block of land adjacent to the new Convention Hall in the Queensgate redevelopment area. The location is readily accessible from all main streets and thoroughfares in the Cincinnati area.

Constructed of steel frame and concrete, the approximately 150 x 140′ building will house studios, production, technical, and office facilities. Exterior wall surfaces are to be exposed concrete aggregate — created by sandblasting the finished concrete — to match the appearance of Convention Hall.

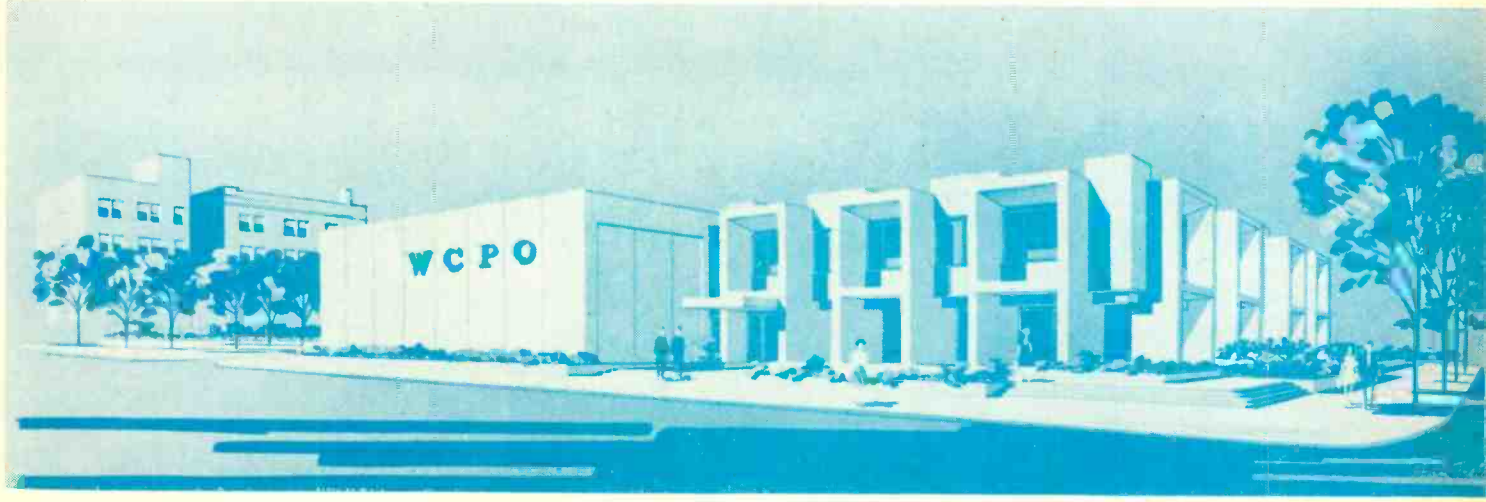
The more than 40,000 sq. ft. floor area will be heated by gas-fired hot water with forced air circulation. A 200-ton air conditioner will cool and ventilate the entire structure. Estimated cost of the building alone is $1.2 million; with land and equipment, the total cost is expected to be in the neighborhood of $3 million.

Studio Design

After witnessing the burgeoning growth of the past fill the present facility beyond capacity, WCPO-TV management called for 5 times more production space in the new building. Two complete studios with individual control rooms will enable the staff to develop bigger and better color productions. Studio A, which is 50 x 70′, will have folding bleacher-type seats — extending to a 17′ depth when opened — with seating capacity for 175 people. Studio B will have a complete kitchen set in its 40 x 50′ area.

In each studio there will be a revolving type cyclorama for rapid set changes. In Studio A the cyclorama will extend around almost half the wall area; in Studio B it will cover about a third of the wall area. By installing the cyclorama sets, production crew time will be cut significantly, thereby permitting more efficient production with a greater variety of settings. Suspended scenery will be installed in each studio, making rapid changes possible by "flying-in" various panels. Each studio will also have a rear-screen projection system to increase production versatility. For

Mr. Dawes is director, Promotion/Publicity, WCPO-TV Cincinnati, O.

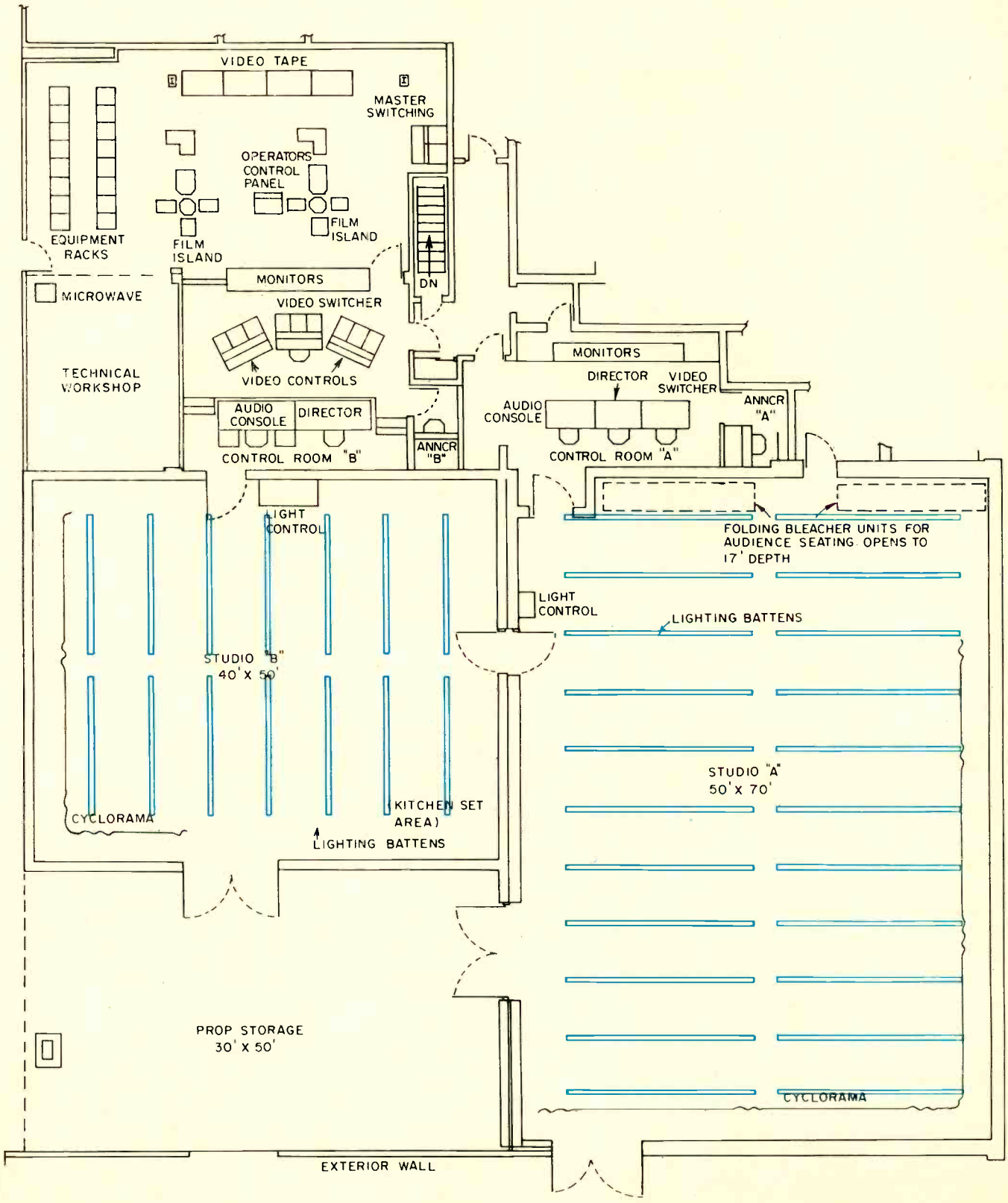


Architect's sketch of Channel 9's "New World of Tomorrow." Sketch of Cincinnati's new Convention Hall is to the left.

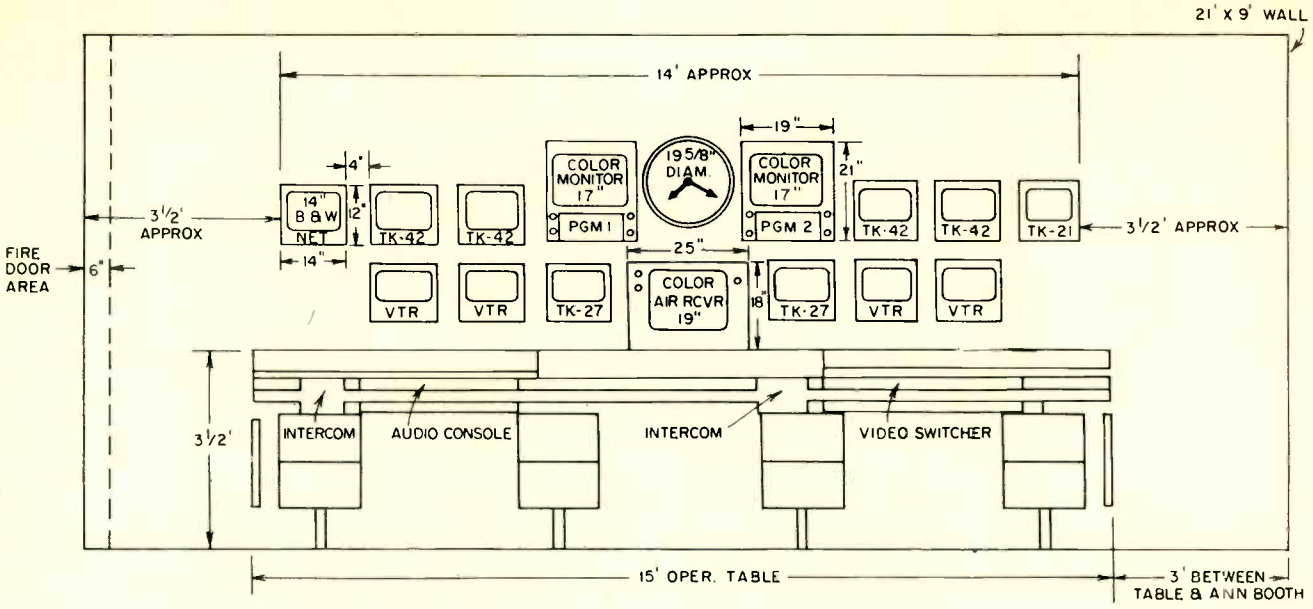
convenience and necessity, numerous camera and mic outlets will be located around studio walls to accommodate video and audio pickup in any part of the studio. A 30 x 50′ prop storage area—with studio height ceiling—is located adjacent to both studios.

Technical Facilities

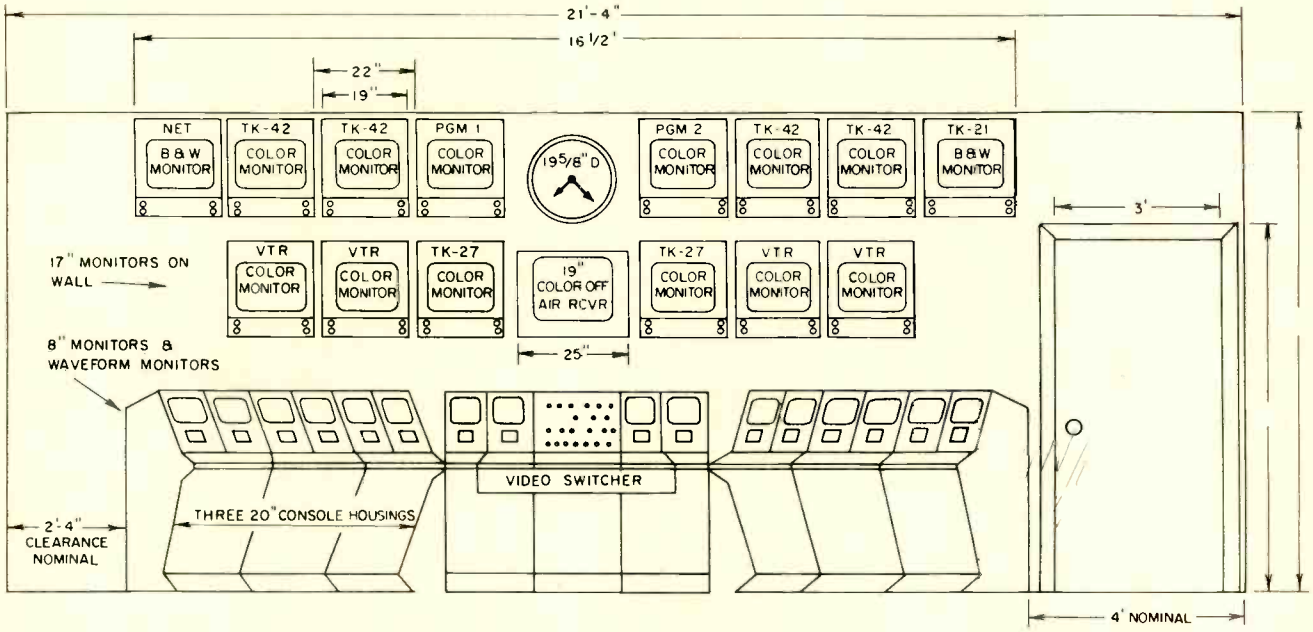
All major equipment will be new, providing complete live, film, and tape capability—all in color—with 4 studio cameras, 4 video tape recorders, and 2 film islands. With emphasis on all-color programming, WCOP-TV engineers designed the new facilities for optimum color operation. Video processing, switching, camera, in fact, all video cabling, has been carefully designed — along with lighting and lighting control equipment—to recommended



Sketch of technical center & upper studio (top) studio floor area (bottom).



Sketch of Control Room A console and monitor bank.



Sketch of Control Room B consoles and monitor bank.

manufacturer and industry specifications.

Studio Equipment

Four RCA TK-42 color cameras will be used for live studio pickup, providing adequate camera equipment for simultaneous production of a live program and rehearsal or recording of another program in the adjacent studio. In addition to the master switcher in the telecine area, each studio will have a separate Sarkes Tarzian video switcher and audio facilities operating in an independent control room. To further broaden production capability, each video switcher will have its own Telechrome special effects generator.

For maximum operational flexibility, each control room and its switching and control center will operate entirely independent of the other. For example, during the broadcast of a network or taped program, another show or a number of commercials may be taped or rehearsed in either or both studios with any desired special effects or film segments integrated into the proper program or commercial.

Lighting

Studio lighting was designed specifically for color production with an illumination of up to 350 ft. candles available anywhere in each studio at 3200°K. Virtually any lighting effect, pattern, and

New Major Equipment

- 4—RCA TK-42 live color cameras
- 3—Sarkes Tarzian Video Switchers
- 2—Sarkes Tarzian Audio Consoles
- 30—Conrac Monitors (18 are color)
- 4—RCA Video Tape Recorders
- 2—Film Islands: Each includes one TK-27, one TK-21, 16mm projector, opaque projector, slide projector.
- 12—Video source picture and waveform monitors and control consoles
- 1—2-way RCA microwave STL

illumination level will be attainable with an electronic lighting control in each studio.

A total of 350 fixtures—mostly quartz — have been allotted to each studio. Ceiling fixtures will be suspended from 22 battens in Studio A and from 14 battens in Studio B, providing the mobility necessary for uniform lighting over the entire area of each studio.

Control Equipment

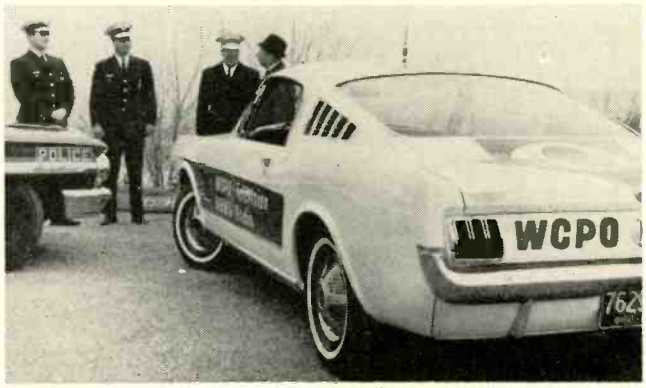
Each control room has provision for a director, audio engineer, and announcer to facilitate independent production from its associated studio, plus video source availability from all cameras, film islands and VTRs. Control Room A will have a 15-ft. operations table with audio engineer and switcher operator flanking the director's chair. The monitor bank will comprise 14″ black and white video source monitors —one for *each* source—and two 17″ color line monitors. (Two independent program lines will run to the master switcher, one from each central room switcher.)

In Control Room B, the audio console and director's console will be positioned directly behind the video switcher desk and video control center. Three 20″ video control consoles will be located—in a lazy U—on either side of the switcher with facilities for 12 video sources (4 live camera, 4 film camera, 4 VTRs). The monitor bank facing the operators will consist of 17″ color video source and line monitors. Each control room will have a 19″ off-air color monitor, for a total of 15 Conrac monitors in each bank.

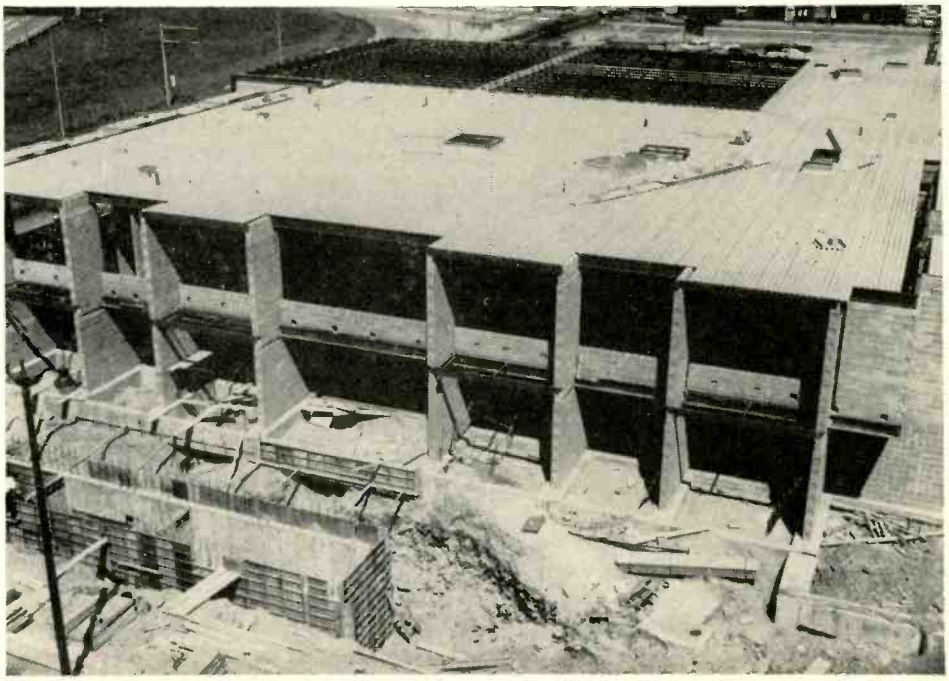
The Sarkes Tarzian audio console installations have been designed to provide reverberation, re-entry, and studio feedback. DC voltages will remote-control associated amplifiers, relays, etc., which will be rack-mounted in the telecine area. The dual intercom system will be capable of regrouping—by means of transfer keys — communication lines with any area or group of facilities in combination with either control room.

In the telecine area, space is provided for the master video switcher console, two multiplexed film islands, four RCA video tape recorders, and 16 equipment racks in which pulse and subcarrier generators, video and audio distribution systems, etc., will be mounted. Plans call for the availability of two separate and simultaneous film camera video sources

Ground-breaking ceremonies were held last February 11. Participating were (l. to r.) Walton Backrach, Mayor of Cincinnati; M.C. Watters, exec. v.p., Scripps-Howard Broadcasting; Robert Gordon, v.p. and General Manager of WCPO-TV; and Charles Scripps, Board Chairman, E. W. Scripps Co.



News Director Al Schottelkotte discusses details of a news story with members of the Cincinnati Police Dept.



Taken Aug. 31, 1966, this photo shows some of the building's structural features. The sub-grade rectangular section (concrete forms) will house showers, locker rooms, power entrance, heating and air conditioning plants, etc.

One of three Mustang Fast-Back news vehicles. A red-and-white point job readily identifies the cars to police and fire officials.

Al and Wanda Lewis have developed the "Uncle Al Show" into the tri-state area's most popular kiddies program, now in its 17th year.

from each island. One TK-27 color camera and one TK-21 black-and-white camera will be installed in each island for film pickup, and for stills and slides; an opaque projector and 35mm slide projector will also be included.

Each VTR will have a 6 x 17 input switcher for production makeup, independent of studio and master switchers, thereby making it possible to record from either studio or to dub from any source in combination with any desired special effects. A switcher in the pulse and subcarrier generator systems will delegate and route signals in any combination to any installation from any of three generators.

Also located in the telecine area, a master clock — continually locked-in with WWV by an off-air receiver — will maintain the accuracy of numerous slave clocks throughout control, studio, and office areas.

WCPO-TV will continue to use the present Symmes St. transmitter site. Programs will be fed by telephone cable from the new studio master control; an RCA 2-way microwave STL will back up the land line studio-to-transmitter feed and also beam remote pickup broadcasts from the transmitter to the studio. The mobile unit antennas and STL microwave dish are mounted on the 1749' (above sea level) TV tower.

Programming

When operation begins in the new building, all locally-originated programs and all locally-produced commercials will be in color. Planned studio facilities will provide a variety of settings for news, domestic scenes, etc., including a permanent up-to-date kitchen set in Studio B. When combined with planned special effects, the producer will be able to provide viewers with network caliber local programming and local advertisers with network quality commercials.

Props and characters for programs such as the "Uncle Al Show" — for 16 years the most popular kiddies' show in the tri-state area — may be designed and produced in a workshop and art department to be located in the studio wing. This will offer producers a greater choice and speedier prop design and construction at more economical costs. While management will not disclose any specific details at this point, it is known that there will be a significant increase in audience participation shows and stepped-up emphasis on local programming (the reason for the bleacher seats in Studio A).

WCPO-TV has always felt an obligation to program timely and informative local news; presently, more local newscasts are carried on WCPO-TV than on any other tri-state area station. In the new facilities, news department activities will center at a horseshoe-shaped news desk located adjacent to the wire room. The gathering and writing activities of the 17-man staff will be directed and coordinated from this center. The more compact arrangement is intended to promote closer collaboration of the inside staff, enabling better and more complete preparation and analysis of story details necessary for in-depth presentations. With the inauguration of the new operation, the number of local newscasts will also be increased, as well as the intensity and scope of news coverage.

Seven outside newsmen constantly cover the area. Three 2-way radio cars provide fast breaking details of local stories to both radio and TV. Both 16mm motion picture and still color photography are used to present visual action; color films will be processed in the station's film and screening department. A mobile van equipped with color cameras is used for remote pickup of important local activity and occasionally, when expedient, for news work.

The Future

With a staff of 172 employees and a new $3 million facility, WCPO-TV plans to offer the Cincinnati area a totally new TV concept of local color origination. As is the case with many of the "original" TV stations, Channel 9 Cincinnati has out-grown its present home, and as a result many undesirable restrictions have been imposed on many phases of production activity. After the move to the new building, there will be an increase in community affairs participation with emphasis on public service and local news. WCPO-TV's goal is to provide tri-state area viewers with the best attainable entertainment and information programming, geared to the "New World of Tomorrow." ●

Planning a New Broadcast Building

By Joseph D. Coons

Planning a new "home"? Here are some of the factors to consider.

IF THE TIME has come when you believe your station is ready to erect a new building, the time has also come for some extensive planning and investigation. Building design requires consideration of many elements and principles, and if any are ignored or overlooked, you may end up with painfully visible or financial reminders.

Design Considerations

A broadcast facility should be housed in a building endowed with unique characteristics. This axiom necessitates careful planning by you, your architect, and the contractor.

General requirements are:

1. Studio acoustics and construction
2. Audio and AC wiring
3. Traffic patterns
4. Heating and cooling systems
5. Inter-room visibility
6. Financing and design costs

Each of these areas must be pondered as you plan each phase of your new quarters, if you are sure you have checked each plan — electrical, heating, cooling, floor plan, foundation — with these items in mind, you will have a completely satisfactory building.

Studio Acoustics and Construction

Most books on studio acoustics were written in the 40's. Since then, however, there have been remarkable changes in materials, costs, and particularly in microphones. The result of these changes caused us to seriously review studio construction methods in a search for the best design within our economic means. By adopting cardioid dynamic microphones as a standard, we were able to minimize concern for the effect of sound reflective glass surfaces which tend to cause echoes. The decision on microphone type was made before any others were possible, and also required us to have a console with a sufficient number of mike inputs, since — if you want optimum pickup quality — only one person can use a cordioid microphone. Our console handles 6 microphones simultaneously; we use that many quite often due to the comparatively high percentage of talk programming in our format.

We also decided to carpet each studio. Although this adds to the overall cost of the building, the carpeting is placed directly on the concrete floor and so saves the cost of tile; maintenance costs are lower, too, since vacuuming is easier than sweeping or waxing. The carpet also deadens the room.

As in virtually any office building constructed these days, the WOHI building uses suspended ceilings in which 2′ x 4′ panels lay in a T-bar framework. Instead of ending at ceiling level, partition walls are carried past the ceiling to the floor of the room above, in order to eliminate sound transmission. This is not expensive; masons simply slap in concrete blocks and mortar. The partitions are neither seen nor bear any weight above the ceiling line. In window construction, however, we were forced to use traditional radio station construction. Two unparalleled panes of plate glass are used. Doors are the heavy type acoustic design with insulated center panels. Doorways, of course, are the weakest potential link in sound insulation, and the rather significant door investment was deemed worthwhile.

Floor plan shows step-saving accessibility between various departments.

Glass dominated facade attracts passerby. Call letters are neon backlighted.

Mr. Coons is pres. and general manager of WOHI-AM-FM E. Liverpool, O.

Chief Engineer George Kelly at the master control console. Monitor panel switches on left select network, mobile receiver, or program lines 1 and 2.

In the general office area, traffic girl JoAnne Brown (foreground) and Angie Frank plug away at their tasks. Studio area is to the right, office and sales to the left.

Concrete block partition construction has several advantages: cost was kept down, the rough surface offers natural acoustic properties, and the great mass of the walls virtually eliminates vibration. If wood and plaster or drywall construction were used, double walls would have been necessary in order to eliminate the mechanical transmission of sound from room to room. Block cells are filled with Zonolite, a standard insulation. The "stack bond" style of block-laying was used so that block cells were exactly aligned in complete vertical columns for the entire wall height. If the more conventional staggered row or lap method had been used, we could have ended up with inaccessible block cells, thereby prohibiting complete insulation. Stackbond construction also makes a better appearance when the walls are painted. Prior to painting, a filler was not applied to the studio walls; it was omitted to preserve as much of the block's rough surface as possible. Last but not least, the ground floor location provides a vibration-free base for turntables, news machines, etc., this is useful not only to keep noise transmission down, but it also avoids mounting problems.

Audio and AC Wiring

A radio station is, in essence, a lot of equipment interconnected by wires. Most engineers do neat initial installation work, regardless of the conditions under which they must work. It is the subsequent additions that usually cause the problems. Any installation, of course, requires the usual standards of *good* engineering — a quality common ground system, effective shielding from interfering fields, reliable and accessible terminal systems, etc.

In our building, audio wiring was a primary design concern. We reviewed various troughs, raceways, under-floor ducting, etc. But we chose a rather different piece of hardware. On studio walls, we mounted a wiring trough of the type used by electrical contractors to tie together major switch installations and power panels. Available in a variety of sizes, this duct or channel comes in short sections about 36" long, plus elbows, ends, reducers, etc. We mounted the wiring trough on the second course of block above the common studio and shop floor so that connec- room.

In addition, the 4" x 4" size we chose has enough room for cabling as well as pyramid terminals mounted inside the duct itself. We installed a pyramid at the duct entrance in each room and a duplicate of the terminal in the shop. All high- and medium-level cabling is cross-connected at the shop. In other words, no cables (except low-level audio) run directly from one room to the next; they go from one room, to the shop, then to the next room. This makes future audio rewiring simply a matter of changing the cross-connects.

We purchased a reel of 15-pair shielded wire; each pair is enclosed in one of the new foil shields with a ground lead. We have run enough of the cable to each room to allow not only for our planned facilities, but also a number of spares as well. High-level signals, for monitors and talk-back, were run in one cable with a tap brought up at each room on a separate area of the pyramid terminal; i.e., the terminals at one end of the block are medium-level terminals, the terminals at the other end are high-level cable taps.

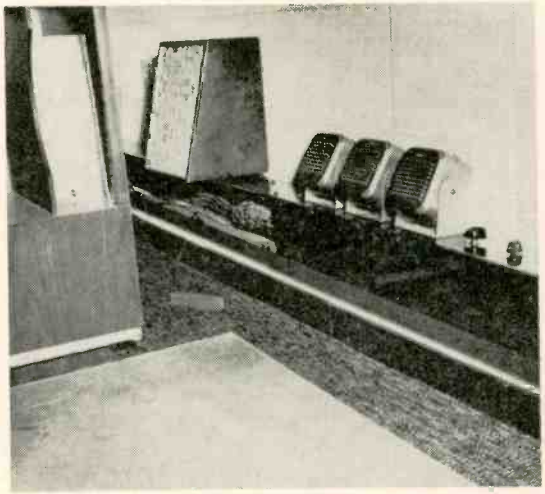
Microphone and other low-level cabling is run separately and directly from termination to termination — not via the shop — in order to keep cable routes short. The duct is convenient here, too; microphone connectors were mounted right in the duct.

Inter-equipment audio wiring is only a part of the problem, however. Also to be kept in mind are requirements for telephone and electric service. We were in touch with our telephone company from the time our architect turned out the first prints. Such necessary items as conduit, telephone locations, cable terminal locations for remote lines, etc., were all worked out in advance. The telephone company, of course, required wall space in our shop; by working together, we were able to allocate sufficient space for a more accessible, neater installation. We paid particular attention to working out a means for getting from their cable to ours.

The result of all this ducting and terminal provision is neat appearance as well as electrical quality. Out of the duct at each piece of equipment comes a cable or conduit, within which are the necessary pairs and spares to do the job.

Program Director Rod Baum at the production room console. Cartridge and mono and stereo reel-to-reel recording facilities are available.

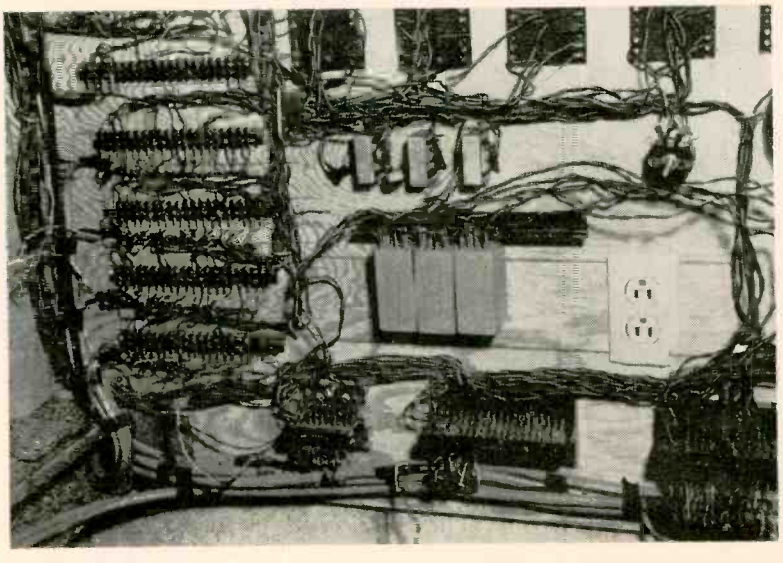
Newsroom has beeper phone and cartridge tape recording facilities.



View of wiring duct near master control console desk. Utility speakers are for mobile, EBS, and talkback; 8" baffle mounted speaker is house monitor (console monitor is theatre-type speaker).

Sales Manager William Kozel closes another one. Monitor panels in all offices (right, above desk) select 5 amplifier outputs: AM, FM, net, mobile receiver, and background music.

View of the shop wiring panel as it neared completion. Each Jones terminal strip feeds a room monitor switch through a 6-pair #18 twisted cable. Pyramid terminal blocks provide control room interconnection through 15-pair individually shielded cables. Cross-connecting wire is #18 solid twisted pair.



Five outside lines were installed, 3 for normal use. The 4th line is the "Beeline" and the 5th is an unlisted "hotline" with receivers in the newsroom and master control for use by staff members when on outsde duty. Studio and office facilities include 17 Touch-Tone sets, two in the control room and newsroom. "Hands-free" phones (with mic and speaker) provide added convenience in the newsroom and manager's office. The other newsroom set is a card-dial phone which automatically dials often-called numbers from punched cards. Studio phones have no bells; they produce a soft metallic tone. In addition, 22 program lines run into the central telephone hookup are used for transmitter program feed and permanently-connected remote locations.

AC power is necessary, of course, and our electrical requirements included several demands. Each room has a separate breaker for lighting and a separate breaker for receptacles; each control room is provided with a 15-amp breaker circuit branch for console and audio facilities; on-air lights are mounted in code-approved boxes.

Traffic Patterns

Naturally, one of the reasons you want a new building is to cut down on wasted steps, and to make your operation easier to supervise and more productive. But remember, too, that some staff members require special working conditions. Copywriters, for example, need quiet surroundings, even though they sometimes may confer with clients or programmers. Salesmen often are engaged in lengthy telephone conversations or in meetings with customers. A manager requires privacy for personnel meetings, financial discussions, etc., yet he must also be aware of his staff's activity.

Heating and Cooling

This is one area that deserves extraordinary attention. You not only have the problems of heat-generating electronic installations, but you also have studios in which there is no ventilation of any kind except that provided by air conditioning. Air conditioning can be noisy, and it can be expensive.

In order to have fully air-con-

Publicity and Promotion

Open House

- Tour of station, bus tour of area, reception and cocktails, dinner for 20 out-of-town clients and reps on Thursday Sept. 22. Cost $9 per.
- Reception and cocktails at station for 220 local businessmen and community leaders, Friday Sept. 23. Cost $2 per.
- Public open house at station with free soft drinks and hot dogs attended by 2300 guests. Cost $.20 per. AM-FM radio given away.

Newspaper

- Full page ad inviting public to open house.
- Half page ad promoting FM.

"Radio Plus" Program Promotion

- Releases to local papers tied in new program features with the inauguration of the new facilities, Mon. Sept. 26.
- Noon news extended to full hour. Additional features include: Entertainment News (Jimmy Fidler), Remember When (Stu Wilson), Daily WOHI Salute, Kaleidoscope, Educational News Special (Ohio Educational Ass'n).
- Ellery Queen's Minute Mysteries at 6:15 AM and 4:15 PM.
- Believe It or Not at 8:55 AM and 5:25 PM.
- Kaleidoscope in noon news and at 6:45 PM.
- Morning show renamed Morning Open House, hosted by Joe Coons, invites on-air visitors to express views on any subject and air pet peeves. Rules specify that no individual or firm name can be used except in reference to an activity of public record.

Contemporary art displays in station will afford local artists and students an opportunity to show their work. Local art instructress will act as curator of exhibits including painting, sculpture, photography, and drawings.

WOHI
WOHI-FM
NOW:
RADIO PLUS

TO SERVE our coverage area, including Wellsville, is our goal. If we are to secure advertising revenues, we must have many of you listening, so our goal is not just idealism. But we also were knowing that we have helped Wellsville from time to time with the communications services we offer.

TO THIS END, we are now stepping up our efforts in many areas, and with our beautiful new building, marvelous equipment, and the finest staff in our history, we think we are serving you, and Wellsville, just a little bit better.

WE INVITE YOU to look us over this Saturday. We're having an open house from 11 AM to 6 PM, and you are invited. We're giving away refreshments, Pepsis and Hot Dogs, and a beautiful prize, a Zenith, AM-FM Radio. And, of course, we'll all be here, Stu, Joe, Barbara, Augie, Tom, Paul, George, Rod, Kathy, and the behind-the-scenes people too. Our address is 236 West Sixth Street, up the superhighway in East Liverpool. Look at this Friday's Review for lots more information.

WE'RE LOOKING FORWARD TO MEETING YOU!

WOHI AND WOHI-FM

SERVING WELLSVILLE FOR 17 YEARS

And don't forget to visit our neighbors, Equitable Life, holding open house at the same time!

Full page ad inviting listeners to Open House appeared Sept. 22, in nearby "Wellsville Press."

Half page ad promoting WOHI-FM appeared Sept. 26 in the Lisbon "Evening Journal."

ditioned offices, yet maintain maximum operational economy, we have two separate "zones" of heating and cooling. The air conditioner for the studios, a gas-energized 3-ton unit, is fully separate from an identical machine used for the offices. It is our expectation that the studios will need little winter heat but much summer cooling, while the offices will require more heat but have a shorter cooling system. We base this thinking on a highly successful installation at our old premises, where the units (now in place at our new building) were installed in 1964. The splitting of the system saved us about 30% on our annual cooling costs.

Inter-Room Visibility

Don't forget the value of operational studio-to-studio visibility. In our case, rooms are separated by glass. We used double plate glass construction, with one pane canted slightly to cut reflections. Bear in mind, too, the acoustic problems that your glass partitions will cause. We sacrificed public visibility to get at least some privacy for our announcers and some acoustic quality for the studios.

Financing and Design

We erected a new building because we needed it. But as a station owner, I immediately realized the advantages — from a station point-of-view — of having the building constructed for us under a lease arrangement. There would be little drain on station capital other than new equipment costs. After seeking local capital to finance the project, I was able, personally, to provide the building, and in turn lease it to the station. Shortly after the plan was announced in the press, an official of an insurance company with offices in our city approached me, and with another lease in the bag, a second floor was added to the plans. The building is financed by a mortgage with a local Savings and Loan Company. About 30% was required as cash in hand, with about 70% of the cost covered by the martgage.

Since I am a radio man, not a contractor, I decided at the start that I would employ a good architect and a good general contractor, and this has paid off.

Continued on page 58

For CATV . . . Superior coaxial cables are the best

Superior never compromises on quality

Superior Coaxial Cable has earned respect for built-in reliability and stable performance — proved in CATV applications which already total millions of feet.

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There is no need to settle for less than the ability to make all frequencies available to your customers. There is no reason to risk any attenuation discontinuity — or any of the skipping and jumping frequencies often found in ordinary cable. For long-term transmission stability, full spectrum capability and outside plant reliability — you can rely on every foot of Superior Cable.

75 ohm coaxials with "Coppergard" corrugated copper shield

Cell-O-Air® expanded polyethylene dielectric is for aerial installations; "Solid-D" solid natural polyethylene dielectric is for direct burial installations. Guaranteed five years.

75 ohm coaxials with "Alumagard" solid aluminum shield

Newest addition to the Superior line — for aerial installation — Cell-O-Air® expanded polyethylene dielectric; extra high strength solid aluminum sheath. Guaranteed five years.

Balloon coaxial cable, 75 ohm air dielectric, also available.

For detailed information and prices, write

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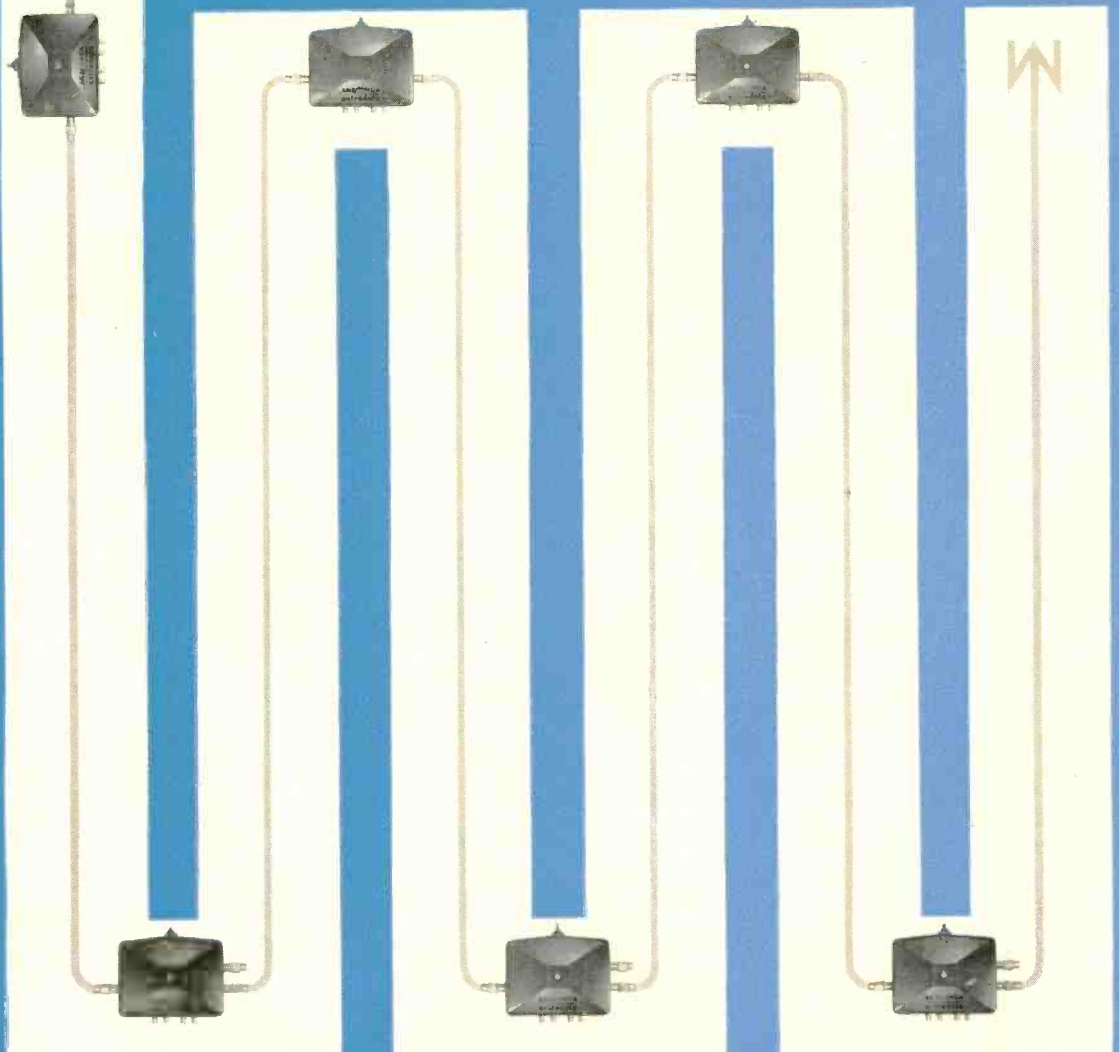
Distribution
Amplifiers



XDR™ Bridgeability sets new performance standard for CATV distribution

Bridgeability—the number of subscribers that can be served from a single trunk bridging location.

Anaconda Astrodata introduces the concept of Bridgeability with the XDR (extended dynamic range) Amplifier line. The XDR Trunk Bridger, together with its subsystem companions, XDR Distribution Amplifiers, can serve up to 1104 subscribers from a single trunk location.

This new dimension of CATV performance is achieved only with the XDR Bridger Amplifier operating at a high output level feeding longer cascades of XDR Distribution Amplifiers—up to six Distribution Amplifiers may be cascaded from each of the four Bridger Amplifier outputs. A single Bridger Amplifier output will serve 36 subscribers and six Distribution Amplifiers, each with a capability of 40 subscribers. Hence, 276 subscribers for each of four outputs, or 1104 total for each XDR Bridger Amplifier.

Even when maximum distribution cascading is not required, the new dimension of Bridgeability provides a high-level distribution system with improved picture quality, and makes it technically feasible to install high quality systems in large communities, or financially feasible to install profitable systems in smaller communities.

For additional information on the Bridgeability concept offered by the advanced XDR equipment, contact your Anaconda Astrodata representative.

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Circle 24 on Reader Service Card

Planning A New CATV System

By Robert B. Cooper, Jr.

The new CATV franchise holder has many things to consider. Here are the various construction routes open to him.

So you have a CATV franchise! Now you must fulfill its terms by building and operating the system. If you think the franchise acquisition was rough, you ain't seen nothin' yet! As any builder-operator can tell you, CATV system construction presents a unique challenge that will test all the patience, skill, and knowledge you can muster.

Generally there are three ways to put a new CATV system into operation: (1) build it yourself, (2) sign a turn-key contract, or (3) sign a long-term lease-back agreement with the telephone company. Let's consider some of the advantages and disadvantages of each approach.

Building Your Own

Build-it-yourself system construction requires that either you have sufficient know-how and experience or that you hire someone who does. Either way, if the responsibility for getting it built is yours alone, here are the general areas in which you will be involved:

1. Negotiations with the telephone company.
2. Obtaining local permits.
3. Obtaining federal permits.
4. Planning system layout.
5. Selecting and buying equipment.
6. Hiring construction people.
7. Buying or leasing heavy-duty construction equipment.

Each of these decision-making areas offers special problems, so let's look at them one by one.

Telephone Company

Assuming you are going to use telephone company poles, you will need to arrange a joint-pole agreement. If you are very, very fortunate, only 90 days will elapse from the day you make formal application until you have your agreement in hand and can begin to use the poles. This is assuming, of course, that the poles are essentially ready to use "as is," requiring little or no existing plant rearrangement.

Along with the joint-pole agreement, you must line up insurance and bonding satisfactory to the telephone company, hold several meetings with the telephone company plant engineer to determine what pole rearrangements will be required, and constantly sit on the telephone company doorstep to insure that your application does not get bogged down with "in-and-out basket fatigue." Plan on spending at least one full day per week on this phase of the project for every week the application is being processed. On the other hand, if you don't mind a 6- to 9-month wait, just leave the application alone and eventually it will thread its way through telephone company red tape.

Local Permits

Your CATV franchise is a permit to build and operate a CATV

Mr. Cooper is pres. of Valley Vision, Inc., Modesto, Cal., and author of the book, "CATV Management and Operation."

Chevy Van used by Clearview of Florida is outfitted with installer interiors from Holan.

Earth-boring equipment and air hammer, powered by mobile generator, are often required when setting your own poles.

system. It is *not* a construction permit for your head-end building and tower; it is *not* (probably) a permit to do business in the city; it is *not* a zoning variance to allow you to install a tower or towers and head-end building in an area zoned R1; it is *not* a permit to dynamite or blast stubborn rock for a tower foundation; it is *not* an agreement with the local electric company to supply power to your head-end site; it is *not* a permit to build a head end *in the county* to serve the city; and it is *not* a permit to run cables from your head end to the city *through the county*. In other words, plan on and expect to be "permitted to death." The more of this you get out of the way before you begin construction, the fewer delays you'll have when work begins. In many cases, the permits are a matter of formality.

If your projected head-end site is in an area where zoning prohibits such an installation, you will have to appear before the planning commission and seek their approval. Assuming you run into no opposition from nearby land owners, this process will take the statutory notice and hearing period, usually 30 days.

If you do run into opposition, you can appeal your case to the city council which granted you the initial franchise. If the city council also turns you down (in truth, you are asking for a spot zoning change, which is difficult at best), be prepared to start looking for another head-end site. At this point, probably at least 60 days has elapsed, and if you start from the beginning one more time, you can count on the mandatory 30 days, anyhow—a total of 90 days.

If your installation includes a tower of any size (over 170 feet if 3 miles or more from an airport, under 170 if closer to a commercial airfield), you must also make application for Federal Aviation Agency approval. This is a 30-day process at best. The FAA may impose a number of tower lighting and painting requirements. Or, they may tell you that it's okay to put up a tower, but that it cannot exceed a certain height, which may be only half of what you feel is required. This may force you to give up the projected site even before you begin because there is no appeal of FAA rulings.

If your site is somewhat removed from regular service routes, the power company may balk at providing service. Operating as they do under state public utility commission rules, there are certain things you can *make* them do. But you may find the cost is higher than if you did it yourself. Charges of $1.65 per foot for extended service in remote areas are not unusual; and, at a cost of $1,650 per 1,000 feet, you should be able to do it yourself

Looking Ahead

What about local origination? NCTA says "go ahead—as fast as possible—with local public service programming." NAB cautions you not to, and the FCC has asked for authority to restrict or completely cut off local programming.

What constitutes local programming? Is a time-weather-news service local programming? What about those systems which televise local city council meetings, and other public affairs programs?

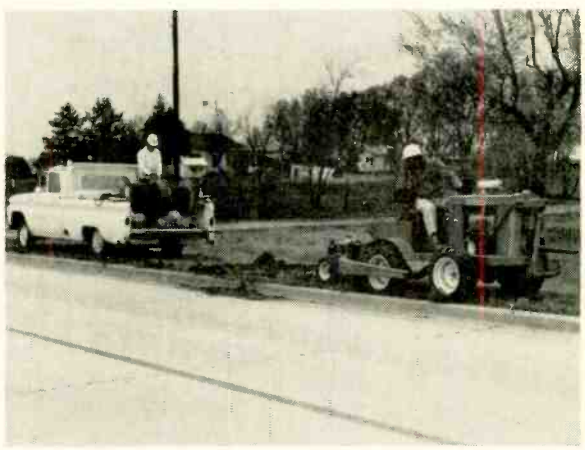
If your town can be reasonably expected to deliver 1,000 or more subscribers at the end of three years, with a potential of another 1,000 or more, you had better give serious consideration to local program origination.

If you originate downtown, programming must be relayed to the head end. There are three feasible methods of accomplishing this. Simply tape everything, and haul the tape to the head end. As useful as a video tape machine might be, this is no way to tie it up.

Another method is to use microwave. A single-channel link might make real sense if the head end is some miles distant.

A third way is a return-loop of coax cable, sort of a reverse trunk. If this done on a subchannel, you may get by without any—or just a few—repeater amplifiers. If you think you might have need for it, plan ahead and lash-in a spare cable between the head end and the office when the system is first installed. Then it will be there when you need it. In most cases, your initial cost will be only the additional cable.

Telsta Corp. manufactures this combination electric lift and Tel-Lasher cable and strand stringing outfit.


For construction of underground plants, equipment such as the "Ditch Witch" trencher is needed.

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McCabe Powers Body Co.
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St. Louis, Mo. 63134

Charles Machine Works
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Perry, Okla. 73077

Stahl Metal Products, Inc.
4570 W. 160th St.
Cleveland, O. 44135

Pitman Mfg. Co.
Grandview, Mo.

Wyoming Valley Eqmt. Div.
714 Wyoming Ave.
Kingston, Pa.

Tele-E-Lect, Inc.
9135 Grand Ave. South
Minneapolis, Minn. 55420

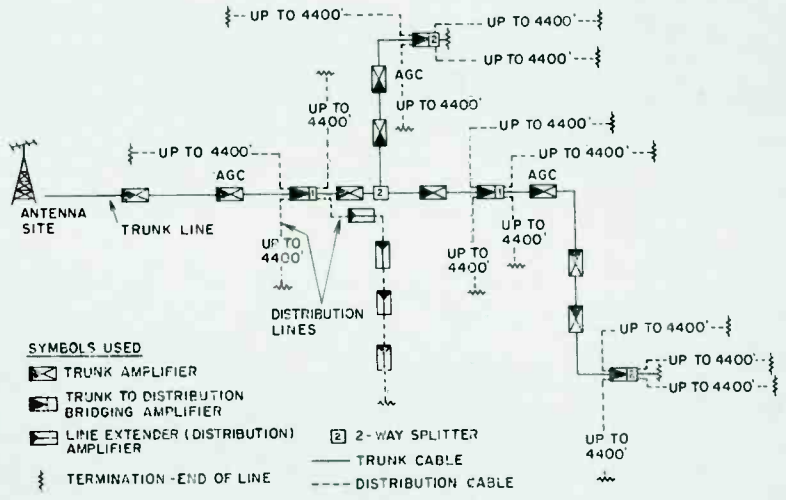
Telsta Corp.
1700 Industrial Rd.
San Carlos, Cal.

Utility Body Co.
901 Gilman St.
Berkeley, Cal.

Davis Mfg. Co.
1514 S. McLean Blvd.
Wichita, Kan. 67213

The Basic CATV Plant

While there is probably no such thing as a "typical" CATV plant layout, shown here for illustrative purposes is the trunk line (heavy solid line) leading from the antenna site (at left) to the right through a chain of trunk line amplifiers. At points A, B, C and D bridging amplifiers (trunk to distribution service) are installed. The dashed lines represent distribution (customer service) lines, four from each bridging amplifier. For sake of clarity, line extender (distribution) amplifiers are shown on only one output leg of bridging amplifier A.



While distribution lines "up to 4400" are shown here, the length of individual distribution (customer service) lines will depend on type of amplifiers employed, type of cable employed, number of subscribers along the line(s), or density, and the number of splits in the distribution legs. Conversely, distances between trunk line amplifiers will depend upon type of cable and amplifiers employed. No AC power circuitry is shown, for simplicity. Assume the amplifiers are cable-powered.

Local Suppliers

Chances are you will be purchasing many small items locally. This might include hand tools, electrical wiring supplies, cement, building materials, specialty power and other machinery rentals —the list is endless. Before you begin construction, make a list of every step and the tools and supplies required. Set up credit arrangements with the necessary suppliers, unless you want to follow your construction people around all day paying cash for 10¢ screw-eye hooks, $5 a-day AC generator rentals, etc. This list will help insure that everything you need *is* locally available. If it is not, better find out what is needed and where you have to go to get it, or construction can come to a grinding halt for hours, or a day or more, at a crucial stage.

The Construction Crew

There is a considerable shortage of trained, skilled crews in this industry. This may be a part of the reason that so many new systems are being turn-key constructed. First and most obvious is that somebody has to know *what* is to be done and *how* it is to be done. If you are not that person, with actual experience, you must find someone who qualifies. Make him the foreman, general manager, or something similar, and lean on him for advice right down the line. He probably will *not* be knowledgeable in all areas; he doesn't need to be. If he knows construction techniques thoroughly, let that be enough.

If you personally plan on doing 8 hours of *physical* work a day (supervisory and otherwise) and have decided that one crew and construction-type truck is adequate, a working foreman and two line construction men should be enough. If, on the other hand, you do not plan on getting into the fray yourself, you will also need a good journeyman technician to help out with the equipment installation, building the head end, towers, and so on. This brings us down to one knowledgeable foreman, one good technician, plus the two line construction helpers, for a company that plans to wire and build 3 miles of plant per week. A foreman will probably be found working as an *assistant* foreman with some other cable company; a technician will probably be working for one of the

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for 1/4th the cost by setting your own poles and stringing your own AC service lines.

If you set your own poles, care should be taken to leave sufficient room to bring your trunk cable out of the head end on the same poles. If the power utility sets the poles, have them reach a joint-use agreement with the telephone utility so you can use the poles under *your* joint-pole agreement to bring your trunk out. This may shave the cost considerably, particularly if the local telephone company engineer feels generous and agrees to pick up his 50-60% of the cost of the poles.

If you are going to cross county property with your trunk, you will need to approach county officials for permission to do so. In some instances this is a simple process. The county building permit office issues the permit, and the county road department issues permission to string cable along county rights-of-way. In other counties, especially in a county with a large unincorporated suburban population, the process may get more involved, approximating the same bureaucratic red tape you can expect to find in a city. The best advice is to tackle the problems head-on as early as possible.

Costs Per Mile

A mile of trunk? A mile of distribution? Or, a mile of trunk and distribution? The variables are endless, so for purposes of discussion let's consider a mile of distribution cable. We have the following costs to consider:

☐ Pole re-arrangements can run the gamut, from no cost to several hundred dollars per pole. $15 per pole would be a high-average. At 40 poles per mile, you would have $600 invested.

☐ Pole-line hardware, including messenger, lashing wire, clamps, and an occasional guy, will run $350 per mile.

☐ Coaxial cable and amplifiers. If you are using .412 for distribution, you will have $100 per 1,000 feet invested—$528 per mile.

☐ In a straight-street mile, with 500-foot blocks, there are 10 corners in a mile. That's 10 splitters for 2-way feeds at each corner, an average connector investment of $200. A 40 db bridging (distribution) amplifier driving 36 db line extension amplifiers will get you through a mile of .412 distribution cable with medium loading. You will use only one of the four bridging amplifier parts. So you have ¼th the cost of that unit; call it $100. In 5 line extenders, at $60 each, you have $300 invested. These 5 line extenders plus the single port of the bridging amplifier will require around 1.5 amps out of a $200 12-amp supply. So total cost for RF and AC for that mile is $450.

☐ Labor: If your crew of foreman and two helpers can install a mile of plant in 12 working hours, you have a direct labor expense of around $140.

☐ Operating overhead will vary considerably, as a direct inverted relationship to the size of the system. $250 per mile is not unusual.

If you have been following this through with a columnar pad, you know by now that the total investment in this mythical mile of distribution plant is $2,518. The figure is way low, you say? Maybe so, but many operators are doing it for this, although individual category totals may vary.

System Layout

Very early in the game—probably before the franchise is let—you have secured the assistance of an individual knowledgeable in CATV system design and have prepared a system-layout map of the town or city. From this layout you have a pretty accurate idea of how many miles of trunk and distribution cable will be required, how many amplifiers will be needed, the number and location of AC power supplies, and the channels you will supply. To obtain this information you need an accurate and detailed map of the city (to a known scale), a study of the telephone plant pole routes (by car and on foot), and an accurate long-term head-end site signal survey.

Equipment Suppliers

Just let a few equipment suppliers know you are going to purchase equipment and sales engineers will come flocking to your door. Each will point out the virtues of his equipment, quote delivery dates and prices, and leave you to sift through a large ream of promotional literature. If you have a system engineering layout, let each supplier with whom you may deal prepare an equipment bid. This will include a wiring diagram, a breakdown of the equipment required, and a total price.

If you are dealing with companies specializing in only distribution equipment, you will need to begin soliciting information and bids on antennas, tower structures, and cable and pole line hardware from separate firms. Antennas are selected on rated performance; tower(s) are purchased first by specifications, second by price. On a competitive bid basis, some firms will quote delivery for as much as 40% less than others. Assuming the bid includes installation, a local firm may save you money on delivery costs. Others may already have an installation crew in the area with slack time in their schedule, thereby enabling them to offer you a bargain. There are a multitude of items affecting tower prices, and if you request bids from reputable firms, based on standard EIA tower specifications, you should be safe with the lowest price.

Coaxial cable prices, because of the highly unstable copper market, keep going up. As soon as you accurately determine the types and quantity required, go ahead and issue a purchase order guaranteeing you delivery at the current price, even if you don't expect to take delivery for 6 months or more. Cable specifications vary from one company to another, but there are a number of cable companies with considerable CATV experience. As long as you stick to one of these, you should have no problems.

So far, pole-line hardware has not been in short supply. Suppliers such as Jack Pruzan have many years of CATV experience, and even though you may not initially understand all of the fine print in telephone company specifications, you can ask for and expect help from such knowledgeable suppliers. Most pole-line hardware companies can supply 95% of what you will need from stock on same-day shipments. So there's no particular reason to get started real early here, other than to get acquainted with the supplier.

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Now RCA brings you the "BIALKALI PHOTOCATHODE" in the new RCA-8673 and -8674 Image Orthicons. This major engineering innovation has greatly improved compatibility with its non-stick target, maintaining resolution and sensitivity over an extended tube lifetime and improving performance of *existing* color or black-and-white cameras. A simple change in a resistor chain provides proper voltages for a trio of these new Bialkali Photocathode Tubes. Wide-range, the 8673 and 8674 fit spectral requirements of all three channels... eliminating the need for another tube type for the blue channel.

Another big difference: the re-designed image section provides reduced distortion and freedom from "ghosts." These new tubes are available singly or as matched sets—a trio of 8673/S or 8674/S types for color service... types 8673 and 8674 for black and white. Main construction difference is in the target-to-mesh spacing. The closer-spaced 8673 enhances S/N ratio for quality performance under sufficient illumination. The 8674 has greater sensitivity under limited illumination. For complete information about the new RCA Bialkali Photocathode Image Orthicons, ask your RCA Broadcast Tube Distributor.

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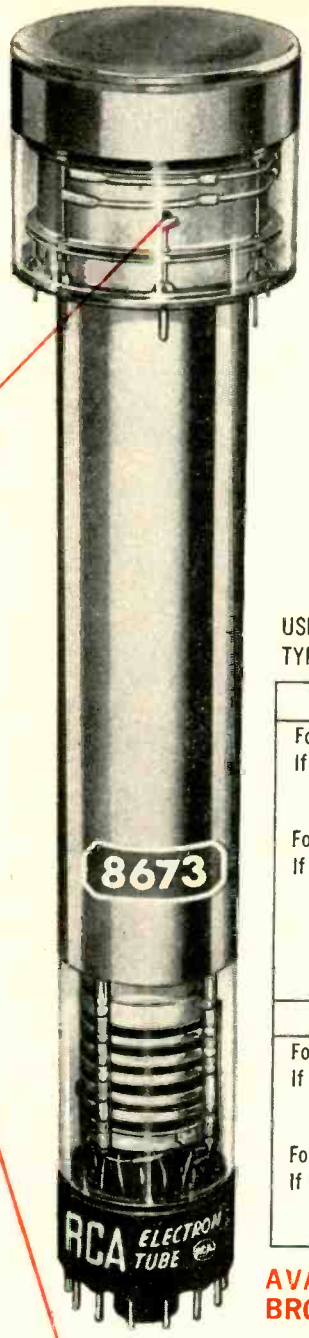

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If you're now using...	You can replace with:
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UNDER LIMITED LIGHTING LEVELS	
For color pick-up,	
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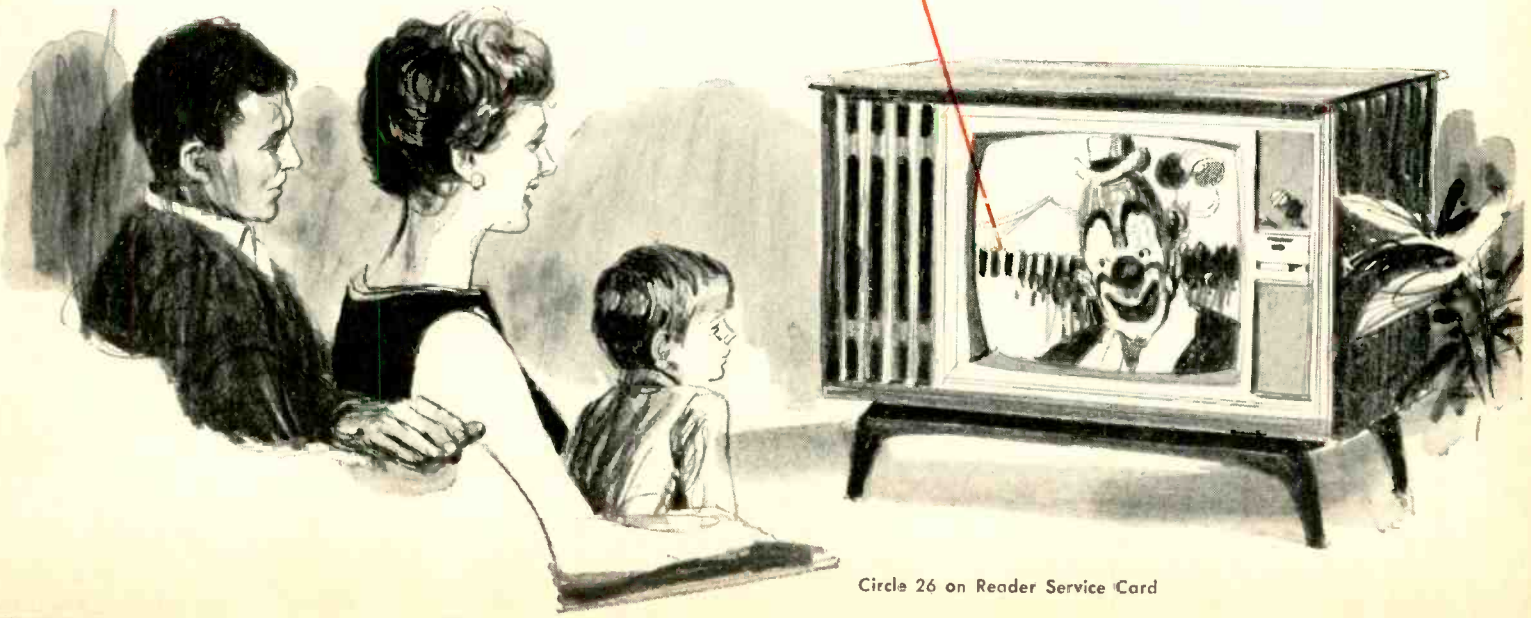

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are all essential items for any construction job.

Turn-Key Construction

A turn-key job is simply this: somebody else builds the entire system for you, but you must obtain all necessary city, county, and federal permits. You will have to make at least a preliminary survey for the head end and a street layout for cable routings. And you will have to obtain the pole agreement. But once you have all of the necessary approvals, you can turn the entire bundle over to the turn-key builder. He may be an equipment supplier, or an independent contractor who specializes only in construction.

You may still need a number of people working for you and have the necessary truck equipment to make the initial drops, and continue with drops and equipment maintenance after the system's initial opening.

Telephone Company Lease Back

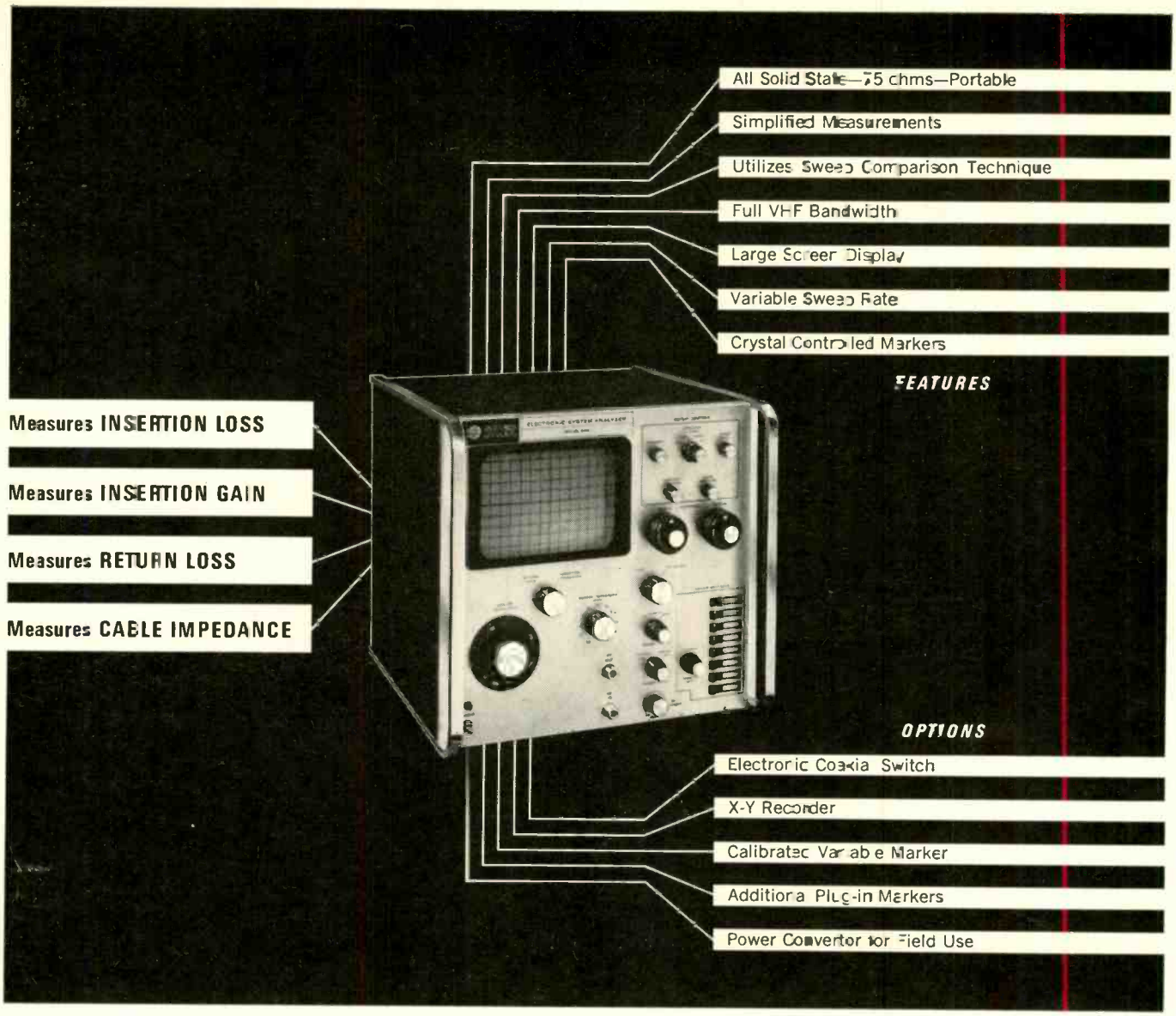
Although this method of system construction is relatively new, it has caught on in many areas of the country. Basically, you sign an agreement with the telephone company. You agree to build the head end; they agree to build the trunk and customer distribution plant and lease it back to you.

The terms of such an agreement vary from one telco to another, but basically they are all the same. You agree to a 10-year lease, at so much per quarter-mile of plant per month, *plus* so much per active drop per month.

Necessary permits are, for the most part, still yours to acquire, except the joint-pole agreement. The telephone crew will maintain the RF amplifiers throughout the system, you will run the drops (in most cases). Of course you do not own the plant—you simply lease it.

Conclusion

The cable operator who carefully plans his expenditures, his construction program, and his after-construction operating techniques will come much closer to having his plant paid for in 36 to 48 months after initial operation than his less careful contemparary. Decisions made early in the system's life will stay with it for many, many years. Make sure they are the right ones! ●



First Complete CATV System Analyzer

Electronic System Analyzer Model 990*

Anaconda Astrodata's complete CATV System Analyzer, the first of its kind, permits sweep measurement of system parameters with a high degree of accuracy. By combining all required sweep set-up instruments into a solid state 75 ohm portable testing facility, the System Analyzer eliminates errors caused by the use of external jumper cables and impedance matching devices. Measurements are made simultaneously by using sweep comparison techniques.

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larger multiple system operators, buried somewhere down the ladder of seniority.

The Construction Equipment

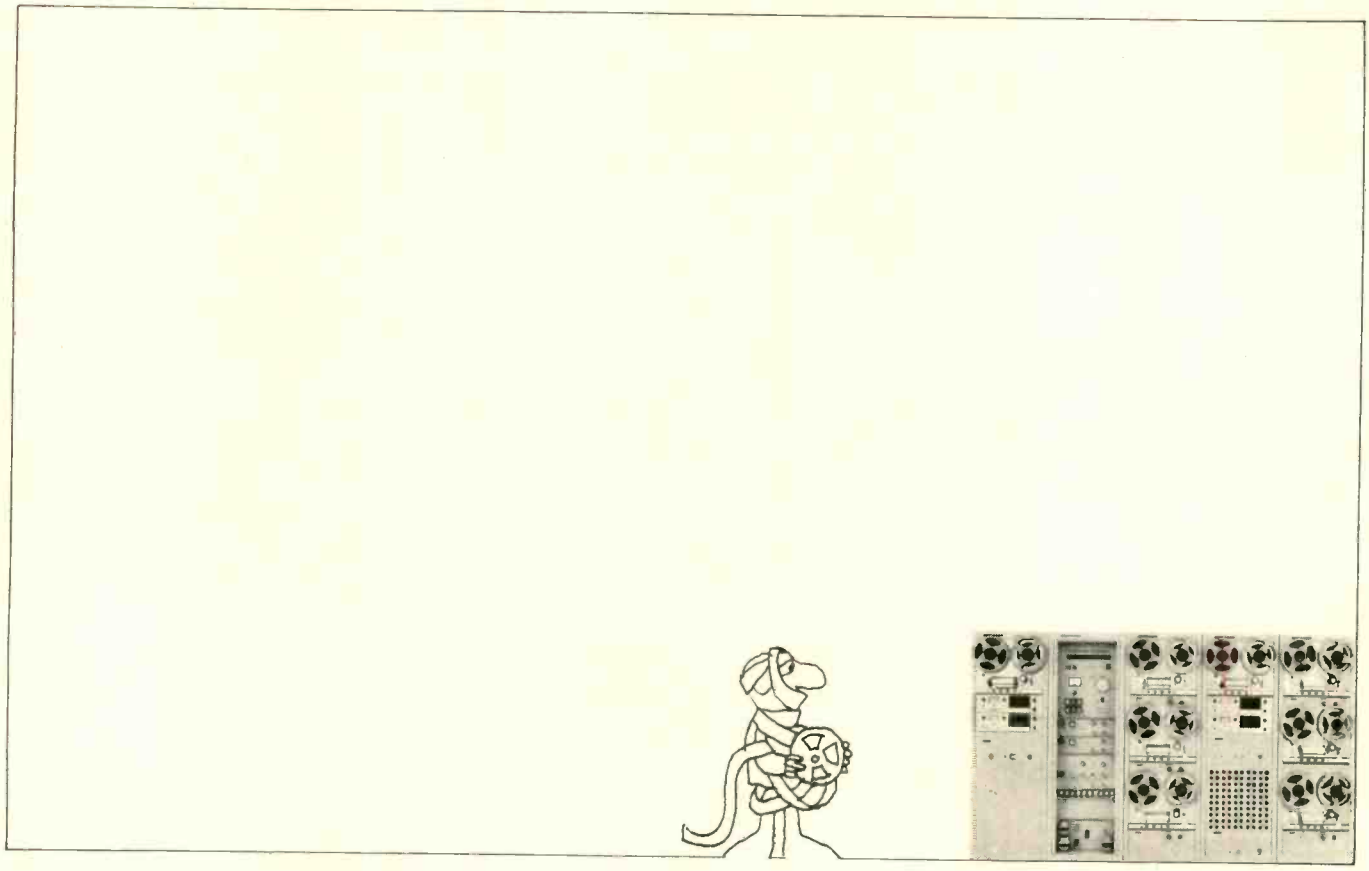
Much will depend here on how large the system is, and how fast you plan to build it. Turn-key system contractors work on the basis of so much per mile of plant. Frequently kicked around in the industry is a magical "$4,000 per mile" figure. Frequently, hidden below the bold print, are notes that this figure is exclusive of tower and head-end equipment costs. Yet, *it is possible* to build a 12-channel system, for $4,000 per mile, *including head-end costs.* Obviously, if the head end costs you $10,000 and the plant is 10 miles long, the system is going to cost $1,000 per mile for head-end equipment, leaving you $3,000 per mile for the actual plant. If the same plant is 20 miles long, the cost-per-mile for the head end is halved to $500 per mile, leaving $3,500 per mile for plant construction. So actually, general figures of $4,000 per mile are not too meaningful unless you know the criteria under which they have been established.

The largest, most expensive single item to be considered is the construction truck. Should you have one? More than one? The most versatile truck is a hydraulic-operated boom truck with bucket. Mounted on a 1½-ton body with 8-cylinder engine, all-around tool cabinets and an AC generator to operate drills and power equipment on the road, the unit will weigh nearly 5 tons and cost around $10,000. For a 10-mile plant, cost of such a truck is $1,000 per mile. A suitable one-ton truck with a hand-operated extension ladder mounted on a swivel, including a small bucket-type working platform, will cost under $5,000.

The best and most logical approach to the decision is simply this: How much will the truck cost per mile? Can you dispose of it after construction and recoup some of the expense? Or, is the system going to be large enough that you can afford to write it off on a 5-year depreciation schedule and utilize the vehicle for routine maintenance, future line extensions, hookups, etc.?

Other construction equipment is much less costly, and the decisions are easier to make. The lashing machine, cable suspension hooks, D blocks, and come-alongs

"goof proof"



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BROADCAST EQUIPMENT

Mic Mixer

Shure Bros., Evanston, Ill. has announced a solid-state microphone mixer with 4 dynamic or ribbon mic inputs with separate level controls; each input is equipped with a high or low impedance switch. One high level input for tape recorder or tuner is provided. The M68 has two outputs—a high or low impedance for PA mic input, and a high level (.5 to 2v) high impedance for tape recorder or amplifier. Optional equipment includes a battery power supply, a multiple mixer stacking kit and rack panel kit. Price is $125.

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Stud Fader

A flat front-stud fader designed for console mounting has been introduced by Painton, Inc., Pleasantville, N.Y. The FM-1 occupies ¾" panel width and extends 2⅝" below panel, 600-ohm unbalanced bridge-T networks with 30-step attenuation (plus off) are available. Cue lighting and micro switches are built-in. Connections are made by rear plug and socket arrangement. List price is $75.

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TV Monitor

Pye TVT Ltd., Cambridge, England, is offering a 17" solid-state studio monitor available with 405, 525 or 625 line scan rate; the scan system is selectable by a local or remote switch on the multi-standard version. Two 75-ohm bridged or terminated video inputs, selectable by a local or remote switch, and a separate 75-ohm bridged or terminated sync input are provided. Video inputs will accept a 0-25v (1-4v peak-to-peak) composite signal or a 0-2v (1v peak-to-peak) video and blanking signals. All wiring is on hingeout printed-circuit boards. Brightness and contrast controls may be remotely operated. The Type 2845 monitor operates on 100-125v or 200-250v AC at 47-70 cps.

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Portable VTR

Ampex Corp., Redwood City, Cal. is marketing the VR-6000 videotape recorder and companion

closed-circuit vidicon camera. Using 1" tape, the VTR operates at 9.6 ips and may be modified later for color. Video response is 30 cps to 2.5 mc; horizontal resolution is 250 lines; audio response is ±4 db from 90 cps to 9 kc. Camera features optical viewfinder, mic plug-in jack for audio-video production, and VTR remote control switch. Luggage model VR-6000 is priced at $1,450; camera is $549. 147 Series tape cost is $59.95 for 60-min. reel.

Circle 59 on Reader Service Card

Solderless Terminal Block

A terminating block capable of accommodating 1,000 connections has been developed by Thomas & Betts Co., Elizabeth, N.J. The Connecto-Blok 500 is 15⅛" between mounting holes, stands less than 4½" high, and has male tabs for snap-on solderless terminals spaced 5/16" apart. Tabs are set in 14½" glass laminate epoxy base. 13/32" holes act as fanning strips for wires;

WHAT ARE THE FACTS ABOUT UHF KLYSTRON TRANSMITTER COOLING SYSTEMS?

MANUFACTURING ENGINEERS FOR KLYSTRON TRANSMISSION SYSTEMS

Klystrons provide the best means of generating large amounts of energy in the UHF-TV band, but in so doing they produce substantial amounts of heat which must be dissipated.

Faced with this problem, Townsend Associates engineers have conducted comprehensive tests comparing vapor phase cooling with straight water cooling. Conclusions drawn from these tests indicate that vapor is more critical than water in three ways:

1. Klystron collector design must be precise to prevent vapor blanketing and consequent collector destruction.
2. The water replenishing system must be carefully designed and maintained to prevent damage resulting either from turbulence or loss of water.
3. System cleanliness must be carefully maintained to prevent film deposition on the collector which could cause a tube failure.

In contrast, the superiority of water cooling is demonstrated by:

1. The design is conventional—time tried—and requires no special considerations other than adequate water flow.
2. Cleanliness poses no problem—the same water may be used continually with no maintenance.
3. Lower temperature is involved: 120° for water as opposed to 212° for vapor. This lower operating temperature is important for both equipment and operating personnel safety.

Having chosen water cooling with Eimac klystrons, Townsend Associates engineers designed a foolproof water flow system free from the shortcomings of others. Water metering devices and control valves are mounted on a subpanel behind one of the front doors of the Townsend Associates transmitter. This gives easy access to the water flow control system while the equipment is in operation, without exposure to high voltages.

Moreover, the cooling system layout is such that should a leak ever develop, it would never disable any of the electrical equipment.

Further, dual heat exchangers are employed to assure maximum reliability. Large, accurate temperature and flow gauges with reliable interlocks provide both reading ease and a maximum degree of protection.

Cooling system design is important. Townsend Associates engineers have designed the only truly modern cooling system.

For More Information Write or Call:

TOWNSEND ASSOCIATES INC.

BOX 215, FEEDING HILLS, MASS. 01030

AREA CODE 413-733-2284

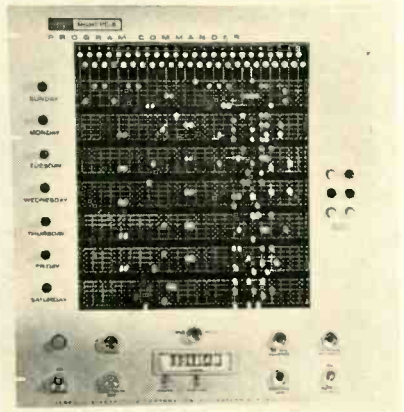
Circle 33 on Reader Service Card

mounting plates may be rotated 45° in either direction. Male-to-wire wrap tabs or gold plated tabs are available for critical low voltage applications.

Circle 61 on Reader Service Card

Non-Dup Switcher

Jerrold Electronics Corp., Philadelphia, Pa. has introduced a non-duplication switcher designed to permit pre-set programming of 6 different output events occuring at any half hour or hour interval during a 1-week

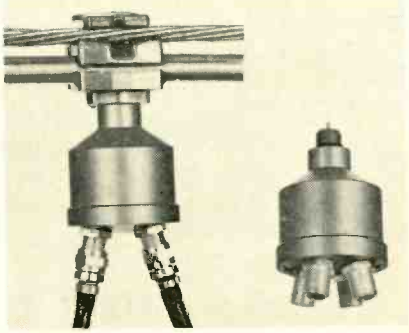


period. The switching sequence is repeated each week until changed. Program output is determined by location of pins; pilot lamps provide check of program output status for any given time. The basic Model PC-6 provides +24v DC for video or RF switching by external relay activation. Internal relay contacts switch B+ to either of two amplifiers. Price is $2175. Model IFS I.F. switcher is $495.

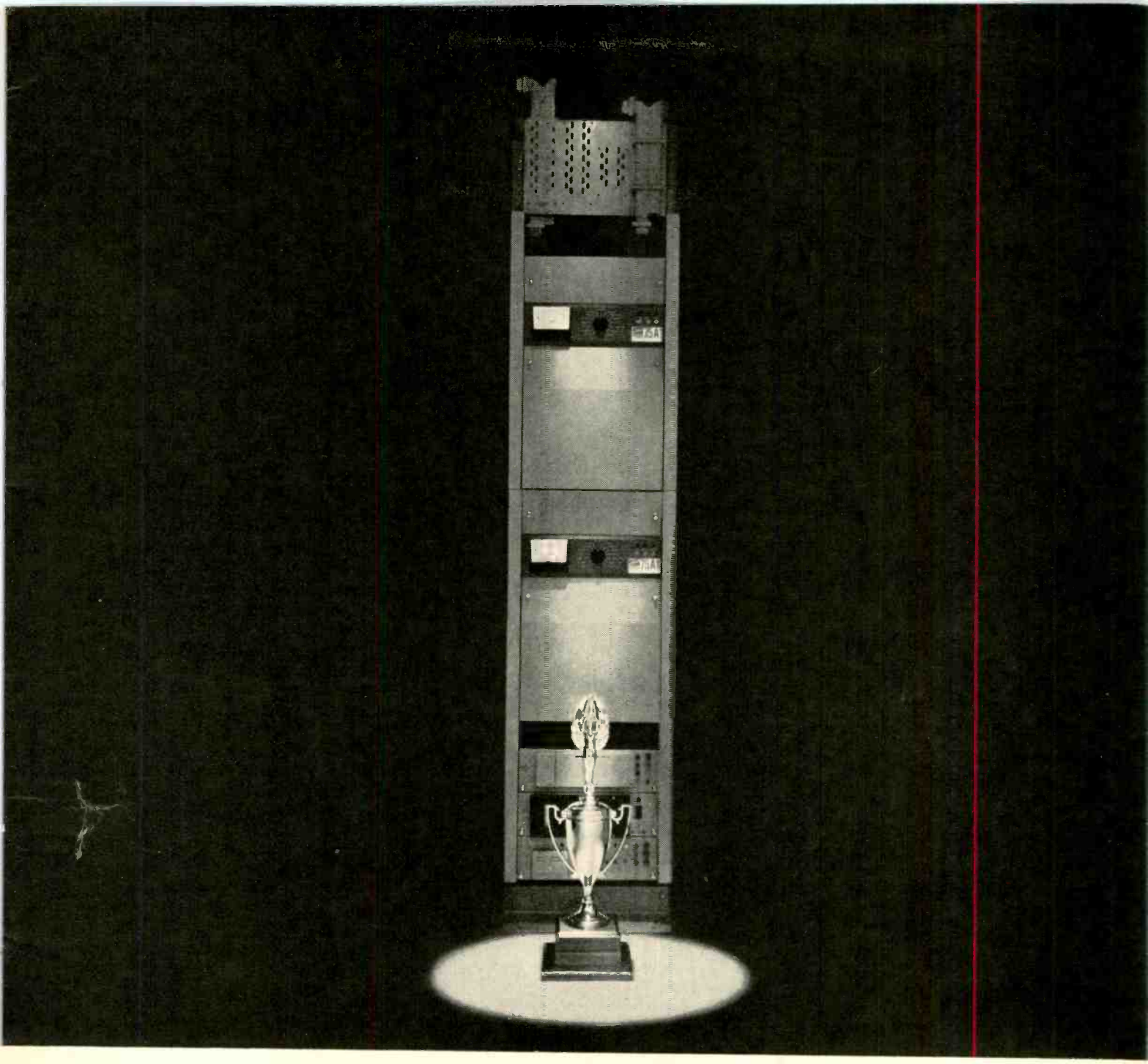
Circle 63 on Reader Service Card

CATV Tap

A multiple outlet backmatched transformer which makes possible as many as 4 outlets from a single existing block without cut-



ting the transmission cable is available from CAS Manufacturing Co., Dallas, Tex. The "Milk-cow" is a direct screw-in replacement for ⅜" isolation units on all standard pressure tap blocks



Will success spoil 75A?

Never.

75A is our rugged, reliable, long-haul, heavy density microwave radio. And, although it's our newest system, 75A has already made its mark. For instance, the 75A heterodyne system is used in a heavy-density toll network in the province of Alberta, Canada. (Proving yourself there, home of some of the most stringent operating conditions on the continent, is hardly a cinch.)

75A has also been used in the AUTOVON system, for a major educational TV system in the mid-west, and for a long-haul telephone network on the West Coast. It has been selected for use with a COMSAT system and for CATV networks in New York and Pennsylvania.

Do we sound like we're bragging a little? Well, we are. But, why not? The 75A has quickly proved itself as the perfect radio for backbone applications. It offers many outstanding features including extremely low distortion, 5 watt output power, and frequency diversity operation or one-for-three path protection.

Also available are a program channel for TV, IF auxiliary amplifiers, variable equalization for group delay and time delay, IF patching facilities, and baseband regulators. And provision is made for bridging off a video signal at any repeater making the 75A ideal for TV networks.

If you'd like to find out more about 75A and how it has succeeded in the communications business without even trying, write or give us a call.

Lenkurt Electric Co., Inc., San Carlos, California. Other offices in Atlanta, Chicago, Dallas, and New York City.

LENKURT ELECTRIC

SUBSIDIARY OF
GENERAL TELEPHONE & ELECTRONICS GT&E

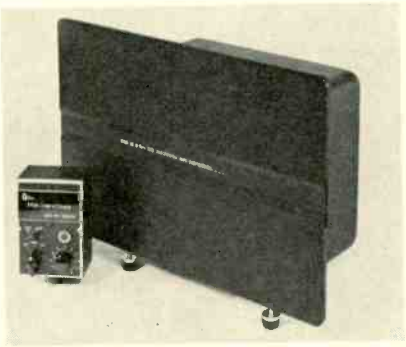
Circle 37 on Reader Service Card

and is available with 2 or 4 outlets at 12, 16, 20, 24, 30, 36, and 40 db attenuation. Minimum isolation between taps is said to be 20 db. Price of MC-2 (2 outlet) is $5.45; MC-4 (4 outlet) is $5.95.

Circle 69 on Reader Service Card

White-On-Black TV Dispatcher

A "Q" tape dispatcher system, designed to present news bulletins and other information in white lettering on black horizontal tape

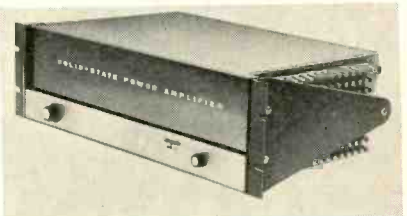


transported across the bottom of the TV screen, is available from Q-TV Sales & Distributing Corp., N.Y.C. The system uses a "Grafic" Q-typer (modified IBM typewriter) in conjunction with a variable speed tape dispatcher. For sports, stock market quotations, election results, etc., information may be vertically typed on the tape and used with a Q-crawl with optional stop-frame action.

Circle 67 on Reader Service Card

50w Audio Amplifier

A general purpose solid-state power amplifier designed for monitoring applications is available from Langevin, Santa Ana, Calif.



The AM-50 is compatible with the Model AM-2A 9-channel mixer and will supply operating power for it by plug-in connection. Amplifier features protection from overload or short-circuit damage.

Circle 62 on Reader Service Card

Elliptical Waveguide

Andrew Corp., Chicago, is offering a Heliax elliptical waveguide

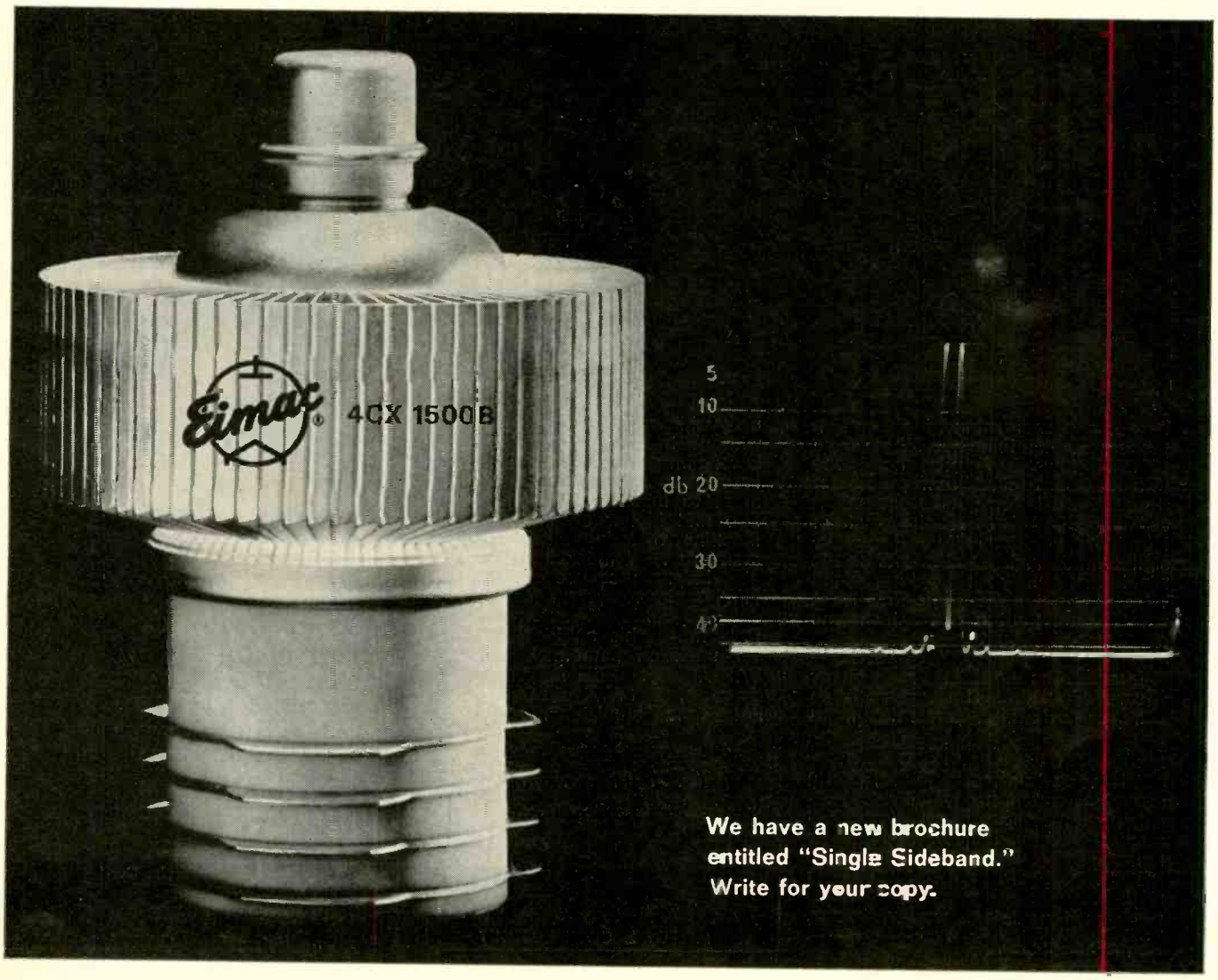
EIMAC offers new 1 kW PEP tetrode for SSB with highest linearity—at least -40 db in typical operation

EIMAC's new 4CX1500B power tetrode is the most linear tube on the market; intermodulation distortion characteristics under typical operating conditions are at least −40db at all drive power levels from zero to maximum. The new tube is ideal for advanced single sideband transmitters demanding high linearity to avoid channel-to-channel interference. The 4CX1500B is the product of a four-year development study which included optimization of internal tube geometry by computer techniques. Rated maximum plate dissipation of this radial beam tetrode is 1500 watts, and control grid dissipation rating is 1 watt maximum. Because the 4CX1500B has very low grid interception (typically less than 1.5 mA grid current), it is possible to drive the grid positive without adverse effects upon the distortion level; the tube is therefore recommended for Class AB_2 linear amplifier service. For further information, write Product Manager, Power Grid Tubes, or contact your nearest EIMAC distributor.

TYPICAL OPERATION (Frequencies Below 30 MHz)

DC Plate Voltage	2500	2750	2900 volts
DC Screen Voltage	225	225	225 volts
DC Grid Voltage	−34	−34	−34 volts
Zero-Signal DC Plate Current	300	300	300 mA
Single-Tone DC Plate Current	720	755	710 mA
Two-Tone DC Plate Current	530	555	542 mA
Driving Power	1.5	1.5	1.5 watts
Useful Output Power	900	1100	1100 watts
Intermodulation Distortion Products			
3rd Order	−38	−40	−40 db
5th Order	−47	−48	−48 db

EIMAC
Division of Varian
San Carlos, California 94070



Circle 39 on Reader Service Card

primarily designed for 1.7 to 2.4 gc. Type EW-17 is intended to replace WR-430 rigid waveguide and has an attenuation of 0.29 db/100 ft. and average power rating of 27 kw. With tuned connectors, a 200′ length has a guaranteed VSWR of 1.10 or less. Available in lengths up to 500 ft., it may be formed to a 28″ radius.

Circle 70 on Reader Service Card

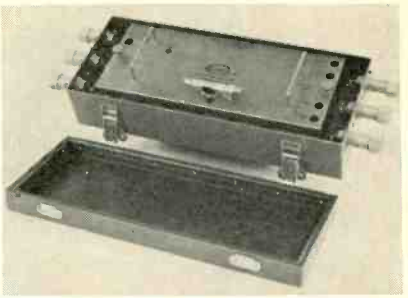
CATV Cable

A line of 75-ohm aluminum-sheathed coax cable is available from ITT Wire and Cable Div., Clinton, Mass. Available in lengths up to a mile, the cable can be supplied with polyethylene jacket or steel messenger in .412, ½, or ¾ diameters. Each length is guaranteed to deliver a minimum of 26 db structural return loss from Channel 2 to 13; a verified test report is supplied with each reel.

Circle 84 on Reader Service Card

CATV Bridger

Bridging amplifiers with minimum 53 and 50 dbmv outputs on each of two and four legs, respectively, are being marketed by C-Cor Electronics, Inc., State College, Pa. Available with direct and directional coupler inputs



with —12 and —20 db coupling, the units have minimum 36 db gain, 13 db maximum noise figure, return loss of 16 db minimum on all connections, and —57 db cross modulation (12 channels). The modular design bridger is said to reduce per subscriber cost by 20 to 40%. Price is $415.

Circle 60 on Reader Service Card

Cartridge Rack

A walnut Formica finish tape cartridge rack is available from Broadcast Products Co., Der-

wood, Md. Designed to hold 90 cartridges, the Model CR-90 measures 22 x 28 x 4 and is said to feature interlocking construction with large openings for easy cartridge removal. Price is $35.

Circle 66 on Reader Service Card

Gold Plated Mics

Altec Lansing, Anaheim, Cal. is offering two special purpose gold-plated microphones for use with religious services, etc. The 681A omnidirectional and 683B cardioid are plated with 22-carat gold and coated with hard-baked lacquer. Prices: 681A is $58.50; 683B is $84.

Circle 56 on Reader Service Card

CATV/Telephone Drop

A combination CATV/telephone drop wire is available from

The case of the unalike look-alikes

(Or why there are no twins in station automation)

Out of the 5,000-plus radio stations in the country, are there any exactly like yours?

Our experience tells us no. We find that regardless of similarity in location, power, personnel, and sound, each station has its own distinctive personality.

At least as far as automation is concerned. And that's why we custom-design ATC automation systems.

We have to consider such things as budget. A good round figure for full automation is $65.00 per week. It could be less. It could be more.

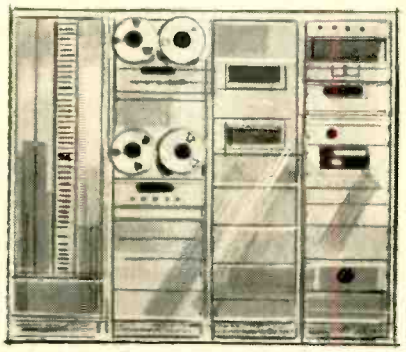
You can buy outright, finance, or lease the equipment.

We have to know what you want to accomplish with automation. Free announcers from control room mechanics for more productive assignments? Make your weekend broadcasts sound as sharp as weekdays without hiring more men? Automate FM around the clock, and AM a few hours a day?

ATC can answer any of these problems, plus many even more complicated.

We can provide three different control methods for automation: (1) punch card, (2) magnetic tape, (3) time/sequence.

We can provide equipment that prints your official log *automatically* as the material is being broadcast. We can provide the original and finest



tape cartridge units. Plus a multiple cartridge handler that plays 55 commercials or program segments in sequence.

The only way you can know for certain what your automation needs are right now is to talk to one of our people. They're all experienced broadcasters. They know your problems. They speak your language.

To hear them speak it, call 309-829-7006. Or write for detailed information on the flexible features of ATC automation.

AUTOMATIC TAPE CONTROL DIVISION
1107 East Croxton Avenue
Bloomington, Illinois 61702, U.S.A.

GATES
Gates Radio Company,
Quincy, Illinois

HARRIS INTERTYPE CORPORATION

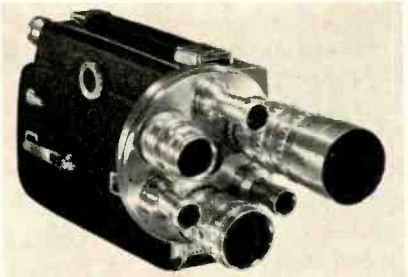
Circle 41 on Reader Service Card

Brand-Rex Div., American Enka Corp., Willimantic, Conn. Consisting of a coaxial cable (either RG-11/U or RG-59/U), plus two twisted pair telephone cables and supporting messenger, the cable is sheathed in a PVC jacket. Also available with polyethylene burial jacket.

Circle 64 on Reader Service Card

16mm Camera

The K-100 16mm professional motion picture camera is again being made available by East-

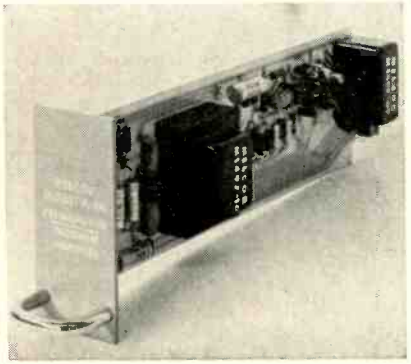


man Kodak Co., Rochester, N.Y. The K-100 has a 3-lens turret enabling use of a combination of telephoto and wide angle lenses. Said to provide simple film loading, the 6-lb. camera offers interchangeable telescopic viewfinders, long running motor, 3-way exposure lever, full-speed range, and a selection of lenses. Nylon gears permit its operation under varying temperature extremes. Price with 25mm f/1.9 lens and 25mm viewfinder is $530.

Circle 93 on Reader Service Card

Tape/Phone Preamp

A solid-state tape/phono preamplifier designed for conventional tape heads or phono cartridges is available from Melcor



Electronics Corp., Farmingdale, N.Y. Noise level of ATP-24 is said to be 6 db below inherent noise generated by unrecorded tape. Equalization for 7½ and 15 ips playback. Frequency response is 20 to 20,000 cps. Price is $125.

Circle 57 on Reader Service Card

Not designed for broadcasting but it's great to have around the station.

It's the Sony Videocorder®—a video tape recorder with its own built-in monitor. It can do everything the big expensive video tape recorders can do. The only differences are: it's easy to operate; it's small and portable enough to put in your office, even on your desk, and it costs under $1000.

Here are just a few places where the Videocorder can pay its way at the station. Executives can use it to keep an eye on programs and commercials – without staying up late at night. They can exchange tapes with other stations to review commercials or programs—because a program recorded on one Sony Videocorder can be played back on any other Videocorder.

Add $350 to the cost of the Videocorder and you have a complete TV studio at your disposal (camera, microphone, tripod). Now you're ready to tape "live" action—preview ideas for commercials and programs.

The Videocorder travels easily from office to studio to home, or wherever you might need it. In its own portable case, it weighs 66 lbs. Model TCV-2010 costs $995. 2020 costs $1150, comes in a handsome oil-finish walnut case with built-in timer for recording programs in your absence. The 2020 is available as a deck Model CV-2000D with a wood base for $695. It's great to have around the station.
How about a free demonstration?
Use the coupon.

SONY Corporation of America, Dept. H
47-37 Van Dam St. Long Island City, N.Y. 11101

Gentlemen:

I'm interested in the Sony Videocorder. Please:

☐ Call to arrange a free demonstration.

☐ Send me further details and the name of my nearest dealer.

Name_____

Company_____

Address_____

City_____ State_____ Zip_____

BM3

Sony Videocorder is not to be used to record copyrighted material

New Building

Continued from page 34

My architect, Robert F. Beatty of East Liverpool, is creative enough to have earned a commission from the U.S. State Department to build one of our new embassies in an African nation, but realistic enough to be a leader in school architectural assignments in our area. Once he understood that I had some idea for the basics, he was able to guide me to the right materials and methods to make the job attractive and economical.

An architect charges 4% for his design services, and an additional 2% for his supervisory services. Looking back, we are mightly glad we had one. Mr. Beatty caught problems on paper before they were too late to solve, and as supervisor of the job, he was able to correct several construction mistakes which we wouldn't have noticed. In this way, we got a better building and saved money.

After the plans had been completed, we had the architect arrange for several firms to bid on each phase of the work. The general contract included all but the plumbing, heating and air conditioning, and electrical work. There were subsidiary contracts for each of these areas, and the spread between bids was remarkable — as much as 40%! We are now convinced that bidding was an excellent way of getting the right price.

On the other hand, we did establish some guidelines for selecting the firms with whom we would do business. We wanted local firms. All other things being equal, our advertisers would get preference. Since it was the architect's job to handle and review the bids, he executed these dealings with tact and discretion and in such a way that all bidders were aware of the requirements.

Of course, throughout the procedure, from the time we acquired our land, our attorney reviewed each legal document involved — our lease, land title, etc. His assistance, too, was invaluable.

Oh yes, the cost: The 2400-sq. ft. first floor cost about $17.50 per sq. ft., plus land. That's $42,000 in all. The total cost of the building was $78,000. These figures include fees, and all items supplied by me as landlord, but do not include the land cost. ●

"Now some recorded news from Gemini..."

THE NEW SOLID STATE AMPEX AG-350 IS THE MOST RELIABLE ¼" RECORDER ON EARTH

Our 350 Series recorders span the entire ages of radio tape recording, and space travel. More than 18,000 are in use. Many with more than 90,000 perfect hours of logging time. Now six of the latest, advanced AG-350 design are at NASA Manned Spacecraft Center, Houston (see left). Prime responsibility: to record voices of astronauts in orbit for release to broadcasters and news services. The new AG-350 provides the prime reliability features for any broadcast use: Super-rigid Ampex plate mounted transport. 100% solid-state electronics with standard plug-in transistors. Plug-in equalizers. Non-wearing glass tape lifters. Straight line tape path. Easy-to-read giant VU's. Volume-level lock. Low frequency equalization adjustment. Tension automatic by reel size. AG-350's are available now for rack mounting, portable or console; mono or stereo; with your choice of two-speeds. For details, contact your distributor or mail the coupon.

To Ampex Corp., Redwood City, California 94063.

☐ Yes, I want more news on the New Solid State AG-350.

☐ Have your distributor call me.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

AMPEX

Circle 46 on Reader Service Card

BROADCASTERS SPEAK

Sirs:

I have been looking at the September 1966 issue of BM/E with a great deal of interest, particularly at the excellent articles on station automation.

While in Australia last year on a sabbatical leave of absence, I learned that a station manager in Queensland (Mr. G. T. Schmid, General Manager, Broadcasting Station 4AY, Townsville) made a trip to the U.S. primarily to investigate automation in American radio stations. I know he would be interested in recieving a copy of this publication and I hope you can put him on the mailing list.

Elmer G. Sulzer, Professor
Dept. of Radio and Television
Indiana University
Bloomington, Ind.

We'll do it! Mr. Schmid surely will appreciate your interest in his welfare.

Sirs:

We're very pleased that you used an article about our operation (page 30, Sept. issue). However, those #@%* Gremlins that plague all of us must have gotten into your type box and caused our call letters to come out WSCS. (Should be WCWC.)

Seriously, though, we are very much convinced of the value of automation. We have had our best successes in streamlining and speeding our traffic and accounting. We will happily share our successes with anyone who cares to take the time to ask.

While I'm at it, let me congratulate you on the fine quality of your magazine. Keep up the good work!

Arlow D. Bice, Jr., Gen. Mgr.
WCWC Ripon, Wisc.

Sirs:

I've been meaning to write you for quite some time to compliment the magazine. Many of the articles have been very helpful to our staff.

Irv Laing, Opns Mgr.
WQTE Detroit, Mich.

Sirs:

AT A SUNRISE BREAKFAST MEETING THIS MONDAY MORNING, OCT. 3, 1966, WE THE SUPERVISORS AND 7 INSTALLERS OF CONNECTIONS FOR CABLE TV OF SANTA BARBARA WISH TO TELL THE CATV WORLD THAT DURING THE PAST WEEK WE MADE 376 INSTALLATIONS IN 350 MAN HOURS. IF ANY GROUP OF INSTALLERS IN THE COUNTRY CAN BEAT THAT, HARRY BUTCHER, OUR PRESIDENT, SAYS HE WILL SEND THEM A BOX OF AVOCADOS.

DALE GILMAN, SUPERVISOR
THE MARINES OF THE INSTALLERS
CABLE TV OF SANTA BARBARA (CAL.)

P.S. WHILE THE INSTALLERS WERE TRYING TO CATCH UP WITH PUBLIC DEMAND, OUR ORDERS FOR THE SAME WEEK WERE 365. GET SOME MORE MARINES TO CATCH UP!

LOU KEPPLER, SALES MGR.
CABLE TV OF SANTA BARBARA (CAL.)

P.S. MAY WE DROP IN ON YOU?

Wire received and hereby acknowledged. Congratulations to both the Marines and Paratroopers. We can't beat you, but tell Harry Butcher we'd love the avocados anyway.

Sirs:

I am one of the 20 Asian Journalists invited by the U.S. Government for a 30-day tour of the U.S.A. I am on the staff of the Army Television Station, HSATV, Bangkok, Thailand. I am interested in BM/E but have no details. If you promptly give me the information before we leave the mainland, I expect to send you a (check for) the first year membership.

The last of our tour will be at San Franscisco Oct. 10, so send the information (there).

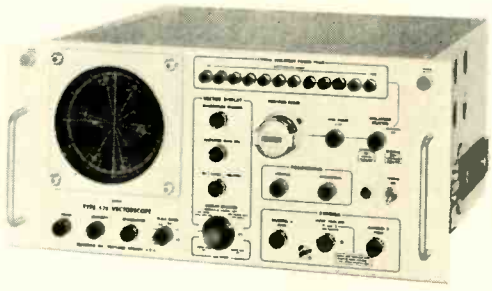
Watt Katchapanan
HSATV Bangkok, Thailand

Done. Hope you and the others enjoyed the tour, and can come back again sometime.

Tektronix Television Instruments

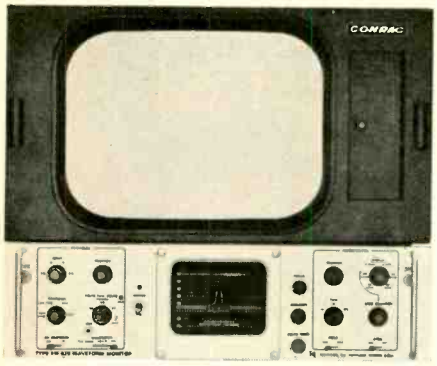
Type 526 Vectorscope for Chroma-Signal Displays

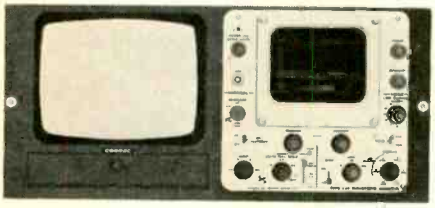
color encoder adjustments
differential phase measurements
differential gain measurements
vertical-interval-test-signal (VITS) displays
video tape-recorder setup



Measuring amplitude changes and phase shifts can be done accurately, conveniently, and independently with the Vectorscope. The Vectorscope presents relative phase and amplitude displays (of chrominance information in the N.T.S.C. color signal). Dual-trace capability permits simultaneous display of two color signals for precise matching of phase and amplitude. In addition to the vector display, the Vectorscope can present the chroma signal demodulated along any phase-angle with respect to time.

Type 526 Vectorscope $1665
Size is 8¾" high, 19" wide, and 18" deep. Weight is ~ 45 pounds. Designed for rack mounting.

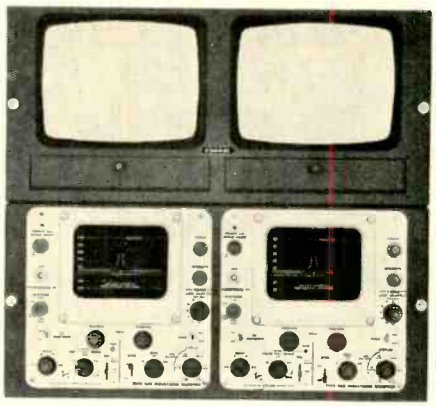


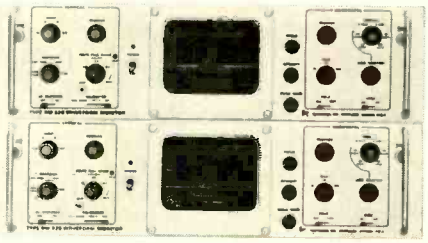


Type 529/RM529 for Waveform Monitoring

vertical-interval-test-signal (VITS) displays
sine-squared pulse and bar testing
transmitter modulation monitoring
YRBG or RBG displays (with color-processing amplifiers)
video signal-level monitoring
bandwidth measurements
differential-gain measurements

In waveform-monitoring applications, the Type 529 and RM529 offer 2 LINE and 2 FIELD displays plus calibrated sweep rates of 0.25 H/cm, 0.125 H/cm, 0.025 H/cm with X5 Magnifier, and 0.005 H/cm with X25 Magnifier. They provide 4 response characteristics necessary to monitor VITS—*FLAT* to 8 MHz (which assures excellent waveform fidelity for sine-squared testing with 2T, T, and 1/2T pulses), *HIGH PASS* 3.58 MHz, center frequency, *LOW PASS*—18 dB at 500 kHz, and IEEE 1958 STD 23-S-1. Other characteristics include a backporch type DC restorer, a positive-going field selector, and a full-field line-selector *including digital VIT line selection.*





Type 529 Waveform Monitor . . . $1050
(8¼" high, 8½" wide, 19" deep, weighs 24 pounds.)

Rack Mount Type RM529 . . . . . $1100
(5¼" high, 19" wide, 20" deep, weighs 27 pounds.)

Power consumption of each model is ~ 80 watts — no fan used.

U.S. Sales Prices, f.o.b. Beaverton, Oregon

Tektronix, Inc.

For complete information, contact your nearby Tektronix field engineer or write:
Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97005

Circle 48 on Reader Service Card

CASEBOOK

Continued from page 68

formers; we normally use from one to four speakers. The switching circuit shown in Fig. 4—mounted on the speaker transformer bracket or on the speaker baffle—varies the output of each speaker and is quite effective in reducing feedback and providing desired sound levels at various locations. Good matching and fidelity is maintained with this arrangement, although some variation does exist when operating with different numbers of speakers and varying amplifier levels.

The remote line feed is bridged directly across the 70.7-volt amplifier output. Since the power required for feeding the broadcast line is so small (less than 0.5 watt) no noticeable amplifier loading or

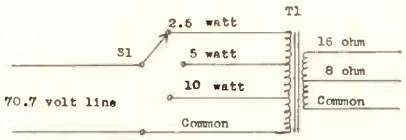


Fig. 4. Schematic of speaker level control. S1-Mallory Type 3115J; T1-standard 70.7 volt-to-voice coil transformer.

level change is apparent. The 50K and 25K ohm taps on the transformer supply approximately 0 to 8 VU to the remote line.

Operation

We found, during operation from a fair booth for instance, that the flexibility of the system is of much value. During non-broadcast periods we carry station programming on the sound system by switching the remote bridge to the off position and connecting a jumper cable from remote line headphone monitor jack to one of the high level turntable inputs. On a number of occasions, taped commercial announcements are fed from the recorder output into a high-level amplifier input. A live interview at a fair or an on-the-spot commercial announcement may be taped by feeding the tape recorder input from the amplifier tape-out phono jack.

When the system is used only as a remote amplifier (without any speakers connected) we connect a 25w 300-ohm dummy load resistor to the 70.7-volt output terminal to protect the amplifier. The dummy load handles approximately 16 watts dissipation.

While this system has served our needs quite well, it may not be the answer to all situations. However, anyone with a need for such equipment can use and expand upon our design.

BM/E

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LITERATURE of INTEREST

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CATV lease-back guidelines available from First National Planning. Corp. 101

Automated programming equipment brochure from Continental Electronics discusses dual intermix and sequential intermix systems. 102

Video **analyzer** described in technical bulletin from Colorado Video. Includes prices, specifications. 108

MATV products catalog from Blonder-Tongue Labs includes conversion, amplification, distribution equipment. 109

Flutter meter described in technical bulletin on Micom Model 8100/8100-w. 110

Acoustical doors listed in brochure from Overly Mfg. Co. Includes acoustical test data. 111

Communications antenna for 2-way radio, citizens band, TV and FM reception described in bulletin from Cushcraft. 112

ETV information contained in "A view of Educational TV" from GPL Div., General Precision. 113

ITV in music education discussed in National Center for School and College Television supplement. 114

5w microwave equipment for long haul video systems described in data from Collins Radio. Discusses IF heterodyne MW-()09E. 115

Weather-Scan CATV information channel equipment described in flyer from R. H. Tyler Co. 116

Automatic broadcast systems described in literature packet from Schafer Electronics. 103

CATV amplifiers designed for high level application described in literature from Craftsman Electronic Products. 117

Cases for portable equipment listed in catalog from Skydyne, Inc. Includes 29 standard thermoplastic types. 118

Photographic solution mixing and transfer tank described in technical bulletin from Houston-Fearless. 119

Automated programming and background music systems discussed in booklet from Tape-Athon. 104

Microwave antenna literature from Gabriel Electronics describes 4-port rear-fed dual-frequency type. 121

Standby generators discussed in 8-page folder from Cummins Diesel. Lists capacities, engine specifications, fuel uses, etc. 122

CATV amplifiers for high level trunk and distribution described in XDR line brochure from Anaconda Astrodata. 120

Audio console data sheet from Ward Electronic Ind. lists features and specs of custom types. 124

Video recording tape specification sheets in folder from Memorex. Covers color and black-and-white applications. 125

Color film camera described in 8-page catalog insert from G-E. Lists specifications and application data of PE-240-A/B 4V system. 126

PA equipment listed in 16-page catalog from Electro-Voice. Includes mics, speakers, baffles and horns. 127

Lenkurt "Demodulator," published monthly, features information on voice, data, video transmission. 129

Automated programming system described in detailed data from Automatic Tape Control. IBM punchcard system may be customized. 171

"Video Switching Techniques," 32-page booklet published by Dynair, describes video and audio switching techniques. Includes many pictorial diagrams. 130

Kinescope recording camera described in catalog sheet from D. B. Milliken Co. Includes specifications and operational data. 131

FM multiplex exciter described in 4-page folder from Standard Electronics. Includes transmitter modernization data. 132

Tape cartridge playback system described in brochure from Broadcast Electronics. Includes 10-spot multichannel programmer. 133

Audio amplifiers listed in 6-page folder from McMartin. Includes LT, MA series and mixer-preamp. 134

Tropo scatter parabolic CATV antenna systems described in SPADECO literature from Ft. Worth Tower. 136

CATV audio/video head-end control unit described in technical data from Benco Television Corp. Benavac provides automatic control. 153

Programmable cartridge tape recorders for audio automation described in brochure from KRS Instruments. 143

2500-mc ETV system illustrated in brochure from Micro-Link. Tells of Houston's 2-channel Spring Branch Independent School system. 154

Measurement instrument applications discussed in periodical "News" published by Rohde & Schwarz. Presents in-depth information in various fields. 169

Cartridge manual, with cross-reference listings of 5,700 phono pickups, from Sonotone Corp. 182

Tropo scatter parabolic CATV antennas described in literature from Hosken Cable TV Antennas. 135

Tube data, thumb-indexed quick reference brochure of English Electric power valves, microwave devices, electron-optical tubes, and other equipment. 178

Studio lighting catalog, describing line of Mogul quartz "converta" spotlights for updating existing systems, from Packaged Lighting Services. 179

Television stands for ETV classroom receivers described in flyer from General Television Network. 180

CATV systems engineering data pre-sented in booklet from Cascade Electronics. 174

Color bar generator described in specification sheet from Riker Industries. Model 5618 provides encoded color bar signals. 175

TV STL equipment described in detailed specification data from Microwave Associates. 190

Books on all phases of radio-TV-CATV, many unavailable from other sources, fully described and illustrated in 18-page literature package from TAB Books. 170

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KGUN-TV, in Tucson, second largest city in Arizona, needs an engineer with first or second phone. Opportunity to join progressive growing Gilmore Group of stations. Contact Studio Supervisor, Box 5147, Tucson, Ariz.

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ENGINEERING
CASEBOOK

Combination Remote Broadcast and PA Amplifier

By Robert J. Hendrick

AT FAIRS, carnivals, beauty and talent contests, church services, store openings, etc., both a broadcast remote amplifier and a public address system often are needed. By using a combination system, we were able to eliminate half the number of microphones and cables which always end up in a tangled mess. The system also minimizes the problem of coordinating the operation of two systems.

Equipment

We established these minimum requirements: (1) The equipment must be compact, light, and simple; (2) It must serve as a PA system only, as a remote amplifier only, or as both simultaneously. For our requirements we needed an amplifier with at least two high-level inputs for turntables, tape recorder, tuner, etc., and at least three inputs for either low or high impedance microphones. We chose the Knight Model KN-3050, which has four high impedance microphone inputs with optional plug-in low impedance microphone transformers, and three turntable inputs. The amplifier also has an output-level meter, tape recorder feed, and excellent frequency response characteristics.

Fig. 1. View of completed unit and speaker.

In selecting a turntable, we wanted a light-weight unit that required a minimum amount of space above and below the mounting board. The Bogen B-61 turntable and arm requires only a 2¼-inch mounting depth, permitting the use of a shallow console-type housing (overall depth only 4½ inches). We chose Electro-Voice Music-Caster PA speakers, which can be mounted on an Atlas SS-2 portable stand when necessary. These speakers have excellent reproduction characteristics and are trim looking whether hung on a wall, set on a shelf or table, or used with the portable speaker stand. Fig 1 shows the complete system.

Construction Details

To construct the console, we used plywood covered with Formica for our basic material. A No. 2 or lower grade ½" plywood is satisfactory since all visible areas are covered with Formica. We recessed the bottom ½" above the outside band in order to obscure the leg mounts. Legs, microphones, cables, etc., are stored in a compartment along the back edge running the entire length of the console. Since the overall console dimensions are 51" x 19" x 4½", it can easily be transported in the rear seat or trunk of any standard size automobile. Standard ¾" pipe legs—with rubber cane or crutch tips on the ends—screw into standard flanges. Some compensation for uneven surfaces can be achieved by tightening or loosening the legs.

The console was so designed that all cables would enter from the bottom through a 2½" x 12" slot cut beneath the amplifier to accommodate microphone, speaker, power, and remote broadcast cables. AC wiring includes surface-mount AC receptacles in each turntable compartment and a standard 2-outlet AC receptacle behind the amplifier. Primary power is supplied to a male AC receptacle, mounted in the upper right-hand divider corner and connected to the AC line feed cable with matching female plug.

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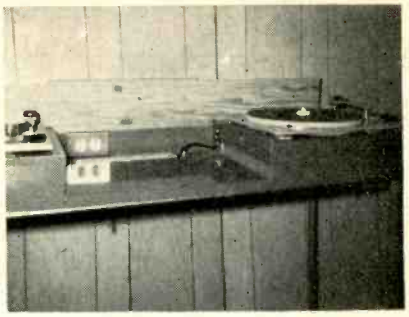

Fig. 2. Detail showing receptacle mounting. Storage compartment lid is in open position.

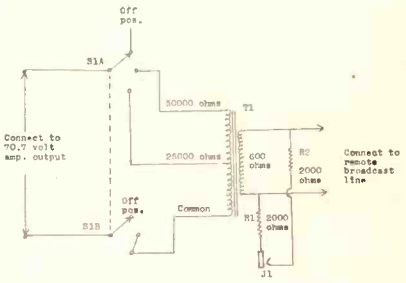

Fig. 3. Schematic diagram of external switching unit. S1-Mallory Type 3123J; T1-UTC Type A10; R1, R2-2k, ½w; J1-2 circuit normally-open jack, insulated from cabinet with fiber washer; mini box — Bud Type CU-2103-A.

Since the equipment is transported quite frequently and subjected to considerable vibration and jolting, it was necessary to devise a means of securing the pick-up arms and cartridges. We used a suitable length of ¼" aluminum tubing as a spacer and a Keystone Type 90 miniature battery clip, bolted to the turntable mounting plate at the correct arm position.

Equipment Modification

The PA system is operated as a conventional sound installation. However, in order to feed a remote broadcast line, we designed an outboard bridging, switching, and terminal arrangement. The bridging transformer, switch, remote line terminals, and cue headphone jack are mounted in a small "minibox" bolted to the upper center of the amplifier cabinet. The remote line feed is independent of the PA system (and vice-versa) by using the bridging and switching circuit shown in Fig. 3. The 70.7-volt output connection allows us to use speakers with individual matching trans-

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