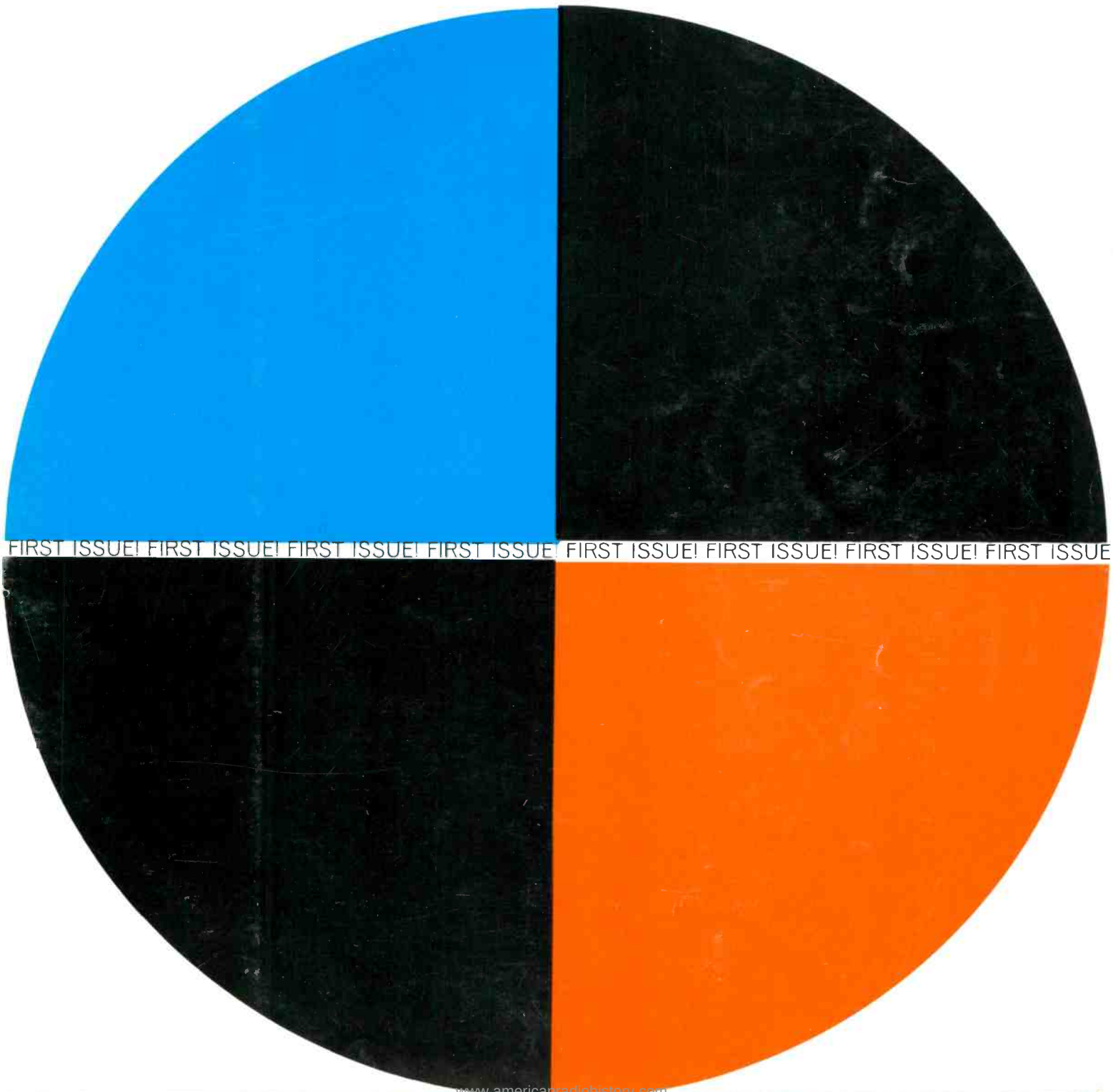
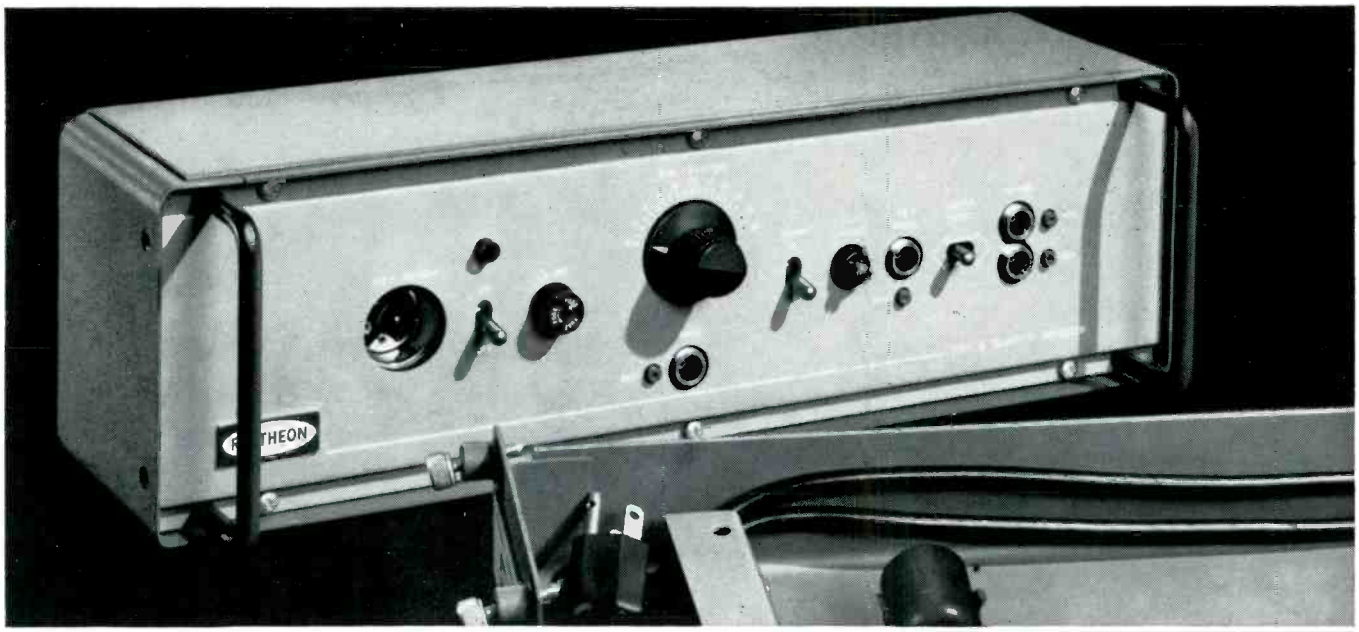
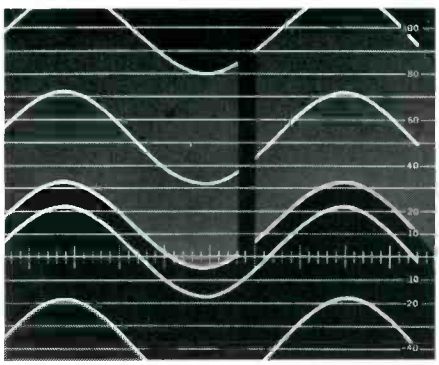
A MACTIER PUBLICATION / PREVIEW ISSUE

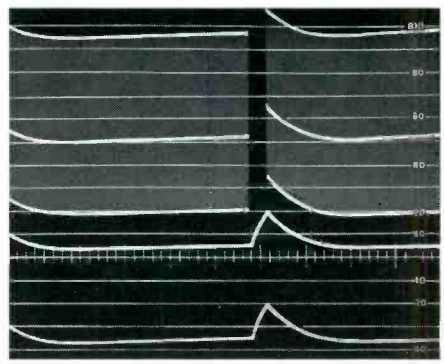
BM/E

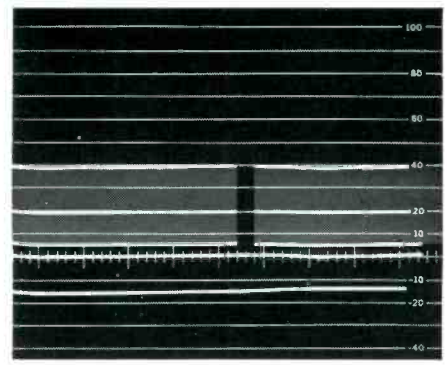
THE MAGAZINE OF BROADCAST MANAGEMENT/ENGINEERING











Raytheon's new Type B Clamper Amplifier eliminates hum, tilt, low video gain

Raytheon's Type B Clamper Amplifier is a precision, all solid-state device designed to do a specific job — *remove low-frequency interference and distortion from a video signal quickly and economically.*

The reliable Type B unit can be used for either radio or cable circuits handling monochrome or color television and, because it is designed to clamp at sync tips, the Clamper will not impair color TV transmission.

FEATURES:

All Solid State — reliable solid state components used throughout; separate plug-in modules permit easy field replacement.

Versatile Performance — can be used as a clamper amplifier or wideband video amplifier with a video gain of 20 db — total power consumption less than 16 watts.

Compact Size — completely self contained — requires just $5\frac{3}{16}''$ of rack space; weighs only 8 pounds.

No Operational Adjustments — just make signal and power connections and set levels with a precision calibrated step attenuator.

Flexible — rack mounted version can be supplied with dust covers compatible with central office racks or standard 19″ racks; portable unit supplied with adapters for mounting in 19″ racks.

Field Proven — in use at more than 50% of major U.S. telephone companies.

Availability is immediate. For an on-the-spot no obligation trial of what Raytheon's low-cost Type B Clamper Amplifier can do for you — under your operating conditions — write: *V.E. Love, Product Manager, Raytheon Company, CADPO, 1415 Providence Turnpike, Norwood, Massachusetts.*

SPECIFICATIONS

Gain	0-20 db adjustable in 1-db steps
Output Level	1 volt pp (0 dbv) nominal 2 volts pp (+6 dbv) maximum
Impedance	Input: 75 ohms, unbalanced Output: 75 ohms, unbalanced; 124 ohms, balanced
Frequency Response	±0.1 db, 30 cps to 6 mc ±0.5 db, 6 mc to 10 mc −3.0 db, 20 mc
Differential Phase	0.3° maximum at 3.58 mc, 50% APL nominal output level
Differential Gain	0.1 db maximum at 3.58 mc, 50% APL nominal output level
Low-Frequency Rejection	Greater than 30 db at 60 cps
Power Requirements	115 vac rms, 50/60 cps, 16 watts (220 vac) 50/60 cps optional
Operating Temperature	−10°C to +60°C
Clamping Point	Tip of horizontal sync pulse

RAYTHEON

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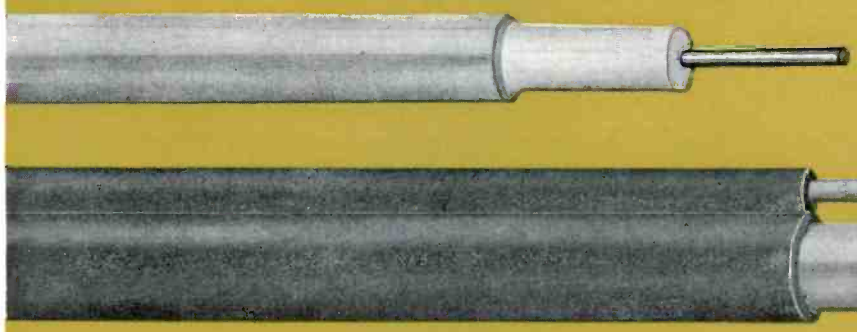
TECHNICAL BULLETIN and ENGINEERING SPECIFICATIONS



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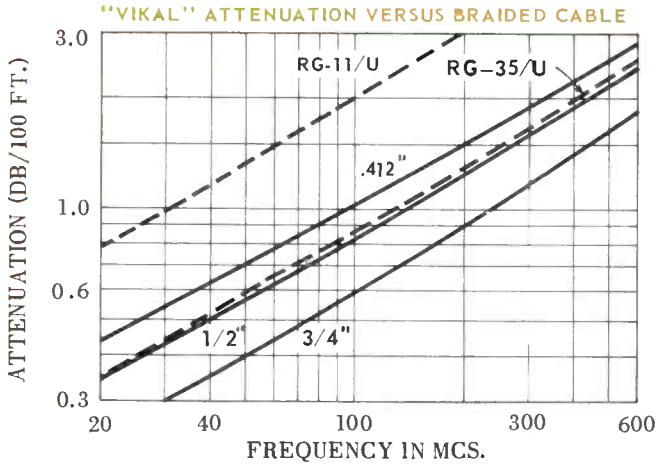

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VK-1412: .412" Low Loss Feeder Cable

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PREVIEW ISSUE

BM/E

THE MAGAZINE OF
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Washington, D. C.

"A cover should, first of all, attract the eye." Working from this basic publishing verity, Art Director Gus Sauter gave us the striking pattern adorning the cover of our first issue. From such a fundamental shape, interpretations are manifold . . . the ideal dipole antenna pattern . . . an axial view of an idealized beam shape. If pressed for a meaning, the publisher might say the closed circle represents the totality of BM/E's coverage of all aspects of broadcasting — both management and engineering.

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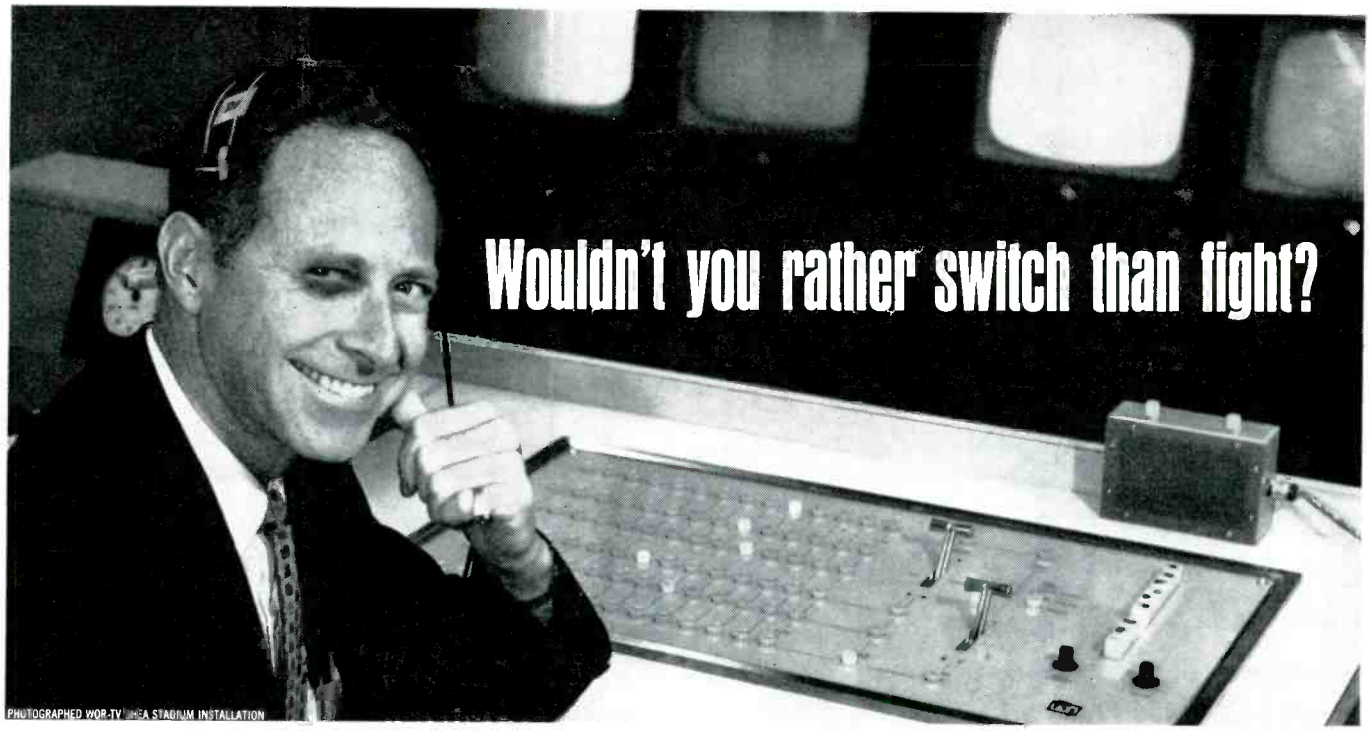
BM/E is circulated without charge to those responsible for station operation and for specifying and authorizing the purchase of equipment used in broadcast facilities. These facilities include AM, FM, and TV broadcast stations; CATV systems; ETV stations, networks and studios; audio and video recording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

 Application to mail at controlled circulation rate is pending at Baltimore, Md.



There is no "fighting" with the RIKER all-transistor Vertical Interval Switching equipment. It introduces a new concept in video switching systems for BOTH COLOR and MONOCHROME, and provides a degree of flexibility not found in any other system. Modular design and plug-in construction of the RIKER switching system is used throughout the entire line of RIKER products. By combining modules, virtually any size switching system can be tailored to your specific requirements. Future expansion may be accomplished by plugging in additional modules. The availability of 8 x 1 and 4 x 1 switching modules assures optimum flexibility and economy. All units are readily serviceable with easily replaceable circuit cards.

Rigid specifications guarantee high quality performance and reliability under all operating conditions.

Differential phase, differential gain and overall amplitude frequency response exceed the requirements for excellent color and monochrome picture quality. Switching in nanoseconds assures invisible transitions, even if operated non-vertical interval.

The RIKER switching system operates during the vertical interval thereby eliminating difficulties found in random and relay switching systems. It is designed and packaged for ease of installation, portability, and minimum maintenance.

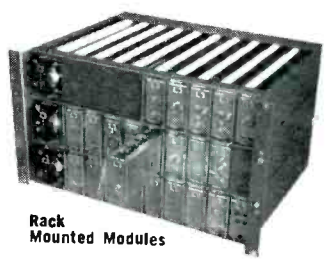
What's new from RIKER

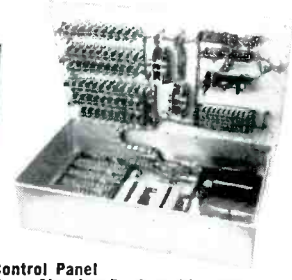
Color & Monochrome stabilizing amplifiers
SMPTE Signal Generator
Vertical Interval VITEAC Signal Generator
Diagonal Bar and Dot Generator

Recent RIKER Installations: **KIMA** 6 in non comp, 4 out, special effects. **MGM** 7 in non comp, 1 in comp, 4 out. **WJZ** 17 in non comp, 8 in comp, 8 out, special effects. **WOR-TV (RKO)** 14 in, 6 out, special effects. **UCLA** 6 in comp, 5 out. **KOLO** 10 in non comp, 4 in comp, 7 out, special effects. **WJVJ** 12 in non comp, 8 in comp, 8 out, special effects, double reentry. **U of Calif.** 7 in non comp, 4 out, special effects. **Sports Network** 6 in non comp, 4 in comp, 5 out, 2 comp/non comp, special effects.

Specifications: Specifications apply to the entire signal path from any input selected on the program switching bus to the output:

Amplitude-Frequency Response	± 0.1 db to 6 mc ± 1 db to 12 mc
Differential Phase at 3.58 mc	Less than 1° at 10% to 90% APL
Differential Gain at 3.58 mc	Less than 1% at 10% to 90% APL
Tilt	Less than 1% at 60 cycles
Cross Talk	At least 55 db down at 4.2 mc
Switching Time	Less than 1 microsecond (after verticle sync)
Imput Impedance	30 K ohms
Pulse Imput Imedance	30 K ohms
Output Impedance	75 ohms terminated


Rack Mounted Modules


Control Panel Open Showing Replaceable Modules

Features: **Plug-in modular construction, completely interchangeable units • Highly reliable all solid state video switching • Modular design for complete system flexibility allows for future expansion very economically • Any number of inputs and outputs • Ultimate stability • Minimum rack space—rugged construction • Picture transition in nanoseconds • Excellent interchannel crosstalk isolation • System completely assembled, wired and tested at factory • Easily serviced with replaceable circuit cards • New fully automatic foolproof double re-entry system (patent applied for) • Preset precision delays prevent phase shift problems.**

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FROM The PUBLISHER

Why BM/E—the magazine of Broadcast Management/Engineering? Why indeed a new publication for the broadcast industry? For the simple—yet nonetheless significant—reason that there is a need for a new communications medium for the communications market . . . need for a publication specifically designed to help broadcasters operate their facilities more efficiently, more capably, more profitably.

This need is no mere conjecture on the part of a hopeful publisher. In our recent survey on the industry (a complete report of which will be published in the near future), 94% of all broadcasters—a record of some sort—stated they needed a magazine of the type expressed by BM/E's philosophy. I think it important to dwell briefly on that concept since, in the long run you, the reader, will decide if it is valid, if it serves a purpose, if it fulfills your needs.

- BM/E is, firstly, designed for the TOTAL broadcast market. Our definition of broadcasting in this context includes not only radio and TV facilities, but also CATV and ETV facilities, audio and video recording studios, broadcast consultants, background music operators, and allied groups. That there is an interrelationship among them is undeniable. Additionally, there is great mutuality of interest in these varied areas of broadcasting (e.g., CATV today is a subject of intense interest to most broadcasters).
- BM/E's circulation is worldwide—again, not only due to a compatibility of interests among foreign and U.S. broadcasters, but in anticipation of true worldwide television.
- BM/E will keep abreast of the fast-changing broadcast field to bring you in-depth coverage of new and important developments. We have no "sacred cows," no predetermined notions, no personal prejudice. BM/E will change as the industry changes, to deliver at all times a modern, lively magazine, as dynamic as the industry it serves.
- Editorially, BM/E will pull no punches. We intend to call a spade a spade. We will present both sides of controversial subjects. Always, however, our editorial guideline shall be—what is good for the industry . . . not controversy for controversy's sake.

Now a brief word about the company which publishes BM/E—Mactier Publishing Corp. Founded just three years ago, Mactier today publishes three other highly respected magazines:
EEE—the magazine of Circuit Design Engineering (47,000 circulation)
ELECTRONIC PROCUREMENT—covering Evaluation & Purchasing (27,500 circulation)
VOLT/AGE—the magazine of Electrical Apparatus Maintenance (19,000 circulation)
Mactier's growth has been far above average in publishing circles. The reasons? Magazines based on proven needs, a concerted effort to truly serve their readers, predilection to chart new paths in publishing, and periodicals which keep pace with the industries they serve.

Introducing a new magazine is not unlike giving birth to a new baby. Just as the proud parents fervently wish for universal acceptance of their offspring, so the magazine publisher desires an acceptance of his "baby" by its readers. And, while we present this, our Preview Issue, with pride, we also realize that, like a baby, BM/E will mature, will grow, will even better serve your needs in future issues. Apropos of this, we solicit your comments, your suggestions, your criticisms. To assist our Editorial Staff in obtaining this feedback from you, we've provided ample space on our Reader Service Card (bound in after page 50) for you to tell us what you like about BM/E, what you don't like, and what you'd like to see in future issues.

I would be remiss in closing were I not to thank those manufacturers whose advertising messages appear in this issue for their support—support given largely because you expressed a need for BM/E.

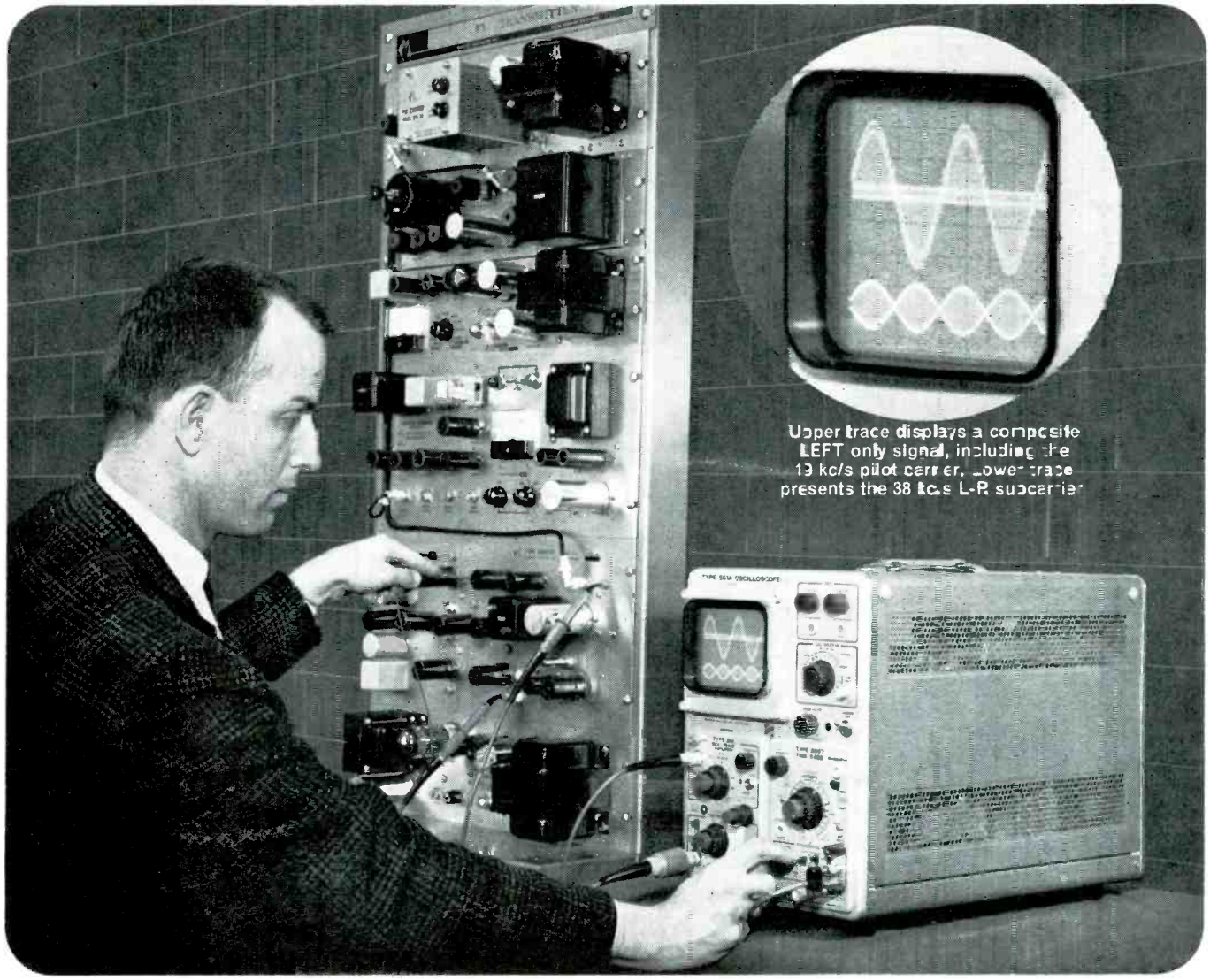
Sincerely,
Mal Parks, Jr.
Publisher

Choosing a name for a new magazine . . .

Some readers may recall that in the first announcements of our new publication, we called it BEAM, the magazine of Broadcast Engineering And Management. This name was chosen, naturally, after a thorough search of Copyright and Trademark Registration Office files.

Subsequently, however, we found that our choice was not completely unique. A religious organization regularly publishes a magazine called "The Beam," without having registered the name.

To avoid confusion, therefore, BEAM has become **BM/E**, the magazine of Broadcast Management/Engineering.



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Type 561A Oscilloscope $500

Plug-Ins illustrated

Type 3A1 Dual-Trace Unit $450

Type 2B67 Time-Base Unit $210

15 other plug-ins available.

For rack mounting, in 7 inches of standard rack height, order Type RM561A $550

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For your test needs, there is a Tektronix Oscilloscope to fit every quality-assurance program —and comprehensive field services to back up every instrument.

For information, call your Tektronix Field Engineer or representative now.

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BROADCAST INDUSTRY NEWS

Lee Wants FCC to Control CATV

Speaking at the final NAB Fall Conference, FCC Commissioner Robert E. Lee said he would urge the Commission to assume jurisdiction over CATV systems and regulate them in the public interest. Moreover, stating that he had given the matter a great deal of thought, he said, "I am willing to take the giant step of assuming jurisdiction over CATV systems—both wired and over the air."

While indicating that he has no objections to actions by Congress, the Commissioner fears that waiting may entail too much delay in solving the CATV dilemma.

"I am going to urge the Commission to face up to this very soon," he said. "The quicker the problem is solved, the better off we will be."

Commissioner Lee feels that CATV systems perform a needed service in areas which are not now adequately served by commercial TV stations. In fact, he urged broadcasters to begin such operations where it would be "good business."

However, he stated that he personally feels CATV systems should be prevented from originating their own programming—except possibly in those few instances where it would provide the first local service in the area.

WNJU-TV Spends $1 Million for Equipment

Metropolitan New York-New Jersey's first new commercial TV station in 16 years, WNJU-TV (Channel 47), has signed contracts with RCA for more than $1,000,000 in new equipment and services. New Jersey Television Corp (licensee) expects the station to be in operation, providing both monochrome and color programming, next spring. Transmitting from the Empire State Building, ERP of the new UHF facility will be 500 kw, more than any commercial station now broadcasting from the building.

Broadcasting from the same tower used by all New York stations, Channel 47 will cover a wide radius, encompassing New Jersey, New York City, lower New York State, and southern Connecticut. Daytime programming will be exclusively oriented for New Jersey audiences; evening broadcasts will concentrate on cultural programs.

Channel 47 will be the first commercial UHF, and the seventh commercial channel in the nation's largest TV market. The New York area has had only six commercial stations since Channel 13 became an educational outlet in 1961.

"Automate Both Engineering and Business"—LTV Exec

"Automatic programming and logging, with proper flexibility, can become a valuable aid to any radio station," says Don W. Clark, Marketing Manager for PROLOG Systems, LTV Continental Electronics Div., Dallas, adding, "To flexibility add reliability and we can use key personnel more effectively to improve programming and reduce costs. Add one more factor, tools for management in the problem areas of broadcasting, and we can approach the problem as a whole."

Realizing that program equipment automation is only half the battle, Mr. Clark cites a specific example of how KIMM (Denver) uses the PROLOG system in combination with IBM equipment for handling traffic and availabilities, customer statements and affidavits, FCC reports, and accounting and sales analyses.

ETV Gets 12-Channel Cable System

One of the limitations to making greater use of educational TV programs has been the lack of sufficient distribution capability. ETV programs are distributed in schools by coaxial cable, but until recently cable systems could carry no more than seven TV channels. Since many subjects are taught simultaneously, this channel limitation prevented greater use of television programs in schools.

A new system, developed by Jerrold Electronics, makes it technically feasible to distribute 12 signals simultaneously, without adjacent channel interference. With the basic unit, Jerrold's Channel Commander, a coaxial cable system can be used as an audio-visual link between program sources and any number of classrooms, as well as between different buildings or schools.

Dr. Phillip Lewis, Director of Research for the Chicago Board of Education, described a Jerrold ETV system linking Richard Byrd School to four others as ". . . the first in the Chicago area with 12-Channel capability."

Campaign Promotes UHF Conversion

Blonder-Tongue has been conducting some worthwhile UHF station promotions in areas such as Dayton and Boston. Consumer cam-

paigns, timed to coincide with new UHF starts, have emphasized the stations while promoting the company's line of converters, antennas and boosters. Built around the theme, "Enjoy (city name)'s newest TV station," advertising in newspapers and local editions of TV Guide is supported by cooperative dealer advertising. Tying their efforts to the individual station promotion activities, Blonder-Tongue's main approach is to make sure people within range of a new UHF know they can receive it.

New Development Enables TV Camera to "See in the Dark"

General Electric has introduced a new television camera control system which increases the brightness range of TV cameras by three orders of magnitude. Said to eliminate "blooming," working latitudes as high as 40,000 are reported. The latitude of a conventional chain is on the order of 40.

In a conventional camera, beam current is set for the highlight brightness and adjusted by the cameraman on a scene-to-scene basis. The GE system, which adjusts the beam automatically as it sweeps the target, is expected to improve camera pickups in applications ranging from shadowed batter's boxes to viewing moon craters. The system was invented by Edward G. Nielsen and S. Peter Stranddorf, who conducted the work for GE's Missile and Space Div.

New Transmitter Firm

A new Transmitter Division, engaged in the design and manufacture of high-powered broadcast equipment, has been established by American Electronic Laboratories, Inc., Colmar, Pa. Equipment planned includes AM transmitters from 1 kw to 50 kw, FM transmitters from 10 watts to 40 kw; VHF and microwave transmitters are also being considered. The new division is under the direction of Raymond S. Markowitz, senior vice president. Robert Jose, formerly general manager of ITA Electronics, is in charge of divisional operations.

Entron Declares First Dividend

The first dividend declared by the company since going public in 1959 was announced on November 30 by Entron, Inc., Silver Spring, Md. CATV equipment manufacturer. Dividend is .05¢ per share plus 5% stock, both payable to stockholders of record as of December 15.

Robert J. McGeehan, the firm's president, also cites a current backlog of $638,000, up 100% over last year. Earnings and sales for the six months ending August 31 were:

	1964	1963
Sales	$985,339	$603,191
Earnings (pre-tax)	66,472	(66,912)

BROADCAST INDUSTRY NEWS

NAB News

CATV Microwave Relays

NAB urged the FCC to withdraw its proposed rules relating to licensing of microwave relays for CATV systems until Congress or the Commission determines CATV's role "in the overall scheme of broadcasting." NAB, while concurring in FCC findings that "CATV systems are part of the nation's TV service and have an inter-relationship with TV broadcasters," said proposed rules were "premature" and a continuation of FCC's "inadequate and dangerous" attempt to resolve piecemeal the problems caused by CATV growth.

Station licenses

NAB will urge Congress to extend the term of radio and TV station licenses beyond 3 years. The Association contends such a move would relieve stations of much red tape and paperwork required in preparing renewal forms; would reduce the FCC backlog of renewal cases; and has been earned by virtue of broadcasters having proved their responsibility and maturity.

Apollo Space Program

The FCC proposal that TV broadcasters share two TV auxiliary services frequencies with the Apollo space program would, says NAB, "greatly restrict" TV's public service. NAB contends ample spectrum space is available among frequencies exclusively assigned to the government to accommodate the Apollo earth-to-space communications channels without encroaching upon the auxiliary TV frequencies, now used for remote TV pickups, STL, and intercity relays.

Staff Changes

Effective Dec. 1st, William L. Walker, formerly assistant treasurer, took over new duties as NAB Director of Broadcast Management. Walker succeeds James H. Hurlbert, who was previously appointed assistant to the President (a post vacant since the resignation of LeRoy Collins). The appointment was made by Vincent T. Wasilewski, NAB Executive Vice President. In the same action, David L. Doughty, member of the Department staff, was promoted to Labor Counsel, reporting to Mr. Walker.

Recent FCC Actions

Newswire Contracts

The FCC has begun an inquiry into contracts of broadcast station licensees with newswire services, with the purpose of proposing rules limiting the tenure of such contracts (usually issued for 5 years). The Commission is concerned that such long-term contracts may affect the licensee's ability to operate in the public interest, particularly if it prohibits him from supplying news programming best suited to local needs. The Commission also wants to determine if additional competition in the newswire field for broadcasters, through shorter-term contracts, will improve news service to the public.

Stereo TV Sound

Should stereophonic sound transmissions be authorized for TV, as proposed by leading receiver manufacturers? The Commission has asked for comments, due by mid-January, to determine if stereo TV sound "will add to the realism or otherwise contribute a worthwhile improvement to the overall portrayal of programs." Further, the FCC wants to know "what system of producing stereophonic sound transmission and reception should be employed." Comments are also desired concerning the availability of stereo program material and techniques.

Rule Changes

Docket 14185: FM broadcast rules, amended, providing means for existing short-spaced commercial FM stations to increase or improve their coverage. Effective Nov. 16, 1964, present short-spaced stations may apply for increased power and antenna height up to the maximum, according to a prescribed table based on co-channel and adjacent channel separations. Except for the latter restriction, Class A stations will be permitted to go to maximums, regardless of short spacing. Class B stations will be permitted increased facilities, depending on the distance to the stations from which they are short-spaced. Stations with 400 and 600 kc separations may request power increases regardless

of existing short spaces. Channel shifts will be considered if they add to service.

Part 73, Subpart E amended to eliminate the requirement that TV stations employ continuously operating type-approved frequency monitors while on the air. Also, transmitter frequencies need only be checked once a day instead of every half hour. Improved TV transmitting equipment no longer makes frequency monitors necessary, and simpler means can be used to check operating frequencies.

Part 74, Subpart D amended to permit the use of automatic relay stations to transmit aural coverage of on-the-spot and other news events for places unfavorable for operation of the usual portable and mobile transmitters.

Parts 74 and 91 amended to permit interchangeable use of TV broadcast auxiliary stations and microwave facilities of closed-circuit ETV systems to transmit material for ETV use. However, this secondary use must be less than 50% of the total use for these facilities in any year. The rules also specify that there be no harmful interference to other stations, and that no charge be made for secondary use of the facilities.

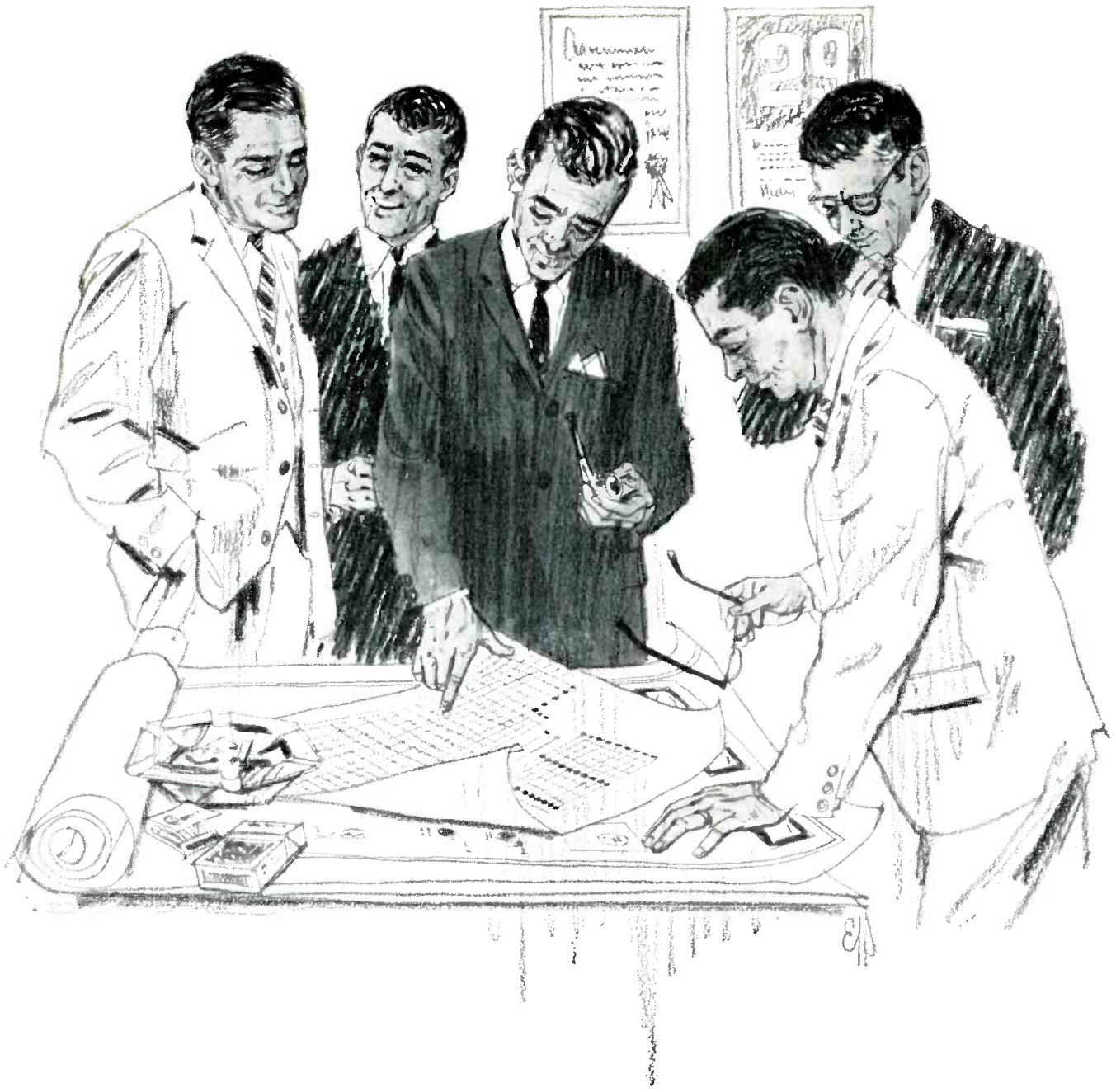
PEOPLE

Sidney B. McCollum appointed Director of Sales of Riker Industries, Inc., Huntington Station, N. Y. McCollum was formerly Field Manager, Mincom Div., 3M Co., Chief Engineer of the Sound Dept., Film Productions International, and Technical Director, WWJ-TV.

Irving Kuzminsky named director of advanced engineering for Entron, Inc., manufacturers of community, master, and educational TV equipment. Mr. Kuzmisky has had over nine years experience in CATV.

Robert T. Ennis promoted by Roanwell Corp. to Product Manager, Telephone and Broadcast Equipment. Ennis will develop broadcast industry markets for the present line of telephone transmitters and headsets, and assume responsibility for new product development.

Oliver Bjerke appointed Western Regional Manager, Broadcast Equipment Div., Sarkes Tarzian, Inc. Bjerke, formerly with a west coast electronics manufacturer, and engineering staff of a San Francisco TV station, will cover six western states from offices in Santa Clara, Cal.



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INTERPRETING THE FCC RULES & REGULATIONS

Is The "AM FREEZE" Really Over?

ON JULY 15, 1964, the FCC issued its long-awaited revision of standards for allocation of new or changed facilities in the standard broadcast radio service. This development heralds a marked departure from the long-established criteria used by the Commission.

As enacted in 1934, the Communications Act contained a modified version of the station allocation plan established under the old Federal Radio Act of 1927. This system was too cumbersome, however, and the Communications Act was amended in 1936 to eliminate specific directions in allocations and to substitute the general language of Section 307(b):

> "In considering applications for licenses, and modifications and renewals thereof, when and insofar as there is demand for the same, the Commission shall make such distribution of licenses, frequencies, and hours of operation and of power among the several states and communities as to provide a fair, efficient, and equitable distribution of radio service to each of the same."

This general language gave the Commission a wide area of discretion in formulating an allocation plan. In fact, the method for allocating AM facilities differed substantially from that used for FM or television allocation.

Until July of this year, standard broadcast allocations have not changed appreciably since the late 1930s. In order to strike a balance between the conflicting possibilities of a relatively small number of high-powered stations and a very large number of lower-powered stations with service areas highly restricted by interference, the Commission divided the 107 standard broadcast channels into four "Classes."

Class I—

(1) assigned 46 designated channels
(2) permitted power up to 50 kilowatts
(3) highly limited in number (normally, not more than two on a single channel)
(4) given extensive protection from interference both day and night.

Class IV stations, restricted in power to one kilowatt daytime and 250 watts nighttime, are assigned in great numbers (approximately 1000) on only six channels, and generally serve little more than the immediate community.

Class III stations broadcast with a maximum power of five kilowatts and are designed to serve a particular city and surrounding area.

Finally, Class II stations are heterogeneous and designed to make the best possible use of "left-over" frequencies. On each of these channels, an assigned station is afforded protection, under the Rules, to a certain service contour, called the "normally-protected contour."

The Commission had adopted these standards in order to overcome three principal deficiencies in the standard broadcast radio service:

(1) Lack of any local outlet in many communities of substantial size.
(2) Absence of competing local stations in many communities which had a facility.
(3) Substantial "white areas," which do not have any recognized radio reception service available—in the Northeast, Midwest, South and Far West.

However, it soon became apparent that, in many instances, simultaneous application of these three standards could not be consistent. It is important to note that under Section 307(b) of the Communications Act, the term "radio service" means both transmission and reception service. Since the goal to provide local outlets and foster competition might conflict with the objective of eradicating "white areas," the Commission decided that a case-to-case or ad hoc approach would balance the dichotomous purposes and result in a pattern of standard broadcast allocations which, hopefully, would reflect equal achievement of these three goals.

The Exceptions Become The Rules!

Accordingly, the Commission, in standards which were relatively unchanged from 1945 to 1962, established two main criteria for granting or denying standard broadcast applications. In the first of these, Section 73.24(b), the Commission provided that an applicant for new or changed facilities in the standard broadcast service could not cause interference to an existing station under Commission engineering standards then in effect, unless the need for the new service outweighed the need for service to be lost. In the second basic rule, Section 73.28(d)(3), the Commission provided that a proposed facility could receive no more than a 10% population loss by reason of interference received during its normally-protected contour.

However, Section 73.28(d)(3) of the rules contained several significant exceptions which permitted numerous grants of proposals receiving interference far in excess of 10%. In addition to these built-in exceptions to Section 73.28(d)(3), the Commission, in a number of cases, weighed several non-engineering factors against strict implementation of the rule. In short, the exceptions to Commission engineering standards became the basis for allocation of new or changed standard broadcast facilities. Thus, there evolved

INTERPRETING THE **FCC** RULES & REGULATIONS

a body of Commission precedent which eroded the standards set forth in Sections 73.24(b) and 73.28(d)(3) of the Rules.

Additionally, between 1945 and 1962, the Commission had become increasingly concerned about the basic assumption which has been employed in computing acceptable levels of signal strength. In view of the deterioration of the normally protected contour concept, questions arose as to whether the signal levels required for city service were adequate to insure meaningful service. The issuance of so many decisions, based upon exceptions and waivers of Sections 73.24(b) and 73.28(d)(3), negated or invalidated the basic assumptions underlying the rules. As a result, there was no clear method of determining what constituted a listenable signal under given circumstances. *In effect, the exceptions become the rules!*

Institution Of The "AM FREEZE"

The Commission decided that it was imperative to re-examine the over-all standards involved in assignments of standard broadcast facilities, and on May 10, 1962 issued its dramatic Report And Order, imposing a "freeze" on acceptance of applications for new or changed facilities in the standard broadcast radio service. As of that date, virtually all such AM applications *would not be accepted for filing*. The exceptions were limited to applications for:

(1) "White areas"
(2) New Class II-A facilities made available as a result of the Clear Channel Proceedings (an unrelated proceeding too lengthy to deal with here).
(3) Stations that would create no interference to existing stations.
(4) Class IV local stations desiring to increase daytime power to one kilowatt.

After considerable study, on May 17, 1963, the Commission issued a Notice of Proposed Rulemaking in which it proposed adoption of standards based upon a "go no-go" rather than on a "demand" basis. That is, the Commission would grant virtually no waivers or exceptions to its new rules, and proposed to refuse acceptance for processing any application in which there would be overlap of defined signal strength contours with certain contours of an existing station.

The Lifting of the "FREEZE"

After reviewing the merits of numerous critical written comments and oral arguments, the Commission took action. It lifted the AM freeze on July 15, 1964, and adopted the general provisions set forth in its proposal. The new allocations standards for daytime operation prohibit overlap for contours as shown in the chart.

There are two exceptions to this "go no-go" or no exception approach. First, where there is a proposal for a first local station in a community, or for change in facilities of a first local station in a given community, the rule would bar overlap of the new 1 mv/m contour of a co-channel station. Under this exception, any "community" outside an urbanized area will qualify. Only communities in excess of 25,000 population will qualify if located all or partly within urbanized areas. Second, the requirements are similarly relaxed for proposals for new or changed facilities which would provide a first service to 25 per cent or more of the area within its proposed 0.5 mv/m contour. No other exceptions to prohibit overlap are permitted. Similar restrictions have been adopted for nighttime proposals.

Frequency Separation	Contour of proposed new station (Class II-B, II-D, III, and IV)	Contour of Any Other Station
Co-channel	0.005 mv/m	0.1 mv/m (Class I)
	0.025 mv/m	0.5 mv/m (Class II, III, IV)
	0.5 mv/m	0.025 mv/m (All Classes)
10 kilocycles	0.5 mv/m	0.5 mv/m (All Classes)
20 kilocycles	2 mv/m	25 mv/m (All Classes)
	25 mv/m	2 mv/m (All Classes)
30 kilocycles	25 mv/m	25 mv/m (All Classes)

Accomplishments of the New Rules

This marked departure from traditional allocation concepts might well be examined in terms of the Commission's three-fold objectives:

(1) Give a local outlet to many communities of substantial size.
(2) Provide competition for existing local stations.
(3) Provide a reception service to all areas of the United States.

It is doubtful whether any of these three objectives is furthered by the new allocation standards, which deprive the applicant of the opportunity, in an exceptional case, to make a showing in support of waiver of the rigid engineering criteria adopted as of July 15th. Moreover, if these standards are followed to their logical conclusion, it can be inferred, in terms of engineering practice, that a radio signal stops at a specified contour or may suddenly change from rendering a satisfactory signal to an unsatisfactory signal without regard to such variables as time, weather, and the like. While the new rules advance administrative convenience for the Commission in processing applications for standard broadcast facilities, grave questions remain as to whether these standards are consistent with the "fair, efficient, and equitable distribution of facilities" required under Section Act 307(b).

In the Commission's view, the retention of the previous standards would only mean further concentration of standard broadcast stations around densely populated areas.

As demonstrated above, the lifting of the AM freeze has enabled a limited number of stations to improve their facilities but, on the whole, *the new allocations standards impose rigid restrictions that virtually freeze further development of standard broadcast stations.* As a practical matter, the general effect of THE SO-CALLED "AM FREEZE" HAS NOT BEEN LIFTED! It is unlikely that this situation will change in the near future.

(Continued on page 17)

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INTERPRETING THE **FCC** RULES & REGULATIONS

FCC Fines Are Beginning To "Pinch"

A SIGNIFICANT TREND in the FCC's increasing control of broadcast licenses is evidenced by the rapidly growing number of penalties, forfeitures, and cease and desist powers which were granted to the Commission under amendments to the Communications Act. Of particular interest are the 1960 changes set forth in Title V, Sections 501-504, of the Communications Act of 1934 as amended. These provisions provide the FCC with the authority to levy fines up to $10,000 for violations of the Act or the Commission's rules. The dramatic effect of these changes is difficult to understand without some examination of reasons for the 1960 modification.

The Birth of Fines & Forfeitures

For many years, the Commission and Congress have manifested grave concern over the Commission's apparent lack of effective methods of assuring and enforcing compliance with the Act and the Commission's rules. Until the 1960 amendments to the Act, the FCC's only recourse for non-compliance by broadcast licensees was to institute proceedings for revocation of license. Naturally, the use of this "death sentence" was (1) most inequitable for minor violations and (2) often required a hearing and resulted in a substantial loss of time and money by both the Commission and the licensee.

To alleviate this situation, Congress enacted, in 1960, the amendments referred to above, which enabled the Commission to issue notices of apparent liability for "willful and repeated" violations of the Act and/or of its rules. Such violations, and resultant fines of up to $10,000, may be dealt with and imposed without recourse to the hearing process. The licensee is afforded an opportunity to respond and demonstrate that the fine should be reduced or cancelled in its entirety. After receipt of the licensee's response, the Commission may (1) reduce the monetary amount of forfeiture,, (2) cancel the penalty, or (3) affirm its original position. Once the Commission has taken its final stand on the matter, the licensee has the right to refuse to pay the fine imposed and request a trial in the United States District Court to seek formal determination of liability. The latter procedure is rarely followed due to the expense involved.

Definition of "Willful and Repeated"

Liability for such fines is predicated on the fact that the licensee has violated, by an overt act or the omission of one, the Act or the Commission's rules in a "willful and repeated" manner. Most of the disputes over the Commission's notices of liability and resultant fines have revolved around a definition of the words "willful and repeated." There are many cases to support the observation that the Commission will hold any violation as "willful." The licensee, and all its employees and agents, are expected to know the rules, and ignorance thereof rarely mitigates the fine. The adage, "Ignorance of the law is no excuse," is strictly adhered to by the Commission.

The cases which have turned upon a definition of the word "repeated" prove equally discomforting. In brief, the Commission has repeatedly held that a violation is "repeated" if it "occurs more than once."

Some Illustrative Cases

To fully comprehend the broad scope of the Commission's growing proclivity to assess large fines in quantity, we offer some examples of those imposed during the last few years. To avoid opening up "old sores," the call letters and locations of the stations have been intentionally omitted: (1) $10,000 for "rigged" sweepstakes contest; (2) $10,000 for violations including inadequate sponsorship identifications, failure to fill time broker contracts, and deficient program logs; (3) $4,000 for making equipment and program tests without notification to the FCC; (4) $5,000 for unauthorized assignment of license; (5) $3,500 for failure to have a first-class radiotelephone operator on regular full-time employment; (6) $2,500 for unauthorized transfer of control; (7) $5,000 for failure to announce the sponsor of advertisements; (8) $2,000 for improper station identification; (9) $1,000 for operating a new antenna without authority; (10) $1,000 for unauthorized pre-sunrise operation; (11) $1,000 for failure to identify the *real* sponsor of a political broadcast.

Fines Will Rise, Court Relief Doubtful

It is clear that the use of forfeitures and fines, as the Commission's primary lever against violators, will become more prevalent and painful in the years to come. Many broadcasters have already felt the poignant sting of this four-year old Commission tool, but many more remain vulnerable targets by ignoring or overlooking the Commission's policing tactics.

There is only a remote possibility that the Commission's forfeiture system will be successfully challenged in Court, because the Communications Act places much discretion with the Commission, and the Court would not normally substitute its judgment for that of the Commission unless the factual situation and equities clearly favored the licensee.

The only comforting aspect of this development is that the Commission, through its seven Commissioners, must pass on all matters involving potential issuance of fine or forfeitures. Such problems cannot be delegated to the staff, nor is it likely they will be in the foreseeable future. Hopefully, this protection will provide an atmosphere for consistent and restrained implementation of this penal power. In any event, it behooves all broadcast licensees to take another hard look at the Act and the Commission's rules and to do all possible to adhere closely thereto. ●

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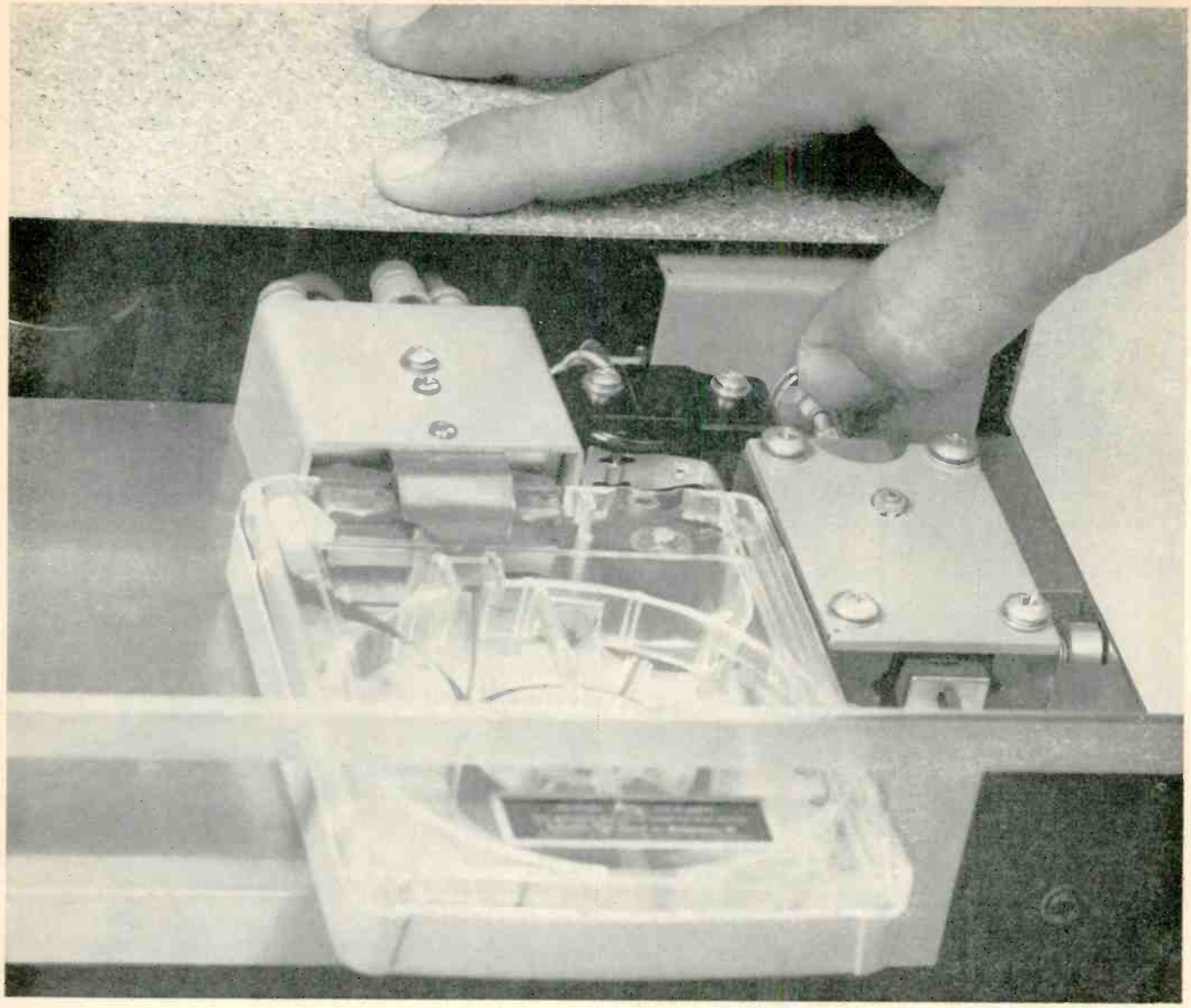

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CABLES, COINBOXES, AND THE PUBLIC INTEREST

CATV Panel Session, NAB Fall Conference, Richmond, Virginia, Nov. 17, 1964

The following 8-pages represent, we believe, a new departure in broadcast journalism . . . a complete transcript of the panel discussion on pay and cable TV conducted at the NAB Fall Conference in Richmond, Va. on November 17th. Panel moderator was William Carlisle, NAB V-P for station services. Panelists participating, in the order of their appearance on the program, were John H. Pinto, V-P, RKO General Phonevision Co., New York; M. William Adler, Adler Associates (CATV consultants and multi-system CATV operator), Washington, D. C.; Wilson C. Wearn, Executive V-P, Southeastern Broadcasting Corp., Greenville, S. C.; and G. Richard Shafto, member of NAB's Future of Television in America Committee, and President, Broadcasting Company of the South, Columbia, S. C. Mr. Douglas A. Anello, NAB general counsel, participated as a fifth panel member to comment on the moral and legal aspects of cable TV operation.

Each panelist was scheduled for 10 minutes to express his views, Mr. Pinto on behalf of pay TV, Mr. Adler in support of CATV, Mr. Wearn as a typical broadcaster concerned about these TV systems, and Mr. Shafto to present the NAB's view, plus comments of his own, as both a broadcaster and CATV operator. We believe this panel discussion brought to light many vital factors of great importance to everyone in broadcasting and have therefore published the entire transcript, through the courtesy and cooperation of the NAB.

MR. CARLISLE: Concerning this panel, I'd like to explain what it is to be, who is on it, the formula or the format that we will follow during the next hour and a half or so. As to the why of the matter, these two subjects, "Pay Television and CATV" have been cores of conversation in many NAB and state meetings. They've been talked about in hallways and smoked-filled rooms, but very seldom up until this year has either subject appeared on the agenda of our meetings. This year we felt it was high time that we shed as much light, and preferably as little heat, as possible, on the subject of cable television and pay television. The interest in (these subjects) has mushroomed so greatly over the past year, we feel that as a National Association anything we can contribute to better understanding of the two subjects among our membership, so that they in turn may make good business judgments, would be a contribution to these meetings. Pay television, we all know that its immediate promise was somewhat inhibited by the results of the California Referendum, or initiative #15, wherein the voters of California voted down pay television for whatever reason, about 3 to 1. However, be it noted that the Hartford experiment, and the Toronto experiment are still in progress and doing quite well; be it also noted that franchises have been granted for four major cities in the United States by Telemeter. As far as CATV is concerned, broadcasters have turned from a former position of pretty much apathy about CATV which, frankly, some people didn't even know what the initials stood for, to the point today that this has been, I think, the hottest subject we have had on our agenda around the conferences in the preceding 7 meetings.

Broadcasters particularly are getting into CATV and we read weekly about a mounting investment, a multi-million dollars in community antenna by broadcast interests, including some of the largest in the country. We made this a joint session (for both radio and television broadcasters). We did it for this reason: Our mail at NAB runs about 5 to 1 on inquiries from radio broadcasters as opposed to television broadcasters, on questions pertaining to CATV. Some radio broadcasters presently are seeking a franchise in their own communities or nearby; other radio broadcasters are combatting cable television applied for by others. Some stations fear the spare channels of CATV wherein (they can carry) music picked out of the air from a far distant city—an FM station, for example, or a local background music service. This represents a potential fragmentation of their radio audience in the future.

And finally I think we have to go to the statistics put out, or the predictions put out, by the NCTA, the National Community Television Association, which is the trade association of the cable companies, in which they project that in ten years about 20% of the television homes in America will receive television by cable. Now if you project to 70 million sets by 1974, you have 13 or 14 million sets which are home entertainment centers which can receive not only television from far away, but radio signals as well. Thus, we feel that this is of equal interest to radio as well as television, and that is why this is a joint session.

Now the format will be approximately this: We will go to each of the four panelists for about 10 minutes of direct presentation, after which we'll ask Doug Annello to phrase the situation as he sees it at that time. Then we'll go back to each of the four panelists for about a two-minute rebuttal or commentary period, after which we will go to the floor and hope that each of you participate. To start out, I'd like to introduce to you our supporter of the pay television principle; we could find no better had we searched all over the country—John Pinto. John has been an articulate spokesman for the principle of pay television every meeting that he has participated in, and I'm sure he will be here. He is the Vice President of RKO General Phonevision in New York, who as you know operate the Hartford on-the-air pay television project. Without any further ado, I give you John Pinto.

MR. PINTO: Thank you, and good afternoon. Before the recent pay TV referendum which Bill mentioned, the CBS radio station in San Francisco came out very firmly *against* pay TV. At the same time, the CBS radio station in Los Angeles came out very firmly in favor of pay TV. This I mention as an example of the freedom which the radio broadcasters and television broadcasting stations, especially with CBS, are allowed in their editorializing. Incidentally, if any of you happen to know a qualified radio station manager who'd like to move to L.A., we might be able to help you (*laughter*). The California referendum obviously didn't make those of us in pay TV feel too well. Pat Weaver hasn't felt as low since he forgot to salute the General at NBC one morning (*laughter*). As you know the theater owners of America, by use of newspaper advertising, told the people of California that 1964 might well be the last year they could see the World Series on free TV, and as you know NBC has the series tied up for two more years. By dint of that and other types of advertising which were roundly condemned by the Better Business Bureau, the theater owners of America terrorized completely the people of California, who voted decisively to throw pay TV out before it got started. We in Hartford are still continuing to experiment on something which we hope will be the answer to helping all of us in the industry preserve home TV, rather than turning over many TV events to the motion picture theater. And in that light, I'd like to, if I may, briefly comment about pay television in three aspects, which I've labeled Purpose, Potential and Position. The *purpose* is RKO General's, the *potential* is yours, and the *position* is that of our mutual association, NAB.

First, therefore, I'd like to briefly state RKO's position in the pay TV picture as it is now, and I think will continue to be. RKO General is, as you may know, one of the major independent broadcasting companies in the business today. Our stations cover 6 of the nation's top markets, we have the number 1 radio station in the country—WOR. As you may know, our company and its stations have long been pioneers in the broadcast business. We got television films for television for the first time by the simple expedient of buying RKO pictures a few years ago—lock, stock, stars and studio; we came up with the million dollar movie concept of block programming; we are today leaders in color broadcasting, both in Los Angeles and in New York. We think that our record and our contributions to this business show pretty well that we're not either stupid or naive. Since, of course, we're prevented today from

buying additional television and radio stations, we're constantly looking for ways to expand our revenue base in the area of communications. CATV is one aspect of that expansion and we're in it. Now pay TV is another. If for one instant we believed that either of these two concepts would replace or harm our present business, we wouldn't be in them at all, even in this experimetnal way. But what assurance do we have, as far as pay TV is concerned, that it won't be bought at the expense of our and your commercial television future? At the start we had none. But now we've been in this business for nearly two and one half years of over-the-air experience, and it is this experience that we ask you to consider in your thinking about pay TV, rather than by blindly accepting inexperienced opinions which we believe are based upon fears and fiction. Today as you know, there are over 51 million television homes in the United States. Tonight over half of those will be dark, and the majority of those will be dark because people just don't care to see what is being offered tonight. We believe that pay TV may be one way to bring many of those back to the box [television receiver], by offering them additional new programming. We don't believe that these programs must supplant commercial television today, but rather that it can supplement it. Today in Hartford we have about 5,000 homes. The people in those homes watch pay TV about three hours a week. Now as you know, the average [time spent in] viewing of commercial television is about 40 hours a week. We believe therefore that we can supplement their [a family's] present commercial viewing in the same way as it is supplemented by their visits on occasion to theaters and other outside areas of entertainment. Home pay TV, in our opinion, will always compete far more with outside box office attractions than it will with commercial TV. What about programming? Well, the actual truth of the matter is that pay TV does not want commercial television programming. Why should it, when we can offer our customers as we do today in Hartford, current motion pictures at the same time as they're seen in downtown theaters? Tonight, incidentally we were going to offer them a fight [Clay-Liston]—(*laughter*) but we have not been able to get into the hospital operating room (*laughter*)—we tried to offer them the operation itself [on Clay] but they didn't allow us in (*laughter*). We offer other attractions which are only available through us and would not be available in the home. We don't believe that the Kildares, the Casey's, and the Bonanzas are the stuff of which pay TV dreams will be made in the future. They will continue to be offered as they are offered today, free. Now obviously the sports area is one on which you all have questions. The networks, as you know, are paying larger and larger sums for sports, and I believe that pay TV may get sports in time by default—because I don't believe that advertisers will be able to continually spend the money they are now spending, especially if prices increase. We believe that pay TV today should have its place in the industry because in the 75-mile blackout area where the National Football League games are played, as you know, only theaters are getting those games. We believe there's an opportunity today for home pay TV to be in that area and therefore preserve that money for the industry rather than [letting it go] entirely to the theaters.

There's also an expressed fear of course, of some in the industry that it will only be a short time until we in pay TV go for commercials. Well I disagree principally because of the economics. As you know, a commercial sponsor will pay a penny a commercial, or 4 or 5 cents for a program per home. Now a pay TV operator gets $1 or more per home per program. We believe that the extra small dividend he could have for putting commercials on pay TV just wouldn't be worth the sales resistance and other problems that he'd encounter with his customers who are getting pay TV or expect to get it without commercials.

Now what about the potential of pay TV to your business? Of course, if you elect to stay out of it, as I've stated, we don't believe it will harm you to any greater extent than your local theater harms you today. You owe it to yourself to thoroughly investigate, not how BAD things can get if pay TV gets here, but how GOOD they can be if you get into the field. Some anti-pay TV spokesmen, as you know, lately have hedged their bet by saying "Well it might be better to get in over-the-air pay TV and thus preserve ourselves from the unscrupulous people who are trying to get into TV over the line."

Well, we're in it over the air in Hartford, and occasionally over our heads; but I don't believe that we should at this time decide whether over-the-line or over-the-air is good or bad. If you believe, as I do, that we're in the business of bringing programs and entertainment to the home, let's not quibble about how it will get there right now. But if you elect to stay out of pay TV when it comes, you can benefit by the renewed excitement and vigor which we think it will bring to the entire industry—commercial and pay. We believe that you'll get renewed opportunities, as I said, to get people back into the habit. Secondly, you may choose to get partially into the business, possibly using the over-the-air system which we use in Hartford and which as you know is manufactured for us by Zenith. It's technically possible for any station today to sell time to pay TV. The pay TV operator would handle everything from outside, including sales, service, etc., and could bring the programs to you and you could sell the time without getting further involved. Now since pay TV of course makes its own programs, even a poorly rated station in the market could make out very handily this way. Or you might start by setting up a combined pay TV and commercial operation as we have in Hartford. You should remember that the economic base of pay TV is completely different than commercial TV, a fact which has not yet been learned, or at least admitted to by many of the anti-pay TV people. In pay TV you need only a very small average tune-in to get your business, because there's a much greater income per home. Tom O'Neil, Chairman of RKO General Company and its parent company, General Tire and Rubber, believe that in the future, pay TV can deliver more than $75 a home to broadcasters, as [measured] against the $40 they get now per home per year on commercial TV. He also believes that with increased UHF channels opening up, this will further cut down on the individual opportunities in any market, and pay TV might be a way to broaden your revenue base.

And now, finally, just a word on the NAB position as far as pay TV is concerned. In California, a business which has spent millions of dollars to get started was thrown out literally on its assets for the crime of competition. The Theater Owners of America, as I said, financed this disgraceful mission. Now the sober meaning of that vote is that it means, in California at least, that practically anything can be put on referendum. In essence, it means that it's possible, for example, for magazine publishers in California to entice people to vote against your right to put commercials over the free air, or as Time magazine said, it might be a good way for the glue manufacturers of America to try to vote Scotch tape out of business. But under the guise of protecting you and free TV, the Theater Owners have so far succeeded in relegating to themselves the future benefits of pay TV for their exclusive use. In this vital test case, the NAB, perhaps above all others, should have been protecting a right of a free enterprise business to live or die on its own merit. For that's the principle upon which our industry was built and one to which the association has long dedicated its efforts. Instead, the NAB hurriedly and baselessly, and to be absolutely correct I should say "unofficially," chose to join with the industry's one time mortal enemies, the Theater Owners, in order to put this business *out* of business. Now, I don't believe that the NAB had any facts to back up its stand. It was easier to hold to the old than to try the new. In this instance, the NAB position is something like voting to outlaw the automobile when all you've talked to is a couple of horses—whole horses, naturally. (*laughter*) I think that the word "unrealistic" is the kindest way to define NAB's action in this matter.

Our two and a half years of subscription TV in Hartford have proved that when people understand it they want it—that they will take programs different from, not stolen from, commercial TV; that pay TV increases, rather than changes, their TV viewing habits; that this new business can be built on a different basis than commercial TV and without injury to commercial TV. We think that pay TV deserves further study to support our premise that it can benefit the public and the industry, rather than [be subjected to] the same objective reasoning that condemned those crazy Wright Brothers before they got off the ground! (*applause*)

MR. CARLISLE: Thank you, John. Now let's turn from pay television to community antenna television. As I

said earlier, in each of these meetings we have tried to get a good vocal spokesman for the various sides, two sides of each of these two questions. We certainly have a vocal spokesman today on behalf of community antenna systems. You'll notice in your program he's a consultant in Washington and is also the operator of several CATV systems. I give you now from Washington, Mr. M. William Adler. (*applause*)

MR. ADLER: Mr. Carlisle, fellow panelists, Commissioner Lee, ladies and gentlemen, I thank you most humbly for allowing me the opportunity to be in Richmond today to talk to you about community antenna television. As I sat listening to John and thinking a little about the comparative impact of pay TV and CATV on broadcasting, my mind went back to advertisements which used to appear on the back of funny books when I was a child, and perhaps in the police gazette, etc. — those Charles Atlas commercials, where the 90-pound weakling kept getting sand thrown in his face by the bully, and I rather felt that perhaps pay TV, insofar as its impact on broadcasting today, is the 90-pound weakling, whereas CATV sems to be the bully. (*laughter*) So if I can dispell any such fears on your part that we are [the bully] I will be most pleased.

Let me begin with WHY CATV—not how or where, but WHY? Why did CATV come about? For a very simple reason. To answer a public need. Along about 1950, in the mountainous areas of Pennsylvania, West Virginia, New York, Oregon, California and Washington, people could not get any television reception from stations only 100 or 150 miles away. Television dealers could not sell sets. Their natural inclination was to find a way of getting a signal into the towns so they could sell receivers. And so the first CATV systems were constructed in such areas, merely as a means of making it possible to sell television receivers. In those early stages, certainly no one envisioned it would grow to an important industry and become such an important part of the broadcast industry as it is today. Nor did anyone realize that it could become such a *profitable* business. Nor I'm sure did anyone realize at that time what a great public service was about to be rendered and is still being rendered by CATV all across the country, in 48 of the 50 states.

The succeeding step after making the first signals available in those small towns was to make multiple channels available. In the beginning, I think no one ever thought that CATV would last any longer than the first day when people could get television reception on their own antennas. Such did not turn out to be the case. CATV operators were quick to add additional channels of service when television stations went on the air in their own particular areas. And so CATV grew into cities that had one local station, and has grown into cities that have two local stations, and systems are now under construction in cities with three local stations, and you've all read about plans for stations in places like Philadelphia and even New York City.

CATV has proved a number of things that only 15 years ago would have been laughed at as the foolish drivel of a maniac. CATV has proved that people will pay and pay happily to receive television. Of course, TV set and antenna manufacturers already knew this. But CATV proved that payment for reception via wire rather than broadcast [over-the-air] was and is a most acceptable idea. CATV proved that people will pay happily for increased quantity of signals—that is, more programs—than they are able to receive off their own antenna. In my opinion, at least 80% of the appeal of CATV is in its ability to provide additional signals. CATV has proved that people will pay for increased quantity of reception, but since quality, usually a very subjective thing, is more difficult to measure in its appeal, I'm suggesting to you that merely to prove the quality of existing reception of a particular town does not make CATV so. It helps, but it's a somewhat less significant factor than the additional programming that can be provided via CATV.

CATV systems that are being constructed today—and many that are already in operation—have an actual capacity of 18 television channels and 40 FM radio channels. They have a theoretical capacity of 35 television channels. And if one particular cable is jammed to its capacity in channel space it's a very simple proposition to add another cable right beside it and get yourself an additional 35 channels of TV and an additional 40 of FM. And, of course, gentlemen, that's what all the excitement is about—CATV's vast ability to deliver tremendous spectrum throughout any city or village in the U. S.

People pay for CATV privilege to get rid of their antennas. An antenna on the rooftop is no longer a prestige symbol—in fact, it's quite the other way around. An antenna off the rooftop is the prestige symbol in communities served by CATV. And lastly, people will pay to keep up with the Joneses; however much additional utility there may be in the addition of New York's independent channels to the three existing network stations in Philadelphia, people in Philadelphia will buy the service once they have it available to them—and in great numbers—not just because of the additional programming, but because it's a natural inclination of Americans to keep up with the Joneses.

CATV has its problems, of course. Some people think of CATV as being immoral, evil. I was at a council meeting recently in Colonie, New York, where a young man stood up in the back of the room and said, "Hasn't anybody considered the moral aspects of this issue?" As the consultant to the applicant, I had sat there all day long, or all night long, and hadn't opened my mouth, but that one really got to me, and I couldn't sit there any longer. They have called it piracy. Well, if CATV is piracy—if CATV is appropriating somebody else's property and selling it as their own and making money on it—the issue is certain to be resolved, because of course there is—at least in the CATV industry—a celebrated copyright law suit now being tried. It will be two or three years in the answer. My own particular prediction is that the industry will win that law suit, because we are not engaging in immoral activity—we are not stealing someone else's product. We are making television signals available to people who have every right to receive them. But if they just happen to be disadvantageously located, they're using a community antenna system rather than their own private antenna.

CATV has been charged with unfair competition, and there have been law suits on that subject. CATV won them. CATV has been charged with upsetting the FCC's allocation plan, with damaging the intent of 6th Report and Order. We in CATV maintain that we have contributed to the success of the 6th Report and Order. We have made the first television signals receivable in hundreds of communities, and we have made multiple signals available in hundreds more. CATV has never been the sole or even a slightly important factor in the demise of any television station. CATV *has*, however, been an important contributing factor in making a number of UHF stations successful, merely by making the signals available to VHF sets and keeping those stations on the air. CATV operators will, in my opinion, contribute to the growth of UHF by building UHF stations in dozens if not hundreds of communities now without local service.

CATV operators believe there should be local service and they believe that there should be local service on a free broadcast system. We know now, although we were once feared of course by free broadcasting, that CATV and free broadcast can exist in the same community without damaging each other. People ought to have free broadcast available to them and CATV operators are already applying for UHF channels. But all of CATV's problems and the problems that CATV is alleged to have created will be settled in the not too distant future in the public interest. It may not be solely in the CATV industry's interest, or solely in the NAB's interest, or solely in certain staff members of the FCC who want to enforce stringent regulations—but I maintain that it will be in the public interest.

And the public interest is in receiving all three national networks, in receiving educational television, in receiving one or more independent television stations, in receiving a number of FM radio stations with a variety of programming. There is only ONE way *all* of the people can receive *all* of these services—by wire. There is only one way all these services can be paid for—by subscription. It would be best, admittedly, to do it all by free broadcasting. But where are we going to get the spectrum, and where are we going to get the financial support? These premises being true, you must ask yourself, "Should I get into CATV?" Your answer must be "Yes," because CATV, or at least wire television, is the future of broadcasting in the United States. Through CATV you can vastly increase your opportunity to serve the public, and not incidentally you can vastly increase your own income.

Come on in fellows—the water's fine! (*applause*)

MR. CARLISLE: Bill, that was one of the clearest dilineations of our mutual problems that we have had so far. Perhaps everything is not quite as rosy as has been just presented, and maybe Wilson Wearn from Greenville, South Carolina, might shed some light on that aspect of it. Wilson, do you want to come up here please? (*applause*)

MR. WEARN: Mr. Chairman, ladies and gentlemen, please bear with us. I notice we have only had two ten-minute speeches and we've been here 35 minutes. (*laughter*) Since John Pinto spoke first, I would like to first address my thought to pay television. From what I have read and heard about prior panels such as this one in other cities, this has been quite a lively session. I suppose it has been due primarily to the very outspoken panelists that have been on, such as Bill Putnam and Ward Quall and others. Unfortunately for you folks, I'm a rather mild mannered person and I don't believe Dick Shafto is interested in getting into any fist fights today. So while I am up here and have the floor, I would like to take the opportunity to say that I think that John Pinto is a great big tall affable *liar*.

Since John didn't smile—(*laughter*) —and since he's also going to be up here in rebuttal in a few minutes, I'd better hasten to say that I don't really believe that he's a liar by design. I think he is unwittingly deceiving you. (*laughter*)

Several weeks ago I had the pleasure of, or at least the privilege, I guess, of hearing Pat Weaver when he addressed the RTES luncheon in New York City. And just as the pay TV advocates want to do, Pat was trying to explain to the people there assembled that pay TV is certainly not going to have any affect on commercial broadcasting.

As a matter of fact, he said, "You take sports. You people think we're going to take all the sports away from you. Nothing is more untrue than that."

He said, for instance, there are perhaps 145 to 160 professional football games every year, and you only have a very small number of those on free television. Surely those other 150 games ought to be received by those people who want to see them. And he said those of us in pay television really believe that the free television games on Sunday afternoon will certainly promote the pay television games, and we want them to stay on there. And, as a matter of fact, I wouldn't be surprised if we don't arrive at the time where pay television will pay free television to carry a game once a week for them.

Well, I never was able to figure whether Pat Weaver was saying this in jest or not, and I think everybody left trying to figure out what he really meant. But the fact that this occurred to him at all bothered me considerably. Frankly, I don't like anything at all about pay television. I think it is inevitably the enemy of free television, because it must depend upon sports and movies and mass audience vehicles for its hope to exist. If it is successful economically in the future, I believe it will certainly have a profound impact on free television. I expect John Pinto will agree with me, however, when I say that it is not for the broadcasters to decide whether we shall have pay TV or not. Indeed, this is the public's decision. I would have said that whether Commissioner Lee had been in the audience or not.

I do feel that the public has spoken rather emphatically in California. It may be unfortunate for us that it was put to referendum, because in my view I believe subscription television would have gone broke anyway. And had it done so without having been put to this referendum and had been voted out at least temporarily, we may have all been better off. The public in the future will definitely decide whether it wants and is going to have pay television. Frankly, I believe that they are going to vote it down. If they vote for it, again we broadcasters are going to have to put up with it, and we'll have to elect whether we want to get into it, or to get along with it taking some of our audience away from us. I certainly do not believe it will ever put us out of business.

Now turning to CATV, that 90-pound bully that's been throwing sand in our eyes, according to Bill, and that savior of UHF, as he puts it: When Bill Carlisle asked me to appear here today, he said he was looking for a broadcaster opposed to CATV. I told Bill very frankly that if I could figure out some way to oppose it I probably would have done so. Frankly, I think it's here. I think that to say you're opposed to CATV is similar to arising on the fourth of November and saying that you are opposed to the Democratic Party. We've got it with us; it's going to grow more; it's going to flourish, too! And the advent of color television and its complex reception problems is going to make it grow even more, I believe.

I do feel that it is certainly approaching the time when some entrepreneurs are going to lose some money in trying to persuade the public to take the service when the public is not ready to receive it. Broadcasters are quite confused at the moment over CATV. If you read *Broadcasting*, and I'm sure you do, a week or so ago you read where Bill Putnam is screaming to high heaven because CATV is allowed to operate at all, and he thinks they all ought to be run out of the country. Happy thought, maybe. And if you read *Broadcasting* this morning, you find a UHF station down in Alabama which says "Make the CATV carry my station and keep them in operation or I'll go out of business."

So we're all divided. Broadcasters individually have the problem that's going to stay with them and it's going to grow. It's for us to decide individually whether we think it is a problem or an opportunity. To anybody who thinks he can make a nickel out of CATV, I certainly advocate him going into it. It has been demonstrated to be profitable under the worst circumstances. And how do you determine in advance whether it will pay off? If you find out, I'd like to talk with you after the meeting.

Should it be controlled, should there be legislation to control CATV? Certainly so, in my opinion. I'm 100% behind it [legislation] and I believe most responsible people in the industry, even the CATV industry, admit that it is necessary. The Commission is already on record as favoring some sort of legislation and, in fact, is controlling part of the industry through its microwave policy at the moment. I am fully in accord with the NAB's Future of Television in America Committee, to attempt to secure legislation covering these areas: Preventing local origination of programs by CATV, except for weather and time services and things of that nature; to force them [CATV systems] to carry local television stations without simultaneous duplication; I think we would all like to have no duplication within 30 days, but I believe this is out of the question. Finally, there must be some kind of limitation on the distance which a station's television signals can be carried by CATV systems.

Why is there a need for legislation? First of all, it's obvious to the broadcasters that it will hurt our business, so obviously there is a need for regulation. This, of course, is a foolish attitude again. It needs to be regulated if it is in the public interest for it to be regulated, and I certainly believe that it is. First, it is a monopolistic type operation engaged in interstate commerce; I say it is a type of monopoly because even with non-exclusive franchises there is simply a limit to how many CATV systems can be put on pole lines in one given town —generally one is it. Secondly, it will upset the multiple ownership plan of the FCC. Thirdly, it will certainly upset the national allocations plan administered by the FCC if it is allowed to continue to grow in an unregulated manner.

Further regulation is coming, regulation of one type or another. ABC, of course, is on record as saying the Commission now has the authority to regulate it [CATV]. I'm no lawyer, but it seems doubtful that the Commission will accept this viewpoint. Pending that regulation, I certainly recommend to you broadcasters—within your primary city coverage, certainly, and perhaps you might want to go out even to your grade A service—that you attempt to appear at city council meetings where franchises are handed out in an effort to get some protection in your immediate area, particularly in your home town, against simultaneous duplication of your programming. Most responsible CATV operators, it seems to me—the ones that I've dealt with—are willing to give this sort of protection to you. You may also be interested in trying to persuade the city council to preclude the origination of local programming, except for time and weather signals, and to preclude pay television. If pay television is to come, I would like to see it come *not* by the back door! But the city council should know what it's getting into when it authorizes such an operation.

Quickly, two other things that may be of interest to you. In our area we operate a couple of stations in some mountainous areas where translators have become commonplace. Recently,

(Continued on page 31)

MR. BROADCASTER...

THINKING ABOUT ENTERING THE CATV FIELD? (AND IF YOU ARE NOT—YOU SHOULD BE!) YOUR KEY TO THE ULTIMATE IN CABLE EQUIPMENT . . . FROM START TO FINISH . . . IS AMECO, THE RECOGNIZED LEADER.

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From a staff of skilled draftsmen who will map the course of action . . . to an experienced construction crew who will install the unsurpassed Ameco equipment . . . to a group of highly trained technicians who will "fire up" your system . . . Ameco is tops!

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First in the CATV industry to offer a wide spectrum of long-term finance plans . . . Ameco has financing to suit your situation be it turnkey or equipment . . . an extension . . . a rebuild . . . or a new system.

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The one and only company in the cable field that cares enough about you and your cable system to provide doorstep delivery. See it . . . try it . . . buy it . . . from Ameco's "Salesmobile" truck.

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Zip: 12201

CINCINNATI, OHIO
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CATV in 10 Proven Steps

By Lon Cantor

A step-by-step approach on how to enter the mushrooming CATV field.

THE FASTEST GROWING AREA in the TV field today is Community Antenna Television (CATV). In spite of a neglected infancy, this lusty youth has grown to multi-million dollar status. New subscribers are presently being added at an estimated rate of 18,000 per month, and the pace is accelerating rapidly. The National Community Television Association predicts that by 1974 20% of all TV receivers in the United States will use CATV.

Moreover, CATV has been an extremely stable business, with remarkably few failures. Lee Zemnick, manager of Jerrold's Community Systems Division, says, "I've been in this business for more than ten years, and I can count the number of failures I've encountered on the fingers of one hand." In spite of all the interest and growing volume, however, the CATV picture is not quite as simple as it once was. In 1950, when the country's first cable system brought TV to Lansford, Pa., a school holiday was declared. But CATV could not be confined to areas with no TV reception. It gradually began to spread to towns with only one TV channel and then to those with two TV channels. The present growth is the result of the success CATV has had across the country, even in towns with three or four stations carying all three networks. Thus, CATV is mushrooming into more, and larger communities.

AUTHOR: Mr. Cantor is with Jerrold Electronics Corp., Philadelphia, Pa.

CATV SYSTEM COSTS

Head End

Tower: $5,000 to $20,000
Equipment: About $1,200 per channel
Building: $2,000 up

Trunk Line

About $4,000 per mile

Distribution System

$3,200 to $4,000 per mile

With growth comes complications. The prospective CATV operator today faces both competition and opposition. Even experienced CATV operators sometimes find the situation so changed from the time they started their earlier systems that they are not sure how to proceed. Yet, a carefully planned step-by-step approach almost invariably results in a profitable venture. Here are 10 time-tested steps used by successful CATV operators.

10 Steps to a Successful CATV Operation

1. Determining the potential income.

This is too important a step to leave to anybody's top-of-the-head judgment. The by-guess-and-by-gosh method can get you into a lot of trouble. Before you spend any significant amount of money, you should make a careful, scientific survey of the community you are considering. This survey should give you a good indication of the potential gross income of the system.

Major equipment suppliers will be glad to give you advice on conducting a study. For a fee, some concerns will even conduct the study for you.

When the results of the study are analyzed, you should be able to estimate the number of subscribers you can expect, with a timetable by years. This will enable you to make a "cash-flow" analysis, once you determine your costs.

2. Estimate cost of system.

Fig. 1 shows a block diagram of a typical CATV system. It is divided into three basic parts, the Head End, the Main Trunk Line and the Distribution System. Signals are picked up, amplified and balanced at the Head End. They are transported to the community by the Main Trunk Line and then sent through the Distribution System to subscriber homes.

In the early days of CATV, a few channels were considered sufficient. But today, the CATV operator must provide at least four, and typically six or seven, channels. It is almost axiomatic that the more channels you provide, the more subscribers you'll have. A limiting factor is that there are only 12 VHF channels (2 through 13) and UHF signals can't be successfully distributed through a CATV system. Further, adjacent channels (such as 2 and 3) tend to interfere with each other.

This latter limitation is rapidly giving way to advances in the state of the art. Most equipment suppliers have solved the adjacent channel problems on the low VHF band (channels 2-6), making all-channel transmission possible. And recently all twelve VHF channels have been included on a single cable.

Where do you get the programming for so many channels? First of all, you carry the local TV channels. Then, you bring in the distant channels from neighboring cities. Signals too distant for ordinary reception methods can be

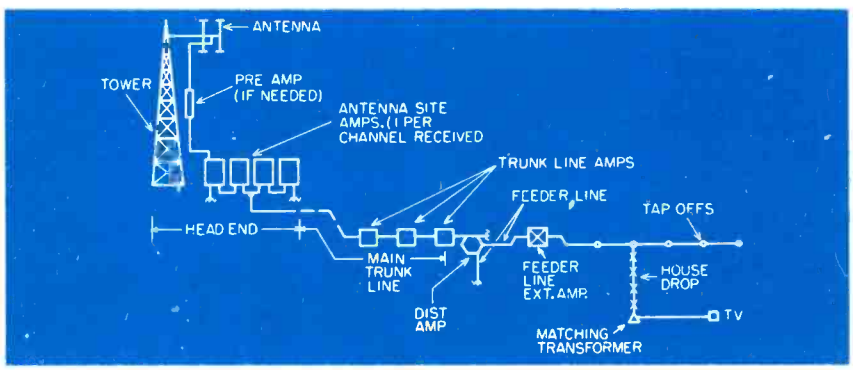


Fig. 1. Elements of a CATV system.

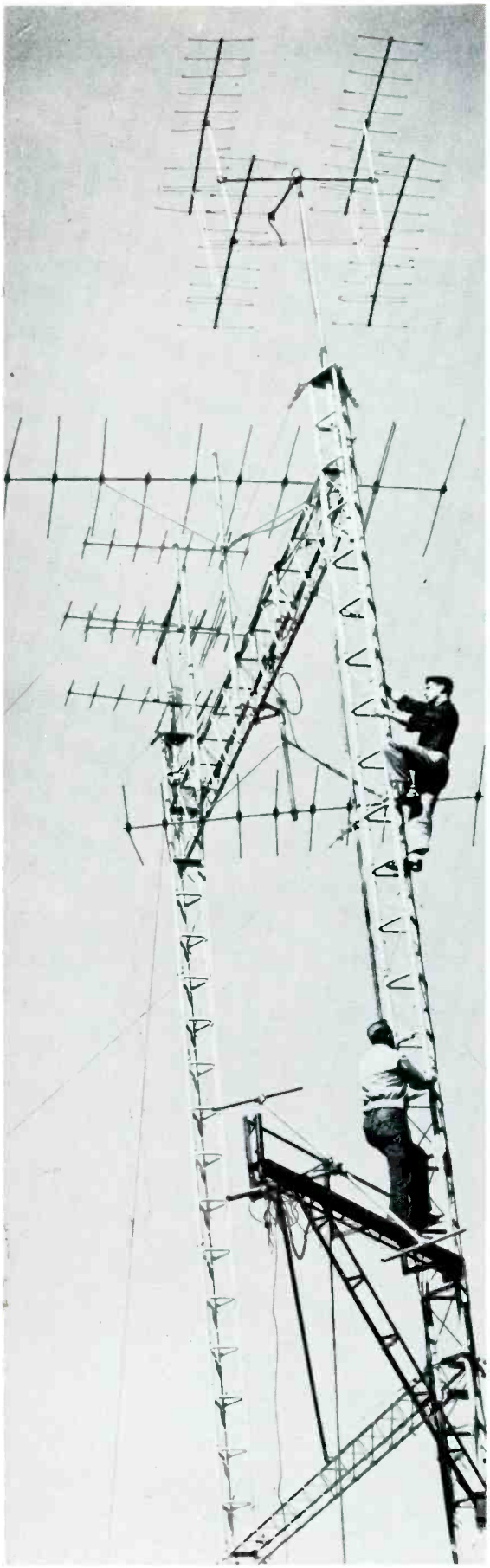


Fig. 2. CATV receiving antenna.

brought in by microwave. UHF channels can easily be converted to an unused VHF frequency and included on the system.

Finally, it is possible to originate signals of your own ,and perform a real community service. You might include a weather channel, showing local weather conditions. Music can be converted to an RF frequency and sent out on a VHF channel. Also, you can use your system to transport educational TV programs, originated in local schools, throughout the community.

Consult with local officials to decide which channels you can carry within the limits of technical and economic feasibility.

Fig. 2 shows a typical antenna site and Fig. 3, a Head End equipment rack. Generally, the Distribution System represents the major cost of the system. Distribution System equipment must be chosen with care, to insure quality and especially reliability.

Quality is important because good pictures are the only thing you have to sell. If potential subscribers get better pictures from their own antenna tower than their neighbors get over the cable, you're in trouble.

A CATV system must bring consistently excellent pictures to all subscribers, 24 hours a day, year after year, in all kinds of weather and in spite of fluctuating power. This requires high quality equipment.

As for reliability, it is your key to low operating costs. System maintenance represents a sizable, continuous expenditure. It pays to spend more in original equipment costs to insure lower maintenance costs.

CATV FACTS & FIGURES

- **CATV** cable strung during 1964 is estimated to be equal to that installed in the three previous years.
- **CATV** systems in the U. S. now number around 1500. Canada has around 450 systems.
- **CATV** now serves 1.6 million homes, roughly 3% of the TV viewing audience, and is growing at the rate of about 18,000 subscribers a month.
- **Capital** invested in U. S. systems is estimated at $550 million.
- **Subscriber connection** costs have decreased sharply during the last year, from previous highs of $125 to about $25. Many systems make no charge at all.
- **Monthly subscription** rates range from a low of $2.75 to around $9.00. Average rate is about $4.50.
- **Costs** for new CATV systems range anywhere from $150,000 to $5 million, depending on size of community, number of channels carried, type of equipment used, etc. Typical system runs about $250,000 to $300,000.
- **Less than** 30 systems are known to have more than 5,000 subscribers, only a handful have more than 10,000.
- **System locations.** Pennsylvania leads the pack with some 230 systems, and two companies are vying for a Philadelphia franchise that would permit one of the largest system starts to date. California has about 110 systems, Texas over 100, New York around 85, and Oregon nearly 80. States having no known systems in operation are Alaska, Delaware, Rhode Island, and North Dakota, although franchises are reportedly being sought in both Delaware and North Dakota. (Remotely located Alaska, although it has commercial TV stations in Anchorage, Fairbanks, and Juneau, does not utilize CATV, as such. Tapes of Seattle programs are flown up for rebroadcast over CCTV cable systems.)

3. Obtain a franchise.

Once you've decided, as a result of your investigation, to go into a specific community, you need a franchise.

The franchise gives you the right to build and operate a CATV system in town. Your attorney must address a formal application to the community's governing body.

(*Continued on page* 28)

THE STORY BEHIND

THE CATV INDUSTRY'S FINEST

Thousands of units now coming

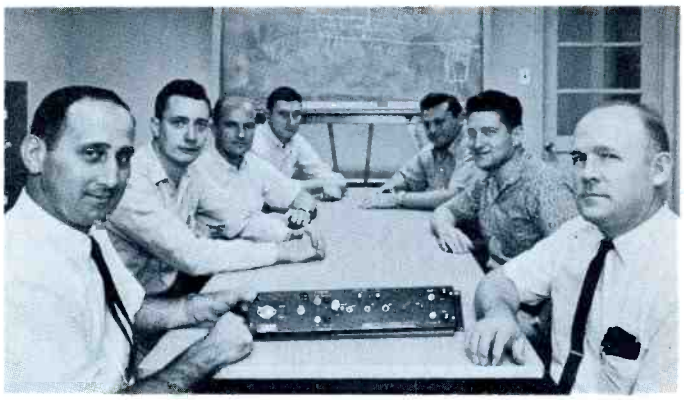
SOLID-STATE EQUIPMENT off the JERROLD production lines!

Three years ago, we firmly determined *not* to rush on the market with transistorized CATV gear until we developed the highest-quality, most reliable equipment ever offered the community-antenna industry.

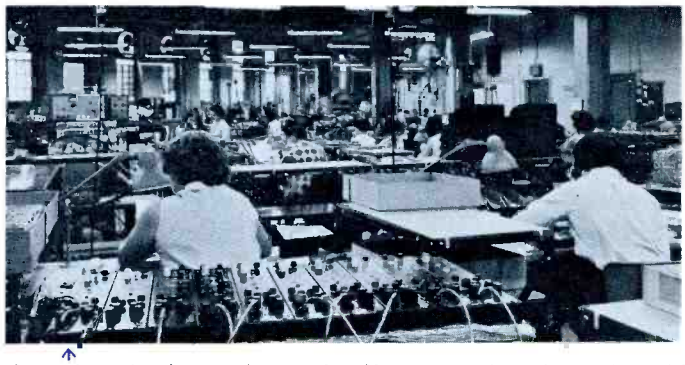
Between 1961 and 1964, our top engineers devoted 50,000 manhours of hard, relentless design work to this program, always insisting that Jerrold solid-state channel preamplifiers, super-cascader mainline amplifiers, bridging amplifiers, and line extenders *must* possess 12-channel capability, with picture quality beyond compare . . . *must* perform day-in and day-out without interruption . . . *must,* in short, guarantee you the most solid foundation on which to build subscriber satisfaction and expanded system services in the years ahead.

Jerrold is now producing and shipping the equipment that meets these stringent performance requirements. Production facilities, already expanded to meet the demands of Jerrold's biggest CATV year in history, have been increased to accommodate the very heavy advance orders for transistorized units. The largest production runs ever undertaken by Jerrold will fulfill both present and future requirements of the CATV industry.

The scenes on these pages are a small example of current CATV activity at Jerrold. Each department—sales, engineering, production, shipping—is ready to meet your needs for the most advanced solid-state CATV equipment.



Twenty-one man-years of solid-state CATV design work are climaxed as seven Jerrold engineers examine a new TML-1 transistorized mainline amplifier.



Jerrold production workers put the finishing touches on new solid-state CATV equipment.

New transistorized Jerrold CATV equipment ready for shipment throughout the country.

Maury Betchen, Production Mgr.; Robert Beisswenger, VP-Gen. Mgr.; Frank Ragone, Engineering; and Lee Zemnick, Mgr., Community Systems Div., inspect solid-state units off production line.

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	412-441-3050					509-248-1717

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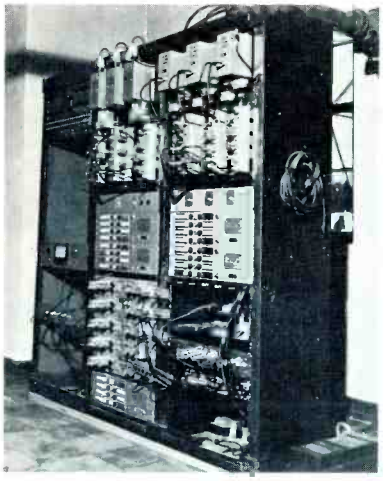


Fig. 3. Head End equipment system, which must be housed.

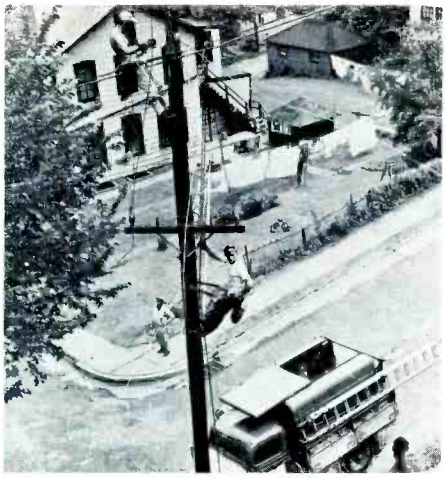


Fig. 4. CATV cables are generally strung on telephone poles.

Exclusive franchises are not common. Theoretically, the community usually leaves the door open for a competitive CATV system. In practice, however, they normally issue only one franchise. Your problem is to make sure that a CATV franchise is granted, and that it is granted to you rather than someone else. This is a public relations project which should be handled with skill and care. Again, it's a good idea to call upon the equipment manufacturers for advice and help, based on their experience in other towns.

4. Negotiate pole rights.

In a few cases, CATV cables have been run underground. Some cable operators have erected their own poles. Most commonly, however, coaxial cables are attached to poles owned by the telephone company (and sometimes by the community). You must apply to the utility company for the right to do this. Write to the company involved for a standard contract and rental rates.

5. Make signal and plant surveys.

Now you're ready to start planning the actual system. A qualified engineer must reconnoiter the area to determine the best antenna site. He must choose a site that gets good reception of all channels to be included, yet is as close as possible to the area to be served.

You should obtain or draw street maps of the areas to be served, using a scale of about 200' per inch. Then, the CATV engineer "walks the poles," determining exactly which poles will be used to bring the signals into town and distribute them to all potential subscribers. If there isn't enough space between power and telephone lines, you will have to pay the utility company extra to provide proper clearance. After "walking the poles," the engineer prepares a detailed routing map.

6. Design the system.

The Head End design is determined by the number of channels to be included and how difficult they are to receive. UHF channels must be converted to VHF, and distant channels can be brought in via microwave. If microwave is to be included, you will have to apply to a common carrier, or to the FCC. (The FCC governs all microwave operations, and issues all grants, and frequency allocations, for their use.)

In general, it's a good idea to include as many channels as possible and to allow for the inclusion of additional channels. It is likely that new UHF channels will spring up in many areas of the country, and you should be prepared to handle them. Great care should be taken at the Head End to insure clean, snow-free pictures and a well balanced output.

Once the Head End has been designed to provide interference-free signals, the Main Trunk Line should be laid out. Amplifier response must be completely flat. Cable attenuation, which varies with both frequency and temperature, should be compensated for.

Then, the Distribution System will have to be designed. In so doing, take care to carefully calculate all signal losses to insure that even the most remote subscriber gets excellent reception.

Finally, prepare detailed drawings and a bill of materials. Equipment suppliers can be of tremendous help at this stage.

7. Construct the system.

After the bills of materials have been made out, and equipment delivered to the job, construction can begin. It's a good idea to use an experienced construction crew, to save both time and money. Local labor can be employed, but should be supervised by experts in each phase of CATV system construction.

8. Check out the system.

System check-out is actually initiated during construction. Each reel of cable should be "swept" before it is installed. Each point of reception and transmission, starting with the Head End, must be tested for quality of signal and

HOW TO CONDUCT A CATV SURVEY

These factors, based on the experience of many successful CATV operators, provide a check list for determining subscriber potential of a proposed CATV system.

1. Number of channels received in the area and quality of reception, generally rated as 1 to 6.
2. Number of homes per mile.
3. Percentage of homes using outdoor antennas, type and cost of average antenna, height of towers.
4. Total number of TV homes.
5. Income levels of residents (available from Chamber of Commerce).
6. Major industries. (A large industry folding in a small town could put a system out of business.)
7. The types of entertainment available in the area.
8. Expansion. (Adjacent communities that could be added later.)

Methods of conducting surveys vary from direct mail to in-depth personal interviews. Most common is to send small crews into town to make visual checks and interview a sampling of householders for a week or two.

proper signal balance.

All pole linework should be checked for physical reliability and adherence to specifications.

Finally, check reception in many subscriber homes, especially those most distant from the Head End.

9. Sell subscriptions.

Your promotional and publicity campaign should begin when you apply for your franchise. To some extent, it really starts with your survey. At this time, public relations is your best sales tool. Your PR efforts should continue right through construction and, on a continuous basis for the life of the system.

Concentrated advertising and promotion plans, aimed at signing up subscribers, should start after you've received your franchise. Work with local merchants, businessmen and civic groups to get the most out of these efforts.

It's a good idea to prepare a comprehensive PR, advertising and promotion campaign as early as possible. Set concrete objectives, budgets and timetables. Of course, your campaign will be changed as you learn more about your community, but a written plan is helpful in preventing serious omissions.

Check with successful CATV operators to see what they've done in the way of opening specials, public meetings, news releases, ads, and weekly newspaper columns. Check also with the various equipment suppliers for suggestions along these lines.

10. Maintain your system in constant operation.

It doesn't take long before subscribers become very dependent on your system. TV is an important part of American daily life, and people who pay for it on a monthly basis feel that they are definitely entitled to continuous, quality reception. Even the slightest interruption of service will flood your business office with indignant phone calls.

It's important to have a well designed, well installed, reliable system. But the best system in the world still requires some maintenance. Make sure the technicians to whom you have assigned this responsibility are capable and conscientious. If you can't find experienced CATV technicians in the area, you might consider sending local TV technicians to school. Some equipment suppliers conduct training courses for CATV technicians.

Incidentally, TV technicians sometimes oppose CATV franchises. Many have been influenced by a group of leading receiving antenna manufacturers who have formed an association known as TAME (Television Accessory Manufacturers Institute). This group, while not concerned about CATV systems "beyond the fringe," see cable systems as competitive when they eliminate the need for receiving antennas and accessories.

Since local TV technicians and distributors are influential, it's important that you win these people over to your side. The one thing they fear most is captive service. Point out early and often that you do not intend to service subscriber receivers. Your practice should be limited to determining by phone whether the complaint is caused by the cable or the receiver. If the receiver is at fault, the cable company advises the subscriber to call in his own TV technician. Of course, you can't always convince a subscriber by phone that the fault is in the receiver. In this case, the policy is to send a man out with a portable receiver to pinpoint the trouble to the system or the receiver. Your men should be instructed not to make even the simplest repair. This message must be emphasized to the local service groups.

Further, it's common to enlist the aid of local servicemen in promoting your system. You can offer them a commission ($10.00 is not uncommon) for each new subscriber they sign up. In some communities, TV technicans sign up 70% or more of all new subscribers.

In spite of all efforts to hold it down, CATV is a growing, profitable field. While government regulation may come in the future, it is more likely to encourage orderly growth than to stymie it. There was never a better time to go into CATV than right now. ●

Continued from page 22

some CATV operations have developed, and there has been quite a controversy developing between broadcasters who want to improve their coverage with translators, and with CATV operators who see that their systems may be jeopardized to some degree by translators. If you have aspirations of improving your service through translators, I recommend that you do so post-haste, before it's too late.

And then one other factor we don't hear very much about is the technical capabilities of CATV systems now being put in. Bill Adler said that theoretically they were capable of carrying 35 television channels, simultaneously. What he is really saying, it seems to me, is that the systems being installed by reliable operators are capable of bringing almost any amount of intelligence into those people's homes who subscribe to the system. In addition, they are capable of bringing into the homes a picture that is technically superior to that which is transmitted through your transmitter. Broadcasters need to be aware, I think of the fact that we are limited to a slightly over 3-megacycle system by our present methods of transmission. Of course, as long as the CATV system continues to receive our signals off the air, they are also so limited. But programming which is not run through the transmitter, and even programming which we normally have at video level around the stations, will be technically superior to those transmitted. And, in addition, there has been a great deal of talk about 1,000-cycle systems to be fed over the wire. These would be capable of carrying enough intelligence so that a wall size picture might be of good quality and be a good thing for the future. Again, I don't know what to do about it, other than to watch it as an interested broadcaster. (*applause*)

MR. CARLISLE: Finally, to bring you the current NAB thinking as represented by its Future Television of American Committee, we have a man who is a pioneer broadcaster, who is a member of that committee, who also operates cable systems in his own right (and very good ones, I might add), from Columbia, South Carolina, Dick Shafto. (*applause*)

MR. SHAFTO: It's pretty tough to be fourth place, because in the light of all that has gone before there isn't much that's left of the talk one proposes to make. I had this same experience in Detroit a couple of weeks ago, and finally Bill Carlisle came to me and said, "You know you're supposed to be neutral, but so far no one has said a good word about CATV, so I want you to take the place of the protagonists of CATV," (which would not well please the Chairman of the Future of TV Committee). (*laughter*)

I did want to make this talk here in Richmond because I was raised in Richmond. In 1923 I started a broadcasting station here, and the Department of Commerce issued the call letters WQAT. One day the inspector from Norfolk came up, Major Van Nostrand. He opened the door and said with one look at the haywire stuff that was about, "So this is W-Quat!" (*laughter*) Later it was my privilege to sell to Mr. Larus while I was engaged in the retail radio business here in Richmond, Parigon Radio Receiver, and I suspect out of that developed Mr. Larus's interest in founding WRVA.

About two years ago NAB President Roy Collins appointed a committee to study and advise the NAB Board of Directors as to its policy on future developments relating to communications. At that time and since, looming largely on the horizon as likely to affect television broadcasting was pay-TV and CATV, and the major time of our committee has been devoted to these two topics. This committee is made up of broadcasters, most of whom have devoted their lives to broadcasting. Our chairman is Dwight Martin. Our membership includes Bill Grove, Clair McCollough, Howard Lane, John Murphy and Bill Walbridge.

In our initial studies we devoted most of our time to pay-TV. We examined large volumes of material on the Toronto operation, the Hartford experiment, the proposed Denver-on-the-air operations. subscription TV plans for Los Angeles and San Francisco. We wished to know how we could protect the service rendered to the public by the American system of broadcasting and to examine and evaluate the degree to which these new services threaten the public interest.

It has been a delightful experience to participate in this crystal ball gazing. Our opinions have never been unanimous, and no one has enlivened them more at these meetings than our thoughtful and very learned counsel, Doug Anello.

Gradually, changes of opinion have been occurring in the committee and these changes were reflected in the NAB people who participated in our sessions. At the start there was only one of us in CATV—today there are four members who are in CATV. I am confident that a more tolerant attitude toward pay TV and CATV has also taken place among the NAB Board of Directors in the last year. I think we all are prone to fear the unknown. It has been said that illumination can make the shadows into pleasant garden spots and give us courage to invade them.

Should pay TV succeed as a widespread service to metropolitan areas, we feel that it brings a very real threat to the program sources for television. I think, assuming such growth, it is safe to say to the public, "You will be paying for what you now see free." Although NAB has been asked to do so, NAB did not contribute to the enormous funds expended by the motion picture exhibitors in the campaign which outlawed pay TV in California. It is true that, as an NAB Board policy, the NAB is against pay TV, whether it be in the homes, whether it comes by wire, or whether it comes off the air.

The Future of TV Committee decided that we would not seek Government aid in California, through legislation, to defeat what we regarded as a private enterprise that has made no use of public facilities. The California-defeat of subscription TV is, in my opinion, a near-fatal blow to all pay TV intended for the homes. At the very least, it will set it back a good many years. However, I think pay TV may have a definite, but limited, function in certain public places such as clubs and hotels. Mr. Pinto has adequately told you of the Hartford operation, making use of the UHF channels. The position of the Future TV Committee is that we are opposed to the principle of "scrambling" a publicly-owned channel in the television spectrum so that only those who pay may see it. So for the Hartford type of experiment, we are against it on two counts: (1) it makes use of public facilities, but denies some of the public access to the channel; (2) it competes with free TV for program sources. As now constituted, we do not evaluate the Hartford experiment as an important threat to the broadcasting structure.

During the past year the activities of Future of TV committees have been devoted largely to CATV. The current attitude of the committee and the staff is the result of many gradual changes—as we became more informed by consultation with members of the Commission, the Commission's staff, the members of the Board of the NCTA, and by an abundant discussion among ourselves.

There are three important areas of action which at this time confront NAB. One is the Commission's proposal to regulate microwave-fed TV systems in Dockets 14895, 15233. The second is the Commission's inquiry as to whether broadcast licensees may properly own CATV systems (Docket 15415). And three, the various proposals for new legislation that would give the Commission jurisdiction over non-microwave or CATV systems making use only of off-the-air pickup.

The first of these, the use of microwave, involves an area where the FCC already has unquestioned jurisdiction. Under its present authority, the Commission now requires the CATV system (1) to carry the local station if it so requests; (2) it imposes upon the CATV system non-duplication 15 days before and after, and (3) it gives the local broadcaster an appeal for future restriction of the CATV system, upon a showing of economic injury.

The thrust of the Commission regulation is aimed at protecting the television broadcaster from economic injury, the result of which might lessen his public service performance. NCTA has filed the reply comments which tended to prove there was no evidence of economic injury. In turn, the NAB very properly embarked upon its own economic study, released about ten days ago, on October 26. If you have seen the official report, you will be astounded at the extent of its statistical compilation. It is a costly, scholarly, and, to my mind, confusing IBM study. I fear that it overstates the effect of CATV on television and television stations, and thereby loses the very objectivity for which its renowned author

and his staff at MIT so ardently strived. Like all research, it is what goes into a computer that determines the validity of its output. With some considerable logic, the Fisher Report contends that a 1,000-subscriber CATV system, which operation blacks out the only local TV station, would reduce the revenue of that station by $1100 per month, or $14,310 per year. It is unfortunate, but quite normal, that only this $14,000 figure draws headlines.

I wonder if broadcasters who read some of these reports know that in all of the 1300 or more CATV systems, there are only eight which black out the local stations. In the other 1292 CATV systems, given the same set of facts, except that the local station was carried on the system or available on the system, the Fisher Report reduces this calculated revenue loss by 35%, or drops it down to $9400 per year.

Noteworthy is the fact that the Fisher Report, while subtracting audience in the home town of the television station, gives no offsetting credit to the additional homes which CATV brings the broadcaster beyond his grade-B contour. One of the stations included in the Fisher CATV Station Revenue Analysis has some 1100 cable subscribers in its own community, all able to view the local station with excellent quality. Additionally, and not included by the Fisher Report, this station reaches via CATV systems some 1500 homes and 2100 motel rooms in two distant communities where the station's normal off-the-air viewing is 5% or less. CATV has brought this station a net gain of 3200 connected TV sets while continuing the ability of the local station to be seen in its local community. I would ask you how, in a fair conclusion of the Fisher Report, this station has lost viewers and therefore lost revenue?

On ownership of CATV systems, in answer to the question, "What is the NAB position with respect to CATV ownership by *radio* stations? I would quote from the NAB response to the Commission's letter of inquiry on such ownership, "Broadcasters should be encouraged to own and operate CATV systems, not discouraged. Through his knowledge of public acceptance for programs, the broadcaster can bring program balance to the CATV offerings and bring a high standard of technical performance comparable to that of broadcast transmission. To place limitations upon the broadcaster who might wish to participate in this new industry would not only be discriminating, but contrary to the public interest."

Final of the three action areas is legislation to regulate non-microwave CATV systems. It is a fair appraisal to say that the majority of CATV operators reflect the views of their own association, NCTA, and are ready for some form of legislation to govern their performance. Certainly the FCC and the NAB also feel that legislation is desirable, and at an early date. If you believe, as I do, that the next decade will see at least 20% of the average station circulation on CATV systems, then surely every CATV system should be required to carry the local stations, whether they be VHF or UHF. Although this is no practical problem, the broadcaster should have the right by law to be carried, if he requests it. Of greater importance, his signals should be carried without degradation, and this necessitates the adoption of technical standards and their enforcement. The effective duplication of local signals is a complex subject. Few broadcasters who have had experience with CATV feel the need for the 15 days before and after broadcast protection that the Commission now provides with regard to microwave stations. Most broadcasters, and I believe most CATV systems, would agree on simultaneous non-duplication.

Program origination by CATV systems can probably be limited to time and weather. I anticipate a tremendous opposition to this view, which is currently the view of the Future of Television Committee. I anticipate tremendous opposition to this view from the NCTA. A possible exception on origination, without doing injury to the broadcaster, would grant to the CATV in an area unserved by an adequate broadcast signal, the right to carry local election returns and public service information of an emergency nature.

A subcommittee of the Future of TV Committee is now actively meeting with NCTA, seeking first an agreement on definition of the local stations and on program origination. Next, the NAB subcommittee will tackle duplication and other program areas, hoping that the resolution of differences will produce an agreement, or partial agreement, so that legislation may be jointly sponsored at the next session of Congress. Thank you very much. (*applause*)

MR. CARLISLE: Next, NAB's General Counsel, Doug Anello.

MR. ANELLO: First, may I say that seldom have I heard a more forthright and more cynical position, taken with respect to the millions of American who enjoy broadcasting, as that taken by Bill Adler. I would like to ask him what he intends to *do* with 35 channels, other than bring pay TV programming in on them?

I say that one of the greatest problems we have is not the protestations of the CATV people that they have no present plans to bring pay TV programming over their facilities, but that to make certain that they are what they say they are — "distributors of free broadcast signals." We must not permit them to use free signals to build up an audience, and then suddenly when they have that audience, to use these spare 35 or 70 channels to promote pay TV. In short, they [CATV operators] should be one or the other and not play both ends against the middle. We must not permit them to carry free signals simultaneously; otherwise the public may not have any choice in pay TV. We all know that the public will pay, as John Pinto has proved in his experiment. They will pay for special and spectacular types of programming, but once you get an audience tied to wire, as Chairman Henry predicted [will occur] within the next two years of CATV system growth, how long will it be before this spectacular program will go over into the Bonanzas and into the baseball and into the football and everything else?

With respect to Mr. Adler's remarks about wire vs. wireless, I have no quarrel with that. Maybe we should have a wire system, but I say to you, Bill, let's have it with our eyes wide open! Let's have the U. S. Government decide what kind of a broadcast system we want, wire or wireless, and let's not do it through the back door. It would have been an easy matter for the Commission when they promulgated the 6th Report and Order to establish a system of satellite communications coast-to-coast with seven stations originating in New York relaying to satellites all the way across the country. But the FCC thought there was more than just multiple signals in the public interest, and that local stations should be permitted to spring up and survive in order that the people may have outlets for expression. I do not believe that the people of the U. S. today are solely interested in entertainment. I do believe that they are interested in expression, and therefore I think if we are to have a change in the 6th Report and Order, the Commission should do it and do it across the board, taking pay, toll, wire, wireless, and wrap them all up—and then let *it* be the decision-maker, and not the individual who has his own ax to grind.

Finally, mention is made of translators. It would be fine if the translators could compete with CATV, but for some reason the FCC won't let them compete. The FCC puts restrictions on translators, they don't put them on CATV systems. For example, you can have a microwave to feed a CATV in a community. I defy you to get a microwave to feed a translator! The Commission just won't let you have it. So therefore I think that we should get an immediate overall look-see, and determine where wire and wireless can exist together, and I think the starting point is the premise that there be no origination [by CATV's] under the present system.

MR. CARLISLE: I think that is a pretty good rebuttal, Doug. Gentlemen, I want to ask you because of the hour to limit your remarks [rebuttals] to two minutes, and I will time you. You will get the gavel when two minutes are up.

Starting with John Pinto . . .

MR. PINTO: Thank you, Bill. I am very disappointed that Wilson saw me not smiling when he called me a liar, no matter how affable. Usually when people call me a liar, *they* smile. (*laughter*) As you know, a liar is one who knowingly tells an untruth. I feel badly that Wilson thinks I *knowingly* told any, and I know that my mother would feel twice as badly, were she here.

I was also interested in the fact that to prove I was a liar, Wilson proceeded to quote Pat Weaver, a gentleman who is not even in the pay TV business—any more.

I think that we can best restate briefly my points. We have been working for 2½ years in Hartford, trying to run an experiment as objectively

and as truthfully as we can, and the FCC is watching us quite closely, and we are reporting to them in quite a detailed manner. Now there is nothing we're doing in Hartford which would be an attempt to pull the wool over the FCC's eyes, or yours, or more particularly, our own. We would only be kidding ourselves. The point is in Hartford that we are extremely satisfied with the programming we are getting, and the customers that we have are obviously extremely satisfied, since we have 5,000 of them with us. I just can't understand the implication that once you get going that all hell will break loose and then you will lose the "Bonanzas" and everything else. Now I am at least happy to see that there is less talk about us taking the "Bonanzas" and "Kildares" and now the entire problem is sports. You would think that commercial TV programs sports 99% of the time and that we in pay TV are going to do likewise. I assure you I don't think we can make a profit that way, any more than you could if you used sports entirely.

MR. CARLISLE: And next, Bill Adler.

MR. ADLER: Doug, I see I did get to you. (*laughter*)

MR. ANELLO: Not very much. You haven't really heard me yet. (*laughter*)

MR. ADLER: I only hope that I got to all the persons sitting in the audience equally. That was exactly my intention. I am not sure that I know what a *cynical* person is, Doug. I didn't think of myself as being cynical. I do think of myself as being here to present you with the facts. But if I didn't want to present you with the facts, I wouldn't talk about 35 television channels or theoretical capacity on a cable system. You might just as well know that this is a fact, and your wishing it away won't wish it away. It won't go away. The channels are there. I am not suggesting that those available empty channels are going to be converted into eventual pay TV systems on a per-program basis. I did suggest that if all of the additional services that might be devised by the minds of men are desired by the people of this country, they can only be provided on wire and I see no way of paying for them except by some form of subscription.

I say to you that the CATV industry will fight any effort on anyone's part to limit the use to which that coaxial cable can be put. It is a closed-circuit communication system. At the moment it is not regulated by a governmental agency, nor should it be. There is no limit to the number of closed-circuit communications systems that can be installed in any community. But one limitation is the space on the poles. This was a limitation, but eventualily all communications are going to be underground, and there are going to be plenty of them. I only say to you, gentlemen (I think my time must be about up), that the services are here, the spectrum is here. What use will be made of it, I do not know, but I think that you as broadcasters will want to play a role in it and I suggest to you that you do so.

MR. CARLISLE: Thank you, sir, and now to Wilson Wearn.

MR. WEARN: Bill, do I have two minutes on each of them, four minutes in all? (*laughter*)

MR. CARLISLE: 30 seconds each.

MR. WEARN: First, regarding John's [Pinto] remark, I have to agree on his definition of the term "liar." He's not one, and I think I made that clear originally. But, I would like to ask John this question: He stated that they would never put commercials on pay TV and I assume that since he is not a liar, he never will, but will other companies agree to such a proposition? We don't know. In addition, it is my understanding that John's company, RKO, has recently filed for a CATV in New York City. I wonder whether or not pay TV figures in the slightest in this move and whether they would entertain the idea of running some commercials on their CATV system if they are successful in New York?

Quickly regarding Bill's [Adler] remarks that CATV does not need regulation, CATV is certainly an extension and an adjunct of the broadcasting industry, and if the broadcasting industry needs regulation and requires a nationally supervised, national allocation structure which is in danger of being completely upset by CATV, then it also must be regulated.

MR. CARLISLE: Thank you, Wilson. And now, Dick Shafto.

MR. SHAFTO: Let me say something favorable, since there was some difference of opinion between Wilson [Wearn] and Bill [Adler]. I would add that my distinguished fellow broadcaster from South Carolina—in case some of you do not know it—was for many years consulting engineer in Washington — so when he speaks of the engineering phases he has real knowledge.

As to John Pinto, I could not buy his comment that 50% of the television sets were dark tonight because of a lack of programming. I wonder if any broadcaster has thought of the responsibility that would be his, and the regulation that would come his way, if tonight every American family did nothing but look at television. I doubt that the day will ever come when we can hope, no matter what programming we provide, to attain greater saturation than we now have, and I doubt that it would be good for broadcasting if we could.

As to my good friend, Doug Anello, I see that this great fear which has been expressed repeatedly—that someday all the CATV systems are going to be tied together—has not yet been laid to rest. Any broadcaster who has looked at the AT&T contract for use of their poles—or Southern Bell or whatever Bell Company you may have, or General Telephone—knows better than that. He is prohibited from ever using pay TV through the cables he puts on those poles. If he looks at the proposed facilities contract that AT&T is offering, where there is more than one applicant, the first thing he comes to is the prohibition against pay TV. I have participated in a great number of hearings before City Councils. We now have four CATV systems operating, four [more] building, and we have applications in six other communities, and not in a single one of them have we ever avoided a prohibition against pay TV.

I would say to you, aside from the technical difficulties of getting these systems together, that there are other prohibitions against them. (time)

Big Voice: So do I have two minutes to reply to Mr. Adler. (several voices together) (*laughter*)

MR. ANELLO: Bill, if you were to start in New York with a wired system and span the country with it, taking no free broadcast signals off the air, I would say, "All the more power to you," and I would defend your right to be unregulated as you are. But you don't do that. You feed off a free broadcast signal and I don't see how you can deny the right to place some limitations on the use of that signal when there are limitations on the transmission of that signal, promulgated by the Commission. I think you are mixing two different things. If you have stuck to wire all the way, that's one thing; but you don't, and you have no intention of it. Therefore, why do you say that you are against any regulation?

And, Dick, unfortunately all CATV opertors are not Dick Shafto's. I would agree that so long as people like you are in the industry, there is absolutely nothing to fear on the pay TV bugaboo, if such we may call it. And I am not against pay TV as John Pinto was trying to put it together. If he can do it, so much the better. He's starting from scratch. But I dislike this starting half-way in the middle, building up the system on free and then all of a sudden—maybe I'm being cynical now—just turning it around, literally overnight—into a pay system. Because you speak, Bill, of a per-program basis. We don't have to have pay TV on a per-program basis. It can be subscription. There is no reason why it can't.

MR. CARLISLE: Thank you, Doug.

Now, gentlemen and ladies, we would like to ask the audience for comments and questions. This does not preclude Mr. Pinto from answering Mr. Wearn's question—we'll go to that right now, but will you please be prepared to ask any you have in mind following this dissertation by our guest.

MR. PINTO: I'll try to make this very brief, Wilson. You asked about commercials on pay TV. Again, I talked mostly of the economics of it. It just isn't worth the money, I don't believe, for a pay-TV operator to go through all this turmoil he has to put commercials on when it brings in such an infinitesimally small extra buck. No. 2: As you may know, today we are regulated by our FCC license in Hartford from having paid commercials on pay TV, and I speak unofficially, but I think I speak for the company when I say we certainly would have no objections to such regulations being a permanent thing, and possibly the FCC might in the future do this on cable systems.

Pay TV, New York City: Though I am not directly concerned with it, the applications as I understand them for the five CATV applicants in New York stress that they will not [mind], and don't mind if the city prohibits pay television now or in the future.

As to the running of commercials on CATV, I don't anticipate that. We are fairly large in the CATV business—we have about 35,000 homes throughout the Southwest. As far as I know, we don't run any commercials, nor do we anticipate doing so.

Dick [Shafto], you asked the question, also—I'd like to clear up one thing. I didn't mean to imply that the half of the sets which were dark tonight were all dark because people didn't like the programming. Obviously, a lot of people are out at the theater. We would rather keep those people home watching television. I do say, as you know, poor programming is in many instances poor to the people who don't wish to see it. We therefore think we could give them more opportunity without it costing commercial TV anything.

MR. CARLISLE: Thank you, John.

Now for questions. Fred Weber?

MR. WEBER: We have one very basic question and a very controversial one. We have heard a great deal this afternoon about the public service, and public service needs. We have heard a great deal this afternoon with respect to, "It is here, therefore the broadcaster must protect himself." I would like to have someone answer directly the reconciliation of seven, thirty-five or seventy services being brought into markets competing with radio and television stations, and how that cannot have an impact? I find no answer to that. That's one question.

Second, I can find no answer from the standpoint of the broadcaster to the question, "How do you extend program materials which you have to CATV as a broadcaster? CATV operations under present conditions. I would like some answers to those two questions.

MR. CARLISLE: Part I will go to Bill Adler.

MR. ADLER: Fred, I am sure there will be some impact—there has to be an impact, of course—some competitive impact if you have that many different services available to you. You are going to look at one sometimes and another one other times. There is no question about it. I don't believe this is the criteria. I think the criteria is what does the public want? Does it want this many services available and if so, then I think it has the right to have them.

Now one time I read a transcript of a talk I made and was quite amazed to see what horrible things I had said. Evidently, I have done it again today. I did not mean to say I did not think CATV, per se, should be unregulated. I think there is need for some regulation of the CATV industry insofar as its impact on so-called free broadcasting, but I do not think that that regulation should go to what can or cannot be presented over a coaxial cable, closed circuit system, so long as what is available doesn't destroy free broadcasting. I think most CATV people want to protect free broadcasting.

MR. WEBER: There are broadcasters who have a point-of-view with regard to program rights, and certain broadcasters are now in this CATV field. What is their feeling with respect to extending program material rights which are limited as to the stations?

MR. ANELLO: Well, I think the broadcaster feels he has a right in the program, contrary to what Bill Adler says, and I am convinced that the courts are going to declare this when they get the right copyright case up. The case that he is talking about is complicated and enmeshed in other issues and it will be years before it is resolved.

MR. WEBER: Even with respect to contracts?

MR. ANELLO: Well, the contract case, of course, is going to go before the Supreme Court. It will probably be decided next year, but we hope to get a much simpler copyright case, based on a single infringement, and then let's see what the Court does with that one. Because if the 9th Circuit meant everything, it said there isn't any question of the copyright infringement here.

MR. CARISLE: Doug, let me ask a question. We are relating this to our radio members. There is in the case of New York—I think you have heard me mention a system which has 5,600 connections, and on the spare channels not used for video purposes we are told by a broadcaster up there, who says he is being badly hurt by this, that these channels are carrying WPAT, WABC-New York, WQXR-New York—and not necessarily all three, but a combination of them. The question: Does the station have any resource, and do the stations in New York whose signals are being picked up have any [legal case]?

MR. ANELLO: I don't think the station has any recourse under the present state of the law as I know it. There is no copyright or statutory infringement on their part. They don't have any contract with WPAT or WQXR. I would say that QXR, under existing law, might well have rights against the CATV operator, but that would take a lawsuit to ascertain—and I would think that this is a simple copyright suit, which should be have been adjudicated years ago. But for some reason we were left with the United Artists suit—not we, that wasn't NAB's doing—it was something else. It has been almost hopeless to make any order out of it.

MR. CARLISLE: Here is a question from the audience. Let me read it to you, I can't attest to the accuracy of the facts here. The question is, "Would the panel like to discuss this: in Chillicothe, Ohio the CATV system is owned by an independent telephone company and operates with this equipment: 2 field cameras, an Ampex recorder, slide and film change, and a film processor and does programming two hours daily. Would you think, gentlemen of CATV convention, that this might be an area in which legislation would be necessary?" Bill?

MR. ADLER: It is clear that the Chillicothe sytem is operated by the independent telephone company. I wasn't aware that they were engaged in closed-circuit programming. By and large, the CATV industry up to now has never done that. Some attempts have been made—I think you could count them on the fingers of one hand—in the last 15 years. They have never been successful up until now because it was much too costly for CATV to engage in it. But it would seem to me that since Chillicothe has no television station on the air in the community itself, that the CATV operator, whoever it may be is rendering a good public service. He is making local video information available to the people of that town, and I don't know how in the world you can argue against it.

MR. ANELLO: I won't argue against it, Bill, not in certain situations, but I'll gave you another example of a CATV operator who originates and he thinks 315 is for broadcasters—not the CATV people. He would pick up Goldwater speeches from this station, tape them and then run them six-eight hours a day. He never showed Johnson. He cut him out.

MR. PINTO: I would merely like to say here that it is very rarely that I get the chance to get on top of anything. I certainly would say that there is something wrong with it, because I know that we at home are under the impression that we have the only pay-TV license in the country—and to think that we have gone through all that we have gone through where other people haven't had to worry about it is a little bothersome to me (*laughter*).

MR. CARLISLE: We know of a Farmington, New Mexico channel that is running bingo twice a day, $100 twice a day.

MR. ANELLO: That channel also runs speech, and movies, and distributes the schedule.

MR. CARLISLE: They buy the feature movies and 14 advertisers in town sponsor those movies.

MR. ADLER: Do these people not have their right to play bingo over television if they choose to do so?

MR. WEARN: You are still in Interstate Commerce, Bill.

MR. ADLER: Well, sir, if I felt that bingo were truly gambling in the ordinary sense of that word, I would agree with you, but bingo seems to be winked at everywhere in the United States, and particularly by the churches themselves.

MR. CARLISLE: I want to compliment Bill Adler before I forget to do so. He has been very forthright in coming here and saying what he thinks. I think we have learned a lot by that.

MR. ADLER: Well, I am only saying to you that wired television has a great deal to offer to the people of the United States. In those areas where it is being offered, they will not be denied it. And I believe that the trend shows that it is going to be offered practically everywhere. I don't believe that there is any practical way of stopping it. I merely say to you: Don't fight them, join them.

MR. CARLISLE: Thank you—We are adjourned. ●

WJFM/WKZO-TV transmitter building at Sun Lake.

WJFM...

Nation's Most Powerful FM Station!

By Bruce M. Glycadgis

Grand Rapids station uses 50-kw transmitter and 12-bay antenna for 25,000 square mile coverage with ½ million watts ERP.

93.7 on the FM dial has become a household term to more than 150,000 families in Western Michigan. For 21 hours each day, WJFM radiates its powerful voice of ½ million watts (ERP) over some 30 counties and dozens of communities. WJFM began broadcasting with this tremendous power (the next highest FM station power is about 260 kw) on November 15, 1961, a significant date for FM listeners in about a third of the state because it meant they could receive noise-free radio programs whether their receivers were small, large, cheap or expensive. It brought on a resurgence in the purchase of FM receivers within the area, especially in localities which had never before received FM. November 15, however, represented not the beginning, but, rather, the climax of a continuing effort to provide FM to the vast listening public of Western Michigan.

The Beginnings of WJFM

The birth of WJFM goes back to 1946, the year Fetzer Broadcasting obtained its first construction permit for the facility. This CP was for the unheard-of (in those days) power of 500,000 watts. The company was confronted with many complications: Equipment capable of producing 500,000 watts was not readily obtainable; also, there was the problem of a suitable antenna site with adequate ac power available for such a powerful transmitting plant. (Over 150 kilowatts, 21 hours a day, are needed to provide the 50-kw transmitter output used today.)

In 1950, Fetzer constructed WKZO-TV, and it was determined that the TV tower would also be suitable for an FM antenna transmitting at reduced power. Thus, on June 25, 1951, WJFM took to the airwaves with an effective radiated power of 115 kilowatts. For the next 10 years WJFM's income was not large enough to pay the power bill, but Fetzer had great faith in the future potential of FM and felt it was in the interest of the radio public to keep the facility on the air.

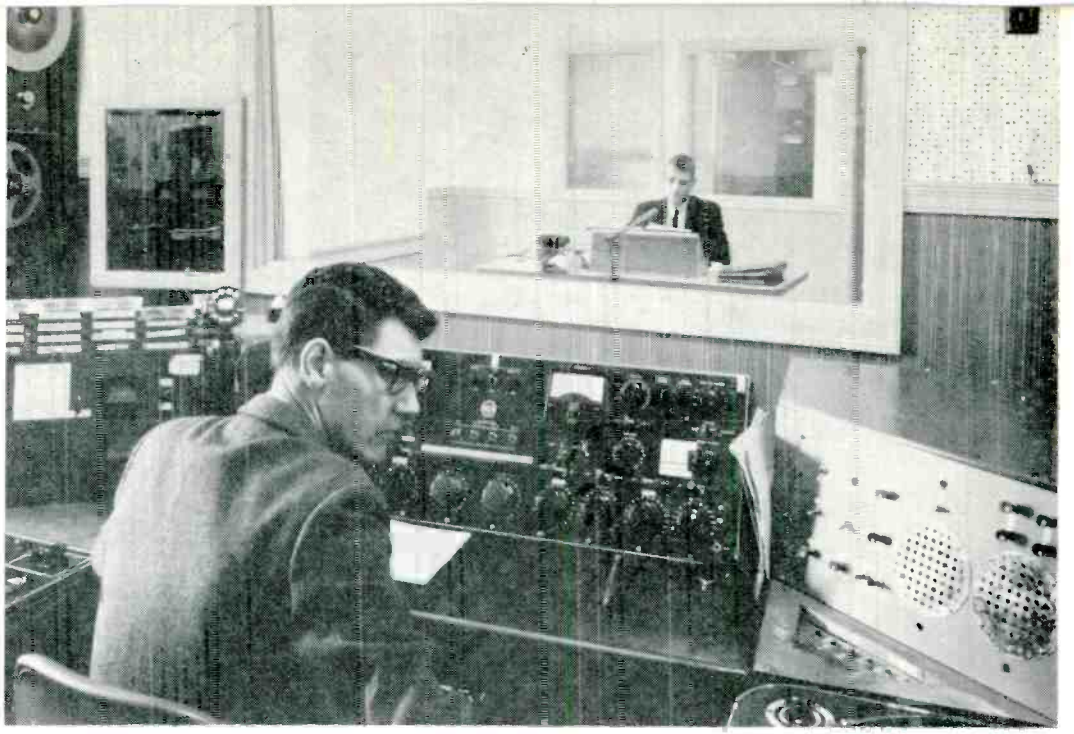
To realize some income from the operation, a Muzak franchise was purchased, and the first multiplexed operation in Southwestern Michigan went on the air .The anticipated increase in power would eventually produce even greater multiplex potentials, a factor supporting the initial decision to purchase the Muzak franchise. All this, remember, took place during the years when many FM stations were going off the air.

WKZO Moves to Gun Lake

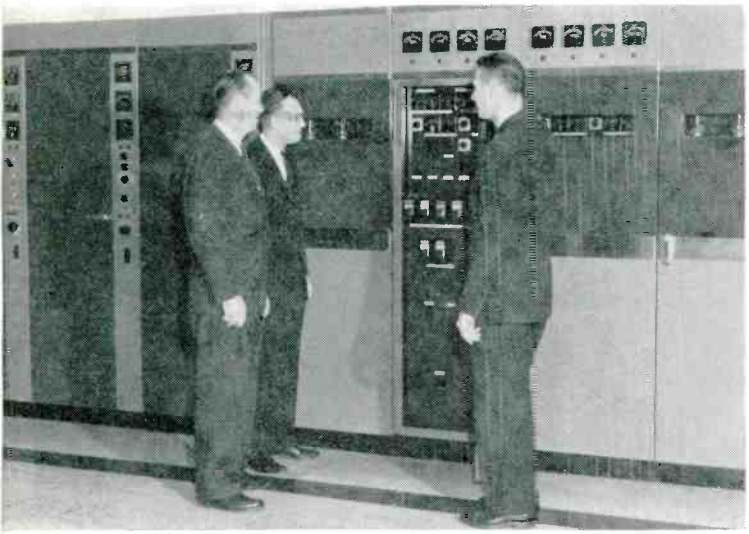
During 1960, Fetzer management decided it was time for a modernization program. Their conclusion: to locate the WKZO-TV transmitter and antenna at a point midway between Kalamazoo and Grand Rapids, to serve both communities. Management further reasoned that the new antenna tower would be an excellent location for WJFM's antenna.

To keep WKZO-TV's signal on

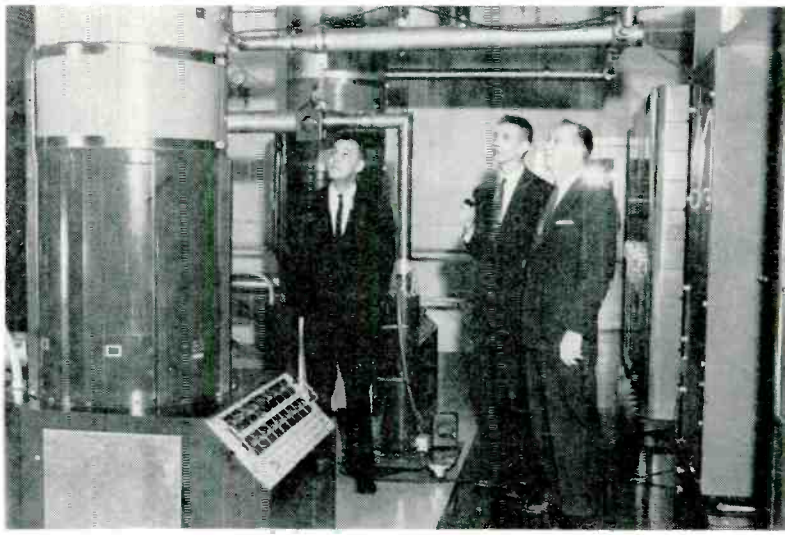
AUTHOR: Mr. Glycadgis is Operations Manager of WJFM, Grand Rapids, Mich.



Main control room with Dave Hunter, night-time emcee at controls, and Dan Smith, day emcee.

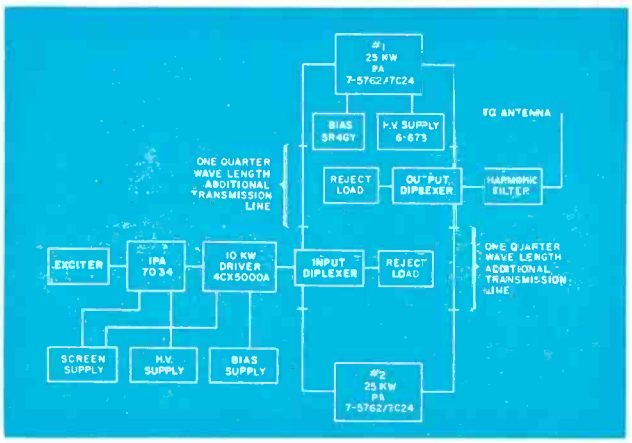


Carl E. Lee (left), President and General Manager of Fetzer Broadcasting; Arthur E. Covell (right), Chief Engineer of WKZO-TV; and the author standing before the control panel of the FM final amplifiers.



FM power amplifiers and associated transmission line.

Dan Smith, popular WJFM emcee, at the stereo control center.



Block diagram of BTF-50B FM transmitter.

the air during the move from Kalamazoo to Gun Lake, management purchased a new TV transmitter. The two 25-kilowatt TV-power amplifiers at Kalamazoo were designated for the FM operation. These were Type TT-25AL amplifiers, and it was a relatively simple task to raise their operating frequency to 93.7 mc, diplex the amplifiers, and raise the 10-kw output of the new RCA Type GTF-10D driver transmitter to 50 kilowatts.

Amplifier Conversion

The power amplifiers use the well-known cluster of seven 5762 triodes operating in a parallel, grounded-grid configuration. This cluster design, owing to the physics of VHF frequencies and the mechanics involved, lends itself excellently to frequency conversions. The modifications resulted in the first BTF-50B transmitter, and system performance has proved very satisfactory.

Side-Mounted Antenna System

WJFM uses a 12-section, gapped-ring antenna to one leg of the TV tower at the 800-foot level. Center-fed, this array provides a power gain of 12.5 and raises the 50-kw transmitter output to 500-kw ERP. Mounted on one leg of the triangular cross-section tower, the antenna provides substantially circular coverage over a 25,000 square-mile area (90-mile radius). This area includes Kalamazoo, Battle Creek, Grand Rapids, and Lansing, plus dozens of smaller municipalities at all points of the compass. In addition, the signal covers a large rural area that would not otherwise receive FM service.

Building Features

Both the TV and FM transmitters are housed in a modern, well-engineered building of prestressed concrete. The 1100-ft antenna tower stands immediately outside to minimize outdoor horizontal runs of transmission lines. Locating the tower so close to the building presents a falling ice problem during Michigan winters; this was overcome through a specially-designed roof that withstands potential damage.

All the electronic gear associated with the transmitters is located on the basement level with the power transformers and blower equipment. This setup keeps the transmitter room on the floor

THE STORY BEHIND THE STORY

What's The Philosophy Of WJFM?

One of the first questions that come to mind about WJFM, quite naturally, is "Why so much power, and for a broadcast service which couldn't, at least in earlier days, support itself?"

The answer lies in Fetzer management's philosophy—the belief that serving the public should be the first and foremost responsibility of every broadcaster. WJFM symbolized a strong faith in the future of FM both as a public service and as an entertainment medium. Located in a section of the country devoid of major population centers, but with several unserved medium-sized cities and towns spread over thousands of square miles, quality FM reception could only be provided to a mass audience with every kilowatt of power that could be mustered.

What About Profit?

Did Fetzer anticipate that WJFM would pay its way? Initially, no—only the dream that FM radio would eventually become a widely accepted, worthwhile broadcast service. Except for the SCA background music service, the station had no other income. No attempt was even made to sell time until two years ago. Today, WJFM is "paying its own bills," including costs for power (which alone average between $2,000 and $2,500 a month) and a rather substantial equipment amortization.

What About Audience?

The latest Pulse Report indicates that the number of FM households in the four major markets served by WJFM exceeds 140,000. Indications—such as the steady sale of FM receivers by Southwest Michigan merchants, and the quantity of mail received from new listeners—point to an increase of perhaps 50% in the FM households in these markets.

What About Sales?

All of WJFM's evening commercial time is sold on contract, and both sponsored programs and spot announcements are booked solid for several months in advance.

During the first 10 months of 1964, WJFM sold a total of 2,415 spots—2,169 local, 246 national. Additionally, 935 programs were commercially sponsored during this period. While WJFM's 500-kw power is significant in selling national advertisers interested in large area coverage, local merchants are not concerned with such "total coverage." Thus, WJFM sales people stress the listener acceptance of program material and the high quality signal received in the areas pertinent to the client. The fact that the 500-kw signal blankets several good-sized communities adds considerably to the number of prospective time buyers.

What About Programming?

WJFM programming is entirely independent of the two Fetzer AM's serving the area (WKZO, Kalamazoo-Battle Creek, and WJEF, Grand Rapids). In setting up completely separate programming, Fetzer management not only provided a worthwhile public service, but stimulated and promoted public interest which resulted in a large FM audience. Today, this loyal audience is obviously a vital factor in selling FM air time. Audiences are continually surveyed to make sure programming meets with listener needs and desires.

Response to mail surveys, from what we learned, is just this side of spectacular—for example, out of 500 questionnaires recently mailed to known listeners (a random sampling of people from all areas who had written in during the several preceding months), 499 replies were received! If this is considered even a remote indication, it appears WJFM has achieved what every broadcaster hopes for and dreams about—a loyal audience which keeps growing because programming and service is designed to fulfill their needs and desires.

above extremely quiet. Further, this arrangement considerably reduces blower vibration in addition to increasing accessibility to the equipment. All of the air is filtered prior to its entry, eliminating the need for individual air filters for the blowers. Outdoor air is first filtered through spun-glass filters, then passed through electrostatic filters to axial fans which "pressurize" the basement room and thus make it a massive plenum chamber.

The blowers, mounted on concrete piers, push the filtered air upward through the basement ceiling and into the bases of the transmitter equipment. Ducting, at the top of the transmitter cabines, is thermostatically controlled so that the warmed air from the equipment goes directly outdoors in summer, or indoors in winter to heat the transmitter room. This loop system, using outdoor air, reduces the BTU requirement of the air-conditioning equipment in summer and delivers fresh, warm air in winter.

In addition to providing a dustless atmosphere in the transmitter room, another advantage in prefiltering the air is the elimination of a settled-dust problem in the basement. This, of course, simplifies maintenance.

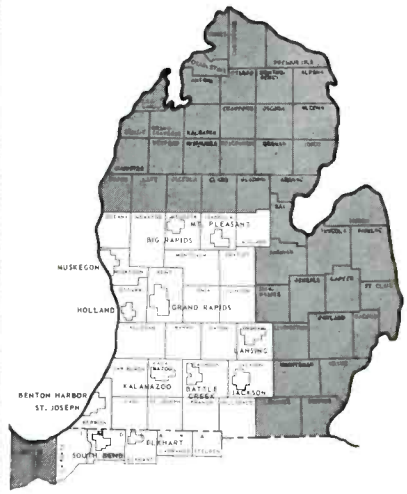
WJFM Programming

When the station went to the half-megawatt power, management decided it should be an entity in itself and should therefore generate its own programming. The staff spent many months making audience surveys to devise the programming that is now a part of everyday operation. As a result, WJFM programs its educational and informational shows throughout the day instead of just during the early hours of the morning. The surveys also indicated that listeners desired large blocks of time set aside for each musical category. As a result, WJFM maintains a considerable disc and tape library which provides an excellent range of musical selections.

FM Stereo Programming

From 8:00 A.M. to Midnight each day, WJFM transmits multiplex stereo, using a stereo subcarrier generator mounted in the center cabinet of the FM transmitter. Since introducing stereo programming, WJFM has built up

WJFM area coverage map



WJFM PROGRAM SCHEDULE**

NEWS ON THE HOUR EVERY HOUR

Monday - Friday	Saturday	Sunday
6:00 Sign On	6:00 Sign On	7:30 Sign On
6:05 Chore Time	6:05 FM in the A.M.	7:31 FM Serenade
6:30 FM in the A.M.	6:15 Agriculture U.S.A.	8:35 Church of the Air
8:00 World News	6:30 Local News	9:10 Voice of the Liberal
8:15 Especially for Women	6:35 Food for Thought	10:05 Invitation to Learning
10:10 Arthur Godfrey	6:50 FM in the A.M.	10:30 Ave Maria Hour
11:10 Houseparty	8:00 World News	11:05 Familiar Melodies
11:30 Ask Miss Fickett	8:15 Wake Up Music	11:35 Salt Lake Tabernacle
11:35 Garry Moore	9:35 Educational Feature	12:10 Familiar Melodies
11:45 Educational Feature	10:10 Music for Everyone	1:05 Leading Question
12:10 Farm News	12:10 Melodie Matinee	1:35 Educational Feature
12:15 B.F.D. on FM	2:00 Metropolitan Opera***	2:00 Familiar Melodies
1:10 Musical Matinee	3:00 Melodie Matinee in Stereo	3:00 New York Philharmonic*
2:11 Classics You Want	4:00 Golden Hour	3:00 Familiar Melodies in Stereo
3:10 Stereo Bandstand	7:10 Adventures in Hi Fidelity	5:30 Capitol Clockroom
4:11 Keyboard Kapers	9:05 The Big Band Sound	6:00 Boston Pops Concert
4:30 Polka Time	10:00 Stereo by Request	6:30 Lawrence Welk Show
5:15 Golden Hour	12:00 FM in the A.M.	7:10 Adventures in Hi Fidelity
6:45 Lowell Thomas	3:00 Sign Off	9:05 Classics You Want
6:55 Sports Time		10:00 Stereo Spectrum
7:10 Adventures in High Fidelity		12:00 FM in the A.M.
9:10 Big Band Sound		3:00 Sign Off
10:10 Broadway in Stereo		
11:10 Classics You Want in Stereo		
12:00 FM in the A.M.		
3:00 Sign Off		

(S) Broadcast in Stereo

* New York Philharmonic to begin October 4, 1964

(**) In order to bring you the very best . . . programs may occasionally change.

*** Metropolitan Opera to begin December 5, 1964

WJFM FM Survey

November 1963
Battle Creek, Grand Rapids, Kalamazoo, Muskegon, Mich.

FM PENETRATION

FM OWNER
29.9%

FM HOUSEHOLDS
140,856

WEEKLY CUMULATIVE AUDIENCE - WJFM
28.2%

LISTENED TO WJFM

EARLY MORNING (6 AM - 9 AM)	13.1%
LATE MORNING (9 AM - 12 NN)	19.2%
EARLY AFTERNOON (12 NN - 3 PM	23.0%
LATE AFTERNOON (3 PM - 6 PM	22.8%
EARLY EVENING (6 PM - 9 PM	52.5%
LATE EVENING (9 PM - 12 MID	21.3%
NO PARTICULAR TIME	11.3%

GENERAL RATES

CLASS A

UP TO 1 MINUTE ANNOUNCEMENTS	1 - 2 WEEKLY	3 - 5 WEEKLY	12 - 17 WEEKLY	18 OR MORE
1 TO 12 WEEKS	$14.00	$13.50	$13.00	$12.50
13 TO 25 WEEKS	13.00	12.50	12.50	11.50
26 TO 51 WEEKS	12.25	11.75	11.25	10.75
52 WEEKS	11.50	11.00	10.50	10.00

PROGRAMS

30 MINUTE PROGRAMS	1 - 3 WEEKLY	3 - 5 WEEKLY	6 OR MORE
1 TO 12 WEEKS	$65.00	$61.00	$57.00
13 TO 25 WEEKS	59.00	55.00	51.00
26 TO 51 WEEKS	55.00	51.00	47.00
52 WEEKS	51.00	47.00	43.00

30 MINUTE PROGRAMS	1 - 2 WEEKLY	3 - 5 WEEKLY	6 OR MORE
1 TO 12 WEEKS	$41.00	$39.00	$37.00
13 TO 25 WEEKS	37.00	35.00	33.00
26 TO 51 WEEKS	34.00	32.00	30.00
52 WEEKS	31.00	29.00	27.00

10 MINUTE MERCAST	1 - 2 WEEKLY	3 - 5 WEEKLY	6 OR MORE
1 TO 12 WEEKS	$20.50	$18.50	$16.50
13 TO 25 WEEKS	16.50	14.50	12.50
26 TO 52 WEEKS	12.50	10.50	8.50

CLASS B TIME 6:00 A.M. TO 5:00 P.M. - 11:00 P.M. TO 3:00 A.M.
10% OFF CLASS A TIME

a separate stereo-record library of nearly 2,000 albums.

Commercial stereo tapes are run through a four-track playback head. The recorder is also equipped with separate erase, record and play heads for two-track stereo tapes. The machine plays virtually all quarter-inch tape recordings —full track, half-track, half-track stereo and four-track stereo tapes.

The dual-channel consolette is in the center of a horseshoe arrangement, with turntables on both sides of the announcer's station. Each turntable contains two preamps for stereo reproduction. Cueing is incorporated within the consolette. An RT-37A cartridge-tape machine serves ideally for spot announcements, permitting greater use of the turntables for program material. The cartridge-tape facility serves for both stereo or monophonic announcements.

Muzak Programming

The SCA subchannel programming comes from two long-play tape machines located in the main control center adjacent to Studio 1. These two machines operate almost completely unattended, using Muzak tapes pre-programmed for such operation. The signal from these machines travels via multiplexed microwave to the transmitter site. Here it modulates a 67-kc subcarrier of a Type BTX-1A multiplex generator which, in turn, modulates the BTE-10B Exciter in the FM transmitter.

Audience Response

WJFM's primary signal-coverage area encompasses more than a million families. Over half of them could not previously receive an FM signal, and WJFM was the first FM station many of them ever heard. In many cases, the primary reason for buying an FM receiver was word-of-mouth praise for WJFM programming. Most of these new listeners are located in rural areas and, quite possibly, would have no FM service were it not for the half megawatt signal.

Fetzer Management believes that high fidelity and high power go hand in hand. Engineering ingenuity made it possible to transmit the most powerful, high quality FM signal on the air today. Programming excellence stimulated the growth of a large and loyal audience. Fetzer's 18-year old dream of providing FM service to the people of Western Michigan has been fulfilled. ●

Getting the Most For Your Microwave Dollar

By Harry A. Etkin

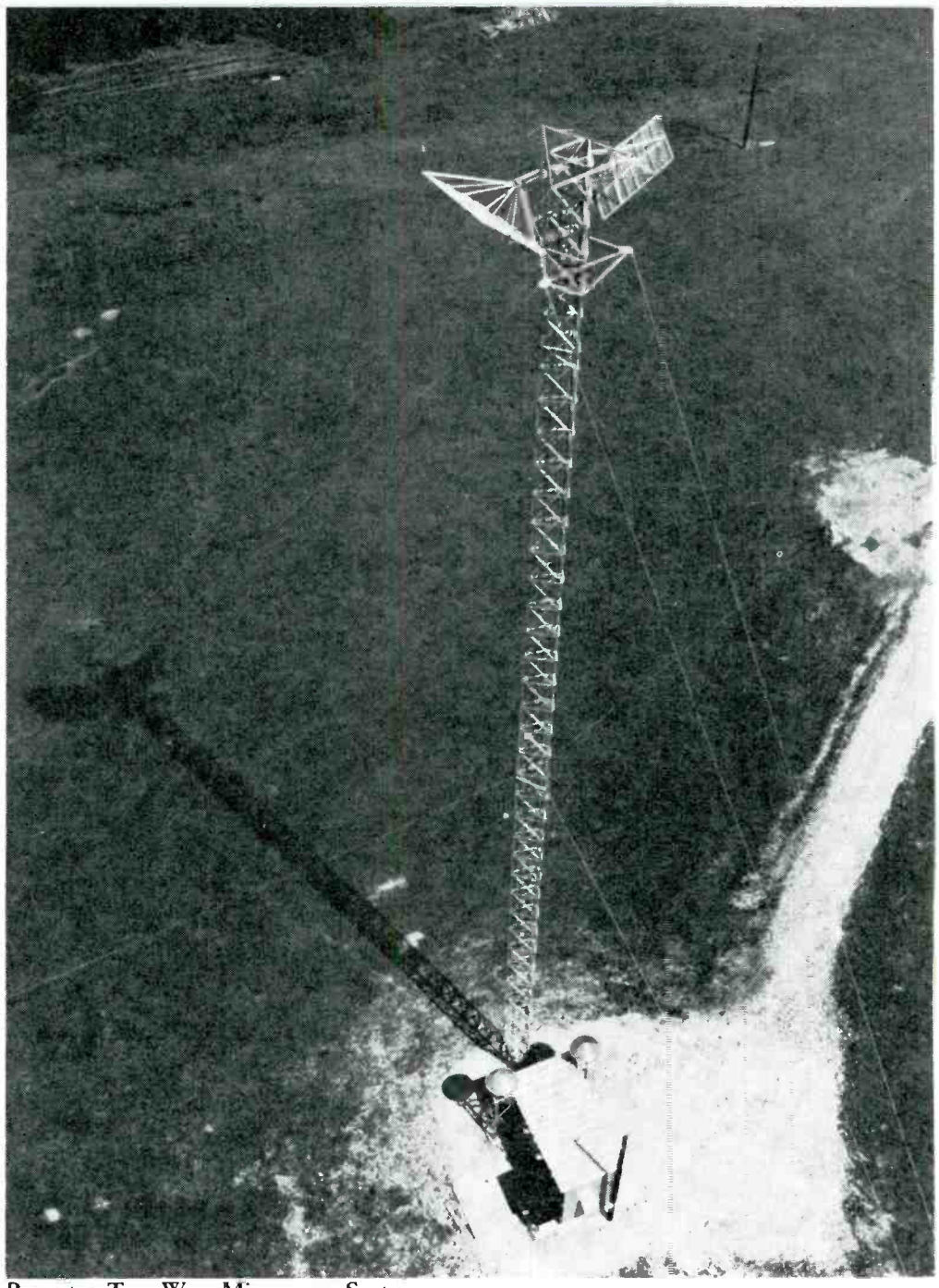
Applications, costs, and engineering criteria to help you in setting up a microwave system.

THE PRIMARY USES of microwave relay systems for radio and television are the transmission of AM and FM radio and televison programs from either the studio or remote points to station transmitter sites. Two-way communications microwave links are used for relaying other intelligence, including telephone conversations, computer data, and telegrams.

Diagrams of typical microwave installations are illustrated in Figs. 1, 2, and 3. Microwave offers a multitude of indispensable communication facilities together with the advantages of economy, versatility, and reliability. A chain of repeater stations, spaced at predetermined intervals, relays signals over long distances and normally operates unattended. Microwave links eliminate the need for pole lines, easements, and line maintenance, and cost less per mile than any other system of comparable capacity.

In general, microwave system

AUTHOR: Mr. Etkin is a Staff Engineer at WQAL-FM in Philadelphia, Pa.



Repeater Two-Way Microwave System.

6000-MC Two-Way Repeater with Dual Path Diversity.

facilities for broadcasters are designated as follows:

1. **Aural broadcast STL and intercity relay stations.**
2. **Television auxiliary broadcast stations.**
3. **Television broadcast translator stations.**
4. **Television broadcast booster stations.**

The band allocated by the FCC for Item 1, aural broadcast STL, is 942-952 mc, which is divided into nineteen 50-kc channels.

The following frequencies are available for assignment to Item 2, television pickup, television STL and television intercity relay stations:

1. **Band AM—1900-2500 mc**
2. **Band BM—6875-7125 mc**
3. **Band CM—12,700-13,250 mc**

In addition to the above frequency bands, 17,700-19,300 mc, 19,400-19,700 mc, 27,525-31,300 mc, and 38,600-40,000 mc are available for assignment on a case-by-case basis. As a word of caution to broadcasters, it should be noted that frequencies between 2405 and 2500 mc are allocated for industrial, scientific and medical equipments; microwave systems operating within this band may have to accept interference radiation by such apparatus.

Propagation Factors In Microwave

A reliable microwave relay system demands that certain clearance measurements be met in the line-of-sight paths between transmitting and receiving stations. These clearance requirements are greatly affected by weather conditions and the details of the terrain over which the signal is propagated.

In this regard, substantial economic considerations will arise, since the amount of beam clearance required is the major factor in determining the physical heights of the microwave towers. Thus, in planning a system, a careful balance between economic operation and system performance must be maintained to achieve the best performance at the lowest possible cost. Through the use of sound engineering practices, excellent performance may be obtained by calculating the amount of clearance for various conditions and using techniques for overcoming the various propagation difficulties.

When the microwave relay system site has been selected, the station engineering staff, or engineering consultant, should make complete measurements and calculations to arrive at estimated figures for the following:

1. **Path or microwave beam clearance.**
2. **Total free space loss or attenuation.**
3. **Antenna gain at transmitter and receiver.**
4. **Net path loss.**
5. **Transmitter power output.**
6. **Expected video and audio s/n ratios for TV microwave relay system and audio s/n ratio for aural systems.**
7. **Fading margin.**
8. **Reliability.**

As the 7000-mc band is the one most popularly employed for microwave relay links, sample calculations for the above will be derived for a typical propagational path.

Microwave Calculation Procedure

A. Plot a profile of the transmission path on a sheet of 4/3 earth radius profile paper which presents the earth's curvature on a radius of 4/3 times its true value. (See Fig. 4.)

B. From topographic maps draw in the path profile and obstructions. The topographic map indicates the height above sea level above 4/3 earth contour, to which is added the height of major obstructions such as buildings, trees, hills, mountains, etc. (See Fig. 5.)

From the drawings, it can be seen that the majority of the useful energy in a microwave beam is generally contained within a region referred to as the first fresnel zone. The distance from the transmitting antenna to a point on the surface of the fresnel zone, plus the distance from this point to the receiving antenna, is ½ wavelength greater than the direct path between the two antennas.

The control point is usually the point where the microwave propagation path passes closest to the earth's surface. In most cases, the control point will be at or near the center of the path, because at this point the fresnel zone radius and the earth bulge will be the greatest.

The final beam clearance (H) in feet for the path may be obtained

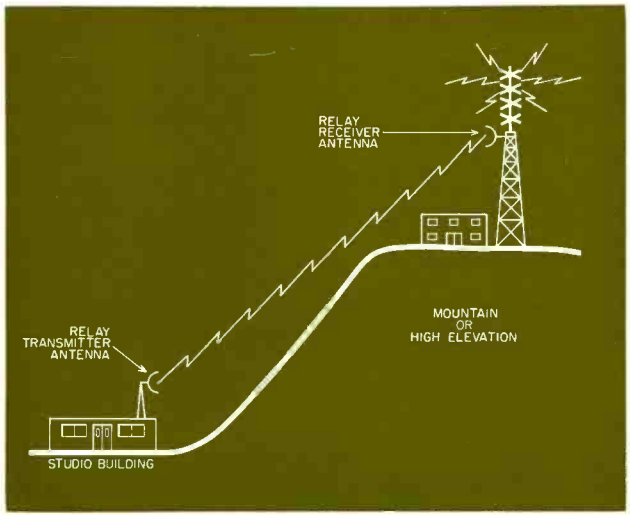


Fig. 1. Fixed microwave system.

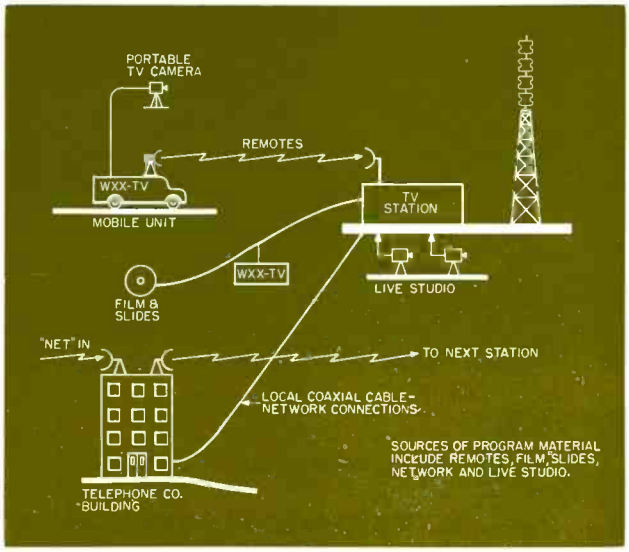


Fig. 2. Remote microwave link.

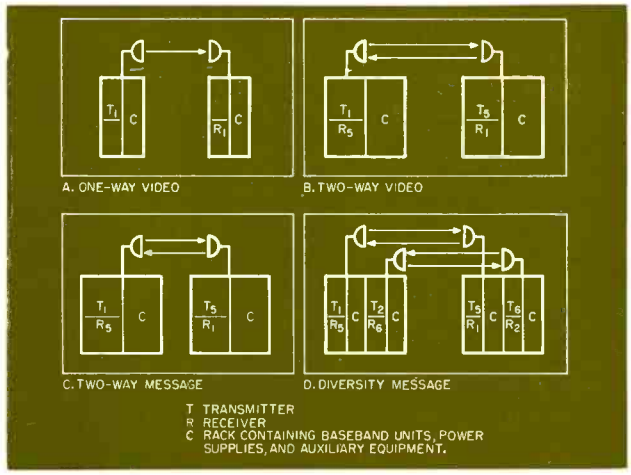


Fig. 3. Various types of microwave systems.

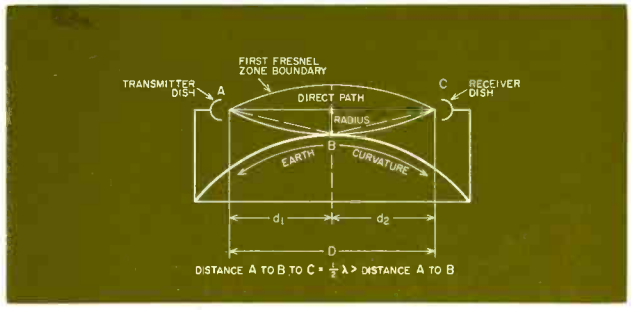


Fig. 4. Profile of transmission path.

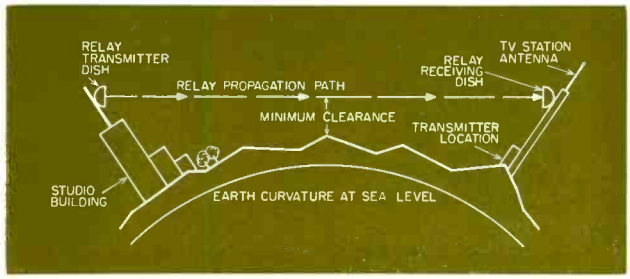


Fig. 5. Elevation above 4/3-earth contour.

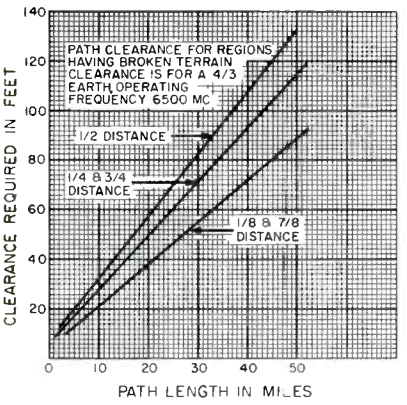


Fig. 6. Transmission path clearance.

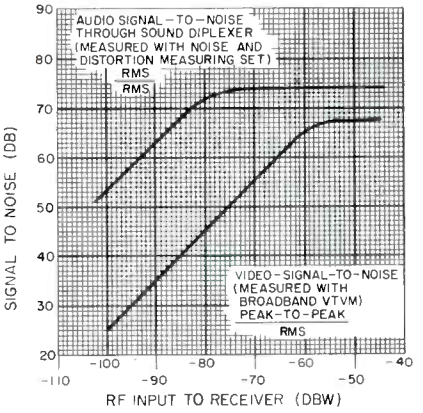


Fig. 8. Video and audio signal-to-noise ratios.

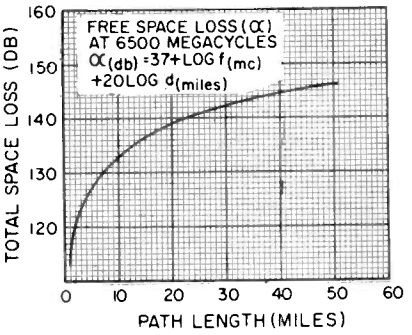


Fig. 7. Free-space loss at 6500 mc.

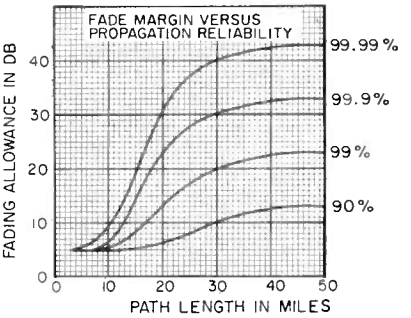


Fig. 9. Fading allowance.

TYPICAL MICROWAVE SYSTEM CAPITAL INVESTMENT

The costs listed for typical applications are approximate—exact quotations can be obtained from manufacturers of the equipment. These costs are for average single-unit installations, and include engineering assistance.

Type of Installation	Estimated Costs
1. Permanent Microwave Relay Link, such as STL service. Aural, Video or diplexed. (Fig. A.)	$12,000
2. Repeater Station of a multihop link, including tower. (Fig. B.)	16,000
3. Single-Hop Portable System, for relaying field pickups to the transmitter or studios. (Fig. C.)	12,000
4. Two-Way System, Aural-Voice	18,000
5. Multichannel Systems, for 300 voice or video channels, RF Section only. Towers and building extra.	18,000
6. TV Translator and Booster	
300-watt output power	19,400
80-watt output power	9,900

Permanent system installations are ideally suited for serving relay links between studios and transmitters, or they may be used to serve small city broadcast and television stations, community antenna systems, telephony and industrial control systems. The microwave relay system can also be utilized as a repeater station for long haul systems and for bypassing intervening obstacles and obstructions.

In this type of installation the transmitter and receiver RF heads can be mounted on the rear of the parabolic antenna, which is usually installed on the tower or at the tower base below the passive reflector. The power supplies and control units are mounted in racks at a building location. When the entire system is rack-mounted there will be a cost saving in maintenance and emergency service as well as a saving in reduced "off-air" time.

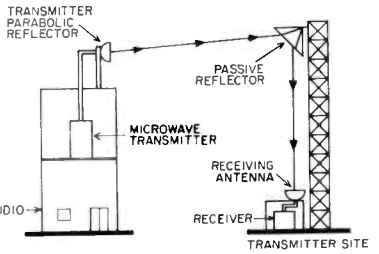


Fig. A. Typical STL system.

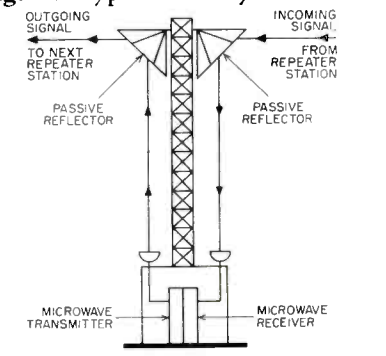


Fig. B. Microwave repeater.

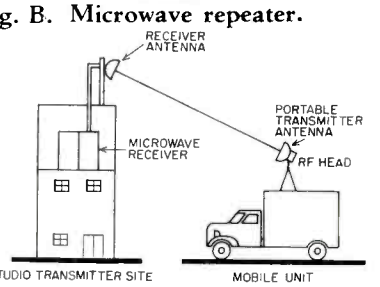


Fig. C. Single-hop portable system.

by solving the following equation:

$$H = \frac{d_1^2}{2} \text{ feet.}$$

Example:
Path length = 30 miles (D)
Distance to control point = 15 miles (d_1)
Clearance requirement at the control point:

$$\text{Clearance } H = \frac{15^2}{2} = 113 \text{ feet.}$$

C. The clearance from the tallest obstruction in the path should equal or exceed that called for in Fig. 6.

D. The free space attenuation for the clearance path is calculated by:

$a = 37 + 20 \log (f) + 20 \log (d)$,

where,

a = free space loss in db (see Fig. 1),
f = frequency in megacycles,
d = distance in miles between transmitter and receiver.

E. The gain of the antenna configuration at each end is calculated by:

$A = a - G_t - G_r$,

where,

A = net path loss,
a = free space loss,
G_t = transmitter antenna system gain,
G_r = receiver antenna system gain.

The values of antenna gains for both the transmitting and the receiving ends, for systems using passive reflectors and 2, 4, 6, 8, and 10 foot parabolas, are normally obtained from the equipment instruction books.

F. Determine the RF power input to the receiver by:

$P_r = P_t - A - L$,

where,

P_r = Receiver power input
P_t = Transmitter power output (nominally 1 watt or 0 dbw)
A = Net path loss
L = Waveguide losses

These losses in db, subtracted from the transmitter power output (0 db) will give the power input to the receiver in −dbw (db below one watt).

G. By using the receiver power input calculated in Step *F*, the signal-to-noise ratios for both video and audio output signals may be obtained from Fig. 8.

The video signal-to-noise curve is the ratio of peak-to-peak video signal to the rms noise at the receiver output. Fig. 8 may also be used to determine the audio signal-to-noise ratio when sound diplexing is used in the system. Audio signal-to-noise ratio is rms/rms over a 15-kc frequency band. The values may be converted to peak-to-peak ratios, as measured on a wideband oscilloscope, by subtracting 20 db.

When measuring noise it is suggested that an oscilloscope be connected in parallel with the VTVM so that the signal can also be observed for hum or interference.

H. From known facts and previous subjective tests, it can be seen that the fade margin and system reliability depends on the RF signal input to the microwave receiver and the signal-to-noise ratio. Usually, a 25 db (wideband) signal is the poorest signal-to-noise ratio which may be tolerated. If signal-to-noise ratios below 25 db are assumed to constitute outage, then an RF receiver input power less than −101 dbw will be entirely unsuitable for applications of a continuous nature such as an STL. A formula for calculating fade margin is: Fade margin = non-faded input power − (−101) dbw. The reliability may then be determined for any length of path by using Fig. 9.

For example, an RF input to the receiver of −73 dbw (s/n ratio of 53 db wideband) will have a fade margin of −75 − (101) = 28 db. Fig. 9 will show that a fade margin of 28 db indicates only a 99.9% reliability on a 25-mile path. Therefore, the signal-to-noise ratio will be better than 25 db for 99.9% of the broadcast time and the signal-to-noise ratio of 53 db will be usable most of the time.

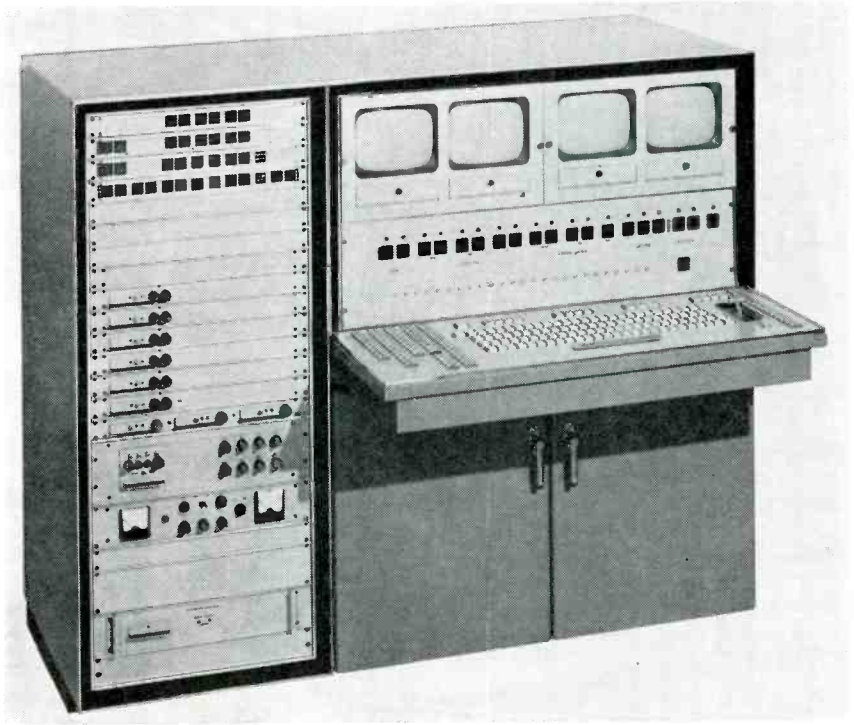
Aging of klystrons, bad antenna alignment, reduced modulation levels, and low receiver noise figure all contribute to reduced signal-to-noise ratio, reduction in fading allowance, and reliability. For a microwave system reliability of 99.9%, the fade margin for a 25-mile path should be 37 db, which requires an RF input to the receiver of −64 dbw (s/n = 62 db wideband), fade margin = −101 −64 = 37 db.

A 99.9% reliability means that during applications of a continuous nature, such as 24 hours per day, 8700 hours per broadcast year, a total outage time (s/n ratio less than 25 db) of not more than 8.7 hours would occur. ●

BROADCAST EQUIPMENT

Solid-State Computer TV Programmer

Sarkes Tarzian's new APT-1000 solid-state computer, designed specifically for TV programming, controls all video sources and effects from stored instructions covering video and audio sources, transitions, on-

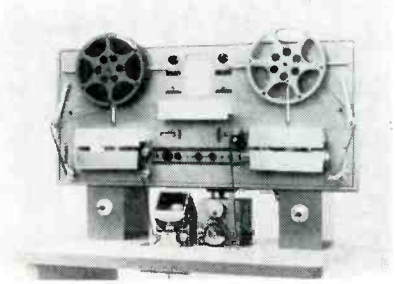


air time, event durations, and other special instructions. The operator communicates with the computer in standard program-log language and always has the system under full control. Projection displays show status of events in number-and-letter code, and TV monitors display actual video for on-air, next event, preview, and net. Manual control may be used at any time to override automatic switching.

Circle 100 on Reader Service Card.

Automatic Film Editor

Superseding the earlier Model Q film editor, Harwald's new Mark IX Inspect-O-Film Editor is aimed at creating the ultimate in film-handling ease. Already in wide use in station film rooms, the unit inspects film electronically for breaks and tears, measures and times footage, counts splices, cleans and rewinds film, and reads and synchronizes sound. Price is $5,950.



Circle 102 on Reader Service Card.

Audio Automation System

With a building-block approach to audio automation as an economical solution to FCC rulings on non-duplication of program material, the Visual Electronics system uses the KRS Stact cartridge system as the key element. The operator can preset sequences with a selection of 15 individual sources, but still make last-minute changes with manual control. At any later date, the system can be incorporated into a larger system with random access, sequencing and automatic operation.

Circle 101 on Reader Service Card.

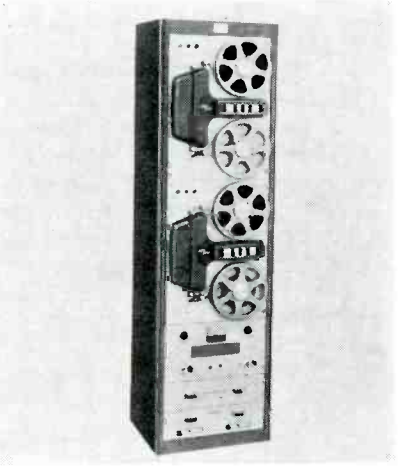
Delayed Programmer

The SPOTMASTER 500 A-DL delayed programmer recorder-playback unit continually delays program material for periods of 6 sec to 16 min. The delay, which may be necessary to delete objectionable matter or to allow time between program origination and actual broadcast is determined by length of tape in cartridges. Rack-mounted style takes 7 in. of rack space. Units are made by Broadcast Electronics, who also recently introduced Cue-trip frequency selective amplifiers and tone-generators for tape-track cueing.

Circle 103 on Reader Service Card.

Multi-Channel Recorder/Reproducer

Continuous fail-safe operation is assured with Magnasync TR-1510 audio recorder covering up to 10 channels. Inaudible control tone



is recorded continuously and reproduced to indicate equipment op-

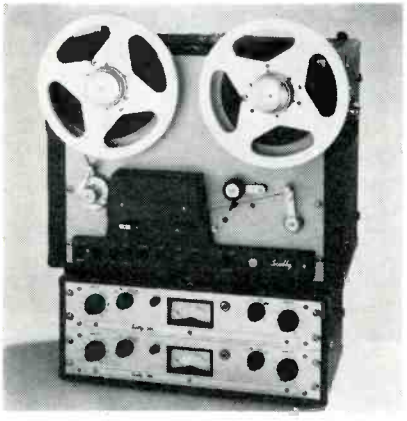
eration. If tone disappears, tandem unit is switched in.
Circle 105 on Reader Service Card.

Program Equalizer

Model 63A rack-mounted program equalizer from Altec Lansing is designed to give continuously variable equalization at selectable low and high frequency points. All controls can be operated during broadcast without injecting noise into signal. Provides 12-db maximum boost, 16-db maximum attenuation at any selected frequency. Takes 3½ in. high rack space. New microphone equalizers and variable filters also are available from Altec-Lansing.
Circle 104 on Reader Service Card.

Recorder/Reproducer

Scully Recording Instruments' new solid-state recorder/reproducer features plug-in heads, plug-in relays, separate plug-in cards for



play amplifier, record amplifier and bias/erase oscillator. Patented disc brakes allow smoother tape handling.
Circle 106 on Reader Service Card.

Cordless Program Plug-Boards

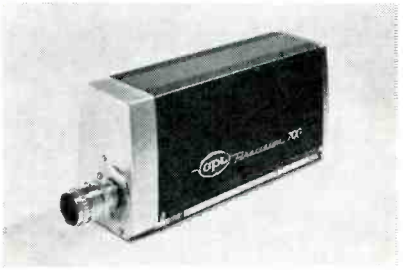
Designed for timecasting TV and radio operations, Sealectro Corp.'s new Sealectoboard provides matrix design, with bussed or individual outputs, and instantaneous visual readout of program plan. All shorting pins, diode holders, component holders and illuminated monitoring pins are available as plug-in accessories.
Circle 107 on Reader Service Card.

VHF/FM Distribution Amplifier

The LHD-404DR distribution amplifier feeds low and high VHF and FM signals into as many as four distribution lines with an output level of 50 dbmv at channel 13. Separate gain and tilt controls are provided for high and low bands. The amplifier, made by Entron Inc., uses 10,000-hr tubes and high reliability Compactrons. Feeds up to 1½ mi. of distribution lines.
Circle 108 on Reader Service Card.

Transistorized CCTV Camera

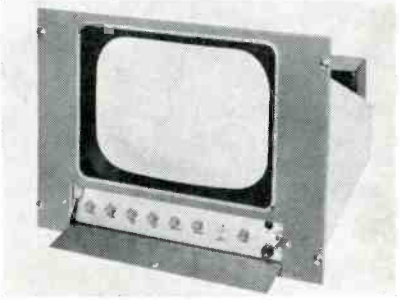
The new Precision 700 camera from GPL Aerospace Group has 700-line resolution and automatic light compensation for remote continuous operation. Accepts all standard vidicons and uses 10-



mc video bandwidth with standard 525-line crystal-controlled horizontal scanning frequency. All controls—on-off, beam, target and electrical focus—are located on camera. Weighs only 12 lb.
Circle 109 on Reader Service Card.

High-Resolution TV Monitor

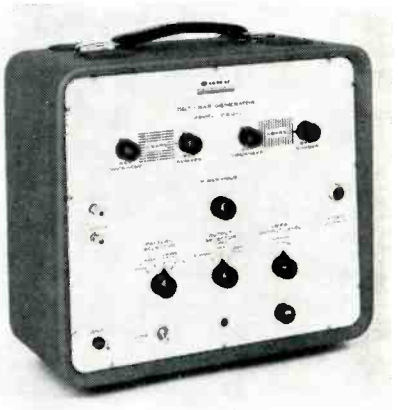
Miratel Electronics introduces its Series HL monitors, featuring 1000-line horizontal resolution,



30-mc video bandwidth, full low-voltage and high-voltage regulation and horizontal scan rates from 525 through 1203 lines. Prices range from $535 to $635, depending on mounting and kinescope size.
Circle 110 on Reader Service Card.

TV Dot-Bar Generator

The DGB-1 dot-bar generator from Cohu Electronics provides patterning with scanning rates of 525 to 945 lines. Thickness and number of horizontal bars or dots can be adjusted with front-panel controls. Base price is $350.
Circle 111 on Reader Service Card.



Antenna Phase Meter

Vitro Electronics' Nems-Clarke type 108-E phasemeter measures phase relations in directional antenna systems, 100 kc to 2 mc, with 1-deg accuracy and ½-deg resolution. Each instrument is tailored for the particular installation. Basic instrument covers up to six antenna elements. Typical four-element system is priced at $750.
Circle 112 on Reader Service Card.

Sync Generators

Computer logic techniques make stable solid-state sync generators in Riker Industries' line of modular units. Generator features: standard EIA and FCC pulses, precise crystal pulse timing, delay-line horizontal timing, binary-counter vertical timing, and low power consumption. Also available: bar-dot generator, color frequency standard, color lock, relay change-over, and special-effects generator module.
Circle 113 on Reader Service Card.

Broadcast Microwave Relay

All circuit elements other than the TWT are solid state in this

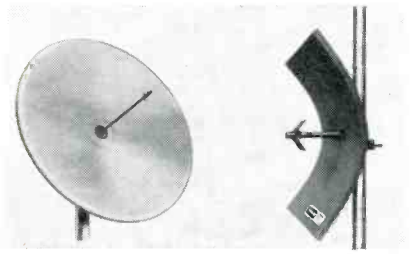
portable 10-w rf power amplifier, model MA-8509 from Microwave Associates. Primarily intended

for TV broadcast mobile relay operations, the amplifier operates in a 1700-mc to 2300-mc bandwidth. The amplifier can be combined with existing vacuum-type transmitters in this frequency range for better signal-noise ratio and extended range.

Circle 114 on Reader Service Card.

ETV Antennas

TACO's two new antennas, a cylindrical parabola and a 4-ft. dish, are designed for the 2.5-2.7 Gc ETV band. The cylindrical parabola covers the entire band without field adjustment at 12.5-db gain, while dish with dipole driver offers 27-db gain.



Circle 118 on Reader Service Card.

Passive Microwave Repeater

Flat billboard type passive repeater, by Microflect Inc., designed for operation to 13,000 mc, offers complete reliability under all climatic conditions. Available in sizes from 7 x 8 ft. to 30 x 48 ft. Can be erected without power equipment and adjusted easily about both horizontal and vertical axes.

Circle 115 on Reader Service Card.

Microwave Relay Link

Micro-Link's new low-cost type 420A portable microwave relay link operates in 10,500-10,700 mc range with 7-mc bandwidth, is ideally suited for such uses as remote TV pick-ups, and studio-to-transmitter link. Transmitter and receiver are each self-contained in their own individual units with parabola mounts.

Circle 116 on Reader Service Card.

Solid-State Microwave Relay

This all solid-state 6,000-mc system from RCA is capable of relaying both color and black-and-white TV signals above 5000 mc. Operating from 48-v battery and suitable for common carrier and CATV, the system does not demodulate signal at repeater stations to achieve long-distance operation. Delivery planned in mid-1965, the system will be available in one-way or two-way multichannel assemblies.

Circle 117 on Reader Service Card.

TV Commentator's Binaural Headset

The new Roanwell TV commentator's binaural headset is specially designed for modern studio use with dynamic noise-cancelling microphone and noise-attenuation earcups. Binaural wiring permits

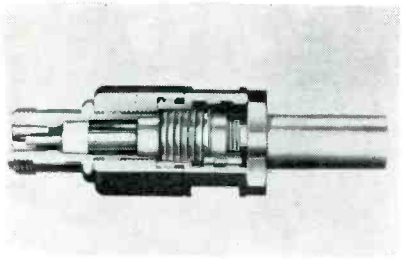
BROADCAST EQUIPMENT

simultaneous program monitoring and instruction reception. Price is $144.

Circle 120 on Reader Service Card.

Instant-Use Connector

The new Times Wire & Cable TIMATCH connector can be installed quickly and is re-usable any number of times. One-piece



construction features patented CoilGrip cable clamp. Repeated use does not impair RF or physical characteristics of connector or cable.

Circle 122 on Reader Service Card.

Silicon Avalanche Assemblies

High-voltage silicon avalanche assemblies from Syntron Co. are direct replacements for rectifier tubes in TV and radio transmitters, and offer better efficiency, longer life and less maintenance. Available with PRVs up to 500 kv, and currents to 1.75 amp, half-wave, the assemblies are priced from $34.25 to $750.

Circle 119 on Reader Service Card

Cable Assemblies

American-made cable and connectors, 33 conductor, can be mated with British connectors and cameras with new Boston Insulated Wire and Cable Co. cable assemblies. Studio cable assemblies with male and female connectors are available in 50-ft, connectors are availabl in 50-ft, 100-ft, and 200-ft lengths.

Circle 121 on Reader Service Card.

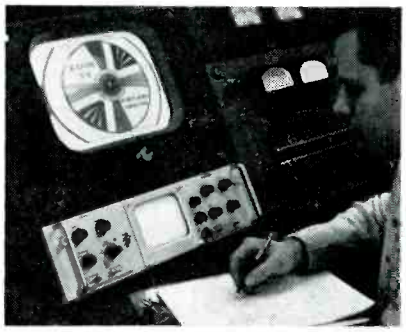
Tape Cartridge Systems

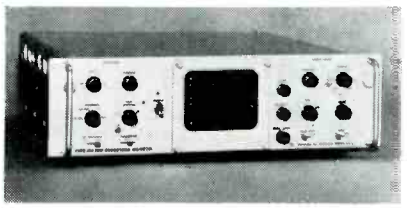
New transistorized tape cartridge equipment from Sparta Electronics includes the Sparta-Matic 400 Series playback or record-playback table-top units and the CD-15 tape cartridge time delay. The 400 series units feature easy cartridge insertion and release and new precision-mounted tape heads. The time-delay unit, for on-the-air telephone conversations, allows delays of 3 sec to 30 minutes, also can be used as a special-effects generator for echo-chamber effects.

Circle 123 on Reader Service Card.

VIT/Video Monitor

Tektronix's new type RM 529 monitor is intended for precise analysis of Vertical Interval Test sig-





nals. The unit, which supersedes the RM 527, uses transistor—vacuum-tube hybrid circuitry, drawing only 80 w, to display VIT signals. Includes positive field identification and a line selector for display of any line, which is also automatically intensified on associated picture monitor. With 5-in. CRT, occupies 5-¼ in. in rack.

Circle 124 on Reader Service Card.

Cable Pressure Tap

For use with all common plastic or aluminum feeder cables, the zinc-plated Telesystems Tele-Tap Sure Grip features self-tightening ground pins, snap-on design, stainless-steel thread insert, and non-slip grip.

Circle 125 on Reader Service Card.

Audio Amplifiers

Compact transistorized 3-w plug-in audio amplifiers operate directly from 24 v dc. Made by McMartin Industries, the amplifiers are available with line bridging input or input transformer for balanced 600-ohm line, and with low-impedance loudspeaker output.

Circle 127 on Reader Service Card.

LITERATURE of INTEREST

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

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BROADCASTERS SPEAK

Broadcasters Speak is your Department—space for you to express your thoughts. We urge you to make use of it. (Editor's Note: The comments on this page are indicative of the hundreds received from recent survey we mailed to all broadcast facilities.)

If your magazine covers the areas of interpretation of FCC rules and regulations, of station operation problems and solutions, of preparing and controlling budgets, of in-depth engineering studies, of financial data on various phases of station management, it will certainly be the most read at this station.

R. Mellon,
General Maanger, WCAT,
Orange, Massachusetts

I wish you all the success and good luck for a fabulous NEW idea in a broadcasting publication. I look forward to your first issue.

Al Shields,
Program Director, WPAC,
Riverhead, New York

Every feature you have proposed is most interesting and I am sure will answer many of our questions. We are looking forward to our copy of BM/E.

Elwayne L. Clement,
Station Manager/Chief Engineer
KIBS, Box 757,
Bishop, California

This magazine can be of valuable assistance if a portion is prepared for the small market operator.

Robert E. Baker,
General Manager, KNOT,
Prescott, Arizona

Thanks!

Bill F. Johnson,
General Manager, KCON,
Conway, Arkansas

Sounds wonderful!

Richard Hyde,
Station Manager, WSCB-FM,
Springfield, Massachusetts

The average engineer, as well as everybody on the management team, has many demands on his time. There are far too many technical magazines reaching us which are a waste of time and a poor excuse as a vehicle for carrying advertising. The *right* magazine (and I can't really say what it would be!) would be valuable and welcome.

H. A. Dorschug,
Director of Engineering, WTIC-TV,
3 Constitution Plaza,
Hartford, Connecticut

If you live up to the plans mentioned in your outline, you should have an excellent publication.

Robert I. Kimel,
General Manager, WWSR,
St. Albans, Vermont

The description of your magazine indicates that you've got a publication that really gets to the "meat" of what a station needs. So, apparently, you people really have your hands in, and therefore a first-hand knowledge of, broadcasting. For this reason I request a subscription.

Victor C. Vigansky, Jr.,
Engineer-in-charge, WLKM,
Three Rivers, Michigan

Look forward to your new magazine. All best wishes.

Rev. W. K. Trivett,
Director & General Mgr., WFUV,FM,
Fordham University,
The Bronx, New York

Your magazine sounds like just what we need to fill many gaps.

J. L. Lamb, Jr.,
Manager, WCNC,
Elizabeth City, North Carolina

Good ideas. We need all the help we can get.

Elden Stielstra,
Secretary & General Manager, WLRC,
Whitehall, Michigan

Need some help on campus-limited broadcasting. I doubt you'd want to devote space to this, however.

Fred Lentner,
Station Manager, WOBC-FM,
Oberlin College,
Oberlin, Ohio

Especially interested in FCC rules and regulations.

James L. Murdock,
Station Manager, WMCO-FM,
Muskingum College,
New Concord, Ohio

Your projected plans are excellent! Looking forward to BM/E with great anticipation!

Leonard Walk,
President, WAMO,
Pittsburgh, Pennsylvania

Broadcast engineers have needed such a magazine for a long time. Sounds like a wonderful idea.

J. Ellis Shockley, Jr.,
Chief Engineer, WGCD,
Chester, South Carolina

I like the sounds of your format. Will be looking forward to it.

Dean Sorenson,
General Manager, KGFX,
Pierre, South Dakota

A great many stations are completely cut off from national advertising budgets on the basis of their standings or rating in surveys by *Pulse*, *Hooper*, *Nielsen* and others. If their methods of operation and the number of contacts made were publicized, it is possible that more accurate surveys would result.

Charles M. McCraw,
Manager, WCNW - WFOL-TV
Fairfield, Ohio

If you cover all you say, you will be filling a great void.

Tom Kita,
Operations Manager, WLEE,
Richmond, Virginia

Although I personally have been in broadcasting for awhile, my experience has been limited in the field as general manager; therefore any additional information . . . related to the broadcast management department would be a welcome addition.

J. M. Schaller,
General Manager, WRJC,
Mauston, Wisconsin

The financial aspect of broadcast engineering is probably the one subject ignored by existing publications.

M. J. Werry,
Manager, CKOX,
Woodstock, Ont., Canada

We only hope this new publication will offer as much as your letter indicates.

Gilbert J. Crouse,
Manager, KSEM,
Moses Lake, Washington

We wish BM/E all the luck in the world, and are looking forward to receiving it.

Carlo F. Zezza,
General Manager, WCFR,
Springfield, Vermont

No publication as yet has come with ALL the answers to problems confronting small radio broadcasting operations. Most of them, and I assume yours is no exception, are geared to larger markets with big operations . . . vaguely helpful to us in small operations.

R. A. Davidson,
Vice President & Mgr., WHAL,
Shelbyville, Tennessee

A column devoted to broadcaster-CATV relations would be helpful. A lot can be done to improve relations between the two groups.

I. A. Elliot,
General Manager, Micro-TV, Inc.,
Miles City, Montana

You're tackling a pretty wide field. If you manage to get all the things you mention into one book it will save a lot of hunting.

J. T. Kielty,
General Manager, CFRA,
Ottawa, Ontario, Canada

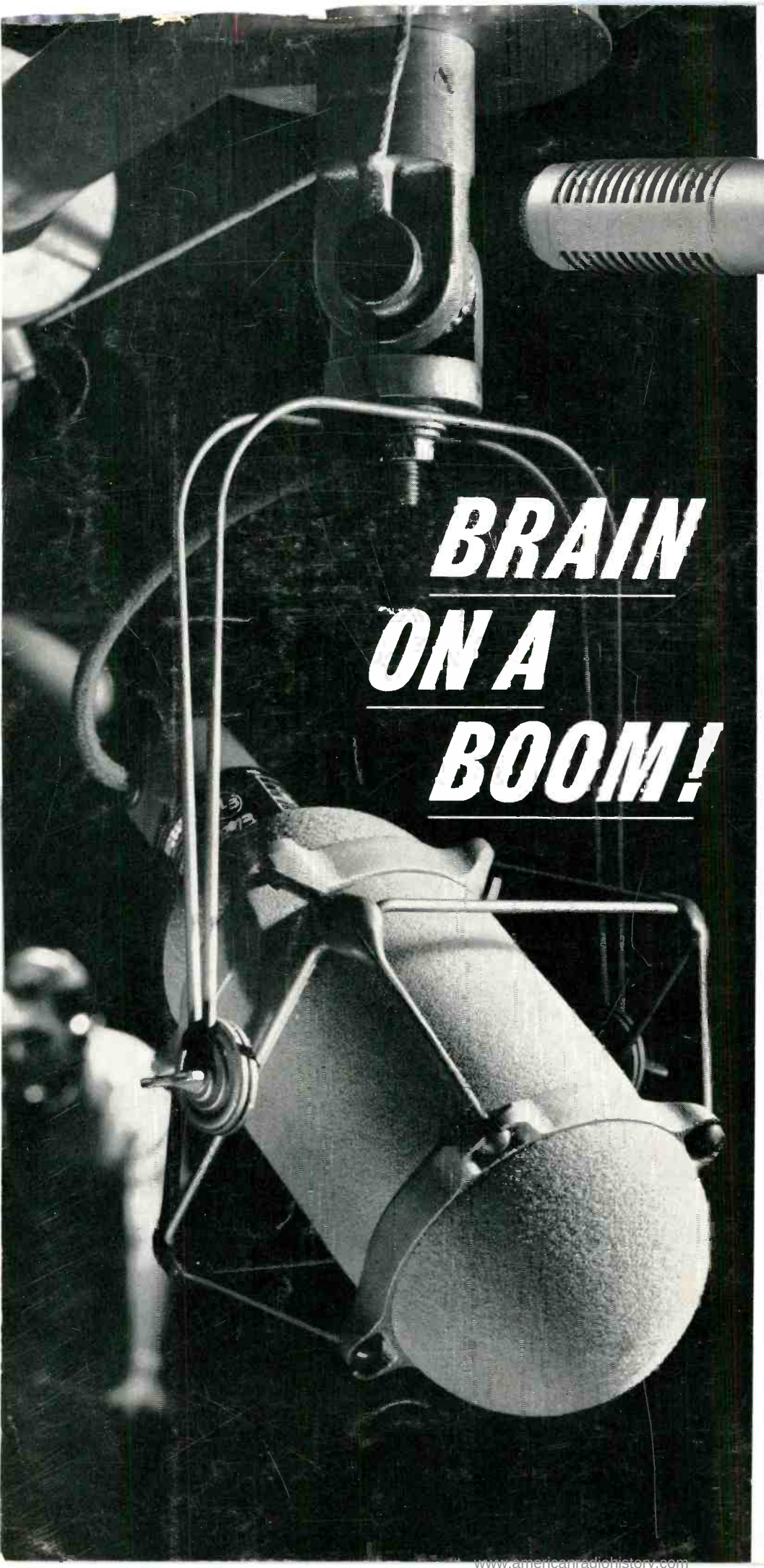
Broadcasting is a diversified, complex industry. We intend to deal with the most important problems faced by the majority of broadcasters—large or small. Understandably, however, we cannot possibly provide in-depth coverage on *all* areas in *every* issue. What BM/E will contain is a well-rounded, balanced content—hopefully with something of interest in each issue to every reader. We solicit your comments and suggestions to help us attain this goal.

Editor

9:01.45	1.00	CHEV 65 SPOT	A79	
9:02.45	1.15	MUSIC	A01	
9:04.00	1.00	UNITED FUND SPOT	A67	
9:05.00	2.30	MUSIC	A04	
9:07.30	1.00	TEXAS FACTS SPOT	A36	
9:08.30	.50	IT'S MAGIC SPOT #2	A51	
9:09.20	.35	CHICKEN DELIGHT SPOT	A14	
9:09.55	2.30	MUSIC	A03	

AIR TIME	SCHED TIME	DUR.	PROGRAM	SPONSOR	CODE
	9:15.00	1.15	MUSIC		A02
	9:16.15	1.00	CHEV 65 SPOT		A75
	9:17.15	2.30	MUSIC		A03
	9:19.45	1.00	HAMMS BEER SPOT		A40
	9:20.45	1.15	M[illegible]		A01

AIR TIME	SCHED TIME	DUR.	PROGRAM	SPONSOR	CODE
	9:15.00	1.15	MUSIC		A02
	9:16.15	1.00	CHEV 65 SPOT		A75
	9:17.15	2.30	MUSIC		A03
	9:19.45	1.00	HAMMS BEER SPOT		A40
	9:20.45	1.15	MUSIC		A01
	9:22.00	.45	L & M SPOT		A91
	9:22.45	1.15	MUSIC		A02



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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.

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