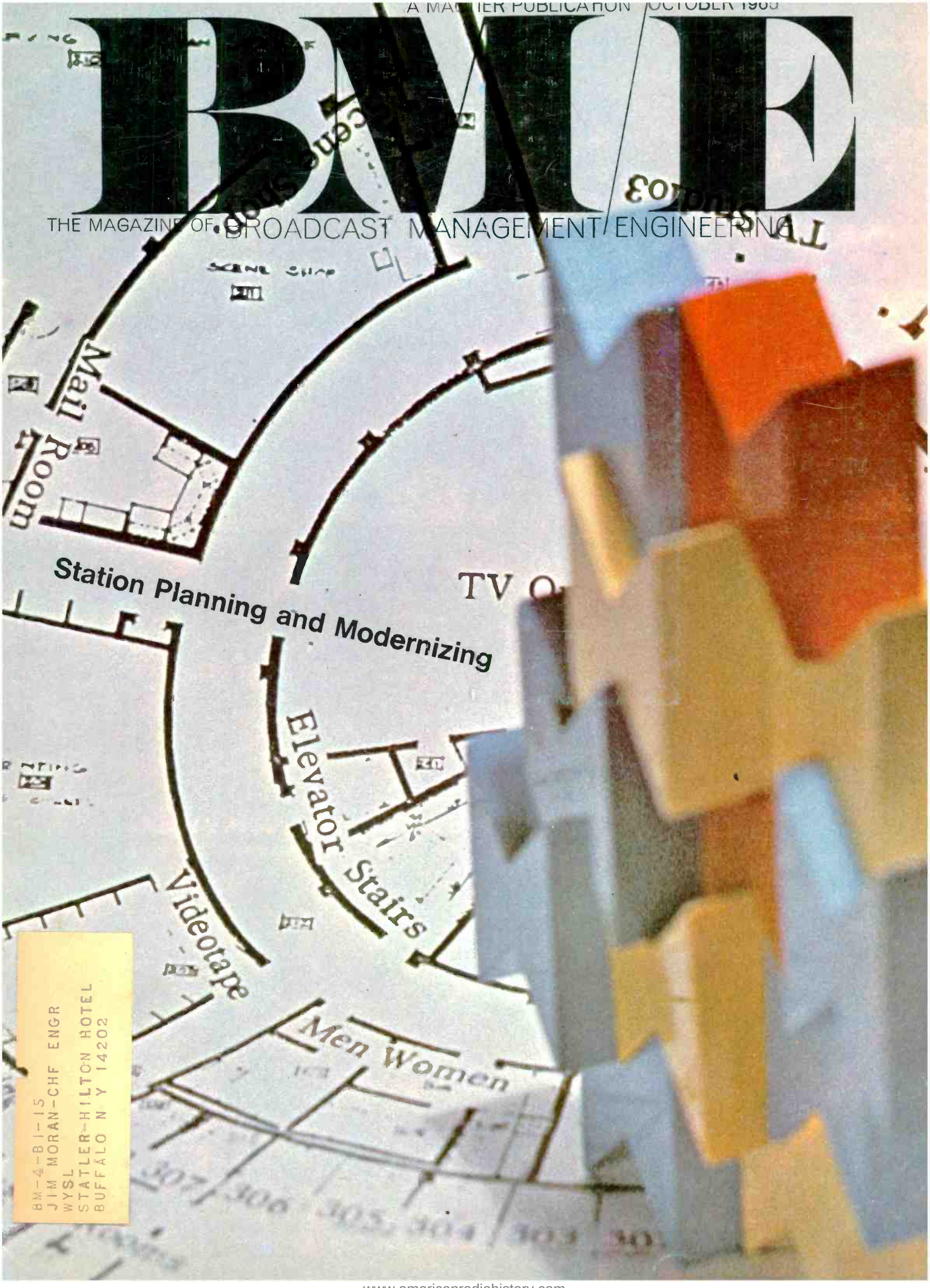
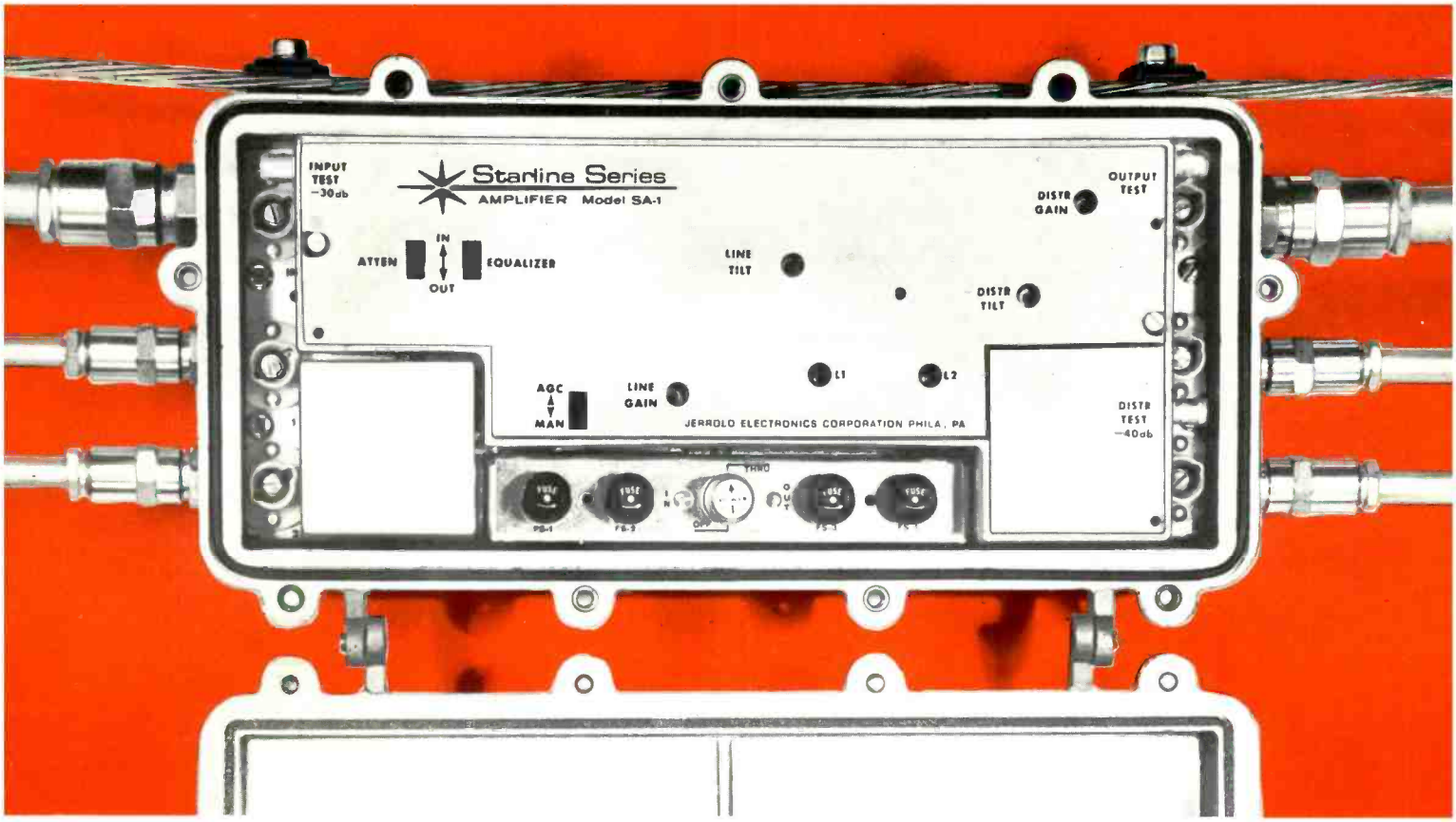
A MACFIER PUBLICATION / OCTOBER 1983

BM/E

THE MAGAZINE OF BROADCAST MANAGEMENT/ENGINEERING



Station Planning and Modernizing



NEW JERROLD Starline™

Here is the exciting new Jerrold *Starline*™ Series—a revolutionary new concept in CATV signal distribution.

New SA-Series station locations give you, for the first time, all the active solid-state equipment for each distribution function within a single weather-proof, radiation-proof housing—ready for easy mounting on messenger, pole, or crossarm. Look at these exclusive features:

- 50-amplifier main-trunk cascadability for 12 channels, with cross-modulation down 57 db
- Main trunk runs in excess of 1,100 db
- All silicon transistors
- Option of 1, 2, 3, or 4 outputs from built-in bridger
- Full-wave rectification, permitting *Starline* power supply to handle more amplifiers
- Completely radiation-proof housing

The *Starline* Series ushers in the Golden Age of CATV. Prepare now for increased subscriber demands—talk to the man from Jerrold, or write for complete information about *Starline* unitized distribution stations.

Patent Pending

Starline Stations

MODEL SA-1 (illustrated)
All-band trunkline amplifier with AGC, plus bridging amplifier to feed one to four feeder lines.

MODEL SA-2
All-band trunkline and bridging amplifiers to feed one to four feeder lines.

MODEL SA-3
All-band trunkline amplifier with AGC.

MODEL SA-4
All-band trunkline amplifier.

MODEL SA-5
Intermediate bridging location on main trunk to feed one to four feeder lines.

All units in same rugged housing.

JERROLD

ORDER THE QUALITY YOUR DOLLARS DESERVE

CATV Systems Division • JERROLD ELECTRONICS CORPORATION • 15th & Lehigh Ave., Philadelphia, Pa. 19132

The nation's largest, most experienced manufacturer-supplier of CATV equipment and services

Circle 2 on Reader Service Card

viking UNITIZED CATV

HIGH LEVEL INLINE MODULAR SOLID STATE AMPLIFIERS

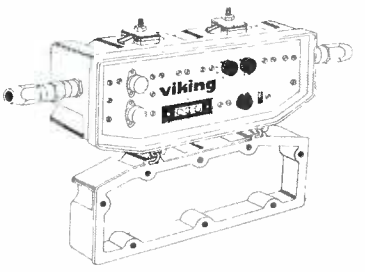
CASCADABILITY – The Viking Solid State amplifiers have been designed with one goal in mind – cascadability. A 12 channel system bigger than 60 main line amplifiers in series or better than 1400 db of cable can be built for a system signal-to-noise ratio in excess of 40db. This achievement has been accomplished by a combination of the best possible electrical and mechanical specifications unified in a single design, in the following ways:

OUTPUT CAPABILITY AND NOISE FIGURE – The Viking amplifiers are designed with the lowest noise figures, 10db maximum, and the highest output capability, 51 dbmv.

AGC – The built-in AGC system of the Viking 574 amplifier operates so that the system can be set for the best signal-to-noise ratio under average conditions. Picture quality will improve with increased signal and not significantly deteriorate with moderately less signal. This is because the Viking AGC circuits are an integral part of the amplifier and operate by changing gain *after* the second stage of the amplifier so that there is an insignificant change in noise figure with AGC action.

The Viking AGC is also designed to tilt the amplifier's response curve to compensate for the tilt change in cable attenuation due to temperature. The Viking AGC thus does double duty: it holds the output constant for a change in *any* TV channel signal *and* automatically compensates for cable attenuation and tilt change due to temperature.

MODULE CONSTRUCTION – Every Viking Solid State amplifier is constructed in module form. The entire amplifier can be quickly replaced without disturbing cable or fittings, without unsoldering any connections and without the use of jumper cables. When a bridger amplifier is disconnected. the trunk signal and AC power is undisturbed.



VIKING'S GOLDLINE SERIES IS THE ONLY SOLID STATE LINE WITH ALL THESE IMPORTANT FEATURES:

- **Directional outputs built in.**
- **51 dbmv output capability for a 12 channel system (5db block-tilt).**
- **External fuses for easy replacement.**
- **Push-pull modular construction.**
- **Inline housing.**
- **Reversible mounting.**
- **Lowest noise figures.**
- **Unparalleled cascadability (60 maintrunk amplifiers).**
- **All silicon RF transistors in sockets and heat-sunk.**
- **Lightning protection beyond 10,000 volts.**
- **AGC amplifiers with separate band plug-in pads and full-wave power supply.**
- **Cable equalization: A 4 position switch plus an overlapping continuous control for 30db of continuous control.**
- **Both RF and AC power feed through the bridger amplifier locations whether or not the amplifier is in place.**
- **Can be strand mounted on side or back; or pole mounted.**

PUSH-PULL CLICK-CLICK
CHANGE AMPLIFIERS THAT QUICK

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THE NEW VIKING - FOR THE NEW LOOK IN CATV

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Circle 5 on Reader Service Card

OCTOBER 1965 / VOLUME 1 / NUMBER 10

BM/E

THE MAGAZINE OF
BROADCAST
MANAGEMENT/
ENGINEERING

Easy as ABC? Not by a long shot! Like an uncluttered, smoothly operating broadcast or CATV facility, this month's cover may look like it was easy to create. Yet, just getting the picture on film took Art Director Gus Sauter and photographer Burt Shavitz (with Pentax camera and special wide-angle lens) several pains-taking hours. Our point? It takes a great deal of thinking and planning to create a smoothly operating facility—one that looks simple enough for anyone to operate.

The circular floor plan was borrowed from Triangle's WFIL Philadelphia, one of the most modern AM-FM-TV facilities in the world. Are you planning a new facility, or thinking of modernizing an existing operation? This issue, devoted to planning and modernizing, should be of help.

MACTIER PUBLISHING CORP., BRYCE GRAY, JR., President
820 Second Ave., New York, N.Y. 10017, 212 MO 1-0450

BM/E Editorial & Production Offices: 18 Frederick Rd., Thurmont, Md. 21788—phone 301 271-7151

Publishers also of:
EEE—the magazine of Circuit Design Engineering
ELECTRONIC PROCUREMENT
VOLT/AGE—the magazine of Electrical Apparatus Maintenance

BM/E, the magazine of Broadcast Management/Engineering, is published monthly by Mactier Publishing Corp. All notices pertaining to undeliverable mail or subscriptions should be addressed to 820 Second Ave., New York, N.Y. 10017.

BM/E is circulated without charge to those responsible for station operation and for specifying and authorizing the purchase of equipment used in broadcast facilities. These facilities include AM, FM, and TV broadcast stations; CATV systems; ETV stations, networks and studios; audio and video recording studios; consultants, etc. Others please write for subscription prices.

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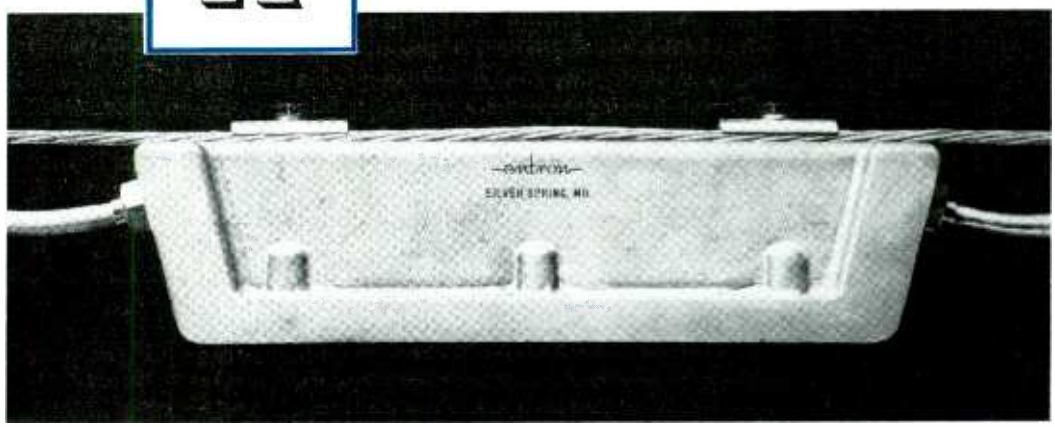
ENTRON—The Most Respected Name in CATV . . . Presents

THE R* SERIES TRUNKLINE AMPLIFIERS

R* . . . for reliability



One of Entron's new In-A-Line family of CATV equipments.

- All Solid State
- Continuous Bandwidth
- Maximum Spacing
- All Types of Fittings Available

The wise CATV system owner can save MONEY and MAINTENANCE with the new R-series of trunkline amplifiers from Entron.

These units provide maximum spacing for economy and solid state circuitry for reliability —two MUSTS in any profitable CATV system.

The R-1, R-2, R-3 and R-4 trunkline amplifiers give continuous bandwidth coverage for excellent transmission from 50 mc to 220 mc. All of the amplifiers are 28 volts. (60 volt models are available.)

The R-3 has automatic gain control and R-4 includes Equatrol° automatic tilt control in addition. Both are spaced 25 db in the trunkline.

Other important features of each member of the R-series are:

- Low Noise—More cascadable
- Versatility—Mount anywhere! Available with all popular fittings
- Heavy Aluminum Housing—Weatherproof
- Strand Mounting—Strand clamps provide instant mounting. No messy drip loops

For specifications and prices, write or call:

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CATV and ENTRON have grown up together!

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BROADCAST INDUSTRY NEWS

Ultimate in Planning & Modernizing

Philadelphia's WFIL (AM-FM-TV) has one of the most modern broadcast facilities in the country. The station moved into a handsome and uniquely efficient circular building early last year, and installed all new equipment.

According to Irwin Ross, Chief Engineer, a vast amount of planning went into the new facility. It is the first circular-designed communications center in which the hub of the building is a master operating core that controls, moni-

tors, schedules, and technically coordinates the entire broadcasting operation. Three two-story TV studios can be observed and commanded—visually as well as electronically—by the adjacent master operating center in the middle of the building and an individual control room on the level above. The off-white precast stone and glass building is five stories high, set on a wooded 4-acre plot. Trucks can be driven up a circular driveway directly to the third floor, which is reserved for TV production.

Of special interest is the care given to studio acoustics. In all three TV studios—one large 65′ x 65′ main studio, another 49′ x 65′, and a 40′ x 50′ space used primarily for news and weather broadcasts—Gustin-Bacon Ultralite fiberglass blanket is used throughout, covering all walls (except for doors and windows) from floor to ceiling (27′ high). The material is vinyl covered, which keeps the fiberglass from rubbing off on people or equipment. Mr. Ross reports that the three studios required some 10,000 sq. ft. of Ultralite blanket, and that it was necessary to treat only the walls to achieve the exacting acoustical requirements.

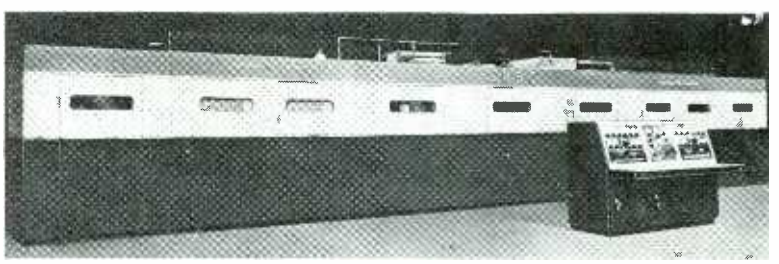
WFIL uses some of the latest designs in automated equipment, including automated audio and video switching, and pre-set studio lighting systems. If you're interested in the ultimate in broadcast facility design, visit WFIL sometime.

Pay-TV Making Headway

RKO General has taken a significant step in furtherance of its subscription TV activities by obtaining options to Zenith's Phonevision system in five additional markets: New York, New Haven, Philadelphia, Washington, and San Francisco. Exercise of these franchise rights will depend on further results of RKO's Hartford, Conn. (Ch. 18) operation, and FCC approval.

RKO has operated Channel 18 as an experimental subscription TV station for the past 3 years, and recently obtained FCC approval to operate for an additional 3 years, and to expand the present number of 5,000 subscribers. Box-office attractions unavailable over conventional TV are offered nightly. Programming consists of approximately 4 hours a night of motion pictures, off-Broadway and summer theatre plays, concerts, supper-club acts, sports, and other

Video tape is rapidly becoming the good right arm of color TV broadcasting, according to William H. Madden, 3M's video tape sales manager. More than 75% of NBC's daily colorcasting this year has been taped, and CBS and ABC will make rather extensive use of color tape this fall. According to Mr. Madden, one of the advantages of using tape is immediate playback to check on color quality, plus the fact that tape is much less costly than film. One of the regular NBC video tape shows is Hullabaloo. The "living doll" above is frenetic Lada Edmund, Jr., 18-yr. old watusi-frug-monkey-swim dancing blonde shown during dress rehearsal. She must be really great when she lets her hair down.



LTV Continental Electronics has completed a factory test of a 500-kw medium frequency AM broadcast transmitter built for the Nigeria Broadcasting Corp., Enugu, Eastern Nigeria. The transmitter is made up of two 250-kw units, combined to deliver full carrier power. In addition to the transmitter, the $1,288,374 contract called for three 840′ towers and phasing equipment for a DA system, spare parts, installation and supervisory services.

Transistorized battery-operated portable oscilloscope

The Type 321A.

It's small and light—weighs only 18 pounds. It operates from almost any convenient power source—typically from 4 to 4½ hours on self-contained rechargeable batteries (recharging them through its own recharging circuit), from any dc source of 11.5 to 35 volts—or from any ac source of 115 volts ±10%, or 230 volts ±10%, at frequencies from 50 to 800 hertz.

It's rugged—designed to resist shock, vibration, and other conditions likely to be encountered traveling or operating in remote locations.

It's easy to maintain—with all components readily accessible, and no selected transistors or tubes.

It's dependable—practically solid-state throughout and built to exact Tektronix standards to operate efficiently over a wide range of temperature and altitude conditions.

Passband is dc to 6 MHz, with writing speed and triggering capability necessary for bright, steady traces over the entire passband.

Precise linearity and accurate calibration assure exact time and amplitude measurements over the 6 x 10 (¼") division display area—for applications involving even the most complex electronic circuitry.

Type 321A Oscilloscope
(without batteries) . $900
Rechargeable battery set 91.50
Protective carrying case available . . . 30.00

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

for a demonstration, please call your Tektronix field engineer

Tektronix, Inc.

attractions. Fees for such offerings range from $1 to $1.50. Programs are not "edited," and no commercials are carried.

Jerrold "Coloraxial" Schools

Jerrold Electronics is holding a series of Coloraxial schools for TV station personnel and dealers. The Coloraxial concept uses a coax lead-in cable rather than twinlead for superior color reception. The schools include actual demonstrations of the difference between twin-lead and coax.

Boston Herald-Traveler Buys Entron Stock

Boston Herald-Traveler Corp. has purchased 294,315 shares of Entron common stock for $1,300,-284, pursuant to the loan and warrant agreement entered into by the companies in April, 1965. Entron President Robert J. McGeehan said that, in the opinion of the directors of both companies, current investment opportunities in CATV properties are of such magnitude that the financing agreement entered into in April is no longer adequate to accommodate immediate requirements. By exercising the warrant, Herald-Traveler has enabled Entron to double its net worth, and thereby enhanced its ability to employ borrowed funds to purchase additional CATV properties. Mr. McGeehan also noted that Entron's sales and earnings for the first 5 months of '65 are running well ahead of '64.

2,000' Tower for KATV

KATV Little Rock & Pine Bluff, Ark., began telecasting from its new 2,000' tower last month. Along with a new transmitter installed to increase power, the station is expected to project its Channel-7 signal to an additional 200,000 viewers, in addition to improving reception in the present coverage area.

Greater Radio Growth—IF . . .

NAB president Vincent T. Wasilewski, speaking at a meeting of the W. Va. Broadcasters Assoc., said that radio is booming along at an "incredible" pace and will continue to grow and prosper—if it is not smothered by the heavy hand of government. He said it must not be restricted by unnecessary rules nor inhibited by raised eyebrows. A small radio station, smothered by the heavy hand of government, will be converted from an operation serving its community into a producer of completed paper forms for the FCC. Mr. Wasilewski concluded, "Editorializing . . . is one of the keys to radio's future success. A radio station that editorializes on vital issues in a community is a felt force in that community."

TV Network Guide

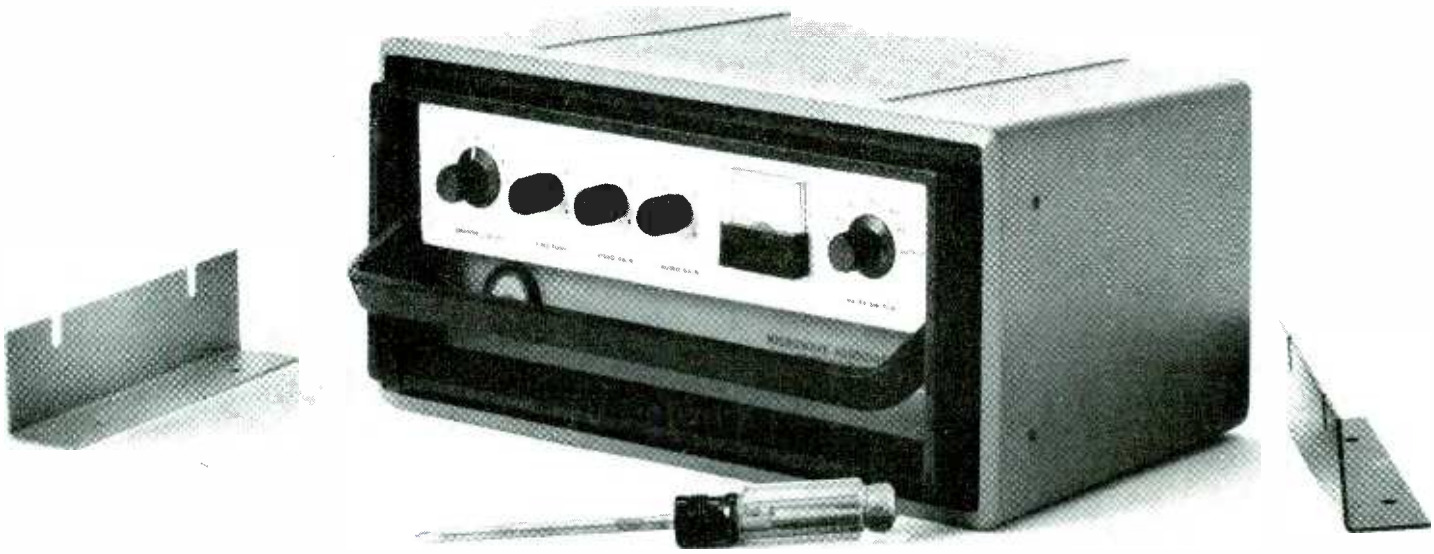
The '65-66 edition of the TV Network Guide has been released by Avery-Knodel, Inc. The Guide has been published semiannually for the last three years, and is now a standard reference source for information on prime-time are available from any of the network programming. Copies eight A-K offices.

700G ETV Contracts

Two contracts totaling $700,000 for special UHF ETV transmission systems have been awarded to Varian Associates, Palo Alto, Cal. Under a $350,000 contract from the Roman Catholic Diocese of Brooklyn, N.Y., Varian's Micro-Link Systems unit will install the largest 2500-mc TV transmission system in the U.S. An additional contract from a major systems supplier calls for $350,000 worth of 2500-mc microwave equipment for installation in school districts and other educational institutions.

NAEB Meet Set

The 41st annual meeting of the National Association of Educational Broadcasters will be held at the Sheraton Park Hotel in Washington, Oct. 31 through Nov. 4. This year's theme is "Educational Broadcasting and the National Purpose." Sharing ideas with broadcasters will be members of the FCC, and officials from the U.S. Office of Education, U.S. Information Agency, and the Department of State. Nearly 1500 educational broad-



"I thought I was an STL."

Only with the brackets on.

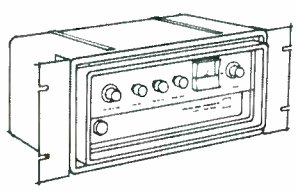
Remove the brackets and the STL becomes a high power, portable, lightweight TV pick up relay.

Put the transmitter and matched receiver on a mountain top — unattended. Give it only 60 watts total power. It becomes one hop of an intercity multi-hop relay link.

So it's an STL — an all solid state STL without klystron, meeting CCIR and FCC video and audio program requirements for color and black and white TV. In the studio, it works with 110 or 220 VAC. As an option, a low noise RF preamp gives extended range systems performance.

But it's more than an STL. In the field, it works with 12 or 24 VDC. It can run on a car battery. It has been flown in helicopters, been bounced in golf carts, newswagons, yachts and jeeps. Very wide band video circuitry assures stable top performance in widely varied environments.

Major TV networks and independents in the United States, Europe, and Latin America, as well as the U.S. military, have evaluated it, tested it, and bought it. Write for details.



Model	Band (Mc)	Nominal RF Power	Nominal RCVR Noise Figure without Preamp db	Nominal RCVR Noise Figure with Preamp db	Allocation
MA-2A	1990-2110	2 watts	10	5	TV auxiliary broadcast, STL, remote TV pickup
MA-6A	5925-6875	1 watt	12	5.5	Misc. common carrier, common carrier TV pickup
MA-7A	6875-7125	.75 watt	12	5.5	TV auxiliary broadcast, STL, remote TV pickup
MA-8A	7125-8400	.75 watt	12	5.5	Government, military, TV & wideband data
MA-13A	12,700-13,200	.1 watt	12	6	TV auxiliary broadcast, STL, remote TV pickup

MICROWAVE ASSOCIATES

Burlington, Massachusetts

Sales Offices: Burlington, Mass.; 9911 Inglewood Ave., Inglewood, Cal.; Hyde House, Edgware Rd., London NW9, England.

Subsidiaries: International Microwave Corporation, Cos Cob, Conn ; Microwave Associates, Ltd., Luton, Beds, England.

casters are expected to convene for four days of lectures, discussions, and panel meetings. The Armed Forces TV Conference will be meeting concurrently. More than 40 exhibitors are planning displays of the latest production and transmission equipment. In addition, samples of outstanding educational radio and television programs produced during the past year will be presented.

Sony Moves NYC Warehouse

Sony Corp. of America, New York, has moved its warehouse and service facilities from 514 Broadway, Manhattan, to larger quarters at 3715 61st St., Woodside, Queens. Sony's new video tape recorder will be handled at the new warehouse and service headquarters.

Gemini 5 News Pool Uses Ampex

The radio and TV news media pool used 6 Ampex AG-350 machines for continuous recording of astronaut and ground control conversation during the Gemini 5 space shot. The units were installed at the network communications center adjacent to the NASA Space Center near Houston, Tex.

TV Homes to Reach 54.4 Million

The number of U.S. TV homes will total 54.4 million by January 1966, according to estimates released by ARB. Using September 1964 as a base, the number of TV homes is expected to increase by 2,723,100 (5%), bringing penetration up to 94%.

Leading in number of TV homes is California, with a projected total of 5,628,700, followed by New York, with 5,459,300. The state with the smallest total is Wyoming, with 100,400. In addition to having the greatest number of TV homes, California is expected to have the greatest gain since last September, some 349,800. Its neighbor across the sea, Hawaii, has the lowest projected gain, 1500.

Although not showing the greatest gain in *number*, Nevada is expected to have a 24.3% increase, from 104,800 to 138,600. Other states showing relatively high percentage gains are South Carolina with 12.6%, and Georgia with 10.5%. New Jersey has the highest penetration, with 98%.

NAMES IN THE NEWS

Walter A. Ullrich has been promoted to product manager of the CCTV and MATV Div., Blonder Tongue Laboratories, Inc. He will have national responsibility for CCTV and MATV systems, including developmental marketing and coordination of sales programs.

George W. Bartlett has been promoted from manager of the engineering department to V-P for Engineering of NAB. The announcement was made by NAB pres. **Vincent T. Wasilewski**, to whom Mr. Bartlett will be directly responsible.

Arthur Stambler has been appointed Special Assistant to FCC Chairman E. William Henry. Mr. Stambler was Senior Associate Attorney with Grove, Paglin, Jackiewicz, et al.

Rex G. Howell has been named chairman of the NAB Editorializing Committee. Mr. Howell is president of KREX (AM-FM-TV), Grand Junction, Colo.

Raymond R. Williams has joined the engineering staff of Jerrold Electronics Engineering Lab. Mr. Williams was previously with Jerrold as a development engineer.

J. Phil Franklin has been appointed director of systems operations for Entron, Inc. Mr. Franklin will be responsible for operations of Entron's owned and partially owned systems, and will serve as advisor and consultant to new system operators. He was formerly V-P and gen. mgr. of South Jersey TV Cable Co., and is president of the N.J. CATV association.

J. Phil Franklin

Vincent Uricchio

Vincent E. Uricchio has been named sales manager for American Cable Co. Inc. according to Donald Atwell, president. Mr. Uricchio was sales manager for H&B Communications and Vumore.

Sam Street, recently of Adler & Street Associates (CATV consultants) has been appointed Director of Public Relations & Advertising, Ameco, Inc.

BROADCASTERS SPEAK

OK. So I'm not management . . . or engineering . . . or purchasing. And I don't spend company funds without first getting grudging approval. But someday I hope to be in that enviable position.

And I enjoy reading BM/E . . . whenever I can snitch a copy that goes to the privileged few. So how much does a subscription cost? I'll pay it, if it doesn't eat up too much of my paycheck.

Douglas E. Caldwell
Frustrated Newsman
WEOL-AM-FM
Lorain, Ohio

So you snitch copies, eh? Tsk, tsk. Maybe the boss has to approve what you buy, but apparently you are in a position to specify. If so, you're qualified to receive your own copy of BM/E—free!

The Southern CATV Association is now compiling a personnel file on persons with TV Broadcast and/or CATV management or engineering experience seeking employment in the CATV industry. Names and addresses, along with qualifications and experience, will be placed in our Association files. Our membership will have free access to this information and will contact individuals directly.

Will you please give our Association a plug? It will assist us greatly in our efforts to accumulate this personnel file.

Robert F. Jernigan, Pres.
Southern CATV Association
711 Hardy St.
Hattiesburg, Miss.

Get ready for a flood of applications, Mr. Pres.

On page 5 of your July issue there is a reference to Electronics Leasing Corp., which leases "turn-key" for UHF's. If you happen to have the address of that corporation, we would appreciate your advising us.

A. L. Stein, Attorney
Washington, D.C.

Try 16 E. 40th St., New York, N. Y. 10016.

I believe BM/E recently published an article describing the conversion of 27-mc Citizens band transceivers for operation in the 26-mc remote pickup band. If possible, I would aporeciate either a reprint of the article or a copy of the issue.

Ian M. Evans, C.E.
KBLF Radio
Red Bluff, Cal.

See the May issue (copy sent)—Mobile News Units on a Shoestring.

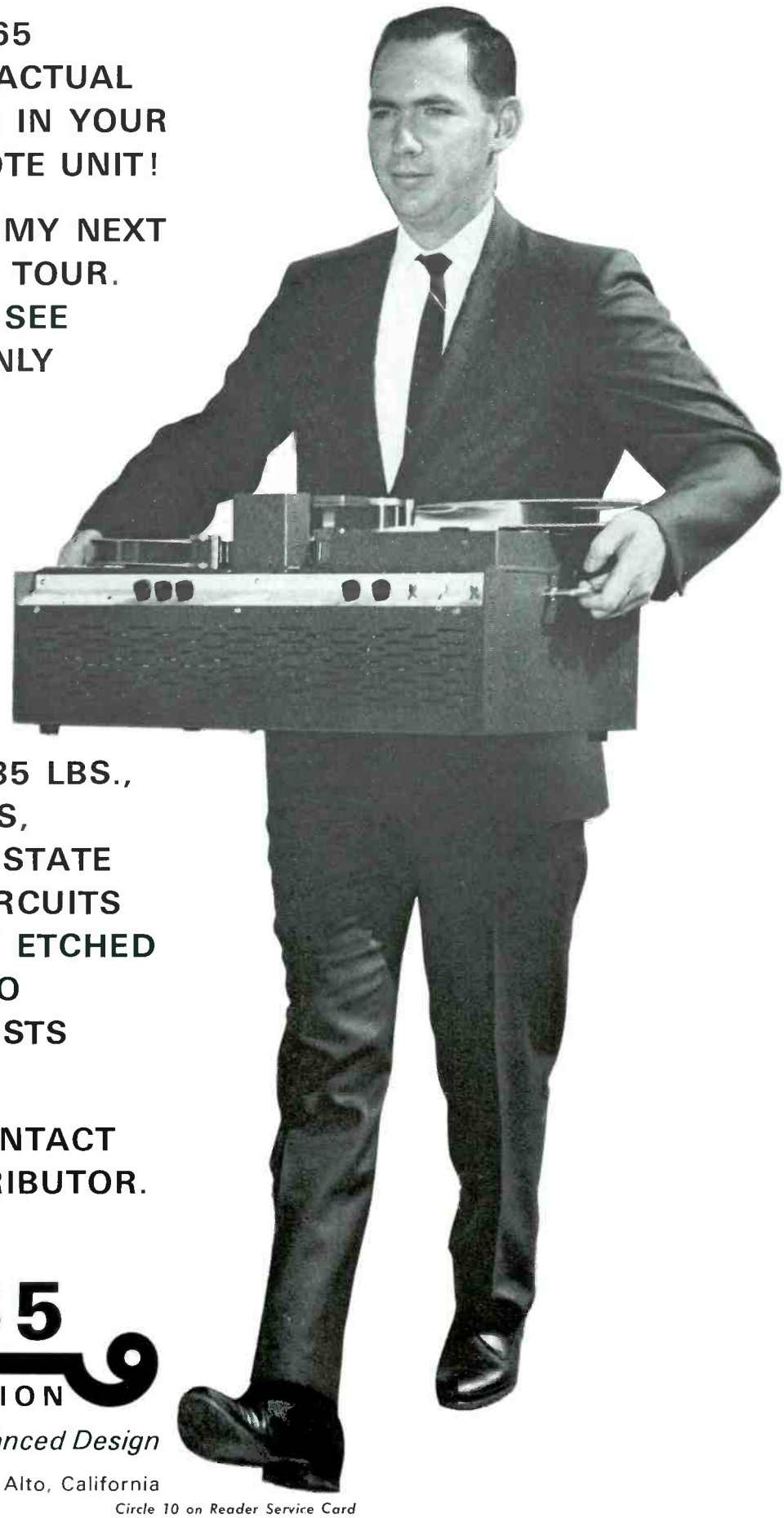
BM/E "Boo-Boo"

Through an oversight, a leading FM antenna manufacturer was inadvertently omitted from the list on page 26 of the August issue. Our sincere apologies to:
Jampro Antenna Co., 6939 Power Inn Rd., Sacramento, Cal. 95828
and General Manager Peter Onnigian.

INTERESTED IN A BROADCAST TV TAPE RECORDER?

I'LL PROVE MVR-65 SUPERIORITY BY ACTUAL DEMONSTRATION IN YOUR STUDIO OR REMOTE UNIT!

I'M SCHEDULING MY NEXT CROSS-COUNTRY TOUR. IF YOU WANT TO SEE AND TEST THE ONLY TRULY-PORTABLE VIDEO TAPE RECORDER THAT MEETS BROADCAST QUALITY, I'LL BRING IT IN.



THE MVR-65 IS SMALL, WEIGHS 85 LBS., MEETS FCC SPECS, FEATURES SOLID-STATE ELECTRONICS, CIRCUITS ON INDIVIDUALLY ETCHED CARDS, DC SERVO MOTORS AND COSTS ONLY $11,350.

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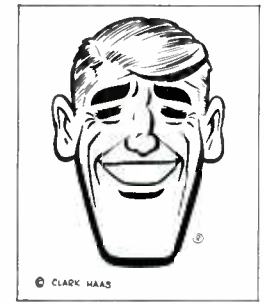
WLYH-TV

WFBG-TV



WNBF-TV

KFRE-TV

G-E 4-V's "color" 94 programs a week—for Triangle

General Electric 4-V color film cameras are now at work for five Triangle stations...providing color for 94 programs a week.

Since late 1963, Triangle has demonstrated its leadership in local color film origination by installing G-E 4-V systems at WFIL-TV, Philadelphia; WNBF-TV, Binghamton, N.Y.; WFBG-TV, Altoona, Pa., and KFRE-TV, Fresno, Calif.

Recently, Triangle decided to install a 4-V at WLYH-TV, Lancaster-Lebanon, Pa. Because of the reliable and highly satisfactory performance of the other four G-E units, Triangle ordered its fifth G-E 4-V...even though there is now a competitive 4-V unit on the market.

This is the kind of customer acceptance that will put more than 100 G-E 4-V's on the air by autumn. No other manufacturer can even approach this record of field-proven performance and market approval. For details on television's most-accepted 4-V color film camera—the G-E PE-24—contact your G-E Broadcast Equipment Representative, or: General Electric Company, Visual Communications Products, #7-315, Electronics Park, Syracuse, N.Y. 13201 (Phone AC 315, 456-2105). GE-17

Visual Communications Products

GENERAL ELECTRIC

Electronics Park, Syracuse, New York

Circle 11 on Reader Service Card

INTERPRETING THE

FCC RULES & REGULATIONS

High Power Translator Stations

ON JULY 7, 1965, the Commission amended Part 74 of the Television Broadcast Translator Station rules to permit high power TV translator operations on unoccupied assignments in the Table of Assignments. In effect, this amendment provides for 100-watt VHF translators that *would exceed the Grade B contours.*

The old rules permit UHF translators (up to 100 watts) on Channels 70 through 83 only. The new rules will permit them on other UHF channels as assigned in the Table.

The FCC asserts that it has received numerous inquiries requesting licensing of unattended TV translator stations on VHF channels, which are presently unused but assigned in the Television Table of Assignments. While there are very few such assignments in most of the country, there are a number of them available in the far west. For example, there are eleven commercial unoccupied VHF assignments in Montana. The people in this state have utilized all the available means of obtaining television service—VHF and UHF translators, CATV's, and regular television broadcast stations. However, due to the small population in the principal cities of the state, it has not been found economically feasible to build and operate regular TV stations on the available channels. Often, service from other states and even from Canada is brought in as the only service available.

The contention has been made that if an inexpensive method can be found to permit building TV stations in communities for which channels are available, existing stations may find it feasible to construct stations in these communities. Such stations could eventually develop into regular television stations, similar to satellites that have no means for local programming and merely rebroadcast programs of another station. Moreover, such translator stations would provide a better service than is available in cases where programs are brought in over long distances, with one translator rebroadcasting the signal of another translator. Additionally, the new rules would encourage the introduction of local rather than out-of-state programming, and would relieve many rural people of the economic burden of providing funds for numerous small translators. There has been much success out of such high power and unattended translator stations in other countries, notably Canada.

Use of such stations would provide the first direct off-the-air TV service or choice of service in many areas. Their operation and construction would be relatively inexpensive, since they would not have to generate a standard TV signal. In fact, the only difference between low power and high power VHF translators is the increased cost due solely to the higher power. Since such translators would operate on channels already in the Table, there would be no undue problem with interference to other TV stations. Due to the relatively low power used, 100 watts peak transmitter output, the transmitter standards and specifications can be the same as for low power VHF translators. The Commission sees no reason why such stations should not be authorized on UHF channels as well as VHF. While the Commission will consider such translator operating applications from non-broadcasters, it will prefer ownership and operation of such stations by licensees of regular TV stations.

The Commission believes it desirable to permit nearby station licensees to operate high

New Translator Rules In Brief

In brief, the amended Rules, adopted July 7, 1965, are as follows:

1. They permit VHF translators of 100 watts transmitter output power on any channel listed in the Table of Assignments unoccupied by a regular TV station or satellite.
2. They permit UHF translators of 100 watts transmitter power on any channel listed in the Table of Assignments and unoccupied by a regular station or satellite. The old rules limit such translators to Channel 70 through 83.
3. The new rules **do not** permit **all** VHF translators, including the present 1-watt VHF translators, to increase power to 100 watts. They refer only to those VHF assignments presently in the Table of Assignments in Section 73.606(b) not now occupied.
4. High power translators will be licensed to regular TV station licensees, or to other qualified parties upon a showing that they have available technical personnel qualified to insure that no interference will occur to other radio services.
5. An authorization for a high power translator would in no way preclude the grant of an application for a regular or satellite TV station.
6. The previous rule, prohibiting existing TV stations to extend their Grade B coverage by means of VHF translators, has been modified to the extent that such translators could be used on the remaining VHF assignments in the Table —about 65 in the U.S.
7. Objections to such high power translators from regular TV licensees will be treated on a case-by-case basis.

power translators, even though they may be located beyond their predicted Grade B contours. In the areas in which VHF channels are unused, this may well be the only manner in which such stations will be constructed and operated. Additionally, the number of unused VHF assignments is quite small—approximately 65 in the conterminous U. S.—therefore, the impact of such operations should not be very great. The Commission will treat objections to the use of high power translators from regular TV stations on a case-by-case basis.

The Commission has adopted rules whereby, after manufacturers have submitted information needed for type acceptance, it would process applications for TV permits for VHF and UHF translators with powers up to 100 watts transmitter peak output, provided they specify presently unoccupied commercial assignments in the Table of Assignments. These stations will be licensed under Part 74 to regular TV station licensees only, or to other qualified parties upon special showing. They will have a secondary status; that is, if and when an application is filed for a regular TV broadcast station, the latter will be processed in the normal manner. *The high power translator licensee will also be given an opportunity to file a competing application* to convert the station to a regular broadcast station conforming to all the Rules. If he does not elect to do so, his 100-watt operation must terminate upon grant of program test authority to the other applicant. ●

The FTC and Deceptive Claims

Investigations by Congress and the Commission have disclosed widespread misuse of audience survey results, use of unreliable survey data, and tampering with and distortion of survey results, resulting in deception concerning characteristics of radio and TV audiences. The Commission believes that, to avoid such deception, the following guidelines should be observed:

1. Anyone making claims concerning important characteristics of an audience is responsible for its truthfulness. He assumes responsibility for interpreting audience survey data accurately, and should not attempt to distort or inflate such data. It is also improper to cite or quote from survey data in such a way as to create a misleading impression of the results, as by unfairly basing audience claims on results achieved only during certain periods, or on a survey of only a segment of the total potential audience.

2. Audience data are based on sample surveys not derived from complete measurements of audiences. Therefore, claims should be accompanied by a disclosure that figures cited or quoted are estimates only, or are based on estimates.

3. Claims should not be based on data obtained in a survey that was not designed, conducted, and analyzed in accordance with accepted statistical principles and procedures, reasonably free from avoidable bias, and based on a properly selected sample of adequate size. Also, claims should not be based on survey data that does not reliably reflect *current* audience coverage.

Sony targets the sound you want

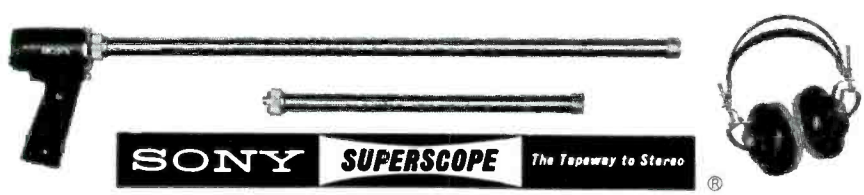
Telemike Exclusive: Built-in Monitor Facility*

Now, with *three* readily interchangeable sound tele-probes, similar in principle to changeable telephoto lenses, you can 'zoom' in from varying distances for the precise sound you're after. The 18-inch probe may be used for 'close-ups,' as far back as 75 feet from the sound source; the 34-inch probe from 150 feet. A 7-foot probe is optional for distances beyond 150 feet.

*The most unique feature, a Sony exclusive, is the built-in, battery powered, solid state monitoring amplifier in the pistol grip handle, which assures the operator that he is transmitting the source with pin-point accuracy.

OTHER FEATURES, OTHER USES: The new Sony F-75 Dynamic Tele-Microphone is highly directional at the point of probe, with exceptional rejection of side and back noises (35 to 40 db sensitivity differential). Recessed switching allows quick selection of impedances (150, 250 and 10K). The uniform frequency response, controlled polar pattern, and unprecedented rejection of background noise eliminates feedback interference in P. A. systems.

The complete Sony F-75 Tele-Microphone includes two sound probes, 18 and 34 inch lengths, monitoring pistol grip handle and the Sony dynamic headset, all in a velvet-lined compartmentalized carrying case, for *less than* **$395.** For specifications and a catalog of the complete line of Sony microphones, visit your nearest Sony/Superscope franchised dealer, or write: Superscope, Inc. Dept. 86, Sun Valley, Calif. *The best sound is Sony.*



Circle 13 on Reader Service Card

Part 2—
An evaluation
of more
sophisticated methods,
including
tone modulation
and telemetering.

By Leo G. Sands

Planning To Go Remote? Here's Help!

MANY CONTROL and metering functions can be performed by the use of tones. Tone pulses can be designed for single ON-OFF and sequential operation and the use of FSK tones will perform multiple tasks on the same tone frequency.

Mr. Sands is a consultant based in New York City.

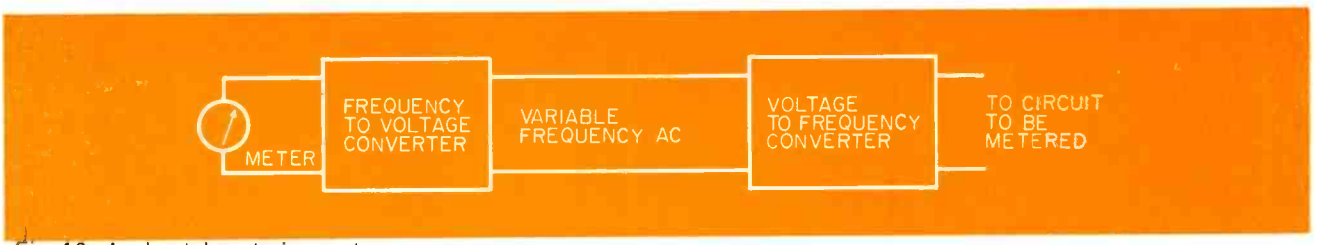


Fig. 10. Analog telemetering system.

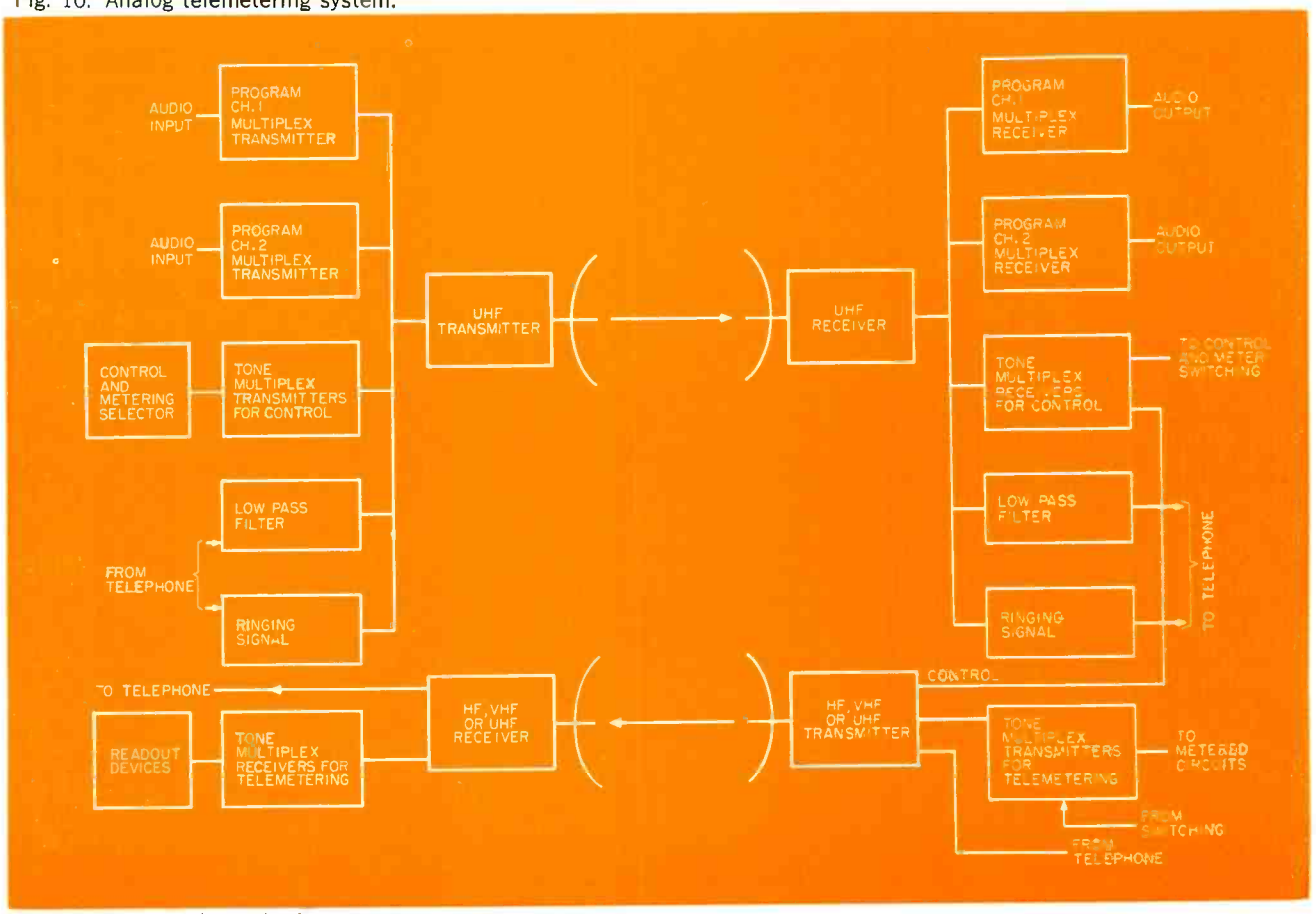


Fig. 11. Radio link block diagram.

ON-OFF and FSK tone equipment is available from several manufacturers. Any combination of ON-OFF and FSK tone transmitters and receivers and common power supply may be stacked in a 19-inch relay rack to accommodate the desired number of modules. In lieu of the power supply module, or as its standby, a 12-volt battery may be used as the power source.

An ON-OFF or two-state FSK tone channel can be used to transmit GO-NO/GO intelligence (mark and space signals). A three-state FSK tone channel can be used to transmit such commands as forward-reverse, up-down, fast-slow, increase-decrease, etc. A combination of these systems can be used to transmit more complex intelligence, including quantitative information, by coding the tone pulses or varying their duration, repetition rate or relationship.

In addition to keyed tones, there are tone systems which convey quantitative information by stepless variation of the tone frequency. As shown in Fig. 10, the tone frequency is varied by changing the voltage applied to the tone transmitter. The output of the tone receiver is a DC voltage which is proportional to frequency. For telemetering, the DC voltage to be measured (reduced if necessary) is applied to the tone transmitter and the value of the voltage is read on a meter connected to the output of the tone receiver.

Current is measured in the same manner by connecting the tone transmitter input to a series resistance in the circuit being monitored. RF and AC can be measured by rectifying it.

A variable frequency tone channel occupies more space than a keyed tone, and thus fewer can be accommodated within the same transmission band.

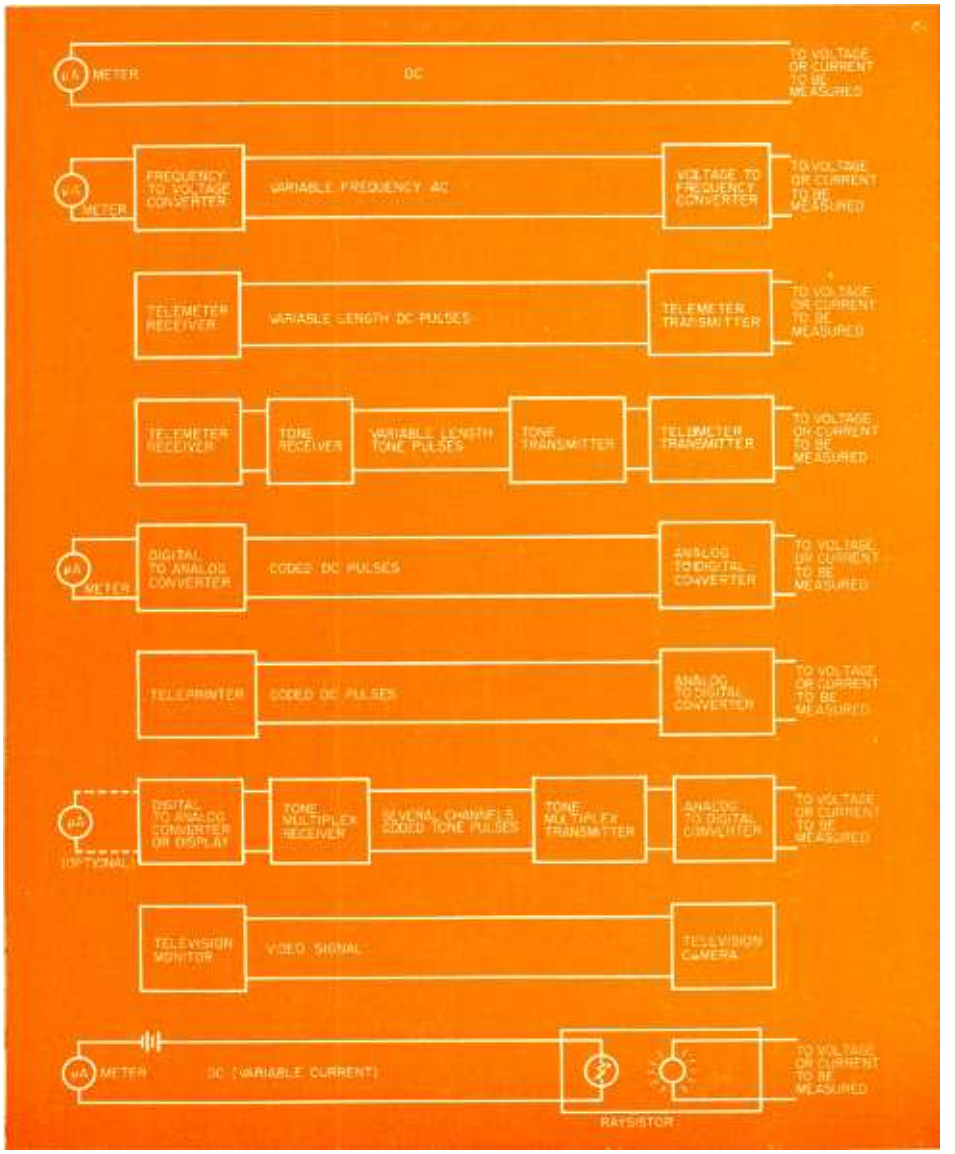


Fig. 12. Block diagrams of various telemetering circuits.

Radio Links

An 890-960 mc band radio link can accommodate all of the required circuits. An FM radio link licensed under Part 4 of the Rules may employ up to ±200 kc FM frequency deviation and, when employing a 4:1 deviation ratio, can accommodate up to 50 kc of intelligence.

A two-way link (Fig. 11) provides the same amount of band space in both directions. When broadband transmission is required in only one direction, the transmitter-to-studio artery may be a DC, 15-cycle, or voice grade wire line, or a narrow band radio link.

The narrow band radio link could operate in the 72-76 mc band, except when close to a TV station operating on TV channel 4 or 5. Or, it could operate on one

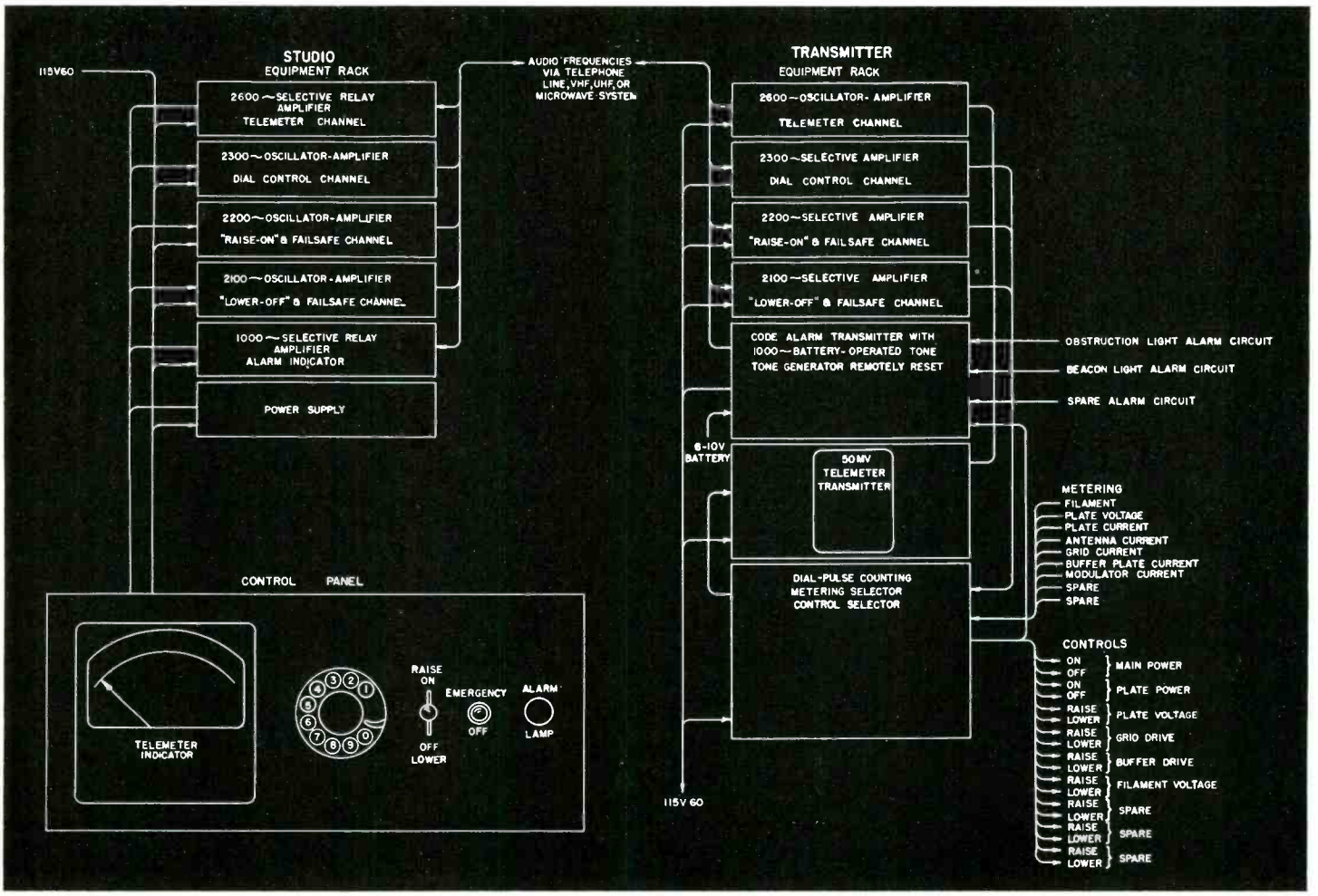


Fig. 13. Block diagram of control and telemetering system compatible with wire line or radio link.

Manufacturers and Suppliers of Remote Control Systems

Company	DC Wire	Tone Wire	STL/Radio
Bauer Electronics San Carlos, Cal.	X		
Budelman Electronics Corp. Stamford, Conn.			X
Collins Radio Dallas, Tex.		X	X
Gates Radio Quincy, Ill.	X	X	X
Marti Electronics Cleburne, Tex.			X
McMartin Industries Omaha, Nebr.			X
Metro-Tel Corp. Westbury, N.Y.			X
Microwave Associates Burlington, Mass.			X
Moseley Associates Santa Barbara, Cal.	X	X	X
Radio Corp. of America Camden, N.J.	X	X	X
Rust Corp. Everett, Mass.	X		
Schafer Electronics Burbank, Cal.	X		
Trepac Corp. of America Englewood, N.J.	X	X	X

of the 26-mc channels on which 30 watts input power and any kind of emission can be employed as long as band occupancy does not exceed 8 kc. The transmitters may be remotely actuated. Licensing would be in the Business Radio Service on a shared basis with other services, with no guarantees against interference.

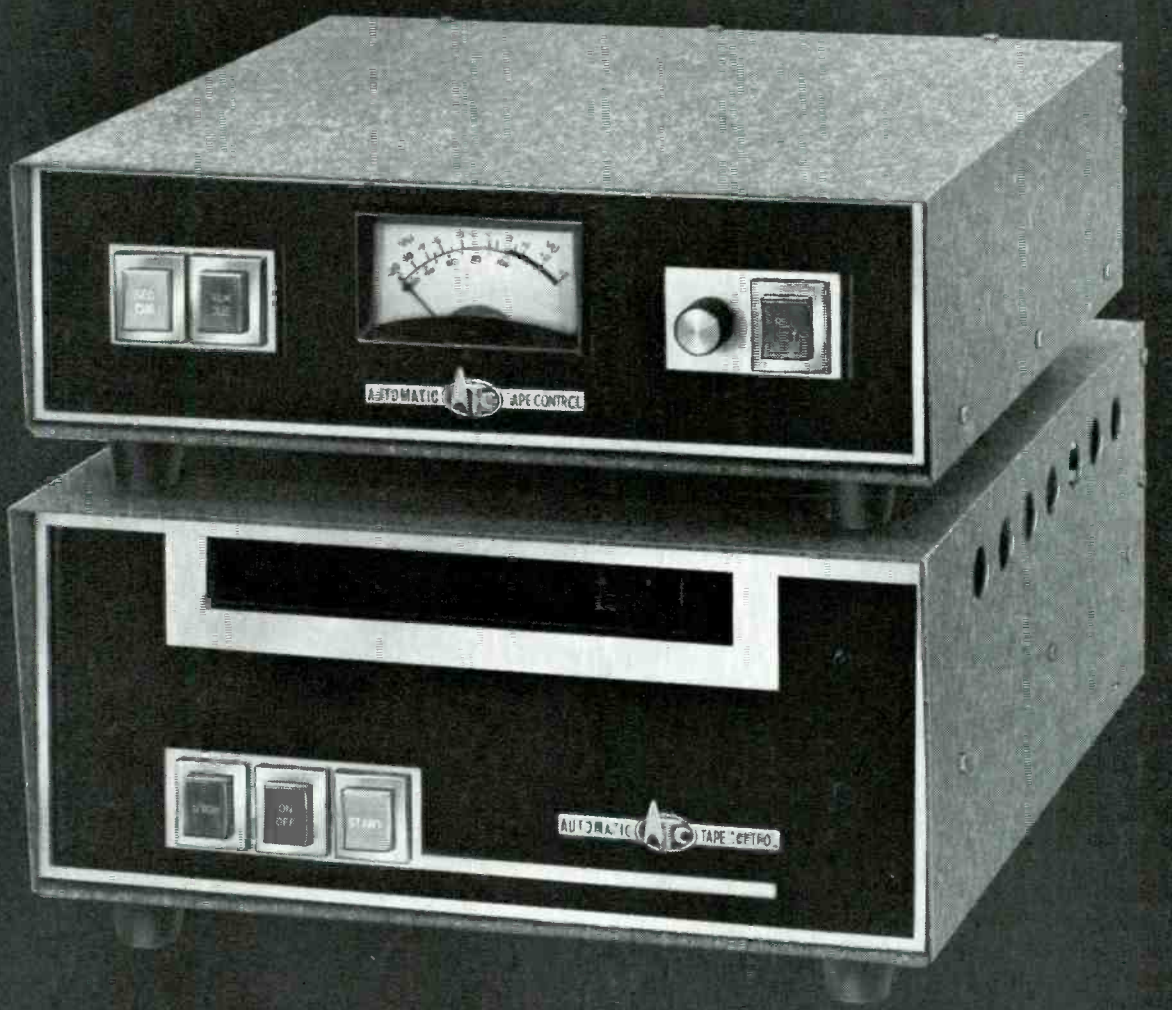
Special narrow bands of frequencies are also available in the 25-50 mc and 150-174 mc bands to business radio applicants on a developmental basis. Any kind of intelligence may be transmitted within the specified frequency limits.

Or, the return link could operate on one of the 48 Class-A Citizens channels in the 450-470 mc band using up to 60 watts input. Class-A stations may be remotely controlled. For example, a tone could be transmitted from the studio via the broadband link, which would turn on the narrow band transmitter when a meter reading is made or control function is verified.

Continued on page 47

New work horse of broadcasting from ATC

The all new Criterion tape cartridge system has become the new standard of the broadcasting industry. In broadcast installations all over this country and abroad, the Criterion system is supplying reliable tape information around the clock, day after day, year in year out. The all new solid state Criterion series has been designed to give the broadcaster the After Delivery Economies which mean more profits through superior performance.



☐ Completely transistorized. ☐ New direct capstan drive, quiet solenoid, plug-in connections and modules. ☐ Choice of one, two, three-tone and stereo operation ☐ Available in side-out rack mount or slim-line, slide-out desk console. ☐ Conforms completely with recently adopted NAB standards.

For complete details phone Area Code 309-829-1228

AUTOMATIC ATC TAPE CONTROL

1107 E. Croxton Ave. Bloomington, Illinois

Circle 14 on Reader Service Card

Adding a CATV Information Channel

By Lyle O. Keys

Here is what a recent survey shows information channels are doing for cable systems.

THE ADDITION of a 24-hour information channel on CATV systems has changed the lot of fishermen, hunters, pilots, and farmers who start their day at an hour which finds the rest of humanity comfortably pounding the pillow. Previously, this hearty group was forced to wait for a radio announcer to give weather data which they urgently needed before embarking on a day's activities.

Now, increasingly popular time/weather information TV systems provide continuous readings on wind velocity and direction, barometric pressure, rainfall, temperature, relative humidity, time-of-day, and in more sophisticated installations, both 24-hour and 5-day local forecasts.

Information channel service has been in use by CATV systems for over four years. It is believed that the first installation was conceived and developed by a CATV operator in Hybbs, N.M. Various commercial versions have been developed since that time, and the industry has standardized on systems which utilize a vidicon camera mounted on a motor-driven pedestal in the center of a semicircular platform. The camera scans back and forth, picking up the weather dials, etc.

The most sophisticated systems have proven to be most popular, perhaps because different people concern themselves with different aspects of weather—fishermen may be preoccupied with barometric pressure, whereas a farmer or gardener is interested in cumulative rainfall, while others may be concerned with relative humidity. Public demand also requires wind velocity, and temperature indicators; thus, a complete time/weather display requires six meteorological instruments plus a clock.

These dials indicate existing conditions, but do not provide weather forecast information. The sophisticated system must therefore have a means of displaying weather forecast information, preferably as provided by the nearest U. S. Weather Bureau station. In the case of at least one system, a weather forecast card is provided which contains eight apertures. Behind each there is a preprinted loop of paper. Four of the slots are used to present the 24-hour forecast, while the other four are used for a 5-day forecast, indicating wind, temperature, precipitation, and cloud conditions.

In addition to time/weather data, some units include a shadow box and projection screen in order to display promotional, public service, and in some cases advertising slides. A projector satisfactory for continuous operation is required, with the addition of thermal protection devices and a means of automatically controlling lamp voltage. This is done by automatically switching the projector bulb from a variable transformer source which provides approximately 90 volts when "on-camera" to a low voltage source which provides about 15 volts to the bulb when "off-camera." Heat build-up is thus reduced while bulb life is extended. The low voltage while "off-camera" minimizes the thermal shock which otherwise occurs when turning the lamp on and off.

Standard 35mm slides are available from various sources, but most operators have found it desirable to obtain their own

Mr. Keys is president, Tele-Mation, Inc., Salt Lake City, Utah.

Results Achieved With CATV Information Channels

Many system operators include the 24-hour information service in franchise applications as a proposed public service. Of this group, the majority felt the inclusion had a material effect in the granting of the franchise. Systems that added the service after they were operational noted significant gains in the number of new drops (from 3% to 11%). Systems going into operation with an information channel reached their saturation points in a 10 to 20% shorter time than those who did not—in two cases, even when local TV stations came into the market. 71% of the systems utilize an information channel as a public service vehicle. Of these, 62% utilized the slide feature, 30% utilized the live feature, and 8% other. 96% carried background music along with time/weather video. Of those carrying music, 53% utilize off-air FM stations, 36% used tape libraries, and 7% other. 8% carry sponsored features, with commercial slides and weather forecast sponsorship.

means for making up slides. This provides a CATV operator with an easy means of keeping his public informed of program changes and special events, as well as an effective method of displaying promotional material. Various automatic programmers are available to permit the system operator to further exploit the slide projector. The simplest of these programmers causes the camera to pause at the projection screen after each scan, while a series of slides is exposed. This multiplies the promotional value of the weather display without materially affecting viewer interest.

Another type of programmer presents Bingo by interspersing Bingo numbers with the other slides. Bingo cards are passed out by participating merchants. The programmer causes the slide projector to cycle through all 81 slides at predetermined 2-hour intervals throughout the day. The housewife selects a convenient time to watch this display and sees about 70 promotional, public service, or commercial slides. while catching the 10 or 11 Bingo numbers. Enough Bingo numbers are inserted to provide one probable winner per day among the number of outstanding cards. Different numbers are used each day, and at the end of the week enough additional numbers are programmed to provide one probable black-out winner. Prizes consist of credit for merchandise at participating stores.

In addition to slides, many operators are multiplexing 16mm film on their information channel. Many others take advantage of a live telecasting feature, wherein the weather forecast card can be removed from its slot to permit the camera to pick up live action. A few systems present regular newscasts, etc., but most use this feature to carry topics of public interest such as council meetings, live public service announcements, and educational discussions. Often the service is used to inform subscribers of incoming video difficulties, a practice which has decreased complaints by as much as 90%. Public service messages, local sports scores, and capsule news are presented via "limited live" facilities. The most valuable aspect of this service to CATV operators is that for the first time they can use their own medium to directly communicate with customers, while providing a locally-originated service not otherwise available to the subscriber.

As information channel service graduated from the "Rube Goldberg" and "Mickey Mouse" stage, it has begun to unfold broader and more profitable potentials. Future uses need only be limited by lack of vision, or failure to promote the functions of this new media. ●

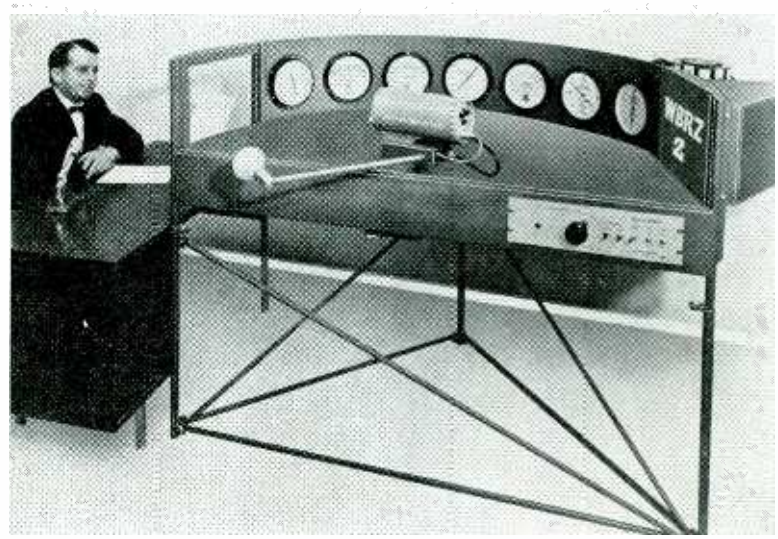
Information Channels Serve Broadcasting Too!

The unattended operation feature of information channel equipment lends itself to TV station use, particularly during late evening and early morning hours. Since weather is generally of more interest during the early morning hours, a station is able to offer the time/weather information service to advertisers at an attractive cost per thousand. Typical sponsors are power companies desiring to reach the weather-conscious farmer, sporting goods stores who want to make inroads with fishermen and hunters, or large industrial employers seeking to reach shift workers during their waking hours.

For broadcast application it is necessary to convert the industrial camera commonly used in CATV installations to EIA RS-170 standards. This is accomplished by using an EIA camera control unit and a video processing amplifier.

Time/weather systems lend themselves to participating sponsorship. One sponsor might be listed in the space provided on the weather forecast card, while other sponsors' messages and station promotion slides are automatically displayed by means of the slide projector. Available programmers permit multiple slide exposure between instrument presentations. A different type programmer expressly designed for broadcast applications permits televising of "weather quickies" throughout the day. The programmer is operated by tally light voltage from the station's video switcher. When placed "on-air" the camera makes one pass of the weather instruments, stopping at the projection screen which carries a sponsor's message.

Information channel equipment also serves as an adjunct to regular live weather programs, usually by having the camera make one scan of the instruments as the announcer gives the readings.



Information channel system used at WBRZ, Baton Rouge, La. for one hour each morning resulted in excellent viewer response. The local weather bureau is quite happy with the installation, too, since it has practically eliminated phone calls from forecast seekers. In addition to the on-camera instrument readings, a tape recording of the weather forecast over background music is used on audio.

Planning a Successful UHF Operation

by William Lowell Putnam

Some guidelines from the world's foremost proponent of high-channel telecasting

MAKE A SUCCESS of a UHF station? It's very simple—if you've got enough money, if you hire the right people, if you buy the right gear, if you put on the right programs, if you pick the right market, if you pick a good transmitting site, and if you're lucky. That's all *anyone* needs!

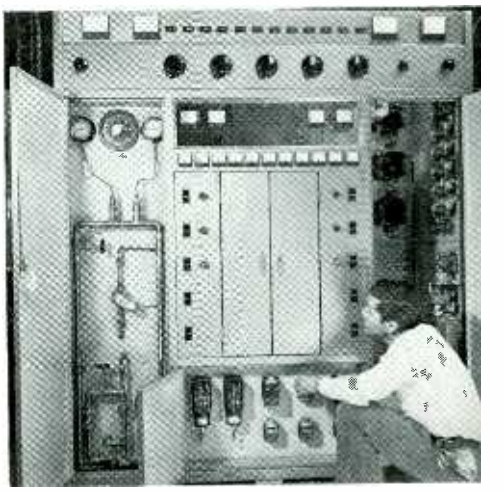
There was a time when UHF—as differentiated from VHF—posed very serious problems. Any allocation on Channel 13 or lower was bound to be successful, and anything 14 or higher was bound to lose. There were many who testified at great length before the Congress and the Commission on these problems. According to these experts, the problems were all technical—there were no insuperable political or economic problems. The almost comical thing was that all these experts were hired by people who never operated UHF stations. The most profound statements, swallowed whole by a gullible Commission, were made by people who knew nothing about the matter and who were parties in interest—interested in restraining competition, that is.

The market place has always determined commerce, ultimately. Granted technical developments in UHF transmitter and antenna design were left dormant while VHF was advancing. But this was solely due to lack of incentive—a fact graphically borne out by recent revelations as to when certain patents were first taken out. The All-Channel law changed many of these things, and it's possible to look at station opportunities in a broader sense—although, of course, the record indicates that a fair number of VHF stations, which didn't have all the criteria for successful operation, managed to die within the last dozen years, in addition to the larger number of UHF stations whose darkenings were more effectively publicized.

The Pattern for Success

In planning a UHF operation, I would say that the first consideration should be to make sure your signal will cover the market you intend to serve. If you do not have the transmitter, the antenna, and the tower height, you are never going to make it. But this first consideration is closely followed by the second, which is to have the right programs. If you've got something that people can see only on your station—and it's really worth seeing—problems of signal coverage can be partially overcome. In addition to these two major criteria, there is the matter of personnel—sales personnel, management personnel, operating personnel.

Once your engineering and programming package is in order, you're ready to fight the battle of Madison Avenue in order to make ends meet. Effective and aggressive sales people are the only answer. National rep firms, unfortunately, can only read numbers. This is because their customers can only read numbers printed by ARB or NSI. And these numbers tell only a small part of the story—a good salesman can tell the rest. A rating tells you, hopefully with some degree of accuracy (a highly debatable matter), how many receivers are turned on during your program. It doesn't say how many people were attentively watching each set, and it doesn't say how many people actually saw the commercials, and it doesn't say how well they were motivated, and, of course, it doesn't say how long the motivation



High-power UHF klystron amplifier manufactured by Townsend Associates.

Kitty Broman, hostess of evening feature program, "At Home With Kitty," has been dubbed "first lady of television" in the Northeast.

About the Author

William L. Putnam, age 41, is President and General Manager of Springfield Television Broadcasting Corp., and has been a successful operator of UHF stations since 1953. He was the principal organizer of the Springfield firm, which received a CP in July 1952 and went on the air with WWLP on March 17, 1953—the first UHF station in Massachusetts and the second in New England. WWLP was the second UHF station in the country to use a high-power (12 kw) transmitter, and the first to receive a license.

Mr. Putnam has since guided the expansion of this corporation to include WRLP (Ch. 32) Greenfield, Mass., Brattleboro, Vt., and Keene, N. H.; WJZB (Ch. 14) Worcester, Mass.; WKEF (Ch. 22) Dayton, O.; WENS-TV (Ch. 22) Pittsburgh, Pa.; and Translator W81AA, White River Junction, Vt. He is also 50% owner of WJHF (Ch. 28) Raleigh, N. C.

Mr. Putnam has been among the foremost advocates of UHF: Chairman of the Committee for Competitive Television and of its successor, the Association for Competitive Television; Director of the Television Allocations Study Organization; and member of the Executive Board of the Committee for All-Channel Broadcasting. He is the acknowledged spokesman for UHF and has testified at every hearing involving UHF by any Senate or House Committee in the past six years, and likewise at all FCC hearings on the subject.

A Word From John A. Fergie, Mgr., WKEF Dayton

Every station operator, of course, is interested in holding down overhead, but costs are more critical for the UHF operator. The fact that he must watch his operating costs more closely, however, does not mean that his station's prog am quality should suffer, or that he should become an inferior entity in the community. Achievement of success is made more difficult when a large V competitor is shooting news film in color and has 90 "stringers" to support an extensive news staff. The viewer, however, cannot tell how large a staff it takes to produce a program. Moreover, he is only interested in the content of the program and its quality. This is indeed a fortunate circumstance for the UHF operator, for through clever programming and distribution of manpower he can become a serious competitor.

Our Channel 22 operation in Dayton reflects much of the modern concept in UHF telecasting gained through years of experience. Our studio and transmitter facilities, for example, are located together, effecting considerable savings in the engineering payroll. On the other hand, of course, UHF operators have the advantage—for the time being, at least—of being able to use remote transmitter control. Aside from the savings incurred by being able to operate with fewer personnel, there is the decided ease of communication and coordination. Our master control and transmitter facilities are located in the same room, and the engineering personnel that maintain the transmitter logs also switch and run audio network and live productions.

Further savings at WKEF have been realized through the use of 1½" vidicon studio cameras. Left on 24 hours a day, we have obtained over 5,000 hours tube life, with none of the stickiness or graininess associated with orthicons.

Using a Townsend Associates transmitter, WKEF maintains an ERP of 500,000 watts video and 100,000 watts audio. Through the use of new high-powered klystrons, it is relatively easy to maintain rated power output, passband, and stability over long periods. This is a far cry from just a few years ago, when tetrodes and earlier vintage klystrons were able to achieve the passband but not the rated output.

WKEF—on the air from 10 AM to approximately 1 AM—schedules programming from CBS, ABS, and NBC, as well as Sports Network. Through the use of a Xerox 914 copier and Flexoline frames and strips, changes in the prog am log are made almost instantaneously, and kept up to date as orders are received. Weekly avail sheets are handled in a similar manner. With this traffic control system, the traffic department is handled by one man.

Traffic also assumes the responsibility for printing all operational forms, monthly program schedules, letterheads, envelopes, etc. The traffic manager also doubles, as needed, as cameraman on early morning live productions.

lasted. These are things that the sales manager of Brand A really wants to know, but somehow, the time buyer of agency X never seems to care. He is under orders to make the assumption that viewers of a program automatically mean buyers of Brand A. The sales manager will often and unhappily tell you, *it ain't necessarily so*! And the aggressive sales manager of the struggling station has the job of telling the time buyer, it ain't necessarily so. Most buyers don't like to hear this. It forces them to exercise initiative and take responsibility —occasionally, a fatal undertaking. Anyhow, it's much easier to read numbers.

Local Selling is the Key

It is my opinion that in most markets where UHF stations will be coming on the air in the next few years, the major source of revenue will be from local merchants. The reasons for this are manyfold. First, VHF stations have, in large part, abdicated the field by their intensive solicitation of the national dollar. Second, V rates are generally far higher than local merchants care to pay. Even though circulation may be high enough to have a favorable CPM, based on NSI and ARB arithmetic, CPM has to be usable, and the local man doesn't care about reach—he needs results! Third, the local advertiser can find much more to assimilate in a local program; we believe in strong local programming, in addition to the usual news-sports-weather routine. Granted, it's costly, but it breeds loyalty you'll never get any other way. A word of caution, though; guard your local clients carefully. They don't care about rating, and they'll be with you forever, if you do right by them.

When we realized in 1958 that national advertisers were shying away from our UHF facility in Springfield, and its companion station in Keene, N.H., because of the greater "reach" of our newly arrived VHF competitors, we decided to institute a merchandising program that might counter the trend and save some of our income. Today, we install in-store displays, insure distribution, solicit broker support, and do everything we can to counter

John Quill, WWLP meteorologist, who at this writing has delivered more than 11,000 weather forecasts.

Tom Colton (r.) is host of "Western Mass. Highlights."

the exaggerated claims and statistics offered by competition. We now find that our merchandising not only accounts for dozens of orders received through the normal channels of national sales, but, interestingly enough, also for a number of sales made directly to local contacts, who, like other local accounts, care not a whit for statistics and ratings. All they need to see is *results*. Strong local effort, sustained over a period of time, *does* bring results, and loyalty. Only a few national advertisers are capable of the discrimination required to exhibit this kind of loyalty, or respond to it; local people are often incapable of anything else.

Programming Concepts

To oversee your programming you need a manager who is smart enough to know that you have a substantial audience for hockey, and so he somehow finds a means of getting hockey on the air, rather than baseball. These are points that the Commission emphasizes, because they want to know if you've made a real analysis of community needs. Unfortunately, "community needs" to the Commission generally means how many clergymen or educators have you talked to—not how many baseball fans. Clergymen and educators are pretty poor viewers and add very little to the statistics that time buyers go for, and they add practically nothing to the statistics that bookkeepers go for. Furthermore, dealings with them always seem to be on a one-way basis. It's usually a case of what have you done for them lately.

In regard to local programming, it is important to be consistent. The temptation to thrash wildly about comes often when bills are high and income is low. There are countless people who will say this or that program should be changed. Often they are right, but more often they are wrong.

It is very important to consider very carefully the gaps in the fare already available to your town, and then to fill these gaps. Do not lose confidence because of the first low ratings; if you felt you were right when you set up a program, ride it all the way, have confidence. This expression, I find, is one I have used so often that my employees often accuse me of knowing no other. But, we have had confidence in our program concepts and personalities to the extent that they are now among the antiques of the industry. At our Springfield station, WWLP, our woman's hour has been hosted by the same lady for over 2600 weekday hours. Our evening local feature program has run with the same local sponsor for the same number of quarter hour visits and with the same host. Our professional weathercaster has delivered some 11,000 weather forecasts, and while he may have flubbed a few, this is a record that no TV station in the world can match. There is no evening feature host like ours anywhere; our Kitty is the first lady of television in the Northeast. Each of these people has suffered through low ratings, many times, but they have survived all competition, and they carry large and loyal followings, and sponsors.

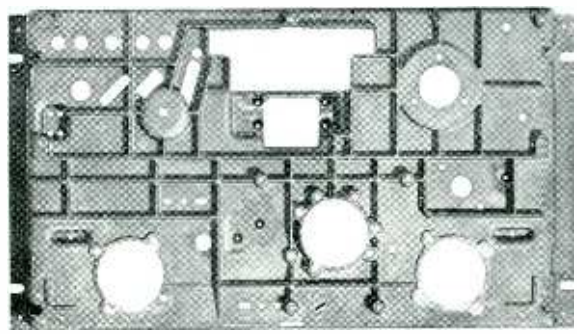
Good Engineering is Vital

From 1955 to 1963, major equipment manufacturers didn't care a bit about developing transmitters and antennas for UHF television. Their effort went into VHF, where the dollars were—and, of course, into studio equipment, which anyone could buy. We were blessed with competent engineers from the outset, and therefore were able to overcome this difficulty by doing our own development work. The abdication of the major equipment manufacturers has given us a place in the sun, and we now feel we know a great deal more about UHF transmitters than anyone. We learned most of it the hard way—trial and error.

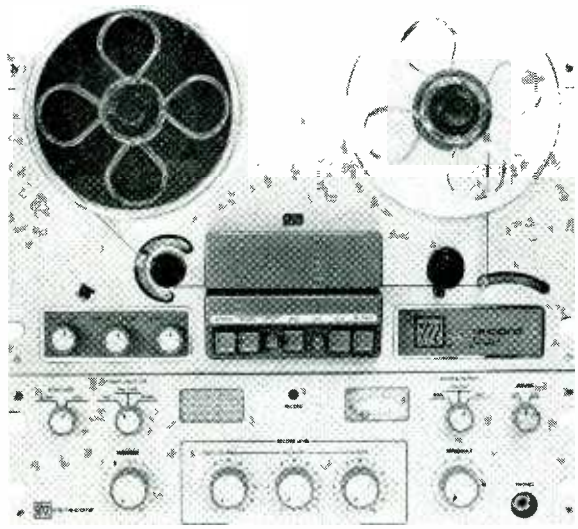
Naturally, you have to have adequate tower height, but this does not mean sheer altitude; it means "apparent height" over the market. If you're going to be 30 miles away from the town you want to serve, you'll need absolute altitude in order to have an apparent height above the town. But if you're right in close, you can get the same apparent height with a much smaller tower. Thus, the new station operator must determine where he really has to have a signal, and then really make sure he puts it there. That means adequate transmitter power.

We don't recommend exceptionally high gain in antennas, since we have learned that this often leads to dead spaces in what turns out to be the most

Continued on page 45



DIE-CASTING

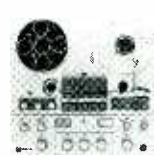


[RHYMES WITH LASTING]

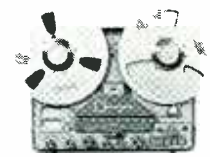
■ Quality in a professional tape recorder has got to last. That's why a sturdy, solid die-cast main plate backs up famous Magnecord durability.

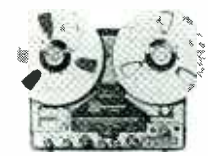
Only a solid die-casting can provide rigid support and stable alignment of assembled parts. Mounting holes and bases are molded in for perfect uniformity between each instrument, insuring precise location and smooth operation. This extra strength in a Magnecord reduces wear to a minimum, cuts down-time and lowers maintenance cost.

Casting about for a professional tape instrument that is broadcast-ready and stays that way? Write for our new brochure featuring the complete line of Magnecord recorder/reproducers.


Model 1021 $708


Model 1022 $788

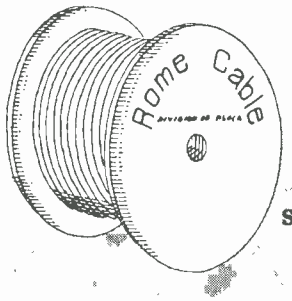

Model 1028 $995


Model 1048 $995

Magnecord SALES DEPARTMENT
MIDWESTERN INSTRUMENTS, INC.
Subsidiary of Telex Corporation / P. O. Box 1526 Tulsa, Oklahoma 74105

Circle 24 on Reader Service Card

Now! All the Rome CATV cable you



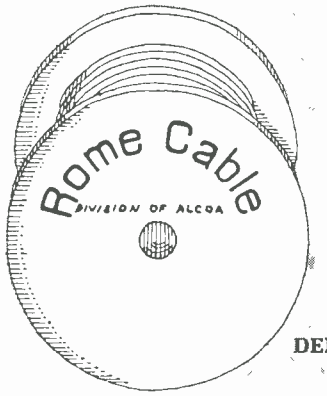
SEATTLE

This simple fact has two important benefits that should mean a lot to you.

You stand to save a considerable sum in shipping costs.

And you get CATV cable whose performance and uniformity are in a class by themselves.

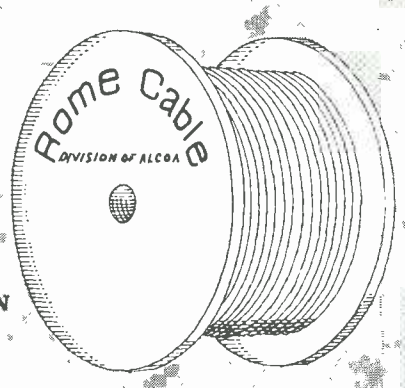
Availability. Let's take the question of deliveries first. It's essential for fast-growing CATV networks to know where their next reel of cable is coming from, and when. Otherwise, crews stand around idle and subscription fees are sacrificed.



LOS ANGELES

DENVER

ST. LOUIS



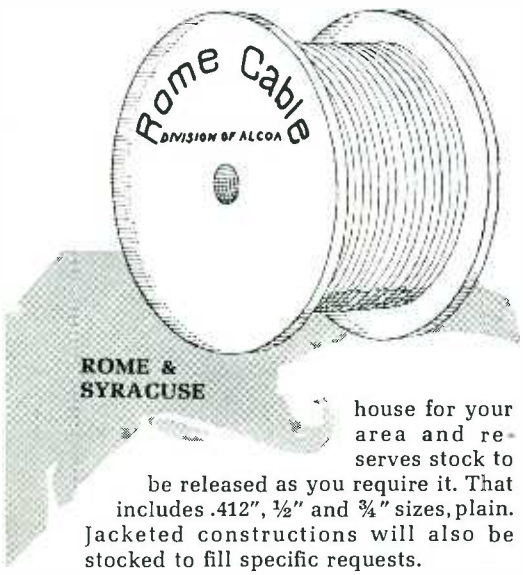
HOUSTON

ATLANTA

want from nearby Rome warehouses

Rome Cable isn't going to let this happen to you. We're stockpiling Rome Unifoam* CATV cable around the country in strategically located warehouses. So we're in an ideal position to help you mesh your cable requirements with fast, on-time deliveries.

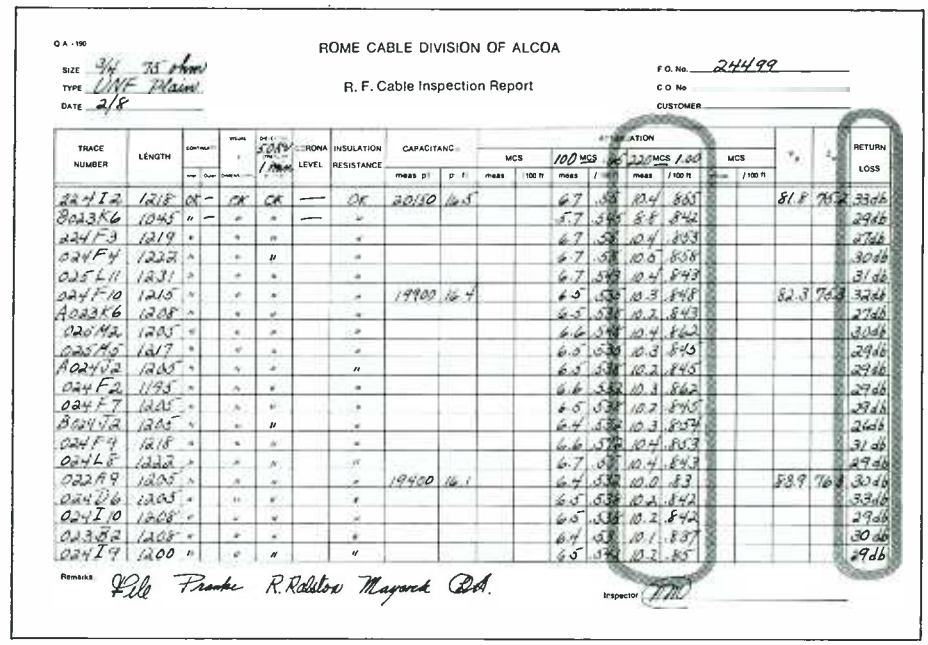
All you do is contact the Rome representative and outline your needs. In turn, he gets in touch with the Rome warehouse for your area and reserves stock to be released as you require it. That includes .412", ½" and ¾" sizes, plain. Jacketed constructions will also be stocked to fill specific requests.



Significant Savings. These custom-tailored deliveries definitely bring down the price of the cable. We sell FOB warehouse freight prepaid and charge. So you don't pay shipping costs from our New York plant. Unless, of course, you're in the Northeast yourself—in which case shipping charges are nothing to worry about.

Now—About Rome Quality. Don't think that quality is merely a matter of guarding your subscribers from eye-strain while they follow "Bonanza." CATV cable quality means dollars in—or out—of your pocket. Cable uniformity and a low level of attenuation values let you eliminate repeaters from your system. And one extra repeater can wipe out anything you save with a less than Rome-quality cable.

What's a Rome-quality cable? The sort of cable you can infer from the typical test sheet on this page. It comes from a recent production run of ¾" cable and it's indistinguishable from hundreds of others you'll find in our Inspection Department—where we examine every single reel of Rome Unifoam.



ROME CABLE DIVISION OF ALCOA

R. F. Cable Inspection Report

F.O. No. 24499

TRACE NUMBER	LENGTH	CONTINUITY	VISUAL	DC RESISTANCE	CORONA LEVEL	INSULATION RESISTANCE	CAPACITANCE		ATTENUATION 100 MCS			ATTENUATION 220 MCS					RETURN LOSS
									MCS		100 MCS			220 MCS			
							meas pf	pf/ft	meas	/ 100 ft	meas	/ 100 ft	meas	/ 100 ft			
224I2	1218	OK	OK	OK	—	OK	20150	16.5			6.7	.55	10.4	.855			33db
B023K6	1045	"	"	"	—	"					5.7	.545	8.8	.842			29db
224F3	1219	"	"	"		"					6.7	.55	10.4	.853			32db
024F4	1222	"	"	"		"					6.7	.55	10.6	.858			30db
025L11	1231	"	"	"		"					6.7	.545	10.4	.843			31db
024F10	1215	"	"	"		"	19900	16.4			6.5	.535	10.3	.848			32db
A023K6	1208	"	"	"		"					6.5	.538	10.2	.843			27db
026M2	1205	"	"	"		"					6.6	.544	10.4	.862			30db
025M6	1217	"	"	"		"					6.5	.539	10.3	.845			29db
A024V2	1205	"	"	"		"					6.5	.538	10.2	.845			29db
024F2	1195	"	"	"		"					6.6	.542	10.3	.862			29db
024F7	1205	"	"	"		"					6.5	.534	10.2	.845			29db
B024J2	1205	"	"	"		"					6.4	.532	10.3	.857			26db
024F9	1218	"	"	"		"					6.6	.542	10.4	.853			31db
024L8	1222	"	"	"		"					6.7	.55	10.4	.843			29db
022A9	1205	"	"	"		"	19400	16.1			6.4	.532	10.0	.83			30db
024Q6	1205	"	"	"		"					6.5	.534	10.2	.842			33db
024I10	1208	"	"	"		"					6.5	.538	10.2	.842			29db
023B2	1208	"	"	"		"					6.4	.53	10.1	.837			30db
024I9	1200	"	"	"		"					6.5	.539	10.2	.85			29db

Remarks: Rib Franke R. Ralston Mayored QA

Inspector

Since we've already mentioned low attenuation, let's look at the attenuation column. Notice that we check every length at both 100 and 220 mc. In itself, that's nothing remarkable. What is an eye-opener is the uniformity of the results. Under 220 mc, for example, they don't stray below 0.830 db/100 feet or above 0.862. They average 0.847. And all measurements are within ±2% of this average.

If any single length exceeds 1.0 db/100 ft. @ 220 mc, it's strictly no-go as far as Rome is concerned.

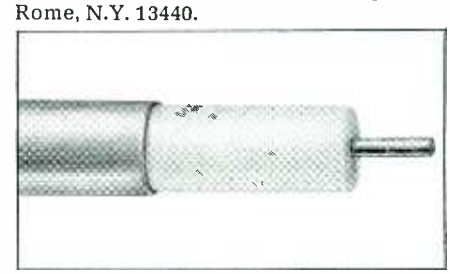
Return Loss. We're equally intolerant toward tolerances in the return loss column. Check it and you'll see that values range from 26 to 33 db down. Actually this represents the *poorest* return loss found in a given length at any frequency between 20 and 220 mc. Moreover, we check each length from both ends and no length gets by us with less than 25 db return loss at any frequency tested. This means an essentially smooth sweep test over the entire range.

So, when we stamp Rome Unifoam on the cable, it means that you get the transmission efficiency you expect and don't even have to test it yourself to make sure.

We also test for capacitance, impedance: the works. In fact, you might say that there's a complete report card on every length of Rome Unifoam we sell and we'll gladly show it to you at your request.

Physical Uniformity, too? Yes, we even go that far in our relentless pursuit of perfection. We check the surface and diameter of the copper conductors. And the over-all dimensions of the cable, so you can make consistently reliable splices, taps and terminations. Even the very cell size of the polyethylene foam insulation, which assures you of reliable electrical characteristics for every length.

Full Facts: Fast and Free. When cable this good gives you the best availability, you owe it to yourself to study it in more detail. You'll find all the information you need in our folder on Rome Unifoam Cable. For your copy, call your nearest Rome/Alcoa representative or write Rome Cable Division of Alcoa, Dept. B105, Rome, N.Y. 13440.



This is the Rome Unifoam CATV cable used in the majority of installations: unjacketed, unvarying, unbeatable.

*Rome Unifoam—Trademark of Rome Cable Division of Alcoa.

Rome Cable
DIVISION OF ALCOA

Circle 15 on Reader Service Card

By E. Mitchell Shulman

ULTRAMODERN STUDIO FOR KW DAYTIMER

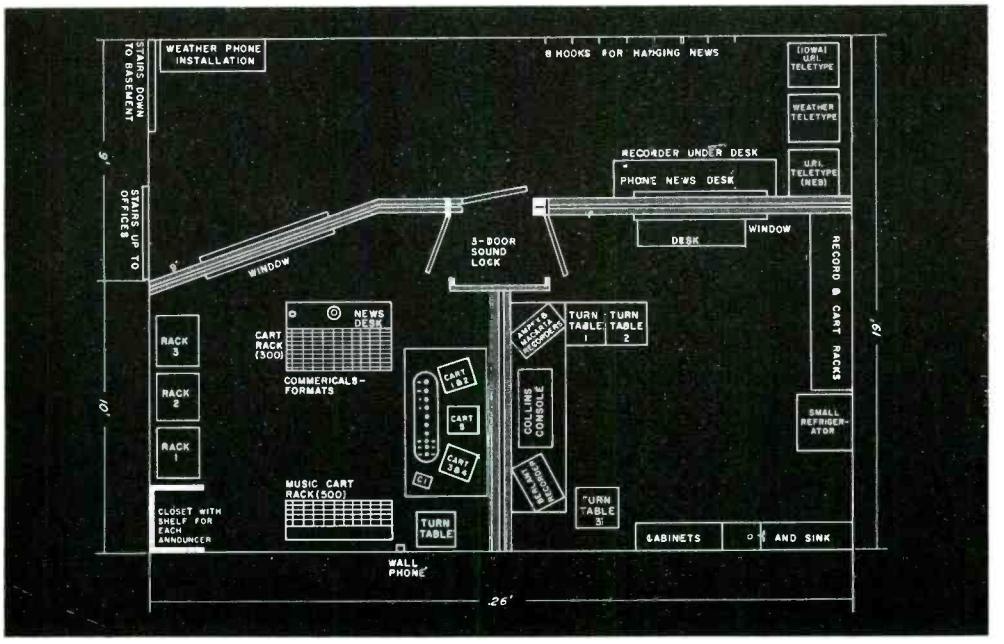


Fig. 1. Layout of KRCB studio complex.

A compact, modern studio, plus complete news and production facilities, in a 19′ x 26′ space—for a cash outlay of only $5,000!

CUSTOM 9-channel built-in board, five cart machines, 800 carts in easy-reach racks, complete news and production facilities in a 19 by 26′ space—for a cash outlay of about $5,000. This was our goal in November 1963, after much thought, the target evolved by the management, programming, and engineering staff of KRCB. Construction of these facilities started December 1, 1963, without blueprints, much less an architect's services. January 2, 1964, less than five weeks after the first carpenter raised his eyebrows at the instructions from KRCB Operations Manager, the entire studio complex was operational.

After 18 months, the total list of staff suggestions for improvement is, "Wouldn't it be nice if we could have another tape recorder and maybe another cart machine back in the production room." We have a tight modern format with a minimum of errors and little operator fatigue; ratings and business have climbed several hundred per cent.

Mr. Shulman is Operations Manager, KRCB, Council Bluffs, Ia.

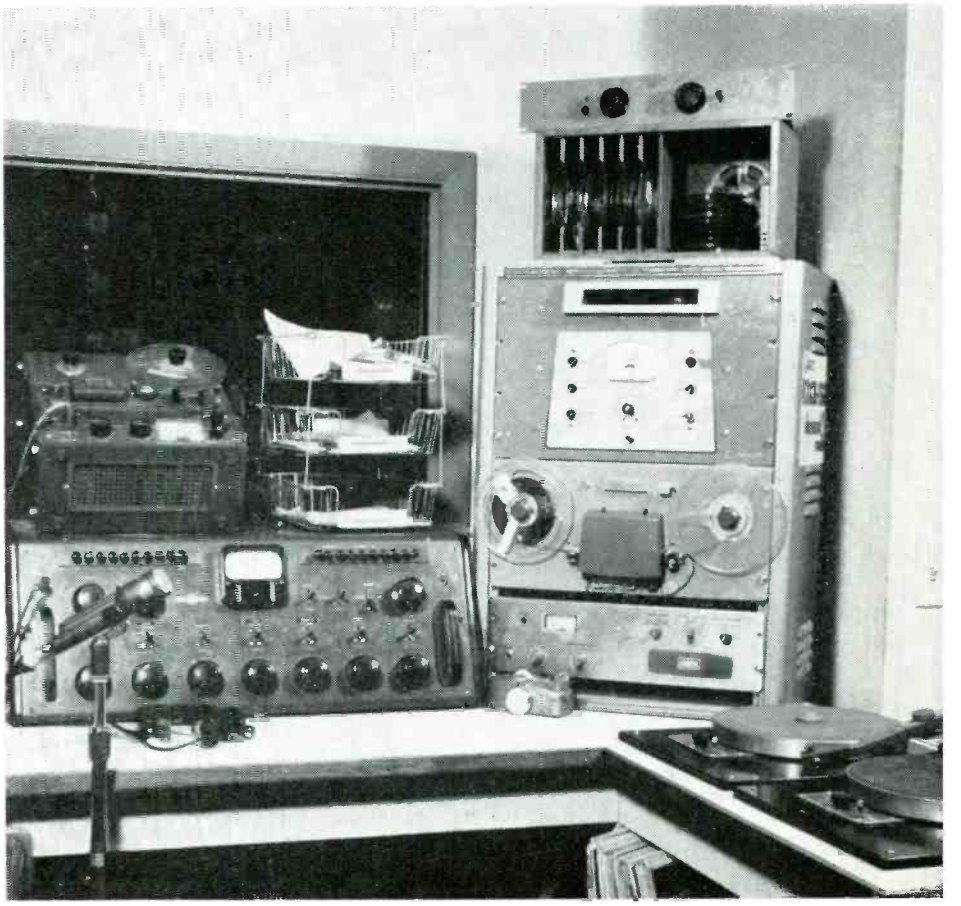
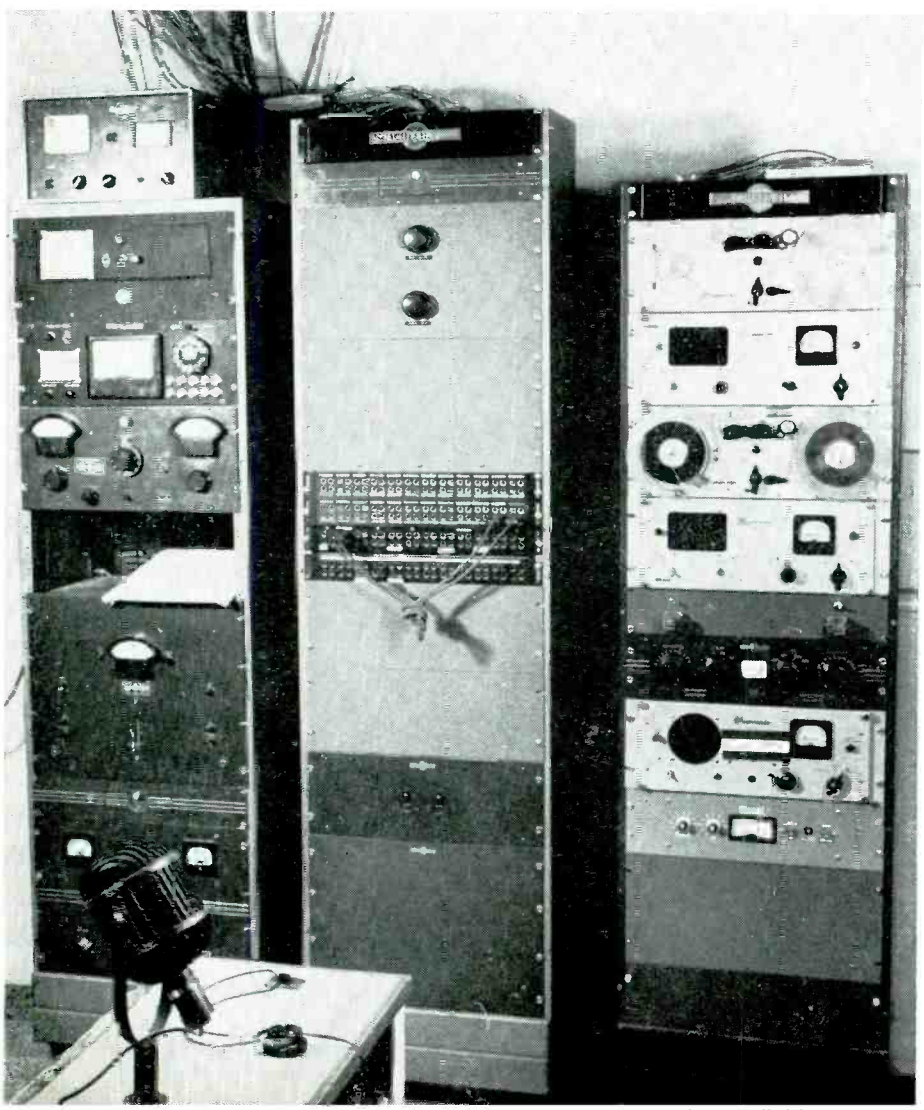


Fig. 3. The production studio. RCA turntable at lower left, and similar one in air studio, are mounted on casters so that either or both may be used in either studio as needed.

Fig. 2. Combo operator's position in the air studio.

Fig. 4. Rear wall of air studio, looking past news desk-cart rack unit to the three equipment racks.



Before plunging into studio construction, a basic management philosophy—linking programming needs, physical plant, and technical facilities—is necessary. Can your physical layout and technical equipment efficiently broadcast the format you have in mind? Watch your boardmen operate. If an operator is in frenzied motion all through his shift, just barely able to keep up with the format, the plant is not efficient and frequent on-the-air errors will occur.

What We Started With

In November 1963, when the present management took over KSWI and changed the call to KRCB, the physical plant was a Quonset hut at the transmitter site, with one studio about 9 by 9′ and a tiny 3 by 5′ announce booth. In the "big" studio were two turntables, three tape machines, one Spotmaster, and a Collins 212-B 7-channel console. Beside the transmtiter was a U.P.I. News teletype. The "announce booth" had two hi-fi type turntables and a Collins 4-channel remote amplifier. The station owned another Collins 212-B console from the good old days when they had downtown studios, and also a Rust remote control unit. We maintained the old format of announcer-selected, middle-of-the-road music and rip-and-read-news—with perhaps some improvement as we added a few features. We restricted the music play list to weed out some of the who-ever-heard-it-before music, and provided incentive to tighten up the operation, while we mulled over a format suitable to our 7-station Omaha-Council Bluffs market.

Before the month was over, we arrived at a decision to program for the young adult audience. A listing of what elements would be aired during each minute of a typical hour was made, and then it was time to begin a paper layout of studio space and equipment suitable for broadcasting this format.

Planning Facilities to Suit Format

We have the unusual situation wherein the Operations Manager is the Chief Engineer, the Program Director, and a combo-announcer all rolled into one,

which perhaps made it easier to derive a layout that satisfied programming needs without seriously disturbing the engineer. We visited a station with a similar format several hundred miles distant and benefitted from their successes as well as from their difficulties. A downtown building in a suitable location was leased. We had some luck—there was a rear room 19′ x 26′ with a 10-foot beamed ceiling and terrazo floors. We hoped to convert this into the entire air-news-production complex.

After much thought, the layout shown in Fig. 1 was evolved. One possible difficulty was that teletype machines were adjacent to the production studio wall, and sound leak-through might be a problem. Also, there was not room for a separate "announce-booth" for a news man, or a production studio isolated from the production control room. The Operations Manager, wearing his Programming hat, insisted over management objection that the newscaster could work in the same studio as the board operator with greater ease than in a separate booth, and that if the on-air announcer could announce while working his own control board, the production studio could certainly operate in the same manner. Putting on his Engineer's cap, he ventured an educated guess that a double wall, properly constructed, would drop the teletype noise to inaudibility. With some trepidation, construction commenced.

The telephone company was consulted and provisions were made to get the necessary cables into the equipment-rack area. The decision to run all wiring overhead, leaving the terrazo floor undamaged, meant installing enough conduit above the ceiling for 60 pairs of wire from the racks to the console area and the production studio, and the installation of all pairs (with both ends of each wire numbered!) in the conduit. One ceiling tile over the racks and one over the console are arranged trapdoor fashion so that additional wiring may be installed in the future. All wiring is brought out through ceiling boxes over the racks and wall boxes behind the on-air and production studio consoles. Belden "Beldfoil" #8450 cable was used.

Wearing both hats, the Operations Manager sat mumbling to himself, moving his hands through the air in a sort of a spastic hula. He was acting out the part of an announcer trying to put our newly conceived format on the air, trying to visualize equipment requirements.

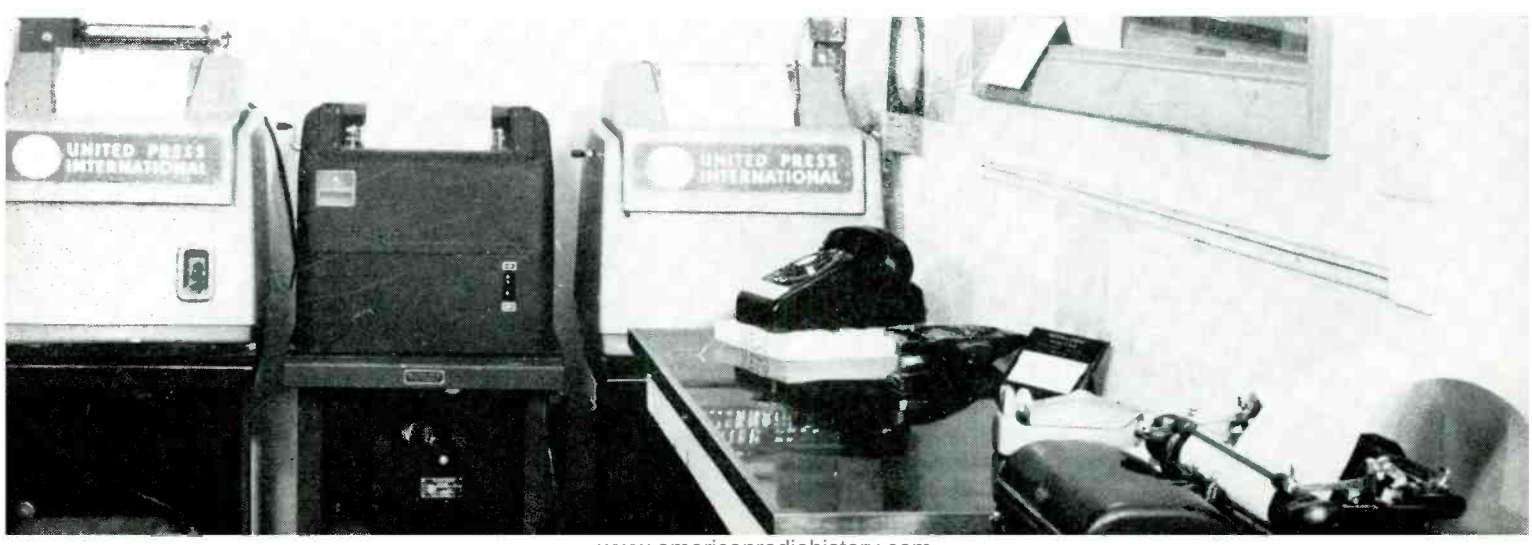
A few days and nights of this put his wife and family in a frenzy, but the idea of completely disassembling the Collins console evolved, mounting all tubes, power supplies, amplifiers, master gain controls, etc., in a rack, and building a panel into the desk containing only the "pots" and switches. Cost and availability showed the plan feasible from the economic and engineering viewpoints, and most attractive from the annoucer-boardman viewpoint.

Plans were drawn; Switchcraft Series 25,000 lever switches were chosen for several reasons: they were small enough not to project so high as to be in the way; they were illuminated from below with light that changed color with each different position of the switch (which helps reduce errors); and Switchcraft would build them to order with any necessary contact arrangement, even going so far as to offer non-tarnishing palladium contacts for audio circuits and heavier coin-silver current-carrying contacts for relay and control circuits on the same switch. Their Series 15,000L push buttons and the small size Series 4200 were the right size to really get a finger on, had internal light bulbs that could be used to signal machine operation, and on special order could be supplied in several colors. Rotary switches were standard Centralab items. The "pots" were from the Collins console, plus two more similar units obtained surplus. The panel itself was a 32″ x 10″ sheet of .090 thick aluminum obtained locally.

Boardman's Setup

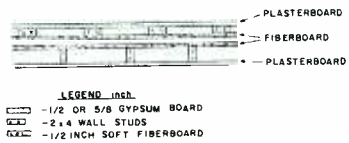
Engineering to a specific format, we set up the 9-channel console as follows: First channel, news mike; second channel, boardman's mike (Switchcraft provided switches for the two mikes that had only "on" and "off" positions—no chance for the announcer to switch his mike to "audition" instead of "on-the-air"); Third, fourth, fifth, and sixth channels each for one cart machine with no switches, just a push button for starting the machine and a "pot" to control volume (again no possibility of being in "Audition" instead of "on-the-air"); the seventh, eighth and ninth channels are equipped with an audition-off program switch, a pot, and a selector switch above the pot.

The 11-position selector switch chooses the input to the channel and gives the operator selection between two Magnecorder tapes in racks, two turntables on either side of the operating desk, the center (#5) cart machine, or three jacks in the patch panel



Details of Studio Construction

Rough sketch of double-wall studio construction. One set of 2x4 studs are set the narrow way so that the wall takes less space. A layer of mastic underlies the floor plate—the 2x4 underneath the studs—to give a sound-proof seal between wall and floor. There



is about 1" space between the inner fiberboard panels so that mechanical thumps or wall movements will not be transmitted from one wall to the other. The only places the two walls come into contact are at the door and window frames. The 2x4's are on standard 16" centers and are not shown to scale.

The studio soundlock doors are standard home exterior doors with a single pane window. The double doors are quite soundproof, and the windows help prevent collisions inside the soundlock, as well as make unnecessary installation of any lighting fixture in the soundlock. Decorative ¼" plywood was used over the plasterboard; it looks better and has a less sound-reflective surface. Ceiling is acoustic tile with a double layer of 3" fiberglass insulation. The 2 panes of glass in the studio windows are installed with tops 1" apart and bottoms 5" apart; sound striking glass is reflected upward into sound-absorbing ceiling.

Each 12' x 13' studio is illuminated by a single overhead fixture containing 4-96" fluorescent tubes using interference-free ballasts. 30 foot-candles of light is available in all areas where an announcer works. Air studio walls are non-parallel and the unsquare shape of production studio reduces the "in-the-barrel" sound.

Fig. 5. News production area in 6' wide hallway adjacent to production studio.

which are used for remotes. There are still three unused positions on these switches. Four decks make possible another unusual feature which makes the operator's life even more convenient—the remote start circuits are switched along with the audio circuits. To air or audition a pre-cued tape or record, the operator pre-sets the selector switch to the desired sound source. When the audition-off program switch is moved from the center-off to either audition or program, the tape or turntable will start. To the right of cart machines #3 and #4 is a small inexpensive 7-station transistorized intercom, used between studio and offices, which doubles as a talk-back circuit for remote broadcasts.

The copy book is kept directly in front of the announcer on a stand on top of the center cart machine. The VU meter is housed in a small case atop the right-hand cart machine. The two red lights on either side of the VU meter are cue lights, operated from the auxilliary tone circuits of the cart machines, to show the operator when a spot or record has ended—a real aid in tight cues and error-free air work. The two bulbs are in parallel so that if one burns out the other will still work. They are operated at a slightly lower than normal voltage, and after more than a year in use the original bulbs were still in service.

A Western Union clock on the wall serves mainly to check the accuracy of a $6.95 "digital readout" electric clock on top of cart machine #1. The announcer makes fewer errors giving time from a clock that says "2:27," compared to a standard round clock face.

On either side of the announcer are cartridge racks. The tall one to his right has room for 500 tapes and is used mainly for music, plus a few format items. On the left is a double-purpose rack. Its slant height was calculated to allow room for 300 carts, while its vertical height is exactly the same as the main desk. The 12" wide top is covered with Formica, as are all other studio and news working surfaces. There is a 12" deep shelf 4" down from the top, on the side away from the announcer, and the back of the unit is not enclosed. It very conveniently doubles as a newsman's air-desk from the rear and a cartridge rack from the front. A Switchcraft 15,000L push button on top of the unit is connected to a reverb circuit for use on news datelines. The microphone has a cough switch on the base. This is simply a small Switchcraft 4200 push button that shorts the two mike leads together and acts as a completely clickless method of shutting off the mike.

On-Air Studio Layout

At the back of the studio are three racks containing the transmitter remote-control system, frequency monitor, modulation monitor, all console and speaker amplifiers, two Magnecorders, and other assorted gear. As there was really not enough room to give passage behind the racks for servicing, they were mounted on heavy-duty commercial casters which have handled the weight extremely well. It is a pleasure to be able to get at the rear of an entire rack without working in a confined space.

Another service feature not yet mentioned—the console panel set in the announcer's desk can be lifted out of the desk by pulling up on any two knobs. There is enough slack in the wires so that the panel may be turned upside down for servicing while the engineer is seated comfortably in the announcer's chair.

To minimize down time, all audio circuits are normalled through the patch panel, so that any defective unit can be bypassed with a couple of patch cords. Spare preamplifiers also appear on the panel. If the preamplifier connected to the announcer's mike goes dead, a couple of patch cords in the right place substitute a spare preamplifier, and operation continues normally.

Production Studio Layout

The production studio was not subject to so much detailed planning, as any error caused by human-engineering would simply mean retaping, rather than an error in full earshot of the listening audience. Equipment from the transmitter studio was put to good use here. A Collins 212-B console was installed as is. Two good RCA turntables were installed in cabinets with heavy-

duty casters so they could be used in either studio as needed, and two low-cost hi-fi type turntables were installed in the console table. A portable Roberts tape recorder was used on the table to the left of the console. A rack to the right of the console contained an Ampex PR-10 tape and a MaCarTa #560 cartridge recorder. A shelf under the hi-fi turntables allowed a small amount of record storage for production effects, and another record rack was built on a rear wall. A free-standing cartridge rack for 200 carts, and a wall-mounted rack for 500 carts, were also included.

A wall telephone is mounted on the left leg of the console table and is connected to a push button on the console for beeper recordings. The beeper can be shut off and the telephone used for filter mike or telephone effects on commercials. Reverb is available from the Ampex PR-10 or the cart recorder.

Newsroom

The news area was just wide enough for three teletypes, one UPI Nebraska, one UPI Iowa, and one from the weather bureau. The two UPI machines give us valuable backup on the national news, as a daytime station is particularly vulnerable to having the morning announcer come in to meet a teletype full of chewed up paper and no news. The wall plugs are wired so that each teletype is fed from a different circuit; thus, a short in one machine, bad enough to open a breaker or blow a fuse, will not take out the other machines.

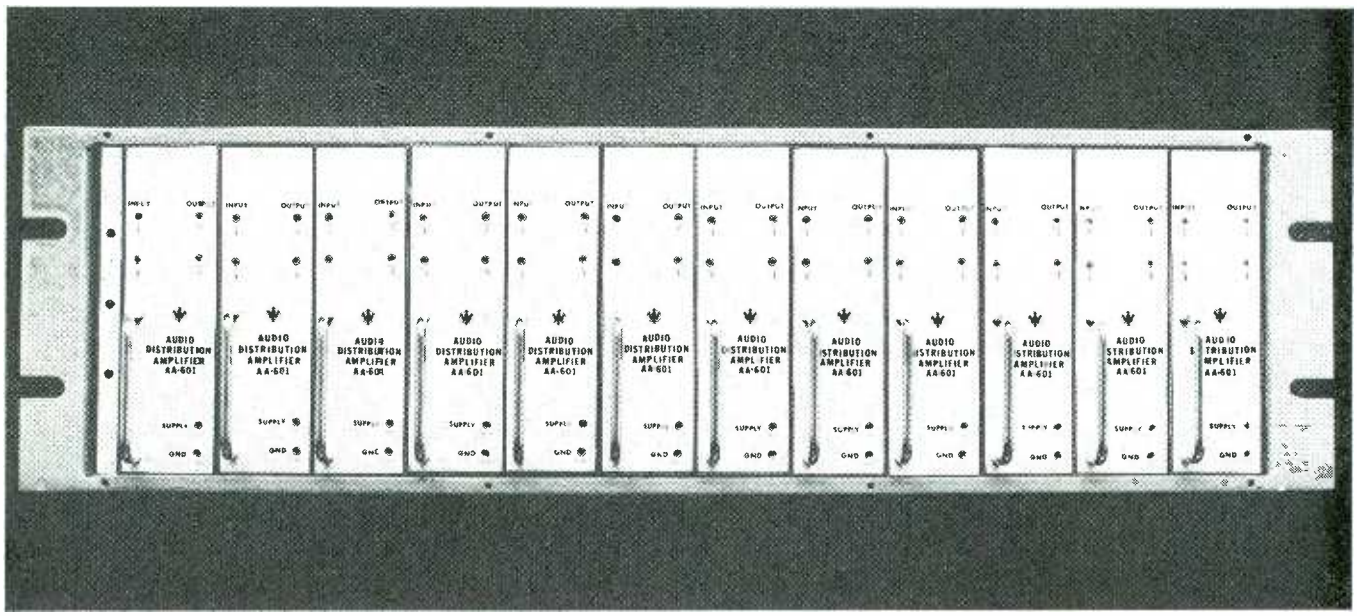
We also have sufficient desk space, a typewriter at the proper height, a telephone, and a tape recorder permanently attached to the phone and wired in such a manner that the line in use is automatically fed to the recorder at all times.

Other Equipment

We were able to obtain most of our reel-to-reel tape recorders from local hi-fi sources who were willing to do a little advertising with us, but the cartridge machines were another matter. We decided on MaCarTa machines. Their all-transistorized model 500 has proven entirely satisfactory in very heavy usage, with extremely little maintenance. We clean the heads once every month or two, put a drop of oil on a bearing once or twice a year, and replace the rubber pinch wheel once a year. We have made one modification, however. As supplied, the machines take about five seconds from the time the cartridge is inserted in the slot until the direct-drive motor is up to speed. We were afraid of wowing, so we strapped the motor leads to achieve continuous motor operation. In 18 months of operation, we have had two ball bearings fail, but found they can be replaced in less than an hour. After a year of experience with several brands of cartridges, we have standardized on "Amerline," by American Phenolic of Chicago, as both best performing and least susceptible to failure.

Attention to the details of human-engineering for your particular format pays off in the way you consistently sound on the air. We certainly find the time and money put into this project at KRCB are a major cause of our subsequent community acceptance and financial success. ●

AUDIO
distribution amplifier
(The Audio equivalent of a Video Distribution Amplifier)



Should the distribution of audio signals be treated differently than video? No! *Why not improve output isolation and eliminate expensive, cumbersome output transformers?* Now you can, with the new Ward Audio Distribution Amplifier! . . . the first of a series of solid-state audio equipments designed specifically for television — with many advantages for radio broadcasters, too.

The Ward AA-601 Audio Distribution Amplifier is conceptually identical to that of a video distribution amplifier . . . one input and a number of identical high level outputs, *highly isolated, balanced or unbalanced.* This new unit facilitates distribution of audio at standardized levels throughout AM, FM or TV systems. Twelve AA-601 Audio DAs, furnishing 48 outputs of 24 dbm, are contained in a single 5¼" rack frame.

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- Balanced or unbalanced transformer input, matching or bridging.
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- High isolation between outputs — 60 db, or better, across the band at 600 ohms, balanced or unbalanced.
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- No external DC supply, operates from AC.
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For Complete Information Call or Write:

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Circle 17 on Reader Service Card

Building an FM Station— From CP to Sign-On

By Carl B. Haeberle and James W. Davis

What's it take to build an FM station from the "ground up"? This first of a series discusses preliminary planning.

IN MARCH 1964, WAJR management requested production and engineering to (1) develop a new concept in FM programming; (2) build a maximum power stereo station within the confines of the present staff and physical plant; (3) produce the end result in a minimum time; (4) continue present duties; (5) sign-on with minimum expenditure but maximum flexibility.

Less than 8 months later, WAJR-FM signed-on with complete stereo facilities including locally recorded events—anything from a basketball game to a tiddly-winks tournament. Three million people now have quality music and news programming 17 hours a day, 7 days a week. One million of the potential listeners had never been able to receive quality FM without more noise than music. The budget to build these facilities, although sizable, was squeezed in every possible way. Over $10,000 was saved by local design and construction.

When you set out to build an FM station, you soon learn that there is not an abundance of available basic information to guide you, and there are few sources of paternal counsel to steer you in selecting equipment and efficiently operating a stereo facility. In spite of these conditions, we were on the air in just a little over seven months after our CP was granted.

Mr. Haeberle is production director and **Mr. Davis** is C.E., WAJR Morgantown, W. Va.

We felt there was a definite need for WAJR-FM. Adjacent counties were not being reached by local radio, and the statewide Mountaineer Sports Network needed a feed signal. Then, too, it was felt that many people were not completely satisfied by a middle-of-the-road AM outlet and the other local station.

WAJR-FM came into being in 1947. By 1962 the old transmitter was outmoded—antique, in fact—and was taken off the air due to instability. The operation had befitted the term "experimental" —a poorly programmed and staffed AM stepchild. Programming was provided via an automatic record changer or by simulcasting with AM. To replace and improve the facility, the station applied for, and was granted, a new channel and a power increase to 25 kw ERP. A new transmitter was ordered and shipped just in time for the FCC freeze in 1963. The transmitter made an about face and went back to the factory.

The matter rested for over a year while allocation procedures were ironed out. Finally, in March 1964, WAJR was assigned a frequency of 101.9 mc and granted a CP for a 50-kw FM station. Then, with the advent of vertical polarization, management felt that the mountainous terrain would be best served by vertical as well as horizontal polarization. FCC approval was then obtained for 50-kw dual polarized transmission.

As of March 15th, 1964, the station was a paper tiger! It had received thought as to means and methods of programming, but concrete construction plans were non-existent, even though an on-air date of September 1st had been arbitrarily set.

On March 22nd, 1964, a member of the AM staff was designated as FM Production Director and assigned the responsibilities of developing the physical plant, the basic administrative structure, and the programming. The Production Director was also charged with the promotional aspects of the FM station. The AM Chief Engineer received the additional duties of FM engineering. His duties were expanded to the development of technical details, including wiring, equipment selection, construction procedures, and the problem of how to set up a "new concept in radio."

In these opening stages, we established that a "quality" sound —from both engineering and programming standpoints — was a basic prerequisite. The music policy was tentatively set—good music with an upper middle-of-the-road approach, stressing instrumental music, with all, or as much as possible, programmed in stereo. As the market was reasonably open there was no reason to specialize in any one area of music. To allow ample room for error, all steps taken prior to sign-on were made carefully, with the idea of a complete middle-of-the-road format at sign-on. As

Here's what it takes—

An **unofficial** cost list taken from sales estimates and purchase orders. Additional costs in administrative supplies, engineering and legal fees, transportation, wages, etc., increase the total cost figure. Comparatively minor items, such as bulk tape erasers, which cost in the neighborhood of $15, are not included in this break-down. Figures on labor and locally constructed electronic and mechanical units are not included in the estimates.

Electronic Equipment
Transmitter and antenna equipment: Collins 830H-1A 20-kw transmitter, 8-bay antenna and 8-bay vertical antenna, 26 U-2 limiter, 900 C-1 modulation monitor; McMartin TBM-3000 frequency monitor **$55,000**

Transmitter Studio: Gates Stereo Yard-Wide console; two Empire Troubadour turntables with Shure M3D cartridges and Audio-Empire Dynalift arms; RCA RT-37A cartridge playback unit; Ampex 354 playback tape deck; locally-constructed console table and storage shelf unit; standard equipment rack **$7,000**

Production Studio: Gates stereo "Executive" console; two Gates CB-77A cartridges; Ampex 354 record tape deck and PR-10-2 record tape deck and portable case; RCA RT-37A record playback unit; locally-constructed console table and cartridge storage rack; two standard equipment racks **$10,250**

Construction*
Transmitter studio and building modification ..... **$ 1,500**
Production studio and office ..... **$ 800**

Office Equipment & Furniture**
Transmitter studio: desk ..... **$ 100**
Office: typewriter, file cabinet, table, card index, three desks .. **$ 850**
Records ..... **$ 800**
Reel tapes ..... **$ 200**
Cartridge tapes*** ..... **$ 350**

Advertising: newspaper and mail ..... **$ 500**
Estimated Total **$77,350**

*Does not include labor.
**New furniture was purchased for other offices where needed. Older furniture was released for FM use; however, costs show new furniture purchases.
***Since all air announcements are pre-recorded, more tape cartridges and reel tapes are required.

Advantages of a Transmitter-Site Studio

From cost, to overall sound, to proficiency, we feel that having production facilities and offices downtown, and the on-air studio at the transmitter offers more advantages than disadvantages. The biggest problem is providing the engineer with enough information to ensure proper insertion of prerecorded announcements and intros, but with practice and training the problem resolves itself. Had we used a downtown location for the on-air studio, we would have had to hire three new announcers or used a packaged program unit, not to mention that there just wasn't enough space for the studio. Then, too, our transmitter engineers' time is put to better use.

The dual balanced 15-kc phone lines required by stereo presented some problems; the telephone company has the equipment, but is short on staff. They didn't appear overjoyed at the thought of installing and maintaining the facility. Also, we received a report that one station was having phase shift problems on their phone lines, resulting in a signal loss by the time it got to the transmitter. A 15-kc line is fine for AM, but the high audio frequency fall-off reduces FM quality considerably. We have discovered that our transmission has more "presence," more consistent audible levels of music and talk.

comments are voiced on likes and dislikes, the station expects to move into new fields. Down to the initial order of records, we developed only a framework program schedule. We ordered only "standards"; i.e., music which would definitely be used regardless of possible variations in the final program structure.

Transmitter and Studio Locations

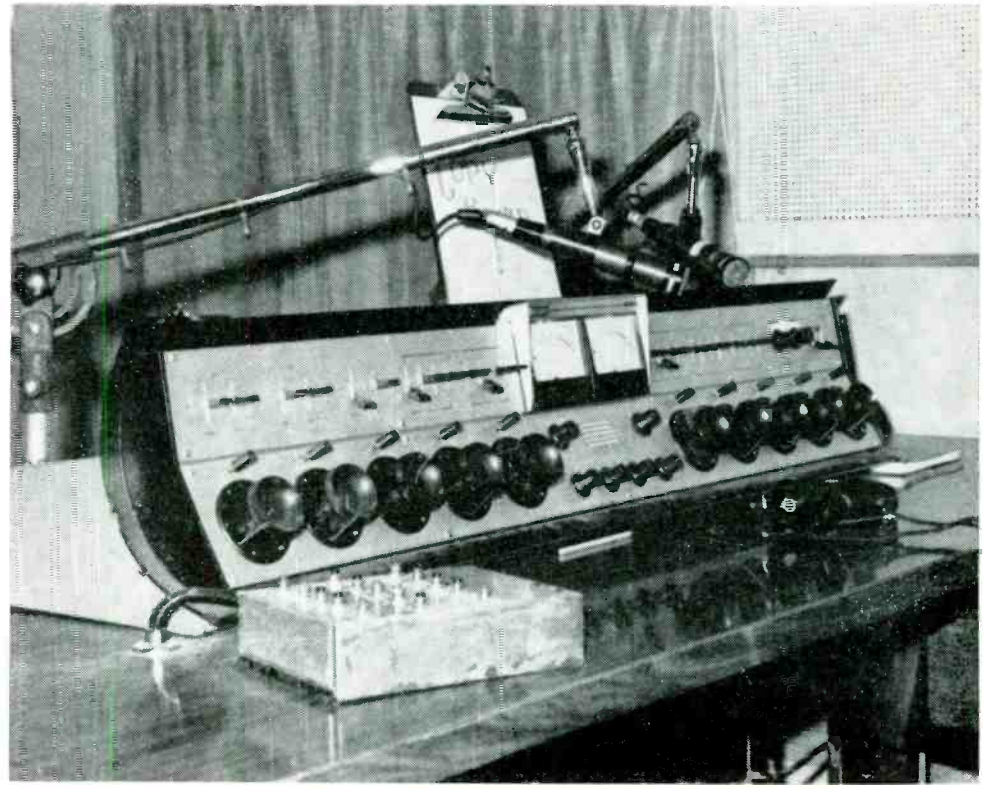
Since the station already had an FM transmitter site, the logical thing was to locate the new FM transmitter there. The old FM had been operated by remote control on a hill within the city limits. The AM transmitter location—5 miles out of town with directional 5,000-watt daytime, 500-watt nighttime pattern—could also serve as an FM transmitter location, complete with an engineering staff.

We learned during our initial research that stereo stations encounter difficulty sending the two audio channels through two pairs of telephone lines without some phase and separation loss. Therefore, we concluded the best studio transmitter location would be on Bethel Hill with the AM transmitter. With this setup the AM transmitter engineers—then only reading meters—could run the FM programming from logged music sheets, using prerecorded commercials, show openings, etc.

Since Bethel Hill is some 5 road miles from the downtown offices and AM studios, we decided to build a production studio at the downtown studio site to reduce the administrative and announcer problem. Here we would "build" the programming material for FM —record the commercials, show openings, etc. The engineer at the transmitter studio would play the records, according to the music sheet, and insert announcements. For news, we would merely simulcast with AM.

Studio Design

After establishing the concept on paper, the next step was to formulate the studio design and operations guide. As of that date, a very limited amount of information was available as to the "best way" to do anything in stereo broadcasting or programming. Thus, all old patterns were basically scrapped. A design for the production studio was set up by a three-man group, the pro-



Broadcost Studio (Bethel Hill)

1 Gates Stereo Yard-wide console
2 Empire Troubador turntables with Shure M3D cartridges and Audio-Empire Dynalift arms
1 Ampex 354 tape deck (playback only)
1 RCA RT-37A cartridge playback Unit
1 Locally-constructed console table
1 Locally-constructed storage shelf unit
3 Standard equipment racks

Production Studio (Downtown)

1 Gates Stereo Executive console
2 Gates CB 77A turntables with Audio-Empire Dynalift arms and Stanton 481-AA cartridges
1 Ampex 354 record tape deck
1 Ampex PR-10-2 record tape deck (plus portable case)
1 RCA RT-37A cartridge record playback unit
1 Locally-constructed console table
1 Locally-constructed cartridge storage rack
2 Standard equipment racks.

Other normal studio equipment, including patch panels, microphones, etc., were also listed, debated, and purchased.

We found that no reasonably priced commercial turntables have (or did not at that time) sufficiently low rumble and wow characteristics needed for stereo "quality" programming.

A rumble or wow, undetectable in AM or in monaural FM, can sound like a wind-storm in stereo. Thus, the two belt-driven "home use" machines were purchased. These are critical to the extent that even tightening the drive belt beyond recommended specifications can induce rumble. A heavier drive belt may also cause audible rumble. The lack of close cue, due to the extremely slow starting characteristics inherent in a belt-driven unit, creates something of a problem in programming until the operating engineer becomes accustomed to the mechanical operation. Critical to broadcasting also is the fact that back cueing is impossible due to a required rubber turntable pad. Actually, with less than two duty shifts using the turntables, the engineers develop their timing sufficiently to provide the desired programming.

We have found, too, that a tape recorder instead of just a playback unit should have been installed at the transmitter studio. With a recorder unit, we could record "on-air" material for later use. Comprehensive air checks could also be made in this manner.

Even announcements are in stereo at WAJR-FM; one of two boom-mounted mics feed each stereo channel. This is WAJR-FM's downtown production facility using a dual channel console, where all voice program portions are recorded. The "box" lying in front of the console is a remote control panel for tape recorders, cartridge machines, and turntables.

duction director, the chief engineer, and the station manager. These ideals were established: The studio must serve as a show room and part-time sales-demonstration room. A demonstration of equipment and prerecorded sample spots seems to aid sales. The room must present a relaxed atmosphere, uncluttered with equipment, an advantage to both operation and sales The operation has to be flexible and semi-moveable in case of a location change in the future. Any operation has to be efficient. If all recording is to be done from one location, and done inexpensively, a limited amount of wasted time is of prime importance. With these mandates in mind, we arrived at our studio design.

Ordering Equipment

As the operational plans were completed, equipment procurement began. Again, expense came into focus as equipment was checked. The "mail-order" system of obtaining multi-thousand dollar equipment units was employed. This proved, at best, a poor means of spending company money. Too late, the value of attending one of the yearly NAB conferences and equipment displays was discovered. In our particular case, however, all equipment obtained *did* perform as hoped, or nearly enough so, that with local changes by the Chief Engineer, the sta-

tion could operate efficiently. Had we attended a display, though, some of the equipment purchased would have been overshadowed by other available units.

An "optimum" list was developed, including everything possible for a "perfect" station. The use and importance of each item was then discussed and debated. If the unit was a luxury item, or one which could be omitted and still maintain the programming concept, it was crossed off the list. By this means no extraneous equipment was purchased, but there was no last minute rush to buy something that had been forgotten. ●

(to be continued next month)

Sales—of Course!

We were lucky in as much as we did not have the requirement of "profit within 'x' number of days." The ownership and the highly successful AM side of our operation gave the FM time to work out its major programming ills and to establish itself within the community before it had to start a sales campaign in earnest.

Concentrated sales efforts were begun this past July. We designed and ordered several printed sales aids and salesmen were on the street with the new packages by the first of September.

The primary printed aid is a brochure-cover unit which contains brief statements concerning the station's services to the community and aimed at the local sponsor, his agency, and as an aid to the station representative working on national business. Printed on tan glossy stock in brown and black, it exudes a "quality" station image. It includes coverage maps of both the AM and the FM signals, SRDS information on the coverage area, and additional sales information.* (Total cost for 1,000 was less than $100.)

A second unit is a style-matched rate card. The AM and FM use separate cards; however, they are designed to complement each other and are cross-referenced for combined time-buying. The rate cards are also printed on tan stock. By use of a single ink (black) and half-toning, a quality appearance was produced at a minimum cost.

The third unit is a simple presentation folder—a legal-size sheet with the bottom third folded up. It holds any material the salesman wishes to give the client (including the contract) and is pre-printed with the station call letters and address. The client's name is imprinted at the appropriate place. The personalized presentation for the client gives the salesman somewhat of a head start.

Additionally, we utilize an individual presentation for each sponsor. When the salesman arrives at the client's door he has in his hand the complete package including his conception of what his client should have on the air. The order is all pre-written and ready for signature.

To introduce the FM station to a new client, and to soften up sales resistance, we used an idea from CHUM-FM in Toronto, Canada, and adapted it to our use. This classical music station used a 6-minute tape presentation which they call an "Emotional Approach to FM Sales." It must be effective—the Canadian station was almost sold out at sign-on!

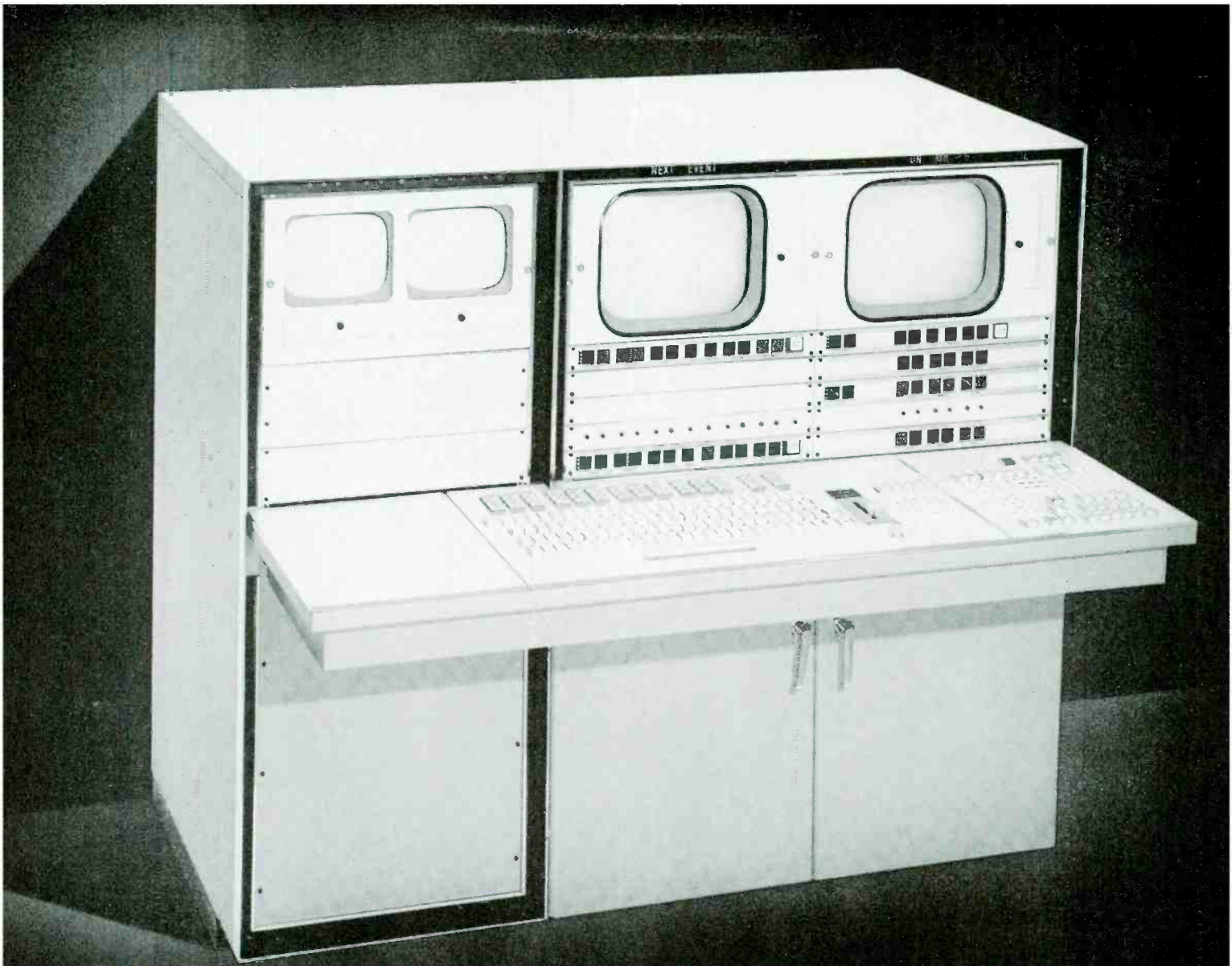
To allow maximum sales, we set up our programming to accommodate virtually anything from one-minute spots to a 2-hour show package. Spots are available (in 60-second time length only) adjacent to the hourly news and on weekends. The remainder of our weekday commercial time is devoted to 25-30 minute and 55-minute blocks. If a sponsor buys, say, a 55-minute package, he receives 25 fifty-five minute shows per year; approximately one-third are programmed in the morning, a third in the afternoon, and the remainder at night. This rotation gives the sponsor maximum audience saturation at a minimum cost and gives us a minimum of production problems. Rates were set, for these packages, by the use of a relatively simple formula. The cost of operation (all payments, wages, etc., included) is divided by the number of commercial-hour availabilities per week-day per year. The less than one-hour shows are priced according to the cost per hour figure.

To provide a "profit margin" for the station, and to offer clients a show which they can "call their own" we also set up three production shows and have developed three holiday shows. These packages are not sold at the lower rotation show rates but are included at the regular rates.

Two daily national newscasts, several local newscasts daily and the annual West Virginia University football and basketball shows, are sold at the standard "card-rate" or combined with the AM sales.

Assuming all rotating blocks were sold, the remaining sales would be profit. Even with only about ¾ of our total availabilities sold we are in a slight "profit" position.

*Mark Data Associates, Albuquerque, N.M.



DON'T WAIT FOR THE REVOLUTION IN TELEVISION PROGRAMMING—IT'S HERE

It started about a year ago, when Sarkes Tarzian introduced an automatic programmer for television. A few were skeptical. There were many questions, naturally, for nothing so sophisticated in television automation had ever before been attempted.

Now, experience confirms it.

Tarzian's APT-1000 is the most versatile television programming system in existence. In fact, performance of the APT has been so sensational, we invite you to try to stump it. We're confidant this solid state computer can handle any programming problem you have—better, faster, and smoother than you ever thought possible. Fact is, it has never been possible . . . before.

A special purpose computer, APT-1000 was designed solely for total and flawless television programming. It can't panic, prime time or any time. Easy operation develops an operator confidence that shows up in improved efficiency and quality of programming.

Television programming now enters a new era . . . for even while the complexity of operations continues to increase, a greater competence and significant cost reduction become possible with APT.

If Automatic Programming for Television sounds phenomenal . . . you should see it in action. All it takes is a call or letter. And ask, too, for details on Tarzian's revolutionary new TASCOM, the digital computer which solves those costly and time-consuming traffic-availabilities-scheduling problems.

SARKES TARZIAN

BROADCAST EQUIPMENT DIVISION BLOOMINGTON, INDIANA

Circle 22 on Reader Service Card

BROADCAST EQUIPMENT

Solid-State 3w Audio Amp

McMartin Industries, Inc., Omaha, Nebr., has added a transistorized 3w audio amplifier to their product line. Designated as the LT-10, designed to plug into

the TR-66 multiplex receiver, the unit is applicable where 25 and 70.7v audio outputs are needed. Its operating power is derived from the receiver power supply strip.

Circle 62 on Reader Service Card

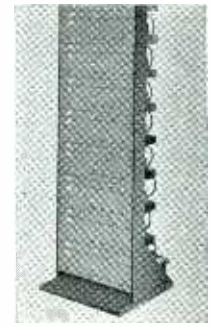
New Lab-Line Products

Blonder-Tongue Labs. Inc., Newark, N. J. has introduced a high-output 75-ohm detector and a switchable attenuator. Model 4123 detector, used wherever a high output for small RF input is required, is suited for use with Model 4124 VHF VSWR bridge, or for aligning BTD-44 tunnel diode converters. The switchable attenuator features the standard 75-ohm impedance from DC to 900 mc and type "F" compatible connectors. It is easily mounted and designed to give up to 62 db attenuation. The 6½-oz. detector sells for $90, the 11-oz. attenuator for $42.

Circle 69 on Reader Service Card

12-Channel CATV Head-End

Dynair Electronics, San Diego, Cal., is manufacturing a 12-channel CATV head-end system designed for color as well as black and white operation. The equipment uses the TX-1B closed-circuit transmitter and the AS-1A aural separator, with capabilities for all VHF channels, or for special frequencies. The visual carrier is said to be stable to 0.005% and the aural carrier controlled to ±1 kc.



Circle 51 on Reader Service Card

AM Modulation Monitor

Visual Electronics Corp., New York City, is offering a new modulation monitor, Type MM-

1A (FCC type approval no. 3-123), which reads both positive and negative modulation peaks and carrier shift. Designed to feed the station's off-the-air monitor, it reads positive peaks to 133% and negative peaks to 100%. A second audio output feeds a noise and distortion meter. A peak indicating flasher may be set to indicate any modulation percentage from 50 to 100%, and an internal relay will operate a remote indicator or flasher.

Circle 63 on Reader Service Card

Taped Automatic Program Logging

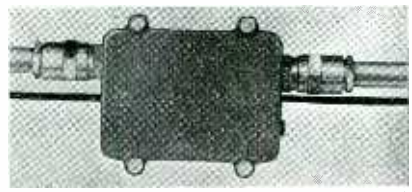
A taped system of automatic program logging has been developed by AuToTronics, Bartlesville, Okla. LOG 96, which meets FCC requirements, reportedly records 96 hours of programming on 1200′ of standard ¼″ tape. A 1-kc tone burst establishes a time reference every five minutes. The unit is entirely solid-state, in-

cluding power supply. Basic model is priced at $595.

Circle 55 on Reader Service Card

Solid-State Line Extender

Jerrold Electronics Corp., Philadelphia, has introduced, as part of their new *Starline* CATV system, a new solid-state line extender with 24 db minimum gain, flat response, and high

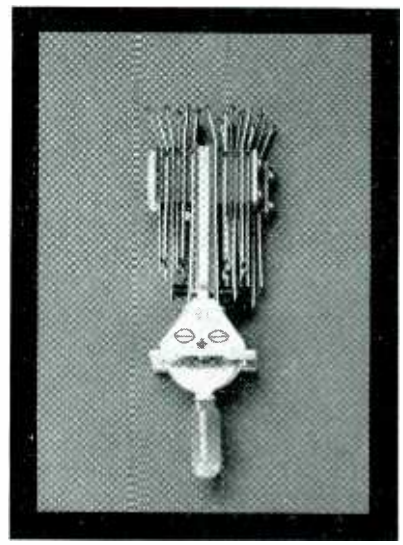


output capability. The SX-1 is cable powered with optional AC bypass, and includes variable tilt and gain controls, plus plug-in pads for additional gain control. Maximum output is 42 dbmv for 12 channels, ±1 db 54-216 mc @ −57 db cross modulation. The aluminum case is as radiation-proof as aluminum-sheathed cable and is vapor-proof, waterproof and dust-proof. Price is $98.75.

Circle 54 on Reader Service Card

Portable Broadcast Tape Recorder

Sony Corp., Inglewood, Cal., has introduced a transistorized audio tape recorder, designed for field work, which provides professional broadcast quality. The Model EM-2N is battery-powered, and uses a DC servo motor to provide steady tape speed. A counter-balancing flywheel permits stable operation while being transported. The unit records full-track at 7.5 ips on a 5″ reel,



The pop-click-hum bug is dead.

Collins' new Speech Console hasn't a mechanical contact in the program circuits.

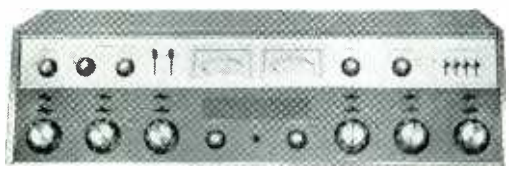
Photoconductive cells instead of relays and switches.
No contacts to wear and get dirty. Nothing at all to keep clean. Result: your most troublesome maintenance problem is ended. Also: no pops, clicks and hums from mechanical switches. Your audio is the cleanest, clearest audio on the air.

A lot less wire (and a lot less hum).
Audio doesn't have to travel to front panel and back. This means you have a lot less wire to pick up noise. (There is no noise, either, from attenuators. They are sealed in protective capsules.)

Module design ends time-wasting troubleshooting.
Simply take out one card and plug in another. Replace attenuator, input switches, and amplifier output switches with one quick shuffle of cards.

The Collins solid state 212S-1 is for stereo and dual channel operation for FM, AM and TV stations. The companion 212M-1 Console has fewer modules for mono program and monitor outputs.

For details, call your Collins representative. Or write: Broadcast Communication Division, Collins Radio Company, Dallas, Texas 75207.



This is the Collins 212S-1 that killed the pop-click-hum bug.

COLLINS

COMMUNICATION / COMPUTATION / CONTROL · COLLINS RADIO COMPANY / WORLD HEADQUARTERS / DALLAS, TEXAS

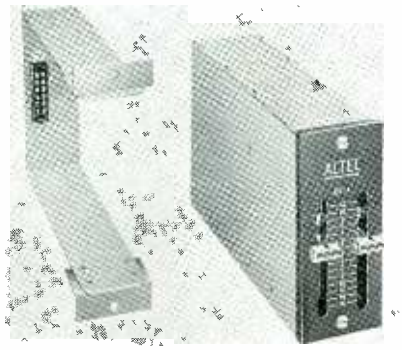
Circle 23 on Reader Service Card

weighs 11 lbs. and operates for 5 hours continuously on one set of batteries.

Circle 78 on Reader Service Card

Microphone Equalizer

Altec Lansing Corp., Anaheim. Cal., has announced the development of the 60A microphone equalizer, designed to compensate for variations in apparent frequency response caused by changes in the microphone-to-

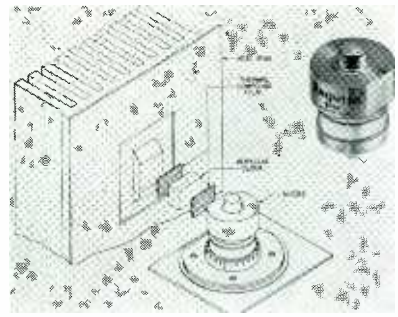


subject distance and for acoustical characteristics of the recording area (indoor or outdoor "dead" or "live" room). The continuously variable low and high frequency controls allow immediate attenuation of many ambient disturbances with minor effect on the program material. The compact unit has sliding linear controls, and is designed for plug-in installation in any type of fixed or mobile mixer console.

Circle 79 on Reader Service Card

Advance in Conduction Cooling

Amperex Corp., Hicksville, L.I., N.Y. has developed an 8560 conduction-cooled tube from the 4CX250B. The new power tetrode is expected to find use in both fixed and mobile equipment as an RF power amplifier at frequencies up to 500 mc with an output of 270w. Uniquely, the plate dissipation of the 8560 is solely a function of the parameters of the conduction cooling system: if the

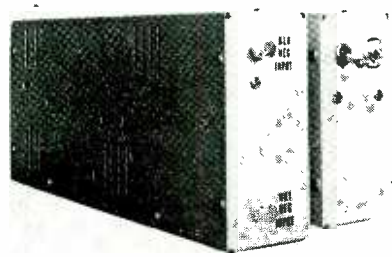


system is able to conduct sufficient heat, the full input of 500w may be safely dissipated should drive power be lost.

Circle 81 on Reader Service Card

75v Video Amplifier

ITI Electronics, Clifton, N.J., now has available model IT-248A solid-state video amplifier, which provides 50% greater output than its predecessor. The re-



sponse is 3 db down at 14 mc with 1100 line resolution. A peak-to-peak input of .25v will furnish the 75v output. Price is $400. Power supply is $200.

Circle 82 on Reader Service Card

Solid-state SCA Tuner

A transistorized SCA tuner, Model T-1, is being offered by Dynatronics, Inc., Orlando, Fla. Features include high sensitivity, crystal-controlled subcarrier detector, adjustable automatic squelch, and stereo compatibility. According to the company, it has excellent adjacent channel rejection and ultra-stable IF. Price is $109.50.

Circle 84 on Reader Service Card

Disc Recorder for TV

The Model VDR-210CF Videodisc TV disc recorder, especially designed and built by MVR Corp., Palo Alto, Cal., for sports telecasting, was used recently by CBS to record and play back action

highlights of a Baltimore Colts intrasquad game — reportedly the first time a disc recorder has been used for TV. According to MVR, simplified operation and light weight make the unit particularly adaptable for broadcast and closed-circuit recording of sports activities where immediate review of action is desired. The Videodisc unit provides complete 20-second segments which can be replayed in regular motion or stopped to provide "freeze action" shots. Units are available in eight models of single- and dual-channel design, providing manual step motor or continuous spiral indexing. Cost is about $10,000.

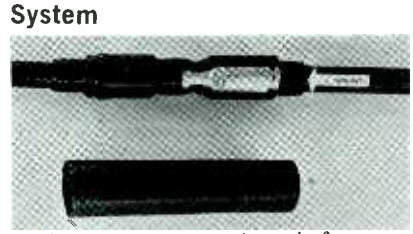
Circle 49 on Reader Service Card

50-kw UHF Transmitter

RCA Broadcast & Communications Div. has introduced a 50-kw UHF TV transmitter using a vapor-cooled klystron for im-

proved efficiency and reduced operating costs. Type TTU-50B uses an integral cavity, vapor-cooled klystron which reduces input power needs by 10 kw over

Cable Connector & Sealing System



A system for connecting, splicing, terminating, and sealing up to seven cables has been developed by Sigma Industries, Menlo Park, Cal. The two-part system consists of a universal connector and a re-enterable or sealing device, designed for underground as well as surface splices. Cables pass through heat-shrinkable leg into the splice cover. The cover around the cables is then shrunk by means of heat application from any 275° source, or Sigma's portable hot-air guns. The Company is also marketing Sigma form plastic, a thick-wall, heat-shrinkable tubing.

Circle 53 on Reader Service Card

Introducing the Ampex AG-350 with solid state electronics.

This new recorder guarantees even greater reliability than its predecessor—the famous 350 Series. Here's reliability you can count on for continuous programming over long periods. Reliability you need for a major broadcast or recording assignment that may represent thousands of dollars in talent and studio set up. Reliability you must have for the "one chance" recording of a hot news event.

The AG-350 offers the ideal combination of all-new, 100% solid state electronics (evolved from years of Ampex transistor research for reliable Aerospace recorders) and the famous 350 Series Transport.

New features for greater operating convenience: overhead electronics in an all-new, functional console design; automatic equalization switching with change of speed; wide head gate opening for ease in editing, threading, cleaning heads; new, simplified control panel and switches; new ferrite erase heads for better erasure.

The Ampex AG-350 is available in console, portable, or unmounted versions; mono or stereo; record/reproduce or reproduce only; single or two channel; 3¾-7½, or 7½-15 ips speed.

Mail the coupon for your free copy of our new illustrated brochure #1706 which contains a complete description and specifications of the new AG-350 Series. And if you'd like descriptive literature on Ampex spot programming recorders, portable recorders, mastering recorders, high-speed duplicators, mixers, tape and accessories, just check the box on our coupon.

Please send me information on:
☐ new AG-350 Series recorders
☐ other Ampex equipment

(please specify) .....

NAME TITLE

COMPANY

ADDRESS

CITY STATE ZIP

Write today to:
Ampex Corp., 401 Broadway
Redwood City, California

AMPEX

Circle 30 on Reader Service Card

Tape Duplicator

Viking of Minneapolis, Inc., has stepped-up production of their 235 tape duplicator system. This solid-state, modular plug-in equipment is available as a basic system of one master and one slave and can be expanded to a total of ten slaves without additional electronics. The basic system is $1,850 full-track and $1,995 for half-track two-channel. The complete ten slave system in half-track/two channel is $5,600, in quarter-track/four channel, $6,730.

Circle 85 on Reader Service Card

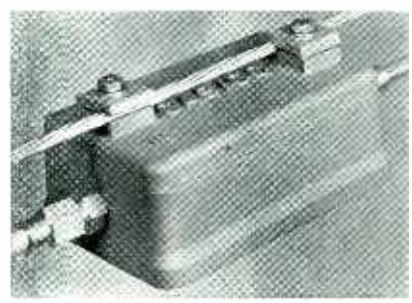
water-cooling methods. Coupled with an appropriate ultra-gain antenna, the system will produce in excess of 2 Mw of power. RCA

has also introduced a new TV transmitter control console, the TTC-10A, equipped with new waveform and picture monitors.

Circle 83 on Reader Service Card

Solid-State Line Extender

CAS Manufacturing Co., Dallas, Tex., is offering a series of six transistorized all-band and low-band line extenders, designed to meet any application. These hermetically-sealed strand-mounting units feature interchangeable bottom cover splitters to convert units for single, 2, or 4 outlet



tap. The TRA-215-A is a standard extender for offsetting cable losses in feeder lines. The TRA-215-2 is identical except it has a dual output. The TRA-215-T provides amplification to a line tap for feeding a multiple outlet building. The TR-105, TR-105-2 and TR-106-T are identical to the above low-band only.

Circle 73 on Reader Service Card

FM Stereo Console

A table-top solid-state mixing console, Model AF-37A, manufactured by Melcor Electronics Corp., Farmingdale, L.I., N.Y., is designed for complete selection and mixing of FM stereo and complementary mono program sources. It features 7 mixing inputs, normalled through push-button selectors to 17 program sources, including 6 dual stereo sources. It also contains adequate facilities for simultaneous SCA operation from a separate program source through use of a third output channel. The program combining key ties the two stereo channels into the third output. According to the company, the unusual cabinet design exposes a complete jack field when the arm support is opened downward.

Circle 86 on Reader Service Card

Extended Resistance Decade

A resistance decade box from Aerovox Corp., Distributor Div., New Bedford, Mass., has a total range of 0 to 1.1 meg in 1-ohm steps. The ARD-41 has an accuracy of ±1% across the entire range and is housed in a high impact plastic case 6¾" wide x 4¼" deep x 2 7/16" high. Price is $47.50.

Circle 87 on Reader Service Card

Successful UHF

(*Continued from page 24*)

important residential area of all —the place your local clients live! (There's nothing more debilitating to the station economy than having a local sponsor find out he can't see his own commercial!) As for your transmitter, don't make the mistake of trying to get on the air with too minimal a power plant. You may be dead before you find out what went wrong. If you're not prepared to play in the same ball park with your VHF competitors, then don't play the game.

There are a lot of variable factors in determining the final

Studio Equipment

Extensive studio facilities using vast lighting boards and numerous cameras are not necessary, if you make proper use of what you do have and get real mileage out of your video tape. Two film chains are highly desirable (one manufacturer provides a multiplexer which allows either film or slide projector to be used with either film camera—a real saving when it comes to color). Special effects generators are also very good investments, as they increase flexibility without adding to the operating budget. This is the real key to equipment buying. Buy all of your gear, with a view to living with it from day to day, and when laying out your station, think of your studios similarly.

Ball-Park Cost Figures

	Minor League	First Class
Transmitter & Antenna	$150,000	$300,000
Tower	10,000	100,000
Building	40,000	150,000
VTR & Studio Equipment	100,000	400,000
Miscellaneous	50,000	200,000

Annual Net Before Taxes for a Well-Known UHF Station

1952	$ (35,775.15)
1953	(154,628.43)
1954	(101,882.20)
1955	16,305.99
1956	133,444.40
1957	10,337.60*
1958	128,845.05
1959	169,588.58
1960	113,972.36
1961	122,770.38
1962	183,534.91
1963	272,914.86
1964	383,541.20

*Special charges account for reduced figure

ERP, but ERP is not the final answer. The real answer is in mv/m at the viewer's antenna. *Never forget this.* If you have to deal with terrain problems and public apathy, you need the apparent height and you've got to go easy on antenna gain. Don't try to straddle markets; don't try to be too many thing to too many people. Pick your own targets and be sure to hit them squarely.

Equipment other than transmission gear is equally important. You can do a very creditable job with minimum camera and studio facilities, but you have to work what you have pretty hard, and you must have engineers capable of keeping what you have in shape to meet the demands placed upon it. You cannot run a decent station these days without video tape. And if I were building a new facility right now, I would certainly look hard at color origination equipment, even if I had minimum capital funds. The future of any station—U or V—lies in staying with the industry, and hopefully a bit ahead of it. At WWLP, for example, a Zoomar lens carries serial number 001, which means more than that we got it long before James Bond became famous.

Management and Money

Your top management has to be of a nature that will acquire the rest of the troops to work long hours for low pay. As I am composing this, the secretary snickers—because she's not sure she's getting paid this week—but, then again, neither am I. When we have ditches to dig or tower lights to change, I often do these jobs myself—partly because I need the exercise, partly because I can't afford to hire anyone else. The net effect, however, in terms of corporate morale, is that people on the payroll know there is no job I wouldn't or couldn't do myself (except, of course, to take this down in shorthand).

Jokes aside, let's take a longer look at the money business. It's very easy to delude the FCC as to how much money you have, because Commission people don't really know what it means to meet a payroll—none of them ever have! And they set up rather arbitrary guidelines as to how much you ought to have for this and that—like enough money to meet the first year's operating expenses (based on the utterly ridiculous assumption that during that one year you'll have absolutely no operating income).

Well, anyone can get a few letters from banks and insurance companies and from miscellaneous capitalists indicating that funds are available. The rub comes when the capitalists go broke and the bankers don't like your balance sheet. Any banker will lend you money if you can prove you don't need it, but have you ever tried getting money from a banker when you're in real trouble? Therefore, availability of money when you really need it is a subject worth serious consideration. It means you must pick your stockholders very carefully, and you must go into the enterprise prepared to lose for some period. There's no future in worrying along the lines of the Commission's specific requirements, because they're ridiculous. But if you intend to stay in business, you better have the dough.

Any TV station, no matter what frequency it operates on, will have a painful growth period. Where you have lack of receiver tunability, the painful period will be longer. At our Springfield station, we lost an aggregate of over $300,000 in operating costs before turning the corner. What happened at our other stations is such a painful subject I don't even discuss it. We don't think that anyone planning to operate a respectable station in a respectable market for the next couple of years should plan on anything much different. You can, of course, run a "sleazy" operation at lower cost—but we're not in a position to give much advice on how it is done. ●

Go Remote

(*Continued from page 18*)

Ordinarily, Class-A stations are authorized for AM or FM radio-telephoning only, but the FCC may authorize use of other emissions upon adequate showing of need. While the point being made is that the operation of the return radio link on business or Citizens channels is technically feasible, such use, from the standpoint of acceptability for broadcast transmitter telemetering, must be approved by the FCC.

While more expensive, a 12,000-mc band microwave link could be used to transmit telemetering signals from the transmitter to the studio. There is ample bandwidth for transmitting video signals from a closed circuit TV camera to a monitor at the remote control point. One or more remotely selected TV cameras could be used for direct viewing of the transmitter's meters as well as the tower lights.

Telemetering

The simplest method of transmitter telemetering employs direct selective connection to the transmitter metering circuits and the frequency and modulation monitors, and a meter at the other end.

Many telemetering techniques, developed to meet the requirements of water works, process machines, aerospace and the military, can be used for broadcast station telemetering.

A pulse duration telemeter transmitter, for example, can be connected to the circuit to be measured through a voltage divider and/or rectifier. The telemeter transmitter keys a DC or 15-cycle circuit, or a tone transmitter. The duration of the key closure time with respect to the total metering cycle time causes the remote telemeter receiver to indicate volts or amperes in values related to pulse duration.

More direct is a voltage-to-frequency conversion/frequency-to-voltage reconversion system, in which the measured voltage or current (DC, AC, or RF) is applied as a small DC voltage to the variable frequency tone transmitter, and measured at the other end with a meter connected to the output of the fre-

Continued on next page

LITERATURE of INTEREST

For additional data, circle No. shown on Reader Service Card.

Professional microphone catalog from Shure Bros., detailing new line of mics and disc reproducing equipment, includes complete price list. **108**

TV relay system; solid-state transmitter and receiver fact sheets from Telequip Corp. **155**

CATV systems described in 6-page file folder from Spencer-Kennedy Labs. **195**

"Tini-Stack switch kit, miniature versions of Switchcraft's standard stack switch components designed to speed assembly and try out new switching arrangements, described in new product bulletin. **196**

Frequency multiplier doubler which extends range of X-band klystrons described in technical bulletin from American Electronic Labs. **151**

Stub towers and roof mount catalog from Microflect. 30-pages of information and specifications on microwave equipment. **160**

CATV trunkline cable brochure from Rome Cable lists specifications, characteristics, applications. **180**

Portable TV relay equipment, solid state, lightweight, weatherproof, described in brochure issue by Microwave Associates. **101**

Video tape recording theory and techniques described in Ampex magnetic tape trends bulletin, covering construction, dropout characteristics, and other considerations. **138**

CATV monthly, "Technically Speaking" published by Ameco for cable system technicians. **172**

Video processing, mixing, distribution amplifiers; vertical interval switcher data included in literature from Ward Electronics, Inc. **179**

Tape duplicating system that accepts up to 10 slaves illustrated in brochure from Viking of Minneapolis. **175**

"The Jerrold CATV Story" a booklet discussing systems, services, and equipment. **170**

Directional FM antennas, including the first to be designed and installed, described in technical paper, "A study Into the Effects of Vertically Polarized Radiation in Broadcasting," from Jampro Antenna Co. **91**

Broadcast equipment described in Short Form Catalog on complete line from Moseley Associates. **92**

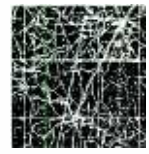
CATV multiple tap catalog sheet from CAS Mfg. Co. describes directional in-line units. **181**

Video master switching system, Ampex/Marconi B3720, described in 12-page catalog from Ampex Corp. **80**

Multiconductor cable for heat-resistance performance illustrated in 4-page brochure from Boston Insulated Wire & Cable Co. **97**

CATV cable & connectors brochure from Times Wire & Cable gives specifications for semi-flexible aluminum cable and connectors. **116**

UHF-TV klystron transmitters, from 12.5 to 15 kw and 25 to 30 kw, described in G.E. brochure which includes specs for 100w driver and 50-kw unit. **148**



"Microwave — Applied CATV / CCTV / ETV", 22-page brochure from Collins Radio, lists system specifications and licensing information. **161**

Microwave CATV, broadcast towers illustrated in literature from Ft. Worth Tower Co. shows installations and applications. **171**

Lighting equipment and control systems featured in new 28-p. general catalog from Colortran Industries. **146**

Communications-CATV cables, seamless aluminum and polyethylene jacketed types specified in product sheet from Amphenol. **113**

FM Station Planner guidebook, plus price list, with block diagram illustrations and system descriptions from Gates. **93**

Video tape electronic cutting and splicing equipment described in a fact sheet from Gotham Audio. **125**

CATV News-Channel described in brochure from TeleMation. Also flyer on integral 6-channel non - duplication switcher. **183**

Yagi antenna, specification sheet from Marti Electronics lists characteristics, prices. **194**

CATV line amplifiers and distribution equipment literature package; CATV Electronic Transmission Systems booklet from Entron. **198**

Tape head cap and pole piece replacements for Magnecorders. Information sheet from Minneapolis Magnetics, Inc. **107**

CATV amplifiers, including solid-state AGC, mainline, and bridging types, illustrated in 8-page brochure from Viking. **121**

VTR, broadcast portable design described in specification sheets from MVR Corp. Includes prices. **105**

quency-to-voltage converter.

Another possible technique is the use of Raysistors to convert voltage or current (DC, AC, or RF) directly into resistance.

Other techniques include the use of magnetic amplifiers and transistors for sensing voltage or current and providing a DC or AC output signal that can be measured at the remote central point.

Digital Systems

Voltage and current can be converted into digital data by an analog-to-digital converter which transmits quantitative information as DC or tone pulses. At the remote control point the digital data may be fed to a numerical display or a teletypewriter for printout. Or the data may be fed into a digital-to-analog converter for readout on a meter or electronic counter. The digital data may be transmitted serially over a single tone channel, or several tone channels may be employed for parallel transmission of data. Digital techniques, using push buttons or a teletypewriter, can be used.

Choice of Systems

Complete broadcast station remote control systems are available. A block diagram of a commercial system is shown in Fig. 12. This one can be used over any two-way voice grade transmission path. Since it employs audio tones, a metallic DC path is not required.

A broadcast station's engineering staff can design its own remote control system employing available components. Using modern technology, it is possible to design automated broadcast station remote control systems which require no human commands, but which can be monitored by the operator in charge, who can take over control when and if necessary. ●

ROUNDTABLE

(*Continued from page* 50)

12-month protection clause. All were well versed by us as to the reasons behind the rate increase. As businessmen, they can understand the purpose when it is correctly presented. No advertiser stopped. Our dollar volume increased. Only a few key advertisers were felt out about the proposed increase, and they understood our reasoning. Their attitute was favorable.

"One thing I'd like to add—there is a definite difference in the attitude of the advertiser toward a station with a good rate vs. the cut-rate station. If he buys from the station that sells cheap spots, he usually does so because they don't cost him much money anyway and not because he is sold on the station. On the other hand, advertisers have confidence in the station with a good rate. That confidence must be justified by the station, but only a station with a good rate can do the things required."

1-kw, full-timer in a one-station market of 8,000 country population. This broadcaster—the smallest of those surveyed—had never before experienced a rate increase. He said, "In 8 years we never raised rates. But last Christmas we had a special program called Christmas Parade. I got to listening and found that in each hour we aired two 2-minute reports from a mobile unit and 5 minutes of news. EVERYTHING ELSE WAS COMMERCIALS! The programming was pathetic, it was like saying 'Welcome to the commercial hour.' We were hurting ourselves, and our audience, because there were no programs, and because we sounded terrible. That's when I decided to raise rates.

"We think our salesmen will have to make fewer calls and fewer production spots after the rate increase. They'll make more money, too. We checked rates of about 20 stations our size before we set the rate increase. We went from a top of $2.35 to $3.75 with a 15¢ boost in our end rate. All advertisers got the same protection, 30 days from the date of notice. Rates went up and that was that. We anticipated an immediate loss of clients, mostly from small troublesome accounts. This happened, but we find even they are coming back now. Our sales manager was not afraid of this rate increase. He was tired of running after $5 and having to put in two hours work to get it. We asked 4 or 5 of our biggest advertisers what they thought about the increase. They understood our problems, and said they've raised prices, too.

5-kw full-timer in six-station market of 150,000. We recently increased our rates to continue quality programming. With overhead going up, we needed more revenue. We have always felt radio advertising has been underpriced since TV hit our market. This most recent rate increase now puts our rates about right to cover overhead and give a fair profit. The rate hike has had no effect on newspaper competition we know of. As usual our salesmen feared the rate hike, but their fears were unfounded. The increase actually was good for them, too, because they are going to make more money per sale. Our increase was about 15% across the board. We reached this figure after completely costing out our operation and then adding a fair profit. Our clients were given one-year protection from the increase. Every client was notified, by personal letter, of the upcoming increase, 90 days before it went into effect. Some advertisers grumbled at first, but almost all of them are running the same amount of spots, but at the higher rate per spot. We did not consult with any advertisers for comments or suggestions on the rate hike—we just did it.

As a parting shot, one outspoken broadcaster said, "I suggest that 9 of 10 radio markets today need to raise their rates. Most stations are underselling their product. Sponsors DO understand the value of less advertising per hour."

It's hard to generalize about radio rates, with so many different factors involved in so many different markets. But several facts stand out in this survey: Rates are increased to clean up clutter and meet rising costs; salesmen do not need to fear rate increases, and negative reaction from advertisers is almost nil. In short, it would seem you *can* raise your rates and no one will raise the roof! ●

MANAGEMENT

ROUNDTABLE

Rate Increases—Actions & Reactions

Why did you raise your rates?

What reactions did you get from advertisers?

What were your salesmen's views before and after the increase?

What effect has the rate boost had on newspaper competition?

Did you consult with advertisers before boosting rates?

How much did you increase rates, and how did you arrive at the amount?

What protection on the rate increase did you offer old-line, TFN, or long-term clients?

AS THE RADIO salesman from a 1000-watt daytimer in a highly competitive 4-station market rounded the corner of the boss's office, he heard a few words that made his palms sweat.

". . . Yes, I have decided that we're going to raise our rates!"

If there's a traumatic experience for most radio salesmen, it's the thought of going through a rate increase. Why? Do advertisers gripe? Or do radio people make a fuss for nothing?

To get the answers, we analyzed the experiences of AM broadcasters in markets ranging in size from 8,000 population to one of the nation's top 25. Each was asked to answer a series of key questions about rate increases.

Following are comments from five broadcasters, all of whom asked to remain anonymous.

5-kw daytimer, single-station market. We raised our rates to reduce total commercial material, which was approaching NAB Code limits. Our local newspaper had raised rates, too, so there was no effect there. Our salesman concurred with the increases (three in 15 months), and after the first boost said it was a great sales help because they had to "resell" the station to each client. Our rate increases totalled 25% in the three jumps. The first did not reduce the number of commercials on the air; the second did, but did not hold, so we boosted rates a third time. Almost all of our advertisers are on one-year contracts, and they were protected for the duration of their contracts. Two good customers complained, but signed at the higher rates for the same amount of advertising. One good customer stopped, tried every other medium, and is now back with us. We did not consult any advertisers before upping our rates.

This broadcaster commented, "The mathematics of rate increases are most interesting. A graph of commercial material, by months, over a period of years shows how the total commercial amount can be controlled fairly accurately with an increase in income. Using a fine old capitalistic principle that a product sells for the price the buyer will pay, and keeping detailed records and changing rates accordingly, I believe it is possible to operate a radio station at peak commercial limits (NAB Code) and peak rates. That has been our experience. I guess you call this the Keynesian method of operating a radio station!"

1-kw country & western daytimer in a highly-competitive 9-station market. The complaint we received most often was "too many commercials," so raising rates and thinning out spots seemed the only plausible answer. Our rate increase has had no effect whatsoever on newspaper competition. We get along well with our newspaper competitor. Three of our salesmen were for the rate increase; the fourth was against it. The lone dissenter has had greater success since the increase than the other three. Basically, our increase was 15%, although in a few cases it was as much as 25%. We feel a series of small increases is better than an occasional hefty one. We protected current advertisers and applied the increased rate only to new accounts, or to old ones who break continuity. Advertiser reaction? We got things like this: One salesman was talking to an account that was cold. The salesman told the man we were so popular we had to raise rates. The client became interested . . . and bought. We did consult with many advertisers in advance of the rate increase. Most said they would rather pay a higher rate and have fewer spots; however, I think they were speaking academically. None offered to voluntarily pay higher rates. Some clients said if we raised rates, they would cancel, but that didn't phase us.

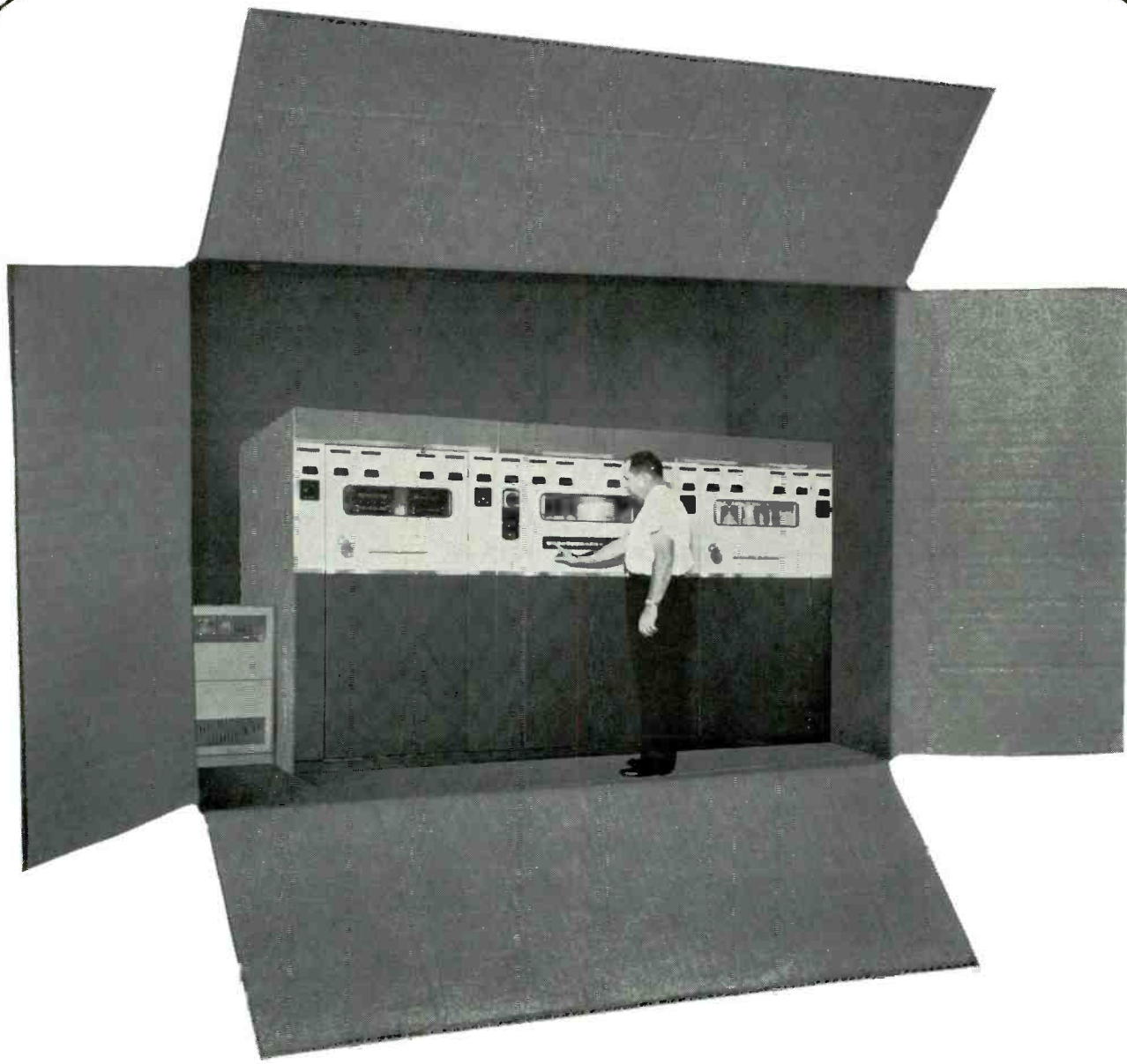
This c & w broadcaster echoed a comment heard often: "Nothing succeeds like success. We found that if properly handled, a rate increase can actually be a sales incentive. The fact you're raising rates creates an aura of success, and everybody likes to be on a winning team."

An additional comment on rate philosophy came from this broadcaster:

"It takes courage to raise rates. This courage must first come from management, then passed on to sales. We find clients understand that rates must go up when you explain the sound management reasons for doing it."

1-kw daytimer in a 4-station market of 40,000. It was necessary for us to raise rates to cover rising costs of improved program service. Our salesmen were well oriented to the needs and advantages of the increase, and were in complete agreement both before and after. They realized higher rates meant better commissions. The increase was roughly 20%; we arrived at this by computing increased costs, taking into consideration the income we would need over our present billing level. All advertisers under contract received a

Continued on page 49



ONE NEAT PACKAGE

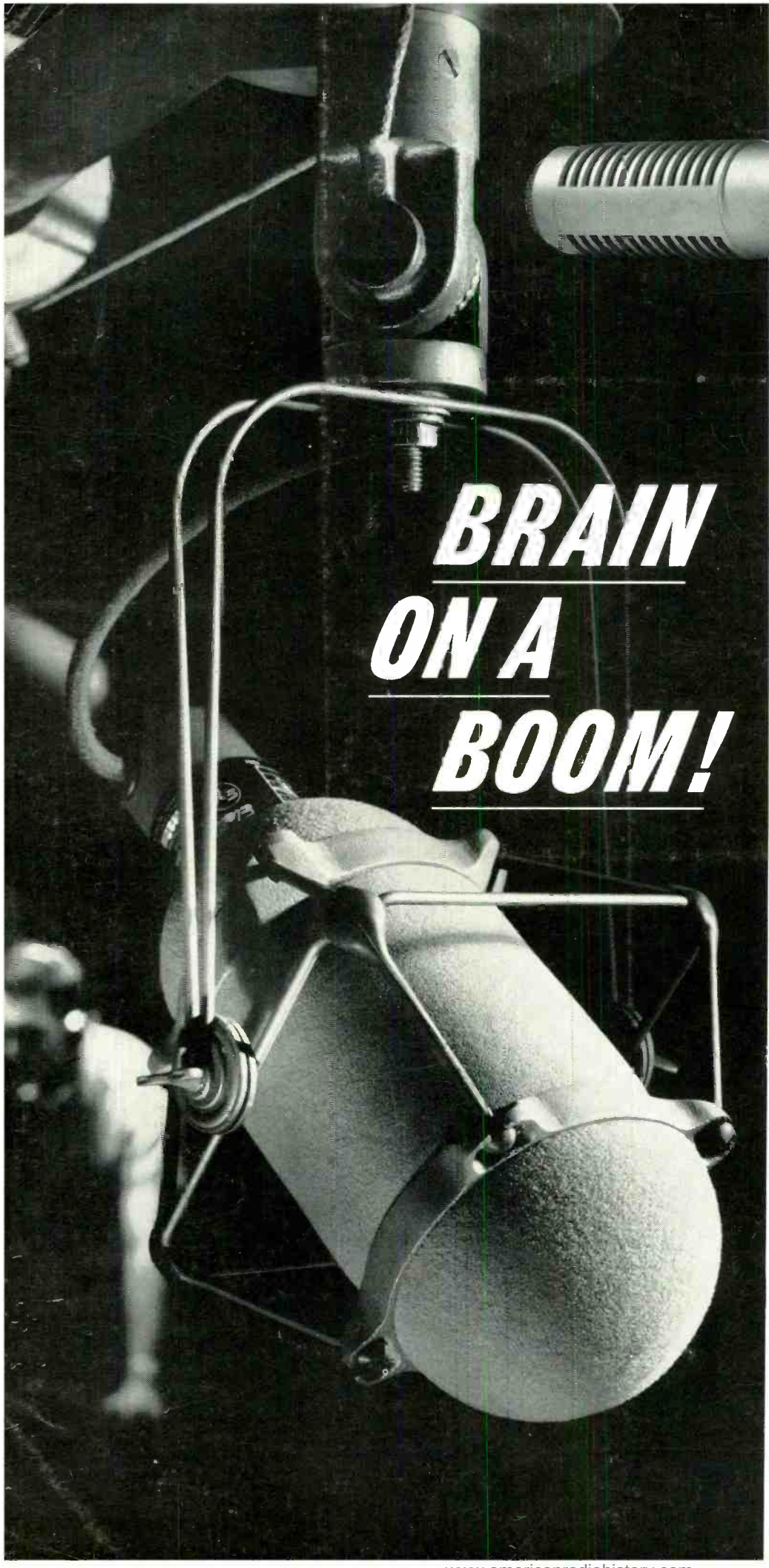
gives you the most efficient 50 kw AM broadcast transmitter built anywhere!

□ overall efficiency: 62% or better □ plate efficiency: 80% or better □ power consumption: 120 kw @ 100% modulation, 92 kw @ 30% modulation, 82 kw @ 0 modulation □ completely self-contained, including blower: compact design assures minimum installation cost and uses only 62 sq. ft. of total floor space.

for a descriptive brochure on Continental's new Type 317C 50 kw AM broadcast transmitter, write: Commercial Sales, Continental Electronics Manufacturing Company, Box 17040, Dallas, Texas 75217

LTV *Continental Electronics*
A DIVISION OF LING-TEMCO-VOUGHT, INC.

Circle 3 on Reader Service Card



New E-V Model 668 Dynamic Cardioid Boom Microphone

with built-in programming panel!

It's just like having 36 microphones in one, at the end of your boom! Simply match the computer-style programming pins to the color-coded jack field inside the new E-V668. You'll get any combination of flat response (40 to 12,000 cps), bass and/or treble rolloff, treble rise, and 80 or 8,000 cps cutoff. The 668 built-in passive equalizer matches response to need precisely without loss in output level—mixes perfectly with any other microphone.

The 668 cardioid pattern is symmetrical in every plane with excellent rear cancellation at every program setting. Two independent Continuously Variable-D* systems provide this uniformity, yet permit high output (—51 dbm) for distant pickup without added equipment or special cables.

Light in weight and small in size, the 668 with integral Acoustifoam™ windscreen and shock mount minimizes shadow problems while allowing noise-free fast panning, indoors and out. Its 1 lb., 11 oz. weight eliminates "fishpole fatigue" and counterbalancing problems.

The 668 is guaranteed UNCONDITIONALLY against malfunction of any kind—even if caused by accident or abuse—for two years. And, like all E-V Professional microphones, it's guaranteed for life against failure of materials or workmanship.

The E-V 668 is the result of a three year intensive field testing program in movie and TV studios from coast to coast. It has proved itself superior to every other boom microphone available. Find out why with a no cost, no obligation trial in your studio. Call your E-V Professional microphone distributor today, or write us direct for complete specifications.

NEW! MODEL 667 Identical to Model 668 except sharp cutoff filters and HF-rolloff eliminated. List price: Model 667, $345.00; Model 668, $495.00 (less normal trade discounts).

Patent No. 3115207 covers the exclusive E-V Continuously Variable-D design.

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