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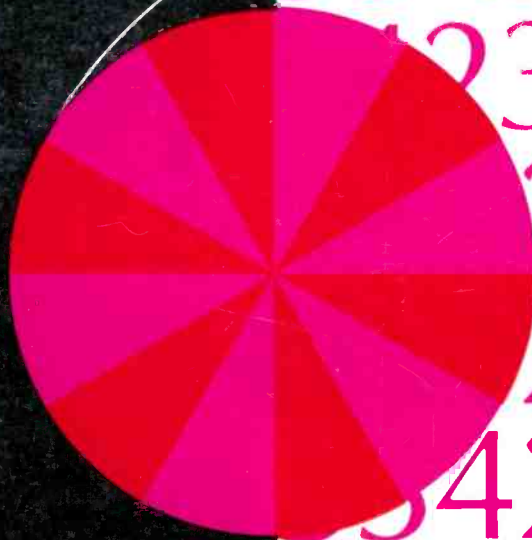
JOURNAL OF BROADCAST MANAGEMENT ENGINEERING

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BM/E Surveys The Industry

Does TV Automation
Pay Off?

Commissioner Lee
Comments on CATV



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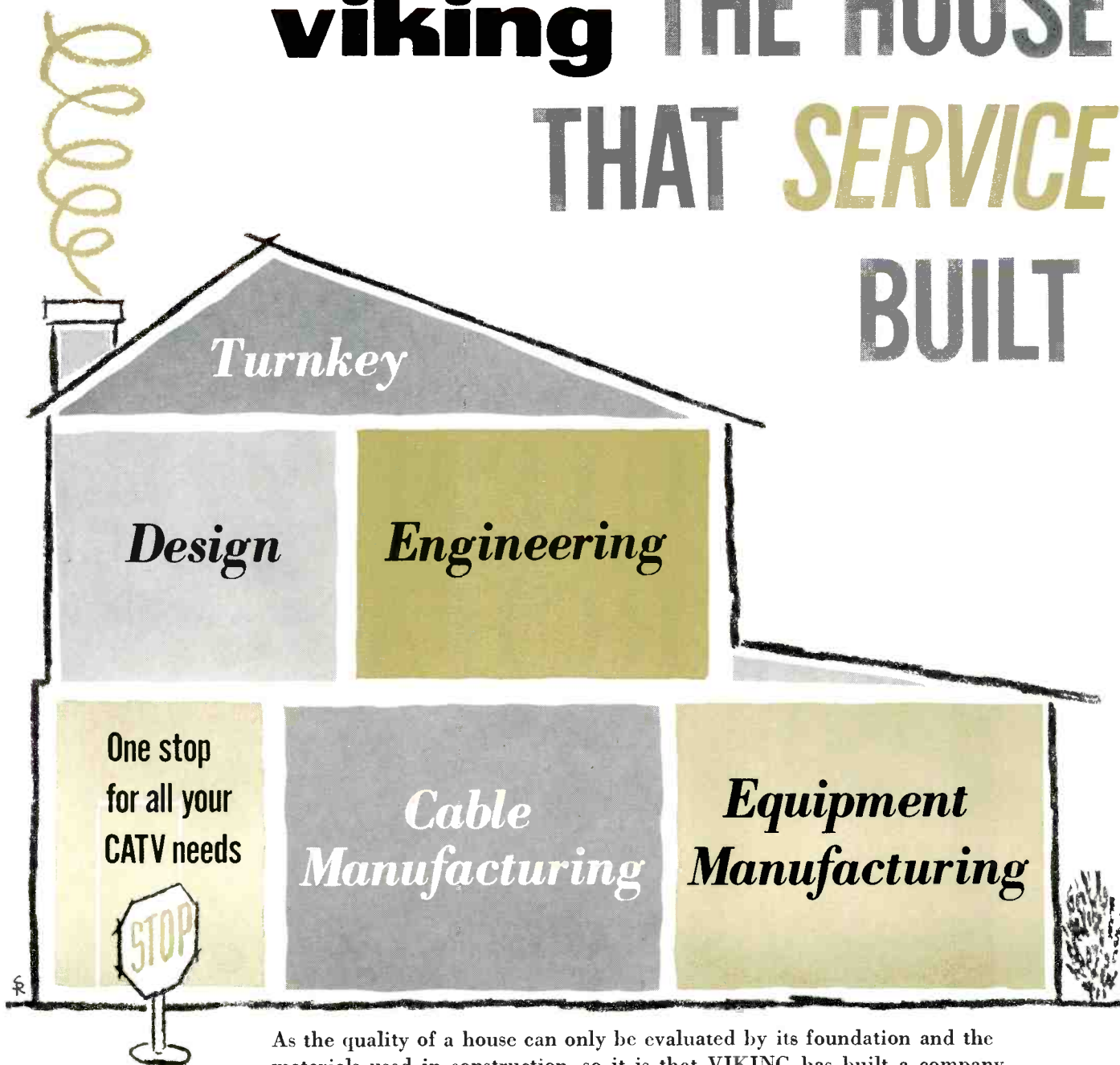
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**THE
BIGGEST
SINGLE
EQUIPMENT
PURCHASE
IN
CATV
HISTORY**

**LIFT
THIS
PAGE FOR
THE EXCITING
STORY**

viking THE HOUSE THAT *SERVICE* BUILT



As the quality of a house can only be evaluated by its foundation and the materials used in construction, so it is that VIKING has built a company dedicated to the complete services and growth of the CATV industry.

Each specialized division at VIKING has been carefully planned to meet the expanding requirements of the CATV Industry and has resulted in the unique formation of an organization "that does everything"; equipment manufacturing, coaxial cable manufacturing, systems designing and engineering as well as complete turnkey construction.

When next you are considering the construction of a new CATV system, or rebuilding an old system, why not call upon VIKING — "THE HOUSE THAT SERVICE BUILT." No job is too big or too small.

viking



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BM/E

THE MAGAZINE OF BROADCAST MANAGEMENT/ ENGINEERING

Publisher:

MAL PARKS, JR.

Editor:

VERNE M. RAY

Corporate Editorial Director:

JAMES A. LIPPKE

Art Director:

GUS SAUTER

Production Manager:

HELEN HORAN

Editorial Production:

RIMA B. WALKER

Circulation Director:

H. C. GAINER

Circulation Fulfillment:

J. EDWARDS

Reader Service:

R. R. BELL

Promotion Manager:

E. L. GRAY

Assistant Promotion Manager:

R. BATTLE

Classified Advertising Manager:

EILEEN HESSION

The numbers on the cover represent the raw material for this month's First Annual BM/E Survey of the Industry. But simple numbers are easy to obtain on any subject; it's the interpretation of the right numbers that's difficult. For our interpretation of the numbers we collected in our survey, see page 24. This is typical of the information that we believe is vital to broadcasting—both management and engineering.

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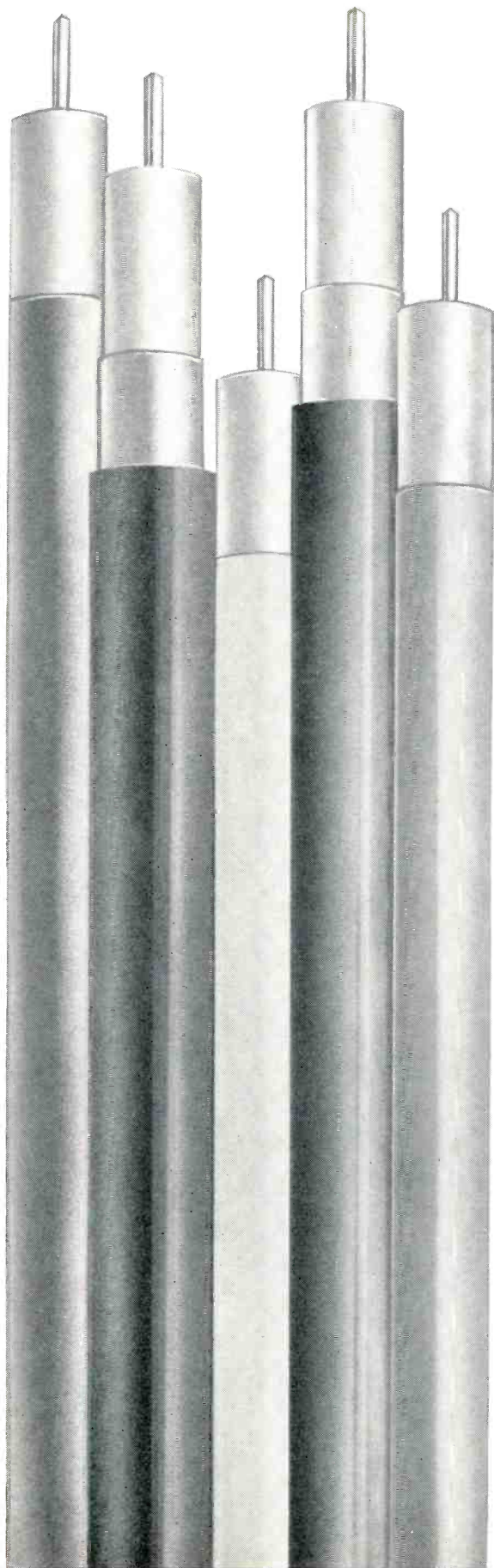
Electronic Procurement

Volt/Age—the magazine of Electrical Apparatus Maintenance

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In a dilemma: whether to build your CATV system for fast capital gains or for maximum operating profits?

Before you install a so-called economy cable system, ask these 8 questions:

1. Is it water & water vapor proof?
2. Is the cable self sealing when tapped?
3. What is the guaranteed maximum attenuation?
4. Will it produce an acceptable color TV picture?
5. Does it give 26 db minimum return loss guarantee?
(Required for minimum ghosting)
6. Will the quality be the same 5 years from installation?
7. Will the cable be adaptable to all pay TV applications?
8. Will it give radiation protection
when high power lever amplifiers are used?

If you install Times JT-1000 seamless aluminum tube sheath cable, the answer will be "Yes" to all the above.

Whether your objective is capital gains or long-term, high net profit, you should give careful consideration to installing a long-life, high-quality cable system: JT-1000 series cable, your best profit insurance. Don't settle for a system that continually degrades from the day you install it, and which may prematurely require replacement in 3 to 5 years.



TIMES
WIRE AND CABLE

Division of the International Silver Co.

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BROADCAST INDUSTRY NEWS

Agreement on CATV Legislation Progresses

Although the NAB Television Board of Directors, in their meeting January 25th, made only one basic change in principles previously agreed upon by NAB and NCTA subcommittees, the Community Television Association's new president Fred Ford claims the "major changes in effect vitiate the understandings." The subcommittees had agreed upon giving stations protection against simultaneous duplication of their programs by CATV systems. The NAB changed this to prevent duplication for 15 days before and after showing. Mr. Ford states that this change "unnecessarily and injuriously penalizes CATV systems with no corresponding benefit to local TV stations." Supposedly, the differences will be ironed out in future meetings of the two subcommittees.

Basically, the approved principles set up priorities for the carrying of various TV signals, guard against duplication, provide orderly standards for so-called "leap-frogging" or the bringing in of signals from distant stations, rule out CATV program originations (other than automatic time and weather services), and call for establishment by the FCC of standards of good engineering practice for CATV's.

TAME (Television Accessory Manufacturers Institute) applauded NAB's position as an important step in the right direction. However, the receiving antenna manufacturing group said, "The NAB proposals do not go far enough and we earnestly hope that further study of the problem will convince the NAB that regulation should be more comprehensive." Among the additional factors TAME feels should be considered in setting up regulations are:

... profiting from taking programs of TV stations without ob-

taining permission or paying for them."

"... observance of the same legal obligations TV stations have (Sec. 315) to assure that the public will obtain the views of opposing candidates for public office, and opposing views on controversial issues."

TAME's statement concludes that these and other problems "can only be dealt with ... by licensing of CATV systems just as TV stations are licensed."

The Association of Maximum Service Telecasters (MST) is now in the act, too. At deadline, BM/E learned that the MST Board issued a policy statement asking the FCC to assume regulatory authority over all CATV's, and made specific recommendations for control. The MST statement further advised it would seek legislation only if the Commission is unable or unwilling to act. In the event the Commission does not take decisive action immediately, MST asks that translator and related policies be liberalized so that television stations could compete with CATV.

Henry Talks of Many Things

FCC Chairman E. William Henry expressed his views on a number of subjects in an informal address before the State Broadcasters Annual convention. He said Congress soon will hold hearings to determine what legislation may be needed to regulate CATV systems. The Commission is preparing its comments and will hold a day-long meeting Feb. 18 to discuss the subject.

"We hope to have a decision by early March," he stated, and said the Commission wants to know "what is the public need and how is it best served?" To help determine this he asked to hear from all groups interested in CATV.

Discussing Section 315, Mr. Henry said his recent proposal for free political time to match pur-

chased time stemmed from the increasingly high cost of broadcasting. He believes his proposal would "allow broadcasters more flexibility" in the political field "by denying equal time to fringe groups." He would limit the equal time provision to major political candidates and have it apply "only to candidates and not issues."

Mr. Henry also mentioned that he is against 5-year license because the Commission uses the renewal period to review a licensee's performance. He believes a review every five years isn't often enough and therefore favors the current 3-year term.

Commenting on the revised radio license renewal form, he said it "will give broadcasters more flexibility." The composite week will be required, but an effort has been made to get away from percentage listings.

Lady Reporters Ride 'Copter 1260'

Starting Feb. 15th, two adventurous young ladies will be making broadcasting history and provid-



ing Washington area listeners with up-to-the-minute traffic information in a unique manner. WWDC Radio will launch its "Copter 1260," carrying a lovely lady to bring motorists the latest in traffic-flow information 16 times daily. Marie McDonald (shown in copter) and Dee Davidson will become the first two women ever to broadcast traffic reports from a helicopter on a daily basis.

Ben Strouse, WWDC President and General Manager (shown holding mic) says, "It's not only different, but a great many people will suddenly become even more attentive to what's happening in traffic while they're driving to and from work."

WWDC's new \$40,000 Hughes 300 helicopter will be used to broadcast sixteen traffic reports during the morning and evening rush hours each day. Miss Davidson and Miss McDonald, were selected from a large group of applicants. (Building shown in background is Broadcast Electronics engineering lab.)

\$2 Million for CATV Modernization

H & B American Corp., Beverly Hills, Calif., owner of 29 CATV systems serving more than 85,000 subscribers in 44 communities, is undertaking a major modernization program estimated to exceed \$2 million. Using the most modern, up-to-date, solid-state equipment available, five systems will be completely rebuilt, one will be partially rebuilt, and one new system will be installed.



According to Leon Papernow, H & B V-P of Operations (at left in photo with Elmer Metz of Jerrold), once the change-over is completed, all seven systems will be capable of carrying up to 12 TV channels plus 20 FM stations. H & B has contracted with Jerrold Electronics for enough solid-state equipment to send signals through more than 500 miles of CATV plant—the largest single equipment purchase contract in the history of CATV.

H & B, a publicly held corporation with some 7,000 shareholders, recently announced earnings of \$140,000 for the first half of the current fiscal year, down \$22,000 from the previous year. The decrease is attributed to greater depreciation and amortization (\$105,000), stemming from ex-

panding activities; cash flow will actually be greater. 13,000 subscribers have been added to the firm's CATV services in the last six months, and the total number is expected to reach at least 91,000 by August 1st.

Things are Looking Uhf

Speaking before the SRA in Chicago, FCC Commissioner Robert E. Lee predicted total revenues for UHF stations this year would be around 70 million (\$18 million more than 1964). He also projected that there would be around 35 new UHF stations in 1965 and between 85 and 90 in 1966. Although the FCC allocation table allows for 3,500 UHF stations, he feels that under present economic conditions only 1,000 could find enough financial support. New UHF stations in many areas, he said, might hurt AM radio more than existing TV outlets. Commissioner Lee foresees the possibility of a fourth all-color UHF network which might form if multiple ownership limit were boosted to 15 UHF outlets.

Meanwhile, the Committee on All-Channel Broadcasting has submitted a recommendation which would make mandatory affiliation of networks with UHF stations in areas where the primary VHF affiliate's signals are of "fringe" strength. Additionally, the Committee recommended that networks be required to find stations to carry programs refused by affiliates.

GE First with 4-V Color

The latest concept in color telecasting—the "four-tube" color camera—was first placed in operation last October at KMSP-TV Minneapolis, according to Chalmers S. Stromberg, Chief Engineer. Within the three weeks following, 34 of the GE 4-V color film channel (PE-24) units were ordered, according to H. E. Smith, Manager-Marketing, G-E Visual Communications Products, Syracuse.

Smith advises that even though these units are being sold as fast as they can be manufactured, any orders received for standard film chain units can be delivered within 60 days or less. Designed primarily for color film and slide pickup, the 4-tube camera is reported to provide improved registration and higher quality monochrome reproduction than the conventional 3-tube design. Price is

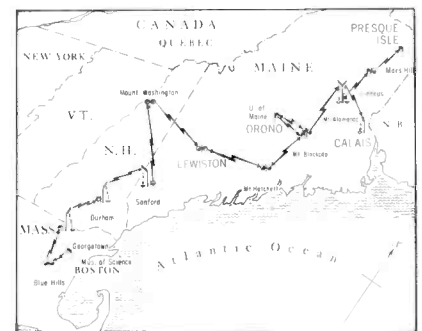
given as slightly higher than 3-tube models.

Seiden Previews CATV Study

Dr. Martin Seiden, special consultant under FCC contract to make an independent study and report on the economic impact of CATV, previewed his findings for the Commission, January 29th. Neither FCC nor Seiden would divulge any information; however, the report is said to be "a competent, impartial job." Subjects known to be covered in the report concern capital investments, types and locations of CATV communities, program source availability, and microwave services for CATV.

Microwave for Maine ETV

A series of microwave relays, now being produced by Raytheon Co., will link four Maine TV stations in Presque Isle, Orono, Calais, and Lewiston. In addition, the in-



trastate Maine network will be hooked up with the Eastern Educational Network via WGBH-TV Boston. Programs produced at the University of Maine will originate from WMEB-TV Channel 12, a new station now being built in Orono, and relayed north, south, and east to cover the more populated sectors of the state. Programs furnished by the Eastern Education Network will be beamed from the Boston Museum of Science via the WGBH-TV transmitter.

Andrew Opens European Office

Andrew Corp., Chicago, specialists in the design and production of antennas, antenna equipment and transmission lines, has opened an office in Copenhagen, Denmark. Through this new facility, the firm is in a position to provide European customers with local assistance in systems engineering and product application. Douglas

Proctor has been appointed manager, European Operations. The European office address is Andrew Corp., Hojsgaards, Alle 82, Hellerup (Copenhagen) Denmark.

Viking Opens New Field Offices

Four new field offices and warehouses have been set up by Viking Cable to provide CATV accounts with 24-hour service. The branch outlets are located in Los Angeles, Omaha, Atlanta, and Lewistown, Penna.

Fairchild Expands Microwave Line

Fairchild Semiconductor, div. of Fairchild Camera & Instrument Corp., has established a new microwave products group in Mountain View, Calif. The firm's present line of solid-state microwave signal sources will be augmented with very low-noise units, a series of tunable and crystal-stabilized miniature and medium power transmitter sources. In addition, a separate manufacturing entity has been set up to produce high performance diodes and transistors, including a unit that can deliver one watt at 1,000 mc with 50% efficiency. The new product group is under the direction of Dr. Irvin H. Solt, Jr., an MIT graduate who has been with Fairchild 3½ years and who recently headed the R & D microwave physics department.

Entron Gives Course

Heinz Blum, V-P engineering Entron, Inc., Silver Spring, Md., conducted the firm's first three-day course in CATV system mainten-



ance. Students from 10 states received instruction in all phases of installation, operation and maintenance of Entron CATV systems. The welcoming address to the group was given by Ed Whitney,

Entron's V-P. Irving Kuzminsky, the Company's director of advanced engineering, discussed head-end equipment and alignment. Other topics covered by the staff included theory maintenance of various units systems layout, extensions and practices. Each school day consisted of eight hours of instruction and alignment practice.

Entron President Robert J. McGeehan awarded the students Certificates of Achievement at a dinner held in their honor. "The acceptance and success of our first CATV School," he said, "has prompted us to continue with similar classes." Dates for the next CATV course will be announced shortly.

Riker to Sell 3M's VDC

Riker Industries, Inc., Huntington Station, N. Y., has been appointed by 3M's Mincom Division, as exclusive representative for the sale of their Video Dropout Compensator. This equipment is now in use by major networks and video tape centers for making dropouts invisible, often restoring to broadcast quality tapes which would otherwise be unusable. Price for the Dropout Compensator is \$2,850.

ASSOCIATION ROUNDUP

NAB Activities

AM-FM Programming Rule

In a petition filed Jan. 18, NAB urged the Commission to postpone until Feb. 1, 1966, the effective date of its new rule on program duplication by jointly owned AM-FM stations. The statement said the August 1 date will not provide sufficient time to resolve "the complexities involved in such a major transition" from present program practices. Stations seeking waivers under the rule should be permitted to file applications three months in advance, rather than six months as now required.

ABC President to Get Award

Leonard H. Goldenson, President, American Broadcasting-Paramount Theaters, Inc., will be presented with NAB's Distinguished Service Award for 1965 at the 43rd Annual Convention, March 22.

New NAB President

Vincent T. Wasilewski, 15-year NAB veteran, has been elected President of the Association. Mr. Wasilewski has been serving as the Association's chief executive officer

since LeRoy Collins resigned last August. The Joint Board of Directors also unanimously re-elected Everett E. Revercomb as NAB Secretary-Treasurer for his 10th consecutive one-year term.

New Code Board Appointments

Harold P. See, V-P and general manager of KRON-TV, San Francisco, has been appointed to a term on NAB's Television Code Review Board. Mr. See succeeds Lawrence H. Rogers, II, president of Taft Broadcasting Co., Cincinnati, who has served the maximum time. Douglas L. Manship, president and general manager of WBRZ, Baton Rouge, La., has been reappointed for another term. Both appointments take effect at the close of NAB's 43rd Annual Convention March 24.

Industry Research Projects Approved

The NAB Joint Board of Directors has approved four major research projects in broadcasting, calling for a total expenditure of up to \$135,000. The projects include:

1. A continuing study of broadcasting and the public purpose to provide periodic measurements of what the public knows, feels, and has been doing with respect to the industry and its practices. Cost: \$60,000.

2. A study of broadcasters and editorializing attitudes and practices to provide information on current industry practices, and to ascertain what is needed to foster editorializing by broadcasters. Cost: \$10,000.

3. A study of the effectiveness of commercials on television to provide data on how well commercials are doing a job. Cost: up to \$40,000.

4. Research in local television audience measurement to help local stations. Cost: \$25,000.

SBE Annual Meeting Scheduled

The Second Annual Meeting of the Society of Broadcast Engineers will be held March 21 at 2:30 P.M., Forum Room, Shoreham Hotel, during the NAB Convention. All broadcast engineers are invited to attend.

NCTA Adds to Staff

Richard E. Munske has been added to the staff of NCTA's Information Office, according to Chairman Bruce Merrill. Mr. Munske will assist Don Andersson, Director of Information, assuming responsibilities as editor of the weekly Membership Bulletin and supervising an expanded sales promotion program.

IEEE Convention Program

The technical program for the 1965 IEEE International Convention will encompass 80 technical sessions and more than 350 papers. Papers will be available at the Convention in a 13-volume Convention Record for sale by volumes or in complete sets.

NAMES IN THE NEWS

Tony Bee and Stephen Reynolds, formerly of Sperry Rand and TMC respectively, have been added to Rego Industries' sales staff as representatives.

Thomas R. Shepherd named Business Manager of Commercial Electronics Div., Sylvania Electric Products Inc. **E. J. Vigneron**, V-P and General Manager of the recently-created division, reports its function is to design, develop, and market electronic systems and devices for commercial and industrial use. Initially, it will operate in closed circuit television, including educational and hospital television.



Thomas Shepherd Edward Whitney

Edward P. Whitney appointed V-P of Entron, Inc., Silver Spring, Md., by President Robert J. McGeehan. Whitney is also general sales manager in charge of the marketing and field operations department.

Harry Lefkowitz, Pres., GBC America Corp., New York, N. Y. has engaged **John J. Kopple** as Marketing Sales Manager to distribute CCTV cameras, vidicons, lenses, as well as all accessories throughout the U. S. Mr. Kopple, who is Sales Director

for Accurate Instrument Co., Bronx, N. Y., has built an organization of representatives catering to wholesale jobbers and distributors.

Paul Switzer appointed Director of Public Relations of Viking, Hoboken, N. J. He has worked at several large agencies and has considerable experience in the industry.

Robert Cowart added to Viking staff as Director of Turnkey Operations, placed in charge of all Master Systems construction. Cowart, formerly Chief Engineer with National Trans Video, has 13 years experience in systems construction, and will operate from field office in Dallas.

Kerwin McMahan, formerly of Plastoid, **Gary Balsam**, formerly of State Labs, and **James Lowe**, Naples Florida CATV Systems, are all recent additions to the Viking Technical sales staff. Lowe will operate from an office-warehouse stocked with a complete inventory to serve Georgia, Florida, and South Carolina.

Roger Kleint named field engineer for AMECO, Inc., Phoenix, Ariz. Kleint, a graduate electronic engineer, has 7 years experience as a design, test, and production engineer, and 8 years experience as a radio-TV serviceman.

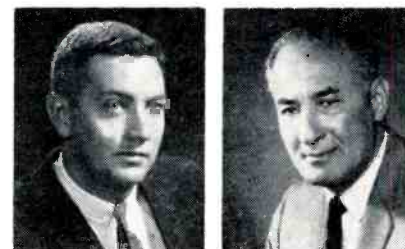
Jack Stone rejoins Ameco staff as tech-rep with Salesmobile No. 2, traveling Texas, Oklahoma and Louisiana. Stone was with Ameco in 1963 with the company's first salesmobile.

H. J. Schlafly, Jr., has been advanced to Senior Vice President by TelePrompTer Corp. Schlafly, rejoining the firm following a year's leave

of absence, formerly was Vice President for Engineering and one of three founders in 1951.

John P. Shipley appointed Manager, New York Broadcast Office, RCA Broadcast and Communications Products Div. Announcement made by E. C. Tracy, Div. V-P. Shipley will supervise sales of RCA broadcast equipment to networks and New York City TV stations, and closed-circuit TV and film sound recording equipment sales to New York accounts. He succeeds **O. E. Wagner** who was named Manager, Broadcast and Communications Marketing, RCA International Division.

S. S. Street, formerly Director of Advertising and Public Relations, TeleSystems Corp., Glenside, Pa., has resigned to form his own CATV consultation company, and will specialize in CATV advertising and promotion, franchise procurement, and economic evaluations. Offices will be located in Southampton, Pa.



S. S. Street David Brody

David Brody appointed Operations Manager, Community Operations Div., Jerrold Electronics. According to **Joel P. Smith**, Division Manager, Brody, in this newly-created post, will be responsible for Jerrold's established CATV systems.

BROADCASTERS SPEAK

I filled out a BM/E subscription request card earlier this month. I did not put it with the outgoing mail, yet I cannot find it. Rather than miss a single issue of your new magazine I enclose another card.

You have been praised a good deal on your new project, but I feel compelled to add an additional dime's worth. Finally there's an engineering publication that presents ideas in a way that allows the engineer to approach management with a new idea and let's him (the engineer) talk with them in the terms they are most concerned with—dollars & cents.

BM/E is comprehensive and I couldn't be more pleased with the layout. I'm looking forward with much interest to forthcoming issues.

Tom Harvey
KBLA Radio
Burbank, Calif.

Kentucky's first broadcasting station congratulates you on a very en-

lightening Preview issue, and wishes you luck and success in the challenging future ahead.

William F. Bratton
Chief Engineer, WLAP-AM-FM
Lexington, Ky.

Thoroughly enjoyed the first issue of BM/E and wish you continued success. BM/E fills a definite need in the industry.

Jerry Romig
Director of Program Planning & Production
WDSU-TV
New Orleans, La.

It looks like with a lot of hard work you have come up with a darn good first issue for BM/E. I hope that you can continue and be able to include articles on educational and instructional and TV broadcasting.

Joseph A. Risse
Chief Engineer, WUSV-FM
University of Scranton
Scranton, Pa.

Aside from a well deserved congratulations on your first issue, I want to thank you for the article on WJFM. We at WVBR, the student-owned and operated station at Cor-

nell University, have of necessity become FM broadcasters. (Our AM is carrier current.)

As operators of a station which manages to break even, we are well able to understand the work which has gone into WJFM. All too often we have seen owners of AM facilities holding their FM licenses only in the hope that FM will come into its own some day.

Thanks to WJFM for proving to all that hope is not enough—that work is necessary.

Buzz Victor
Business Manager, WVBR
Ithaca, N. Y.

We can't tell you how much we like BM/E. It's going to be must reading for our entire staff.

Would you arrange to have all our radio station managers receive copies as well as the executives here in our Boston office? Attached is a listing of the people who would like to receive BM/E.

We wish you much success and look forward to coming issues.

Shirley I. Roy
Director of Planning & Development
Knight Quality Stations
Boston, Mass.

INTERPRETING THE **FCC** RULES & REGULATIONS

Chairman Henry Proposes "Gordian Knot" to Avert Repeal of Section 315

SECTION 315 of the Communications Act, a seemingly forthright and simple Congressional enactment, has stimulated as much controversy and confusion as any subject in the broad field of communications law. The news has been full of statements from prominent industry leaders who are urging its repeal.

Chairman E. William Henry, in response to proposals for repeal of Section 315 by Robert Sarnoff of NBC, Frank Stanton of CBS, and others, addressed the Commonwealth Club of California on January 15, 1965. In this speech

only to situations involving political candidates. Unhappily, the reverse is not true. While Section 315 applies only to political candidates, the fairness doctrine, in theory, encompasses the broadcasters' obligation "to operate in the public interest and to afford reasonable opportunity for the discussion of conflicting views on issues of public importance." As such, the "fairness doctrine" seems to include political campaigns.

As a result of this knotty overlap, many in the industry are never quite sure where one rule begins and the other ends—even legal counselors are often confounded as to the best method of ensuring compliance with "the law" as seen by the FCC.



Chairman Henry spoke vigorously in opposition to such repeal, suggesting instead a broad amalgamation of Section 315 and the "fairness doctrine" which might well create a "Gordian knot" to be unravelled by the broadcast licensees.

Section 315 and "Fairness Doctrine" Distinguished?

The side-by-side existence of the "fairness doctrine" and Section 315 has constituted a festering sore in the industry's side for some years. While most broadcasters appear to support the general requirements of both, understanding and complying with the Commission's ever-changing views is difficult indeed. Since the ground rules for compliance with Section 315 are different from those under the fairness doctrine, the problem is often "which doctrine is applicable?"

In brief, the so-called fairness doctrine requires that, when a partisan position is expressed over a station, a reasonable opportunity must be afforded opponents of the view to present their side. Section 315, on the other hand, applies

315 in Simple Terms

Specifically, Section 315 provides that any broadcaster who allows the use of his facilities by any legally qualified candidate, must provide "equal opportunities," without censorship, to all other such candidates for the same office, at the same rate. The problem, as usual, is one of semantics. Consider the following:

1. A "legally qualified candidate" is one for whom the electorate can vote; the laws of the state determine how and for whom the electorate can vote.
2. "Any public office" includes federal, state, municipal, and other elections in which the local citizenry may vote.
3. "Use" of the broadcaster's facilities by a candidate has been broadly defined as "any and all appearances by a candidate other than for a bona fide newscast, news interview, news documentary, or on-the-spot coverage of a news event."
4. "Equal opportunities" means comparable time, rates, and treatment.
5. "No power of censorship" has been repeatedly held to preclude all censorship except for deletion of obscene language or material.

The Problem: Big Money Controls

Chairman Henry has astutely pinpointed the basic problem that faces the public—big money can purchase more time and tends to control the electorate, and the broadcaster is unable to provide "free time" to one candidate, party, or spokesman without accepting the obligation to do likewise for all of the others. How can this situation be altered to allow good candidates, with limited funds, to run for public office? Chairman Henry prudently objects to repeal of

(Continued on page 16)

How did they fill the holes in Manhattan?

WPIX-TV: G-E VHF Zig-Zag Installation (2nd from top)



INTERPRETING THE FCC RULES & REGULATIONS

(Continued from page 16)

is granting these applications rather quickly. After review of the application, the Commission will determine whether the proposed change may be authorized by a mere modification of license,

New Rules for Frequency Monitors

On November 12, 1964, the Commission adopted a notice of proposed rule-making that had been pending for four years. The new rule effects changes in the operation of frequency monitors at TV broadcast stations, recognizing the inherent stability of modern TV transmitters. Accordingly, Rules 73.672, 73.690, and 73.691, were altered in the following respects:

1. The requirement that a type-approved monitor be kept in continuous operation during all periods of TV transmitter operation was deleted.

2. The requirement that the frequency of the transmitter (as shown by the monitor) be logged every 30 minutes, was deleted.

3. The requirements for type-approval of frequency monitors were deleted.

4. The licensee is now required to *check* the operating frequency of the visual and aural transmitter with the frequency monitor, or other suitable frequency reference source, at sufficiently frequent intervals to insure that the operating frequencies of the station are kept within the prescribed tolerances at all times. *At least one check shall be made each day.* The daily frequency checks need not be an exact measurement of the actual operating frequencies, but merely a determination that the transmitters are operating within the prescribed frequency tolerance.

5. The licensee is required to *measure* the operating frequency of the visual and aural transmitter with the frequency monitor, or other frequency reference source, as often as necessary to insure that the operating frequencies are maintained within the prescribed tolerances. *At least one such measurement shall be made each month.*

6. The station must now check the frequency monitor, or other reference frequency source, against the standard frequency transmissions of WWV or WWVH, at sufficiently frequent intervals to insure that its accuracy is adequate.

Although the Commission no longer requires the use of a type-approved frequency monitor, it

or, because of modification in existing circuitry or elimination of certain transmitter stages, a CP will be issued.

Where a CP is issued, a covering license application (FCC Form 302) must be filed. Such applications will normally require new performance measurements; however, these are necessary only on the aural portion of the station's facilities.

This amendment affords television licensees an excellent opportunity to experiment with reduced aural power and, hopefully, to effect valuable economies in their operation.

is continuing the provision for type-approval of frequency monitors which meet certain basic specifications. While this does not guarantee the performance of individual monitors, it will indicate the requirements for monitors capable of meeting specifications.

Undoubtedly many licensees will continue to rely on some locally generated reference signal, such as a continuously operating frequency monitor, frequency counter, or other apparatus, for at least the *daily tolerance check*. Although such devices may be highly refined, they are not primary frequency standards and must be compared with (or measured against) a frequency source of known accuracy—such as WWV and WWVH—as often as necessary to insure compliance and at least *once a month*.

The Commission's objective in the instant rules is to stress the responsibility of the licensee to maintain visual and aural carrier frequencies within the prescribed tolerance at all times. The Commission has accorded the licensee considerable latitude in achieving this end. The use of a continuously indicating frequency monitor is only one of several ways of keeping a check on the operating frequencies of a TV station. The FCC believes that a broadcaster should be permitted to choose, from the various methods, the one best suited for the station. Individual experience will dictate whether or not transmitter frequencies need be checked more often than the specified minimum to assure compliance.

In adopting the new frequency monitor rules, the Commission simplified the language initially proposed and required merely that the licensee take adequate precautions to insure that the transmissions stay within their assigned frequency space and observe "good operating practices" without spelling out in detail how this shall be done. The consensus is that the new rules constitute a great improvement for all concerned.

FCC Personnel

Edward W. Allen, Jr., FCC chief engineer for the past 14 years, was chosen by NAB to receive coveted Engineering Achievement Award. Presentation will be made March 24 at the final luncheon of the 1965 Broadcast Engineering Conference. George W. Bartlett, NAB manager of engineering, said Allen, with the FCC for 32 years, was selected not only for his "distinguished career" in engineering but for his "advancements in the art of broadcasting and his

leadership in both domestic and international broadcasting affairs."

Arthur B. Goodkind was appointed Legal Assistant to Chairman E. William Henry, succeeding Leonidas P. B. Emerson, recently appointed Chief, Office of Opinions and Review.

James O. Juntilla was promoted to Deputy Chief, Broadcast Bureau. He has served as an Assistant Chief since April 1962.

HOW DOES THE FCC FEEL ABOUT CATV?

An exclusive interview with Commissioner Lee discloses his judgment on controversial points.

Commissioner Lee, CATV has been credited with upsetting the FCC's TV allocation plan, but proponents claim that CATV has actually contributed to the success of the 6th Report and Order. Care to comment?

I believe that, depending on specific situations, CATV can be both a help and a hindrance to the allocation plan. The only way the Sixth Report and Order can be fully implemented is by the activation of additional UHF stations. To the extent that CATV gives them a part of an instant audience, it helps this implemen-

"... within the next year to 18 months a UHF network will develop."

tation. However, if the CATV is in the community first, there may be little incentive for a UHF station to enter a market. Hence,

while the urban population could receive multiple service, the rural population would receive none forevermore. It is for this reason that I favor broadcasters owning and operating the CATV systems. In this way, we realize the maximum benefits of wired and off-the-air reception.

CATV has been credited with contributing to the success of a number of UHF's, by making the UHF signals available on VHF channels. How do you feel about this, and what regulations would you recommend to assure CATV helping UHF's succeed?

Before we get to the problem of what regulations we need to assure that CATV will help UHF, we must settle the question of jurisdiction. We presently have asserted jurisdiction through the back door, where a microwave is required. However, approximately half of the existing systems do not use microwave, and there is a divided legal opinion as to whether or not we need legislation to obtain jurisdiction in these cases. I would favor the joint step of asserting jurisdiction and then proceeding with a rulemaking to pick the brains of everyone and determine how best to regulate this industry in the public interest. I have no information which would lead me to a conclusion as to whether in fact CATV is more help than hindrance to the institution and success of UHF stations.



"... I favor broadcast-ers owning and operating CATV systems."

We note that some CATV operators are applying for UHF channels. Is ownership in CATV systems weighed in FCC decisions on UHF applications, and if so, what favorable and unfavorable aspects are given consideration?

We currently have a rulemaking weighing the relative advantages and disadvantages of common ownership of CATV and broadcast stations in the same community. I have indicated earlier I would favor such common ownership,

and I believe the Commission will probably reach this result. At the present the Commission is divided and has deferred action on certain renewal applications where licensees own CATV systems in other than their own communities.



"... I favor asserting jurisdiction and proceeding with rulemaking."

Do you feel that the future of UHF depends mainly in the hope of transmitting network programs in areas not presently served by network affiliates?

I believe the future of "U" is conditioned on the fact that we rigidly maintain our engineering standards in both the "V" and the "U." I do not agree that the future of UHF lies mainly in the transmittal of network programs. I feel that as more stations go on the air, additional program sources will develop. I further believe that within the next year to eighteen months a fourth television network will develop, primarily devoted to UHF programming. I believe the old bugaboo of terrain inhibiting good reception in certain areas will quietly disappear. There is no more difficulty with the UHF signal than with the "V" if the proper height and power are utilized and the receiving apparatus is properly installed. I am convinced that UHF will, under these circumstances, show its superiority.

Considering a mythical case of a community needing improved or additional TV signal service which could be supplied by existing stations with satellites, or by a new UHF station, would you be opposed in principle to the take-over of such services by a CATV operator?

No—in principle, I would not.

If and when CATV comes under federal regulation, how would you view the following situations where a broadcaster and non-broadcaster are both vying for a CATV "grant."

1. Assuming the broadcaster is providing TV service nearby, but his off-the-air signals are not

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grade A because of terrain, distance, etc., and CATV seems to be the answer?

2. Assuming the broadcaster is providing AM or FM services in the area, but has decided to serve also the community with TV via cable?

In situation No. 1, I would favor the broadcaster. In situation No. 2, I find no significant reason to favor one over the other.

"... I do not fear that pay TV would drive free TV off the air, and I have long favored giving pay TV a chance."

Commissioner, many broadcasters seem to fear pay TV more than they do CATV. Thus, many of them seemingly would back proposals against authorization of pay TV. Yet, it is possible that some CATV systems might conceivably carry pay TV shows. What are your views on pay TV?

The Commission has already authorized pay TV on an experimental basis. I have always felt that this new service could serve a need to cultural viewers and sports fans where they would be permitted to pay a fee to receive something that they do not now receive. I do not fear that pay TV would drive free TV off the air and have long favored giving pay TV a chance.

Many in the industry feel the Commission now has the authority to regulate CATV. Outside the use of microwave, do you agree or disagree?

I agree that we do have the authority.

"... I agree that we do have the authority to regulate CATV."

How about CATV's originating programs, beyond weather, time, and news? Is there any reason why they shouldn't, even though they might be competing for a broadcaster's audience?

My early reaction is that I would be opposed to CATV's originating programs beyond weather, time and news. My reasoning here is that I feel it would impair the development of a station that would serve not only the densely populated areas, but the rural audiences as well.

Several broadcasters indicate that it is "difficult" to obtain approval

for translator operation, especially on VHF. UHF translators, in many areas, may not be desirable because UHF-equipped receivers may still be too limited. Is it really so difficult to get FCC approval for VHF translator operation to extend a station's coverage?

I have been opposing translator operation on VHF primarily because I feel it is inconsistent with the development of UHF. The Commission's Rules contain certain restrictions regarding VHF translator operations that are not imposed upon UHF translators (power and eligibility). It is possible to obtain expeditious approval of UHF translators. If a person is willing to contribute money to the installation and operation of a translator, it is inconceivable to me that he would be unwilling to convert his own receiver to obtain these signals.



"... I would be opposed to CATV's originating programs."

What regulations do you envision for fostering growth of both over-the air and cable TV?

I feel that there is room for the development of joint service, but unfortunately I do not feel that this can be done without regulation. Obviously, if we permit CATV to bring programs from distant sources, we must go back on our promises in the Sixth Report and Order for local and regional programming. Not to be overlooked, of course, is the fact that unless stations are available, political broadcasting, other than on a national basis, would be impossible. Theoretically, the unregulated extension of CATV could mean that only one program source would be necessary, namely, New York City. I believe it is part of my responsibility to see that this does not happen. The principal difficulty with CATV is that the receiver is disabled from receiving off-the-air signals and from thence forward the subscriber is a captive of the cable.

Thank you, Commissioner Lee, for a most interesting interview.

Tips & Techniques For Handling Live Audio

By Philip Erhorn

**How to make live programming "sparkle"
by using proper studio engineering
techniques—for operations managers,
studio, program and engineering directors**

ONE OF the most important technical aspects of live studio operations is the technique of audio mixing. While the technique naturally varies from one engineer to another, the man who combines musical knowledge with a good memory and keeps calm under pressure, is the type who eventually gets his name in the credit lines for a number of important network shows.

Our first consideration is the method used in setting up the mixer board. There seems to be an inherent urge on the part of most audio engineers to set up their mixer readings from left to

AUTHOR: Mr. Erhorn is manager of broadcast equipment, Melcor Electronics Corp., Farmingdale, N. Y.



right—that is, with the most important mics tied to the left-hand mixing pots. This tendency has probably been carried over from the early days, when it was prudent to connect the announce mic to the number 1 pot, so that it could be grabbed in an emergency without looking.

In most instances this mic doubled as the vocal mic for an orchestra setup, and the rest of the board was arranged about like Fig. 1A. This simple arrangement could handle many shows involving a house band and vocalist, but when expanded to meet the modern demands of a complex show, the board tends to be off balance to the left. Such an arrangement is shown in Fig. 1B. Because only two pots of the large-knob rotary type can be simultaneously controlled with one hand, the most important pots, requiring the most gain riding, are not conveniently placed. This, of course, makes the mixing job more difficult.

Fig. 1C illustrates a more sensible method of setting up the mixer suitable for a large musical TV show, with the addition of two submixers to accommodate the relatively large number of microphones more easily on a conventional console. The submixers (which may be outboard portable units) feed into two pots on the main mixer panel for a more compact two-hand layout within a reasonable span. Note that the left hand may normally control the string mic and Boom 1, while the right hand controls Boom 2 and the chorus mic. The most important mics are comfortably centered and under complete control, and a hand occasionally can be released to touch up the woodwind,

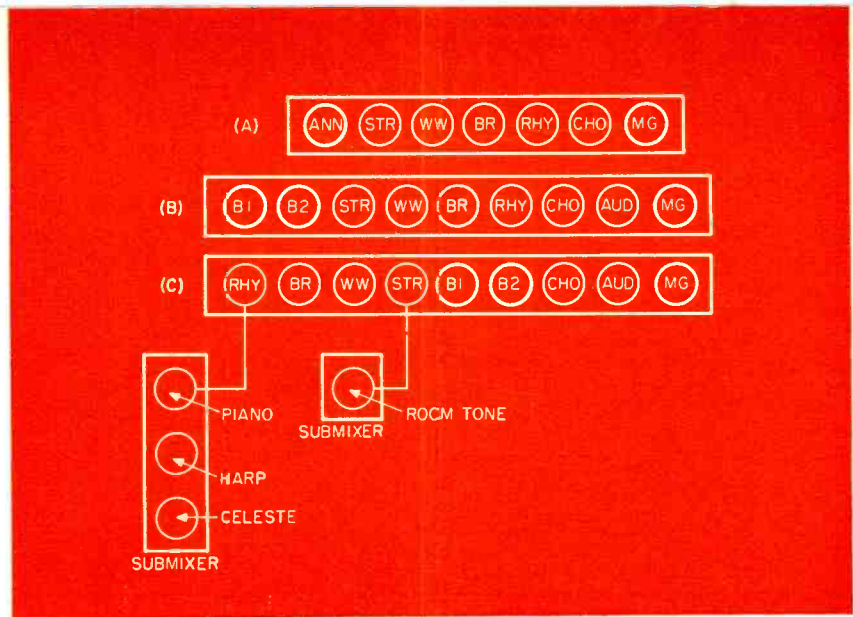


Fig. 1. Comparative Board Arrangements. a. Standard method. b. With more pots, board becomes unbalanced. c. Sensible method of balancing mixer pot arrangement.

and muted brass, audience reaction mics, etc.

A room tone or echo mic is shown submixed with the string mic. This idea works well in a large, but typically deadened studio. Even in a theater studio it will help to augment the sound of a small string section. As the string mic is opened, room tone tends to counteract the "rosiny" sound of a close-miked string section.

The Importance of Microphone Choice

The second important consideration for improvement of TV audio is the choice of microphone used on the stage booms. Even casual examination of the comparative curves of the older ribbon cardioids and dynamic/ribbon combination cardioids shows considerable leakage at both ends of the spectrum (Fig. 2). The front-to-back ratio is quite poor except at mid frequencies. Obviously leakage into the stage booms from a

pit or off-stage orchestra is always severe. It is a psychological fact that musicians always play twice as loudly on air as in rehearsal, ruining a carefully set balance via pickup on the booms. In addition, ambient set noise is aggravated by spacious acoustics, particularly so in theater studios.

The newer dynamic cardioid and line microphones make a tremendous difference in handling these problems. Front/back ratio has been increased and made quite uniform over a wide frequency range. Leakage in the old sense of the word is minimized, and working distances may be substantially increased. Of course, the boom operator must be more alert in positioning the mic, because of the increased directivity. Not the least of the advantages gained are mechanical ruggedness and freedom from shock, plus reduction of proximity effect.

Control Engineer's Cue Sheet

With the physical setup of the

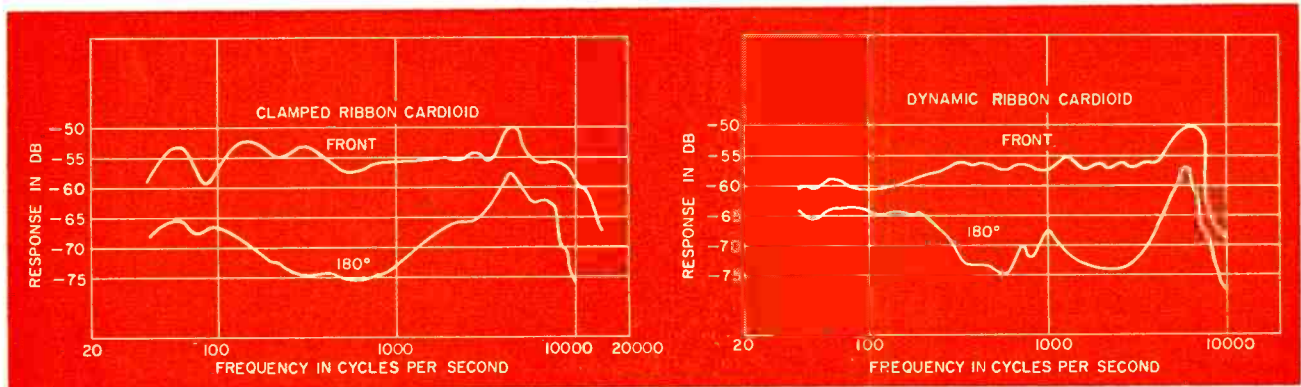


Fig. 2. Response curves of typical ribbon-type microphones showing severe leakage at both ends of the spectrum.

board arranged so that the most important mics are centered among the pots, and the possible boom microphone problem alleviated, the next important consideration is some means of "prodding" the engineer's memory during the course of a long show.

Memory serves an important function because levels must be constantly adjusted on cue throughout the show, and critically changed to adapt to vocal entrances, dynamic orchestra levels, and commercials. For live shows, the audio control man has only one chance to do the mixing job correctly.

Because the average popular musical number runs only 3 to 4 minutes, memory is hardly overtaxed with regard to vocal cues or relative mixing levels. However, memory certainly needs regular jogging during the course of a long show involving many numbers, several commercials, and much repositioning of the booms, not to mention prerecorded sections, film spots, etc. Cue sheets and notes on the script are very necessary. The most important level changes and cues are in the transition from one musical number to another. As the announcer or performer takes over the boom at the conclusion of a number, the orchestra mics and other important mic pots must be reset for the start of the next number. They may need closing down (but not off) during announcements in order to hold down set noise, but must be quickly and accurately reset for most effective levels at the start of the next number.

Fig. 3 illustrates a simple shorthand method of marking a script or musical cue sheet so as to leave no doubt about proper pot settings. A rectangle with arrows represents the important mixer pots concerned with orchestra accompaniment. The circles represent the two boom mics. While this notation is correct for rotary pots only, a variant will easily suggest itself for those studios fortunate enough to employ vertical, slide-type mixing pots in their consoles.

Relative settings of all the important pots are shown at a glance by the arrow positions. If the engineer is supplied with song word sheets, important level changes can be shown throughout by

quickly sketching in the rectangle and arrows during rehearsals. The arrows are best interpreted as set at the hours of the clock; the actual engraved dial setting is unimportant. If the boom pots need critical adjustment at the same time as orchestra pot changes, simply add the circles to the right of the rectangle, and write in the name of the person the boom is on at the time.

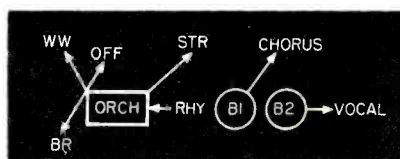


Fig. 3. Typical Script or Cue Sheet Shorthand.

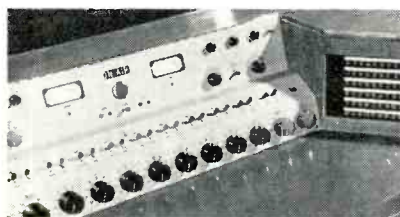


Fig. 4. Typical 2-Channel Console with Rotary Mixing Pots.



Fig. 5. Horizontal Control Panel with Slide-type Mixing Pots.

With the hands so busy with mixing, a foot-switch of the type used with certain home appliances can be an asset to a busy engineer. This switch should be tied in parallel with the talk-back or boom-cue key on the console, so that the boom operators can be cued in at important transitional points during the show, and without having to release a hand to operate the key. The addition of the foot-switch can do wonders for the smoothness of boom positioning, since communications with the operators is instantly available without fear of jeopardizing other mixing chores.

Familiarity with Music Helps

While a good memory is an im-

portant factor in mixing of any kind, let us stress that an understanding of music is the most valuable asset an engineer can have, since so much of today's mixing is directly concerned with broadcasting music. There is nothing to be gained by assigning an engineer who normally spends his scheduled hours handling dramatic shows, telecine cut-ins, or news shows to a big musical extravaganza, unless he is musically competent. A man who knows music will have a feeling for what is coming next, even if he is not familiar with a particular number, and he can automatically anticipate dynamic level changes and vocal entrances.

In the pickup of a symphony orchestra on TV, the word mixing is almost a misnomer, since fewer mics are used in an ideal setup. The less the manipulation of the mic pots, the more natural the dynamic realism, assuming room acoustics are a help and not a hindrance. Touching up accent mics to go with changes in camera shots may be necessary and should not be ignored. There is nothing worse to a classical music lover than to see a close-up of the woodwind section and to hear the incongruous sound of an overall, distant pickup. If the audio engineer cannot follow a score, the production personnel should see that he is cued in ahead of the camera switch.

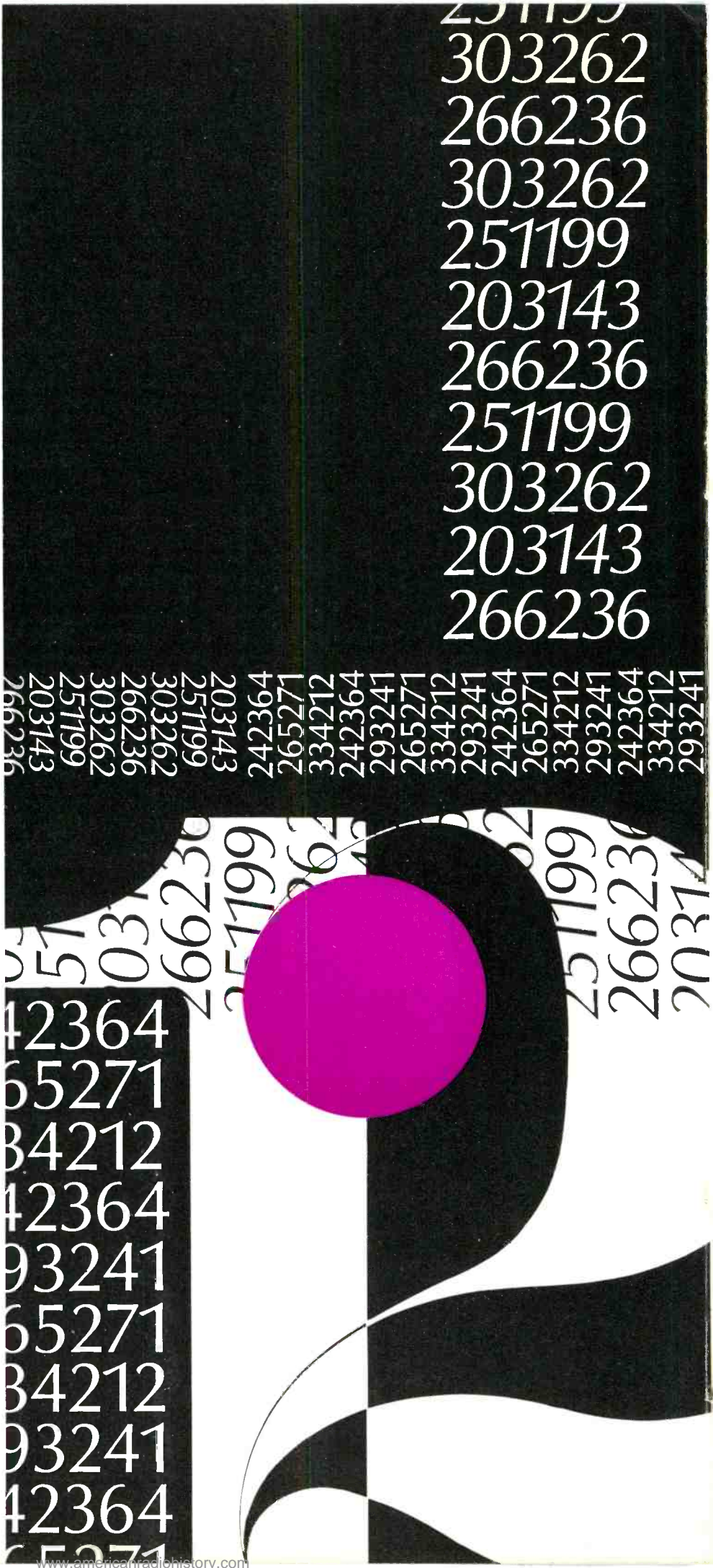
By contrast, popular music mixing techniques continually call for compression of the dynamic range, and the general musical balance is, to a considerable extent, taken out of the hands of the musical conductor and placed in the hands of the studio engineer. If he is astute, the relative levels between accompaniment, vocalists, and announcers are kept uniform, without obliteration of one by the other, and as a bonus, the radiated power at the transmitter is commercially efficient. A second method of dynamic range compression involves the well-known but improperly understood compression amplifier. Since the use of such a device brings up certain other system philosophies and problems, however, suffice it to say that the newer, slow-attack, medium-recovery compressors are best suited for regular studio use. Fast-at-

(Continued on page 39)

BM/E SURVEYS THE INDUSTRY

First Annual Survey confirms industry growth, reveals these important trends:

- Planned capital expenditures to set new record
- 25% of stations plan to diversify
- Almost 60% of CATV operators to set up new systems



FEW INDUSTRIES can so precisely pinpoint their annual sales volume, expenses, and profits as can broadcasting. By virtue of FCC requirements, every station must report these figures to the Commission, which then releases them as industry-wide statistics (see Table 1).

But sheer sales and profit statistics, however interesting they may be, seldom reflect the true vitality of an industry, certainly don't reveal facts about future plans, and often leave unanswered as many questions as they answer.

BM/E Survey—Why and How

In an attempt to obtain the facts behind the figures, BM/E recently conducted a survey of the over-all North American broadcasting industry. To our knowledge, many of the facts it reveals have not heretofore been available to broadcasters.

Realizing that surveys can often be slanted by the way in which questions are asked, we had several marketing research professionals check our proposed questionnaire. Their opinion: a valid study, which should result in meaningful, unbiased facts.

Thus, in late 1964 a copy of our survey was mailed to the 5033 offices responsible for every TV,

AM and FM station in the U.S. and Canada. A similar, separate questionnaire was mailed to the 1101 offices responsible for the approximately 1900 operating U.S. and Canadian CATV systems. These figures confirm the large percentage of multiple ownership which exists in both broadcast and CATV facilities.

The survey consisted of three parts: a letter, 1-page questionnaire designed to determine reading habits and needs, and a 1-page questionnaire on station purchasing and diversification plans.

When returns were cut off 6 weeks after mailing, we had received 1330 replies from broadcasters, or about 27% of those mailed, and 157, or 15%, from CATV systems . . . certainly enough to represent a valid cross section of the industry.

Part I Results

Top informational needs indicated by broadcasters were:

Interpreting FCC Rules & Regulations, 85%

Operating Problems & Solutions, 84.7%

New Product Information, 73.9%
80% of CATV operators said they needed data on CATV operating problems and solutions, and 70% mentioned a need for new product

information. Totally, over 95% of all respondents answered Yes to the question: "Do you need a new magazine based on BM/E's philosophy?"

Who Buys

A total of 26 different titles were given in answer to the question, "Who, in order of importance at your station, specifies, approves and purchases various types of

(Continued on page 28)

Table 2—Who Responded to the Survey

Type of Station	
AM Only	52.6%
Combined AM-FM	18.5
FM Only	14.0
TV Only	9.6
Combined TV-AM	2.4
Combined TV-AM-FM	1.8
Combined TV-FM	1.1
By Title (Broadcast)	
General Manager	27.3%
V-P Engr., Chief Engr. or Technical Director	25.5
Manager or Station Manager	19.7
President	12.5
Owner or Partner	5.1
Executive V-P	2.8
Misc. Management Titles	2.7
Misc. Other Titles	4.4
By Title (CATV)	
Manager or System Manager	32.5%
President	31.3
Owner or Partner	14.2
General Manager	10.4
Misc. Management Titles	3.2
Director of Engineering	2.3
Vice President	2.2
Misc. Other Titles	3.9

Table 1—Broadcast Revenues, Expenses and Income

	1963 (in millions)	1962 (in millions)
Revenues:		
Radio	\$ 681.1	\$ 636.1
Television	1,597.2	1,486.2
Industry Total	\$2,278.3	\$2,122.3
Expenses:		
Radio	\$ 626.2	\$ 592.6
Television	1,254.0	1,174.6
Industry Total	\$1,880.2	\$1,767.2
Income (before Federal tax):		
Radio	\$ 54.9	\$ 43.5
Television	343.2	311.6
Industry Total	\$ 398.1	\$ 355.1

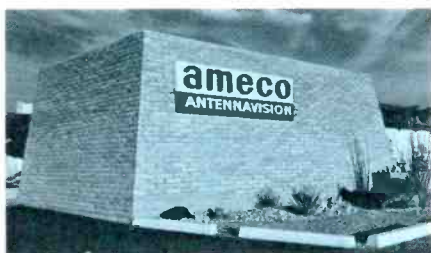
Above figures compiled by FCC.

EDITOR'S NOTE: *This, the first in a series of planned surveys of the broadcast-CATV field, logically enough presents total industry statistics. Future surveys will zero in on specific subjects—average operating ratios, profit and loss studies, operational policies, programming methods, marketing and promotional efforts, etc. Suggestions for subjects you'd like to see covered are welcome.*

Considering CATV? THE "Six Steps" to Cable

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Choose a "full service" company . . . a company that will provide doorstep delivery and valuable technical advice long after the system is completed. Choose a company that "those in the know" . . . those already in CATV choose. Choose a recognized leader . . . the company that sets the pace while others follow two or three years behind. Choose Ameco . . . the *proven* standard of the cable television industry.

CONSTRUCTION

STEP 2



Have Ameco's Contracting and Construction Department lay out a dependable *all* solid-state system from your pole maps. Turnkey or rebuild, if it is Ameco built, it is the finest that money can buy. Solid-state from head-end through active taps . . . Ameco is the *only* equipment manufacturer who can offer a 100% solid-state system. Ameco originates while others attempt to imitate.

FINANCING

STEP 3



If you need financial advice . . . or if you just plain need financing . . . Ameco can and will help you. Headed by George Green, formerly with Boothe Leasing Corporation and widely known as the financial expert in CATV, Ameco's Financial Department provides a service unparalleled by any other cable equipment manufacturer. Large system or small, Ameco can tailor a financial package expressly for you.

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Technical Sales Representatives

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1622 5th Ave. SE
AC 205 353-1185
Zip: 35602

HARRISBURG, PENNSYLVANIA

Bob Vandergrift, Carl Richard
Lloyd Tate, Dick Yearick
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AC 717 737-0487
Zip: 17105

PORTLAND, OREGON

Richard Old
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STEP 5

SERVICE

Ameco is the only major manufacturer in CATV operating a fleet of "Salesmobiles" . . . a mobile warehouse on wheels manned by a skilled solid-state technician. Every 30 days an Ameco "Roadrunner" calls on your cable system to provide doorstep delivery of parts and technical assistance. Some "sell and forget" . . . Ameco "sells and services." Another excellent reason for considering Ameco when you consider CATV. . . . "see it, try it, buy it."



STEP 6

ASSISTANCE

A final but important reason for "going Ameco" are three extras. Each month you receive two publications: the "Business Booster" giving tips on how to get more hookups and "Technically Speaking" with important technical information. Or feel free to send your technician to the Ameco Solid-State School . . . there is no tuition fee. Ameco is the company that cares about you and your cable system.



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Dallas, Texas — George Barry
6111 Harry Hines Blvd. — AC 214 FL 1-1567

Decatur, Ala. — William Bryant
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in CATV

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Jack Stone, Paul Clark
6111 Harry Hines Blvd.
AC 214 FL 1-1567
Zip: 75235

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Table 3—Anticipated Capital Equipment Purchasing Plans

Broadcast Stations Area	1965	Future Plans	No Definite Plans
Building or Modernizing Studios	29.3%	33.9%	36.8%
Building or Modernizing Offices	23.9	28.7	47.4
Changing Transmitter Equipment	24.5	25.3	50.2
Changing Antenna System	23.7	22.7	53.6
Adding to or Replacing Recording Equipment	47.4	31.6	21.0
Adding to or Replacing Mobile Equipment	32.7	22.6	44.7
Automating the Station	10.5	18.8	70.7
Adding to or Replacing Business Machines	18.6	22.2	59.2
CATV Systems			
Building or Modernizing Facility	73.1	18.5	8.4
Building or Modernizing Offices	35.9	28.3	35.8
Changing Antenna System	43.2	31.8	25.0
Adding to or Replacing Microwave Equipment	38.4	7.8	53.8
Adding to or Replacing Distribution Equipment	73.4	20.3	6.3
Adding to or Replacing Head-End Equipment	55.9	25.5	18.6

Table 4—Diversification Plans

Broadcast Stations	
Total Plan to Diversify	27.7%
<i>Of These:</i>	
25.6%	Plan to Diversify into CATV
38.2%	Plan to Set Up Background Music System
36.2%	Plan Other Diversification Activities (new stations, etc.)
CATV	
Total Plan to Diversify	55.4%
<i>Of These:*</i>	
31.7%	Plan to Diversify into Background Music
12.2%	Plan to Build Microwave Links
43.9%	Plan to Diversify into ETV
24.3%	Plan Other Diversification Activities
*NOTE: Adds up to more than 100% because 12.1% of respondents plan to diversify into more than one activity.	
% of Present CATV Systems Owners Who Plan to Set Up New CATV Facilities	
	59.8%

SURVEY

(Continued from page 25)

equipment and services?" CATV showed 12 different titles. The most significant of these appear in Table 2—Who Responded to the Survey.

The answers on purchasing responsibility are too varied and complex to report on here—nor, indeed, is it necessary to do more than generalize by saying primary buying power fairly closely follows the percentages in Table 2.

It is interesting to note that in the younger CATV field, in which the average operation is smaller than in broadcasting, generally fewer titles were shown, reflecting, no doubt, less complex operations than broadcast stations. Additionally, it would appear that principals of CATV facilities are more active in day to day operations than in broadcasting.

Anticipated Capital Equipment Plans

Table 3 fully reveals anticipated 1965 capital equipment purchases. Not too surprisingly, plans to replace or add to recording equipment showed up highest, with almost half of all stations indicating their intentions to update audio equipment. Adding to or replacing mobile equipment showed up second highest in planned purchases, with almost one third of all stations indicating plans in this area—possibly as a result of the need and desire to offer greater public

service programming.

Percentage-wise, CATV systems plan more upgrading, modernizing, and rebuilding than broadcast facilities. No doubt this is due to their being younger, to growing at a faster rate, and to starting from a smaller base. 73.4% of all CATV systems plan to add to or replace distribution equipment in 1965. Three major reasons for this are constant addition of new subscribers, replacing of much present equipment with new solid state gear, adding more channels for increased customer service.

Significantly, for both broadcasting and CATV, the survey reveals fairly good year-ahead planning and budgeting, but that not many stations plan ahead concretely for more than a year. Perhaps this is due to the volatility of the industry itself, perhaps to the fact that the majority of stations are for the most part small- to medium-size, privately owned businesses.

Diversification Plans

Ordinarily, three factors prompt diversification: aggressive management, a profitable base operation, difficulty of expanding the present business. All three are present in the broadcast industry, the latter in the form of a limit on the number of stations one can own. Thus, it is not surprising that 28% of all stations have specific plans for diversifying. The largest single area mentioned,

logically enough, was background music systems. The second, again logically, is CATV.

A larger percentage—over half—of CATV owners plan to diversify, and an overwhelming majority—almost 60%—plan to set up new CATV systems in the near future.

Summing Up

Reflecting the vitality of the industry they serve, broadcast and CATV emerge as a story of spectacular progress—of expansion, of upgrading facilities, of diversification. It is probably safe to assume that few, if any, industries present such an exciting picture. This view is confirmed by the substantial number of manufacturers who have, or are planning to, enter the broadcast-CATV equipment field.

Admittedly, the figures presented here are industry totals. But, you can apply the thinking behind them in your own operation. They reveal the significant trends the industry is experiencing—trends of which you should be aware. For example, if you've been toying with upgrading facilities, of adding new services, or with diversifying your activities, but have been putting off the decision, you'd better take another look at the statistics. You're liable to wake up tomorrow to find your competitor has already made the decision and is a step ahead of you.

A Closer Look At CATV

With all the interest in CATV, readers should know "what makes it tick." Here's the inside story on two systems.

SINCE ITS INFANCY approximately 15 years ago, CATV has grown into a lusty adolescent. Today, conservative estimates indicate that some 1600 CATV systems serve nearly two million homes. Capital investment in systems is approaching 600 million dollars. The original purpose of CATV was to service regions where television reception was poor. During the past few years, however, the increase in off-the-air signal availability, and demand for the multiple-channel service provided by CATV, has created considerable overlap in the two services. In addition, technical improvements in equipment have enhanced CATV's attractiveness in urban areas where high quality signals already exist. Inevitably, CATV has become

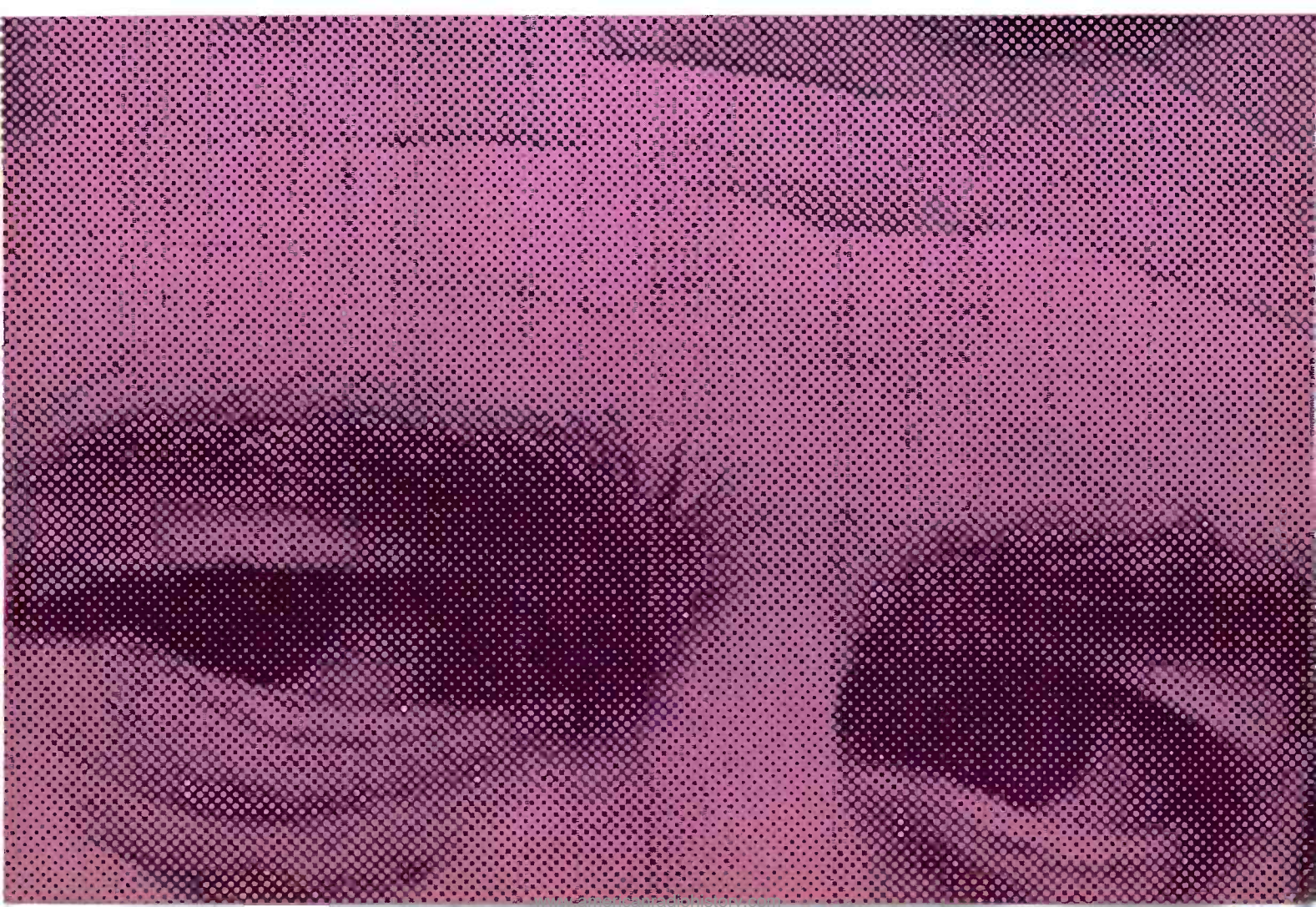
part of the broadcast industry, and it is therefore important to analyze its management and operation more closely.

But just what is a CATV operation? It is difficult to define a "typical" CATV system. There are so many variables that descriptions of two CATV companies, each providing the same amount of service for the same number of subscribers, may well be vastly different. For example, it is not unlikely that one system will have three times the capital investment of the other. The reason can usually be found in the answers to such questions as: Is the terrain flat or mountainous? What are the ERP values of the originating TV stations and how far away are they? What about co-channel interference? Over

what area is the cable distributed? What is the concentration of subscribers? What about local ordinance restrictions?

These and other contrasts show up in this month's reports on Berkshire and Atlantic Coast operations. The Berkshire system is located in semi-mountainous dry terrain while Atlantic must contend with a moist salt-corrosive sea level environment. Berkshire, with less than half the subscribers of Atlantic, has approximately three times the cable-amplifier complex.

Such differences help describe the specific makeup of each individual CATV operation. They are the significant factors BM/E has sought in gaining a better understanding of what a "typical" CATV operation entails.



The Berkshire Telecable Company

The Berkshire Telecable system is located in the mountainous terrain surrounding North Adams, Mass. The present organization is an outgrowth of a local antenna service company, and now has eight years of operational experience. Starting with only 850 subscribers, it serves 3,000 families today, using over 150 miles of cable covering a triangle of three communities—Adams, North Adams, and Williamstown, Mass. Approximately 60% of the TV homes are on the cable. Installation charge is \$15 and the monthly rate is \$6.

Berkshire carries 9 TV channels and 12 FM stations. The antenna complex, located on nearby Florida mountain, consists of three antenna arrays and a microwave dish. One set of cut-to-channel yagis picks up Channels 2, 4, and 5 from Boston 138 miles away. A second set, directed southward, picks up Channels 3, 9, and 13 from Hartford, Manchester, and Albany. Channel 6 Schenectady and Channel 10 Albany are received on the remaining bay, and WPIX Channel 11 is received via microwave relay from New York City.

Head-end equipments process the received signals and feed a 4900-foot trunk line. Two amplifiers are required before the signals reach the main distribution center. New aluminum-sheathed cable is being installed as part of a half-million dollar rebuilding program. The distribution system itself uses 210 tube-type amplifiers. This system, including service equipment, three trucks, office space, etc., represents a total in-

vestment of some \$500,000.

Mr. Carmen DiLego, General Manager, regards Berkshire as a typical CATV system. The company's personnel consists of himself, a chief engineer, three technicians, and two clerical people. This small staff handles all the business routine, public relations, and technical service.

Service to subscribers is provided on a demand basis, and, in addition, there is a scheduled preventive maintenance program. A routine monthly maintenance check of equipment and facilities and routine tube replacement every three months ensures maximum trouble-free operation.

The technical staff continually appraises new equipment and makes recommendations for improvements, many of which have already been incorporated into the system. For example, amplifiers represent a major capital investment. In providing multiple-channel service with its present amplifiers, Berkshire converts the high band frequencies (Channels 7, 8, 11, and 13) to a lower sub-channel. At an appropriate location, another conversion restores the original channel frequencies.

Community relations are excellent. Since there is no local TV outlet there are no station conflicts. Berkshire's growing subscriber list is a further indication of its favorable acceptance in the area. Berkshire participates in many civic activities and services local institutions at special reduced rates. Service and programs are provided without charge to police and fire stations, the chamber of commerce, and the local YMCA. In addition, educational TV programs are supplied free of charge to the local schools.



Berkshire technicians like Roy Mannikko use Uti-Lift for maintenance of amplifiers where feasible.



During recent open house, Berkshire Telecable lined up dozens of TV personalities, gave away 50 cameras and a portable TV as door prizes. Hundreds of new subscribers signed up during the event.



The Atlantic Coast TV Cable Corp.

The Atlantic Coast TV Cable Corp. serves residents of the world's most renowned convention city. Subscribers are fed seven TV channels over a tight spider-like network utilizing some 125 miles of cable.

The present system has been in operation since 1958 when it started with 2,000 subscribers. M. Hugh J. McGinty, President, has guided the company to its present subscriber level of 7,000. The original McGinty Television Company started in 1952 via the old "block-busting" erection of antennas on the resort's apartment buildings. Atlantic charges an installation fee of \$24.95 and a monthly service of \$3.85. Also, hotels and motels are charged a flat rate of \$200 a year, providing service for a potential of 10,000 additional receivers.

Atlantic's organization comprises ten service technicians and five office employees. From offices located downtown, a fleet of nine trucks cover the area. The antenna and head-end complex is located atop the St. Charles Hotel. Direct pickup from Philadelphia, via cut-to-channel yagi arrays, is supplemented by microwave link service bringing in New York Channels 5 WNEW and 11 WPIX. Total system investment amounts to approximately \$125,000. Future plans call for replacing the direct Philadelphia pickup with microwave link service to eliminate some presently experienced co-channel interference from Altoona, Pa. Also, pick-up of an additional channel is planned via the New York links.

The Atlantic CATV system represents what might be considered an idealized operation. Because of Atlantic City's peculiar geography, the population is confined to an area of approximately 5 square miles. The longest cable run to the farthest subscriber is only 5 miles. An arrangement like this permits maximum signal distribution with minimum cable equipment. A total of only 83 amplifiers are required to completely serve the entire community. Not only does this lower initial investment and replacement costs, but it minimizes maintenance and associated expenses.

Most of the foam-filled polyethylene cable is distributed over public utility poles; however, local ordinances prohibit overhead runs



Econovan equipped with Servi-Lift facilitates maintenance of Atlantic's pole-mounted amplifiers.



Berkshire technician Ray Fisher prepares to install a cable connection for new subscriber.



A fleet of 9 trucks and a 10-man technician crew are required to service Atlantic Coast Cable System.

BARRY GOLDWATER

1625 Eye Street, N.W. • Washington, D.C. 20006 • 628-6800

October 24, 1964

Mr. Hugh McGinty
3805 Ventnor Avenue
Atlantic City, New Jersey

Dear Mr. McGinty:

Let me personally thank you for all the help you gave us for the Goldwater Breakfast in Atlantic City.

We appreciate all you are doing for us in this Campaign, and hope you will keep up the good work.

With best wishes,

Barry Goldwater

Barry Goldwater

Complimentary letters were received by Atlantic as a result of providing closed-circuit service during last year's political conventions.

November 5, 1964

Mr. Hugh McGinty
Atlantic Coast TV Cable System
3805 Ventnor Avenue
Atlantic City, New Jersey

Dear Hugh

I want to tell you how pleased we are with the fine service which was rendered at the 1964 Democratic National Convention by means of your Atlantic City community antenna system. The fact that you were able to make available a separate television channel for our exclusive use made it possible for us to effectively disseminate important information to the convention delegates on a continuous basis. We were also able to prepare programs for their consumption which supplemented the programs of the television networks.

This concept represents a significant step forward in convention communications, and it demonstrates in still another way how a wired television system can truly serve its community.

Sincerely yours

Marcus Bartlett

Marcus Bartlett
TV DIRECTOR - CLOSED CIRCUIT
DEMOCRATIC NATIONAL CONVENTION

in the downtown area. In this restricted area, the cable is strung beneath the city's famous boardwalk.

While facilities and equipment checks and periodic replacement of equipment follow the usual routine, special attention must be given to minimize effects of the highly corrosive salt air. Thus, sealed equipment chassis and protective coatings are utilized. Also, part of the cable run to outlying subscribers required a transverse of 14,000 feet of water. A solution was effected by members of the technical staff who donned skin-diving suits and laid the cable underwater.

Because of the special needs of Atlantic City as a convention center, Atlantic makes a channel available for closed-circuit coverages. The nature and interest in this type of programming was evidenced by the coverage of last year's presidential conventions. To some lesser extent, other conventions have similar appeal. These activities are regarded as a community service and are provided at cost.

Further evidence of Atlantic Cable's participation in public service is the no-charge distribution of signals to public schools, police and fire stations, veteran's organizations, churches, and hospitals.

Does TV Automation Pay Off?

A report on the results achieved with automated video switching and programming systems.

“ON-THE-AIR” experience with automated TV program control systems leaves no doubt of their value in improving efficiency and minimizing costly mistakes. Today’s television stations may choose from a full range of automated equipment, ranging from pre-set switchers to full-time computer-controlled systems.

Pre-set switching and automatic program source control is no longer an innovation. Local take-over from network has been simplified to pressing a single button. VTR’s start and stop, film and slide projectors are actuated, and audio cartridge tapes go into action—all automatically—according to pre-determined schedules. More sophisticated systems not only provide full-time automated switching, but also simplify program schedule preparation, logging, and accounting.

Regardless of the type and cost of automation equipment utilized, the ratio of investment vs. savings seems to be fairly consistent. Generally, automated video programming systems have been paying for themselves within two

years, depending on the operation. Those stations who made the greatest investments refrained from making drastic cut-backs in personnel; technicians relieved of heavy control-room responsibilities were employed in non-automated operations to reduce human error and equipment failure. As a result, costly mistakes and equipment breakdown were reduced.

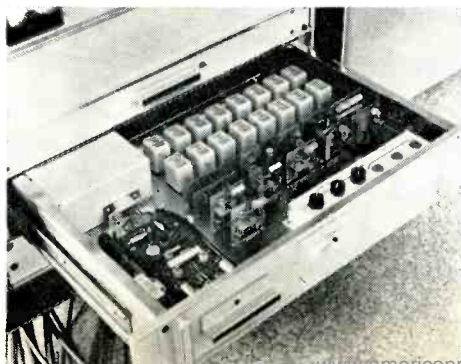
Our study indicated that break-period automation is becoming almost commonplace; automatic operation of both video and audio sources, at least during station breaks, is considered essential. The extent of automation beyond this point seems to be based mainly on two primary considerations: (1) the amount of capital which can be budgeted with expectation of recovery in a reasonable period, and (2) the effect of automation on personnel. Thus, the question facing TV station management today is not “Should we automate?” but rather “How much shall we automate?”. The information reported here will help the management-engineering team arrive at answers to this question.

Sarkes Tarzian APT-1000



While not as yet in actual use by a station, the Sarkes Tarzian APT-1000 computer-controlled system is now available and will be shown at this year’s NAB Convention. Basically, the overall system comprises three integral equipments—a specially designed digital computer, a video automation unit, and a modified version of the VIS-88 modular solid-state switcher. The computer is designed to store 20 data elements for 100 different events, and is capable of controlling 27 different program source machines. Appropriate displays, command functions, etc., are incorporated for monitoring, modifying, and manual take-over. The video automation unit controls camera dissolves, superpositions, fades, etc.

Biagio Presti, Broadcast Equipment Div. Manager, feels that computer-controlled operational facilities is only the first step in automating a station, citing that a much greater dollar savings can be accomplished in scheduling and availabilities. The next step would be to set up the scheduling computer to control the programming computer. Mr. Presti estimates that a totally computerized operation in a relatively large station could save up to half a million dollars a year. Used in conjunction with a teletype operation, such a computer system could be set up to produce the same information for group-owned stations, printing program schedules and availabilities, and controlling program source equipment.



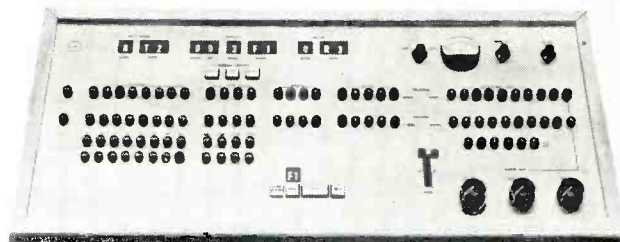
System cost: (Computer and automation unit)	\$60,000
(Modular switcher, depending on individual requirements)	30,000 to \$100,000
Total investment	\$90,000 to \$160,000
Payout period (est.)	18 to 24 months

WMAL-TV Ward Electronics System

WMAL-TV Washington has selected a CDL Type VSA-102 switcher manufactured by Ward Electronic Industries. Scheduled to be installed the latter part of March, the system consists essentially of a video switcher with pre-programming capabilities plus a relay memory storage unit. In the automatic mode, all audio and video sources are controlled and monitored by the memory unit. The regular pre-select controls and indicators are used to program the memory unit, which stores action sequences until time to roll. All regular controls retain their normal functions, enabling the operator to exercise executive control in case of emergency or to make any necessary changes to the previously stored programming. An optional stepping switch relay clock permits automatic sequential changes of events on a time basis. The VSA-102 system permits all functions to be handled in master control with just two men.

By eliminating the chaos of panic periods and cutting down on make-goods, the system is expected to pay for itself within two years.

Ward also offers larger computer-controlled systems, designed to fill the specific needs of the station.

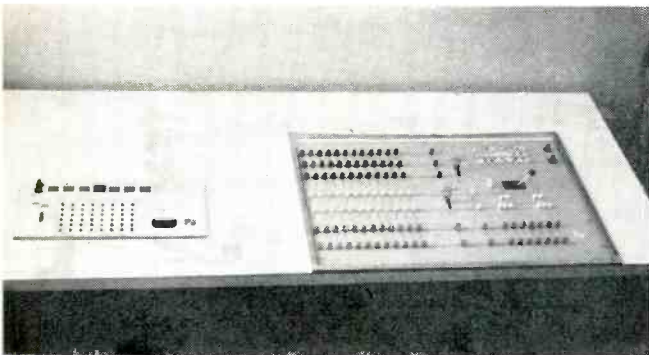


Basic system cost (VSA-102)	\$32,500
Installation cost	500
Total investment	\$33,000
Annual savings (est.)	\$10,000 to \$20,000
Payout period (est.)	20 to 40 months

Riker Automated Switcher Control

Riker Industries, another well known video switcher manufacturer, has just completed engineering design of a self-contained automation unit. Mr. H. Charles Riker, President of the company, advises that all Riker switchers have built-in provisions for adaptation in any automation system. The newly designed automation control unit, which is completely portable and may be assigned to various switchers where more than one is used, will be shown for the first time at this year's NAB Convention. Using a low cost "memory board," which can be programmed to control 25 events, the unit is designed primarily for automating break periods; however, by using several such boards, a full day's programming may be set up in advance.

Automation unit cost (avg.)	\$8,500
Annual savings (est.)	\$6,000
Payout period	17 months



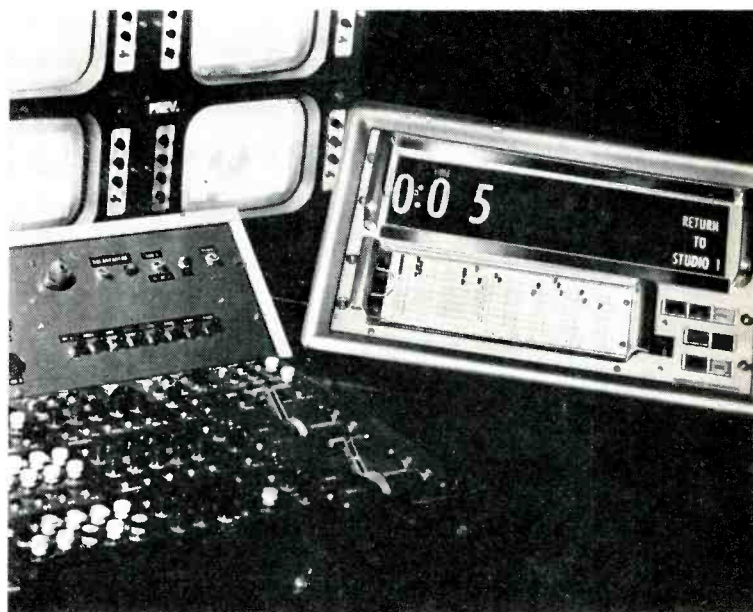
WAGA-TV Chrono-Log STEP System

Station-break switching at WAGA-TV Atlanta, Ga. has been automated since April, 1963, using the Chrono-Log STEP System. Each break period is programmed on a plug-in "pinboard" assembly. Several boards can be set up in advance, and used to control switching for an entire day. A completely new board can be programmed in just a few minutes, and automatically controls switching of all audio and video sources during breaks on an elapsed time basis.

The entire break sequence can be previewed, and errors corrected, prior to running, and the operator can manually override switching at any time in an emergency. Mr. Hugo Bondy, Chief Engineer of WAGA, reports that the STEP system has greatly improved break-period switching, eliminating panic periods and reducing the load on the program director and studio engineers. While operational costs have not been reduced, studio engineers and technicians have been able to devote more attention to slide, film, and tape machine operations, resulting in fewer slip-ups in these activities. Thus, the savings in make-goods alone has more than offset the investment in the system.

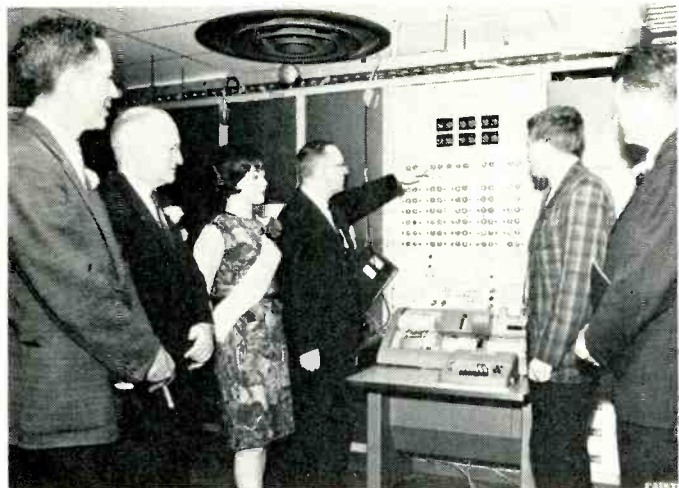
Other stations reporting similar results with the STEP System are WTVR Richmond, Va. and KNTV San Jose, Calif.

Basic System cost	\$6900
Engineering & installation	1500
Total investment	\$8400
Annual savings (est.)	\$6000
Pay-out period	17 months



WTTG Visual 6000 System

WTTG Washington is one of two Metromedia stations using the Visual 6000 Programmer, which operates in conjunction with an IBM 26 Printing Key-punch machine. At WTTG, a traffic girl punches two sets of IBM cards for each day's operation. One set is used to print the program schedule, which is then duplicated for distribution to station personnel.



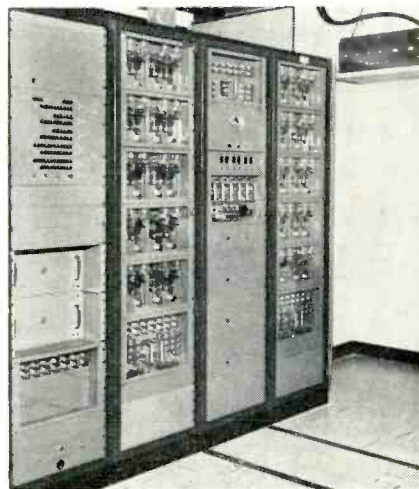
Rather than re-use the same cards, which may be "dog-eared" or bent, a separate set of cards is used solely for switcher operation. Although programming changes and corrections can be made by punching and inserting a new card, WTTG has found it more expedient to punch new information directly into the Programmer keyboard or to manually override switching as needed. Operation can also be turned over to another control room for live programming.

Because of union requirements, WTTG normally utilizes six men during automated operation, although only one man, normally the technical director, is needed in the control room. The other five, including a supervisor, take care of video tape, film, and cartridge-tape make-ready, and a large share of one man's time is devoted to routine maintenance.

Mr. A. L. Harmon, Chief Engineer at WTTG, says their setup literally forces programming to be scheduled two days in advance, greatly minimizing wear and tear on personnel, and the inherent costly mistakes which result from last minute preparations. Moreover, break period operations are run like clock-work, and make-goods as a result of operational errors are rarely necessary.

Basic equipment cost	\$70,000
Installation cost	1,400
Total investment	\$71,400
Annual savings (make-goods only)	value undetermined

WKRC-TV RCA System



The WKRC system, which has been in operation since January 1960, is a "one-of-a-kind" pioneer development conceived by the WKRC engineering team headed by Wm. H. Hansher, and designed and installed with the help of RCA engineers. Heart of the system is a paper-tape controlled "electronic brain" which automatically controls all program source material from sign on to sign off. A Friden "Flexowriter" is used to simultaneously prepare the daily schedule and punch two paper tapes. One of the tapes contains only data relative to program times and sources needed by the electronic brain. The other tape contains the additional data needed for the program log. The system can be programmed to automatically control operation according to a pre-determined time schedule, and/or pre-set for approximate times. The latter mode requires that operation be initiated by pushing a button on cue. In manual operation, the system acts as a preset switcher, but the operator controls timing. A single button initiates each event, and a flashing red signal tells the opera-

tor he must do something before the next event can go on the air.

Although WKRC has not as yet expanded automation into sales and accounting, operational facilities are almost entirely automated. Film and slide equipment, loaded twice daily, require no further attendance. Even studio cameras used in live programming are operated by remote control from the control room, where the operator uses a "joy stick" to control pan, tilt, zoom and focus of two cameras.

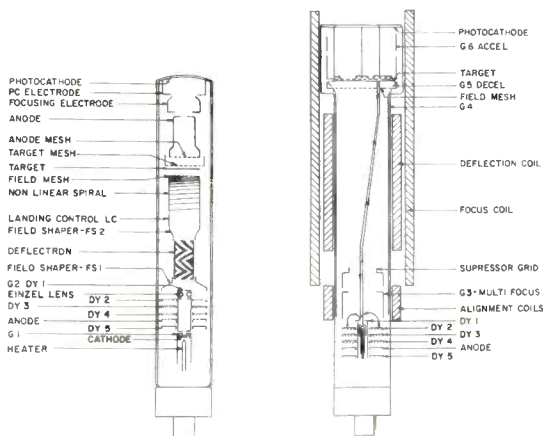
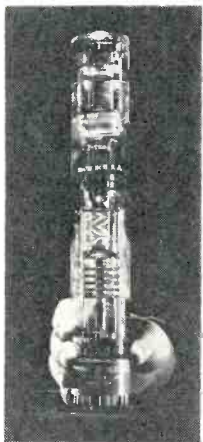
Roger Reed, WKRC's vice president, reports that the automation system permits operation with 5 to 6 fewer technicians than would otherwise be required. Moreover, the station is realizing savings in terms of improved product, reduction in errors and make-goods, and a simplified traffic operation.

System investment:	\$175,000
Annual savings (operating costs only, est.):	60,000
Payout period:	35 months

BROADCAST EQUIPMENT

"See-in-the-Dark Image Orthicon"

Announced by the GE Tube Dept's. Pickup Tube Operation, Syracuse, is a new image orthicon, the Z-7804, which the firm believes will greatly reduce the volume, weight and power requirements of comparable low-light-level camera systems. Company officials state that, because it controls the beam by electrostatic focusing and deflection, the Z-7804, when compared with a 3" image orthicon and its associated coils, represents a thirty-



fold reduction in power, twentyfold reduction in weight, and a fivefold decrease in size. Overall length of the tube is slightly over 13"; weight is 11 oz. Possible use would be in combination with a portable video tape recorder as a suitcase-sized remote TV studio. Price for an engineering sample is \$6000.

Circle 116 on Reader Service Card.

Viewfinder TV Camera

A viewfinder version of their 322 vidicon TV camera is being offered by Ampex Corp., Redwood City, Calif. The 322V permits camera operator to focus and compose pictures with precision; is auto-



matic, solid state, completely self-contained, and consists of the 322 camera, a 7" high intensity monitor, a 4-lens turret, and provision for 2-way communication and remote control. Sells for \$4,190 (322 alone is \$1,960).

Circle 105 on Reader Service Card.

Solid-State Audio Amplifier

An improved Model LT-300A, 32 watt solid-state audio amplifier has been introduced by McMartin Industries, Inc., Omaha. Features of the unit are: provisions for 2 plug-in MT-4 mic transformers; balanced 25 and 70.7 v speaker outputs; new output transistor heat dissipator; separate bass and

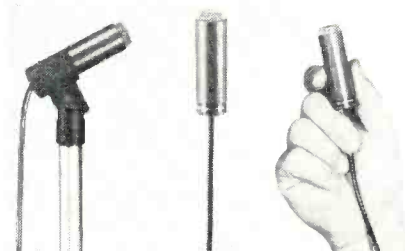


treble controls; continuous boost and cut; separate volume controls for both mic and program inputs; optional plug-in preamplifiers for tape head and magnetic phono program inputs. 3-pin push-lock mic connectors are also available.

Circle 111 on Reader Service Card.

Extra-Small Mic

Model 571—measuring only 2 5/8" long x 3/4" dia.—has just been introduced by Shure Bros., Inc., Skokie, Ill., for applications where small size without loss of voice characteristics is needed. An omnidirectional, moving coil dynamic mic, the 571 features an essentially flat frequency response from 50 to 10,000 cps; a single impedance which matches any low impedance input from 50 to 250 ohms; a mic rating Gm at 1000 cps within ±3 db of -153 db. For use either on



a stand or in the hand, the 571 weighs only 2 oz., and is priced at \$95 including a 30-ft. 2-conductor cable and stand adapter.

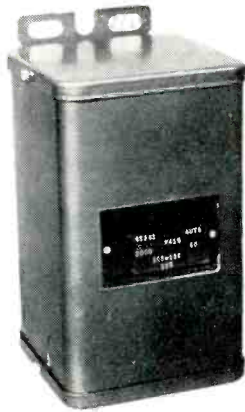
Circle 102 on Reader Service Card.

Boost-Buck Transformer

Designed to convert the output voltage of its constant-voltage transformers to specific load requirements is the tapped auto

BROADCAST EQUIPMENT

boost-buck transformer available from Sola Electric Co., Elk Grove Village, Ill. Type TA "Auto-former" has adjustment range of $\pm 15\%$ from 118 v nominal. En-



ables user to adjust output up or down and to counteract the effect of power factor loading on output voltage from the CV. 3 models available: 2,000, 4,000, and 10,000 VA capacities.

Circle 101 on Reader Service Card.

CATV Modulator; Amplifiers

Completely solid state is the new Ameco-Tran II modulator available from Ameco, Inc., Phoenix, Ariz. Circuitry of the device (which comes in standard 19" rack) is mounted on 5 modular etched circuit boards; with op-

5-Year Warranty Microwave Relay Equipment

Raytheon's CADPO Div., Norwood, Mass., is now marketing new microwave relay equipment which carries a five-year warranty—said to be the first such warranty in the industry. The new KTR II rack-mounted relays can handle NTSC color or monochrome TV with 7.5 mc program audio, is of solid state construction except for final klystron output, and operates from 24 or 48 v batteries or 110 or 200 v AC. Units are designed to permit updating with new advances, e.g.: new tunnel diodes reduce typical receiver noise from 10 db to 5.5 db. Offering a wide variety of antenna branching, the KTR II is of reduced size—an entire frequency diversity terminal is housed in a standard EIA 7½ ft rack. Prices vary with system configuration.

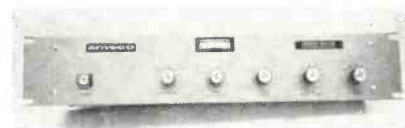
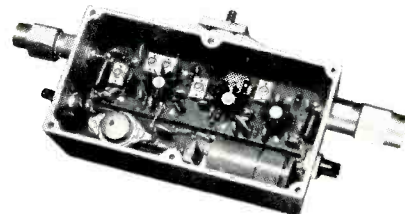
Circle 119 on Reader Service Card.



tional circuit boards it can be adapted to signal sources either having separate audio and composite video inputs, or with combined video and 4.5 mc FM carrier signals; modulated RF output can then be directed through coax. Output levels of audio and video are independently variable.

The firm's ATM-70 amplifier, company spokesmen say, features several improvements over prior models; it provides lower noise figures, higher output and greater

cascaability. It also is of solid state construction with etched circuitry. Hermetically sealed for weatherproofing, the amplifier features input and output test points, so performance can be checked without taking unit out of service.



Made of aluminum, the ATM-70 has inline housing which eliminates jumper cables.

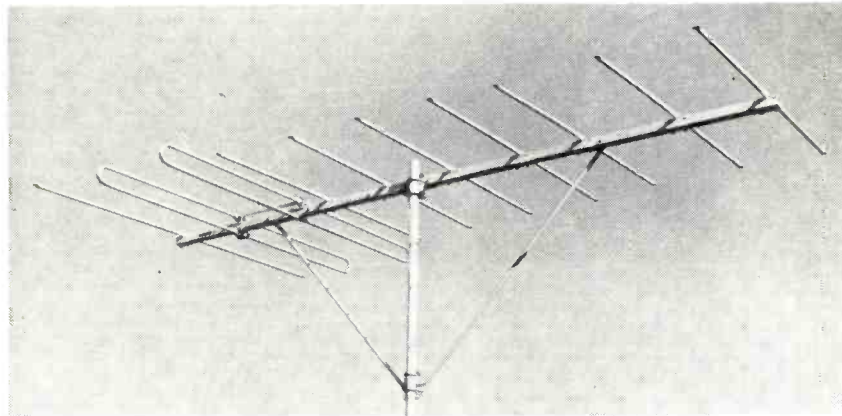
Circle 108 on Reader Service Card.

Portable Console Design

Combining the qualities of permanent studio equipment with transistorized modular construction is the A-50B portable broadcast studio offered by Sparta Electronic Corp., Sacramento, Calif. Flexibility is enhanced by fold-down feature which permits use for remote broadcast requirements. The turntable section can be ordered specifically to meet the needs of each user; if only one is used, remaining surface doubles as a work area, or can be utilized as mounting space for other equipment. In addition to the A-10B audio console unit, the

10-Element VHF Yagi

Model Y104-4 for 66 to 72 mc service has an 11.2 db gain. Made by Technical Appliance Corp. (TACO), Sherburne, N. Y., the unit employs a 2" square crossarm, and elements of ¾" dia. reinforced with



⅞" dia. sleeves—to withstand severe windloading and icing. Vibration dampeners in the longer elements improve resistance to fatigue and crystallization. Direct coax feed of either 50 or 75 ohm is accomplished with an internal balun. Power rating is 800 watts. Price is \$213 painted, \$200 unpainted. Other Y100 series antennas cover the spectrum between 50 and 305 mc.

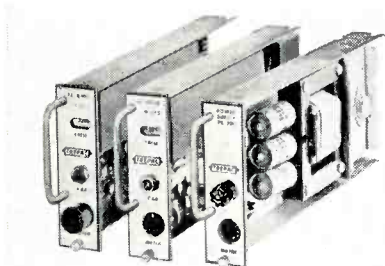
Circle 114 on Reader Service Card.

A-50B includes either one or two TT-12 professional turntables; optional Electro-Voice 625-A mic; cue system; monitor amplifier and speaker with muting; plug-in facilities for a total of 6 low level and 2 high level inputs. Priced below \$850, the A-50B weighs less than 100 lbs.

Circle 117 on Reader Service Card.

Solid State Tone System

Designed to allow compatibility with present equipment, as well as building block growth capability is the new solid state "Datatone" tone system being marketed by Trepac Corp. of America, Englewood, N. J. The line includes AM and FSK transmitters and receivers, power supplies, loop DC supplies, regenerative repeaters, 2-way DC repeaters, telemetering adapters, diversity combiners, and filters. Standard CCITT recom-

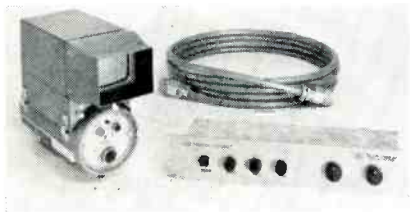


mended frequencies and channel spacings available from stock; other frequencies can be provided. Each module in the line has a test socket on front panel which allows "by the numbers" testing of operating systems. Also featured is plug-in frequency determining elements and single type plug-in transistors.

Circle 121 on Reader Service Card.

High Resolution Camera Chain

Complete solid state circuitry, high resolution, low power consumption, regulated power supply, and self-contained video process-



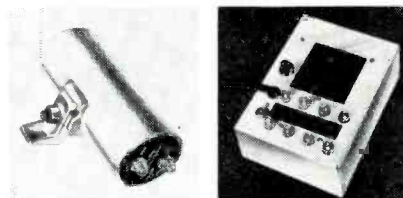
ing amplifier in broadcast-type control panel are features of the TMC-214 camera chain offered by TeleMation, Inc., Salt Lake City, Utah. Unit is designed to adapt GE designed cameras to meet all EIA and FCC regulations. Com-

ponents of the system are a TMV-101 camera control, a GE TEO14 camera and RE-575 viewfinder. Overall camera chain is of light weight and compact size.

Circle 120 on Reader Service Card.

CATV Remote Power Supply; Line Extenders

Two items for CATV systems use are being offered by Craftsman Electronic Products, Inc., Manlius, N. Y. First is the CPS-4 remote power supply which features 117 v, 60-cycle AC input; 24 v 60-



cycle output at 2 amp; power lamp and cords; MF-61A fittings on input and output. Will power up to 4 of the firm's MD-2100 line extenders in 4 different directions, and up to 15 when in cascade. Size is 7" x 4 3/4" x 3 1/2"; weight is 3 1/2 lbs.; price \$39.95

The MD-2100 line extender of

aluminum, weatherproof construction operates on either AC or DC; mounts either on pole or messenger strand; has separate gain and tilt controls; an input of 15 db without overloading; an output of 40 db nominal without cross-modulation; and features a high frequency printed circuit board. Priced at \$62.50; input and output connectors available with F, UHF and .412 or .500 aluminum fittings.

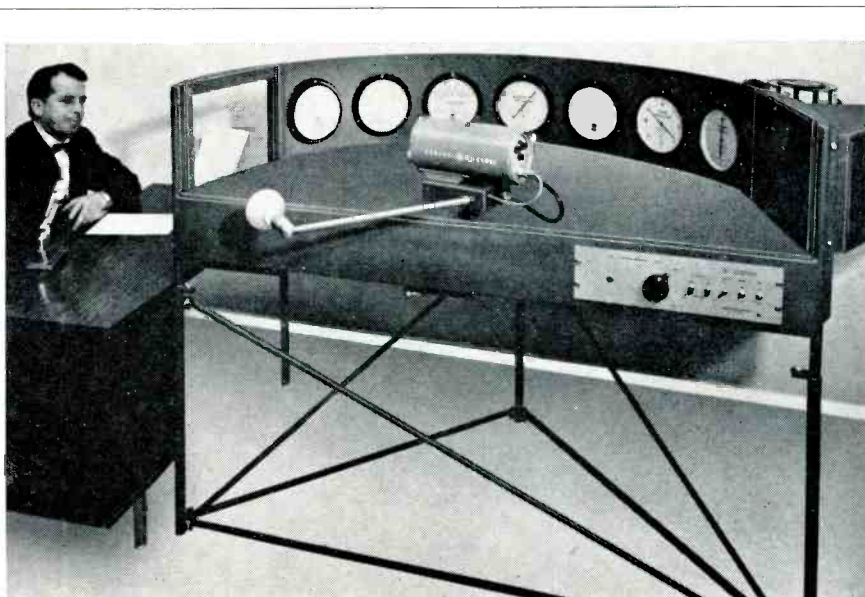
Circle 107 on Reader Service Card.

New CATV Equipment

The 946 "Mighty Thor" high gain amplifier has just been announced by Viking of Hoboken, N. J. With an output capability of 42 db gain on low band and 46 db gain on high band, the amplifier has a frequency response of 0.25 db and a low noise factor of 9 db. Features four 24 v AC outputs for line built equipment. Price is \$385.

Also available from the firm is the 520 back matched transformer insert designed for Entron block. The 520 is designed to clear up ghosting, smearing and suckouts on poorly-matched subscriber's TV

(Continued on next page)



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Circle 10 on Reader Service Card

BROADCAST EQUIPMENT

sets. Price is \$3.00. Just added to the Viking series is the 528 trunk line coupler designed for sub-channel operation with low loss of 3.25 db. The unit is able to pass 4 amps DC or AC; price is \$5.50.

Circle 118 on Reader Service Card.

Portable Production Center

Northern Electric's (Belleville, Ontario, Canada) TPC-1 provides essential control room facilities for remote as well as emergency station operation. Console consists of two McCurdy 3-speed 12" turntables; Gray type 212TN viscous-damped transcription tone arms with cartridge slide mount; 8 in-



puts, selectable by 4 telephone keys; 4-channel solid state mixer amplifier which can be removed and used as a remote amplifier by itself, and which can be equipped with optional rechargeable batteries; separate controlled level output for operation of PA system; and built-in solid state cue amplifier and speaker. Cue selector switch allows selection of any input. Choice of straight legs or folding stand. Price \$1,995 includes all import duties.

Circle 110 on Reader Service Card.

Mobile Mic; Binaural Headset

Two new units have recently been announced by Roanwell Corp., New York City. Pictured is the RM-515 noise-cancelling mobile carbon mic which cancels an aver-



age of 18 db of ambient noise, has a frequency response of 300 to 3500 cps; a carbon noise of less than 0.001 v, and maximum intermittent current of 250 ma.

Portable TV Tape Recorder



Machtronics, Inc., Palo Alto, Calif., has introduced a 7.5 ips tape speed portable broadcast TV tape recorder for 60 cycle, standard 525 line operation. Weighing 83 lbs., the unit has a start of 6 seconds maximum, and rewinds in 3 minutes. Video input of 75 ohms unbalanced, composite video is adjustable from .5 v to 1.4 v p-p, as is output. Features fast forward, rewind, play, record and stop, all remotable and electrically interlocked; head override switch for fast start; audio input and output adjustment on both channels. Cost of basic unit is \$15,750; remote control kit is \$79.50; spare video disc head, \$375; tape splicing kit, \$39.50.

Circle 109 on Reader Service Card.

Second is the 106100 binaural boomman's headset designed for TV studio use. Housed in noise attenuating earcups, unit comes with 28" retractile neoprene cord (15' extended). Frequency range of the earphone element is 300 to 3500 cps; impedance is 275 ohms and sensitivity is 113 db at 1000 cps reference .0002 dynes/cm² with input of 1 mw. Earphones are wired binaurally to permit boomman to monitor program and also to receive directions. Price is \$92.

Circle 123 on Reader Service Card.

Dropout Compensator

The "Mincom" dropout compensator, which eliminates or reduces effects of dropouts in tape recorded TV signals by replacing missing information from tape with stored video from the previous line, is now available from Riker Industries, Inc., Huntington Station, N. Y. Self-contained and operating from an integral regulated power supply, the unit is completely transistorized with plug-in printed circuit boards. Compatible with all color and monochrome recorders operating under the 525/30 standard. Price is \$2,850.

Circle 124 on Reader Service Card.

New CCTV Line

"Meets the needs of many CCTV users for systems of high performance and reliability at moderate cost," say officials of RCA Broadcast & Communications Products Div. about their new line. Basic product in the series is a transistorized, non viewfinder vidicon camera, PK-301, designed for continuous operation without cor-



rection of focus, contrast, etc. Selling for about \$2,500, the camera is already in production, and will be followed by TV monitors, solid-state distribution amplifiers, switching equipment, etc.

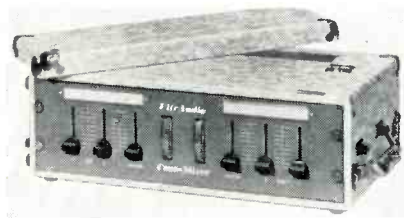
The PK-301 weighs 16 lbs., is around 6" x 6" x 10", and uses a new 1" electrostatic-focus vidicon (developed originally for use

in spacecraft TV systems). Of modular construction, it is available in 16 different types, such as battery operated and remote control. Operates from a power source of 117 v, 50-400 cycles, or 12 v DC. Video output is a black-negative 75 ohm unbalanced signal. An optional interlace generator can be added, as can a remote focus kit; also possible is addition of an EIA sync adaptor module.

Circle 115 on Reader Service Card.

Stereo Mixer Amplifier

Offering 2-channel stereo output at high impedance, and an illuminated vu meter for each output line, plus 600 ohms zero level, and 4 low or high impedance inputs, is the D4 "UltraAudio Custo-



mixer" being marketed by Oberline, Inc., Beverly Hills, Calif. Model M5 has single output channel and 5 inputs. Both units contain their own power supplies, have master gain controls, push-pull output stages, plug-in amplifier stages, and input transformers, and are equipped with linear-motion gain controls. May be used as portable units or mounted in standard racks. Price of each unit is \$447.

Circle 113 on Reader Service Card.

Frequency Standard

The Type 1115-B Standard-Frequency Oscillator is General Radio's newest quartz-crystal frequency standard. An mc, fifth-overtone gettered crystal is used in a three-stage transistor oscillator. Crystal, oscillator, and AGC circuits are oven controlled. Short-



term stability is 100 parts in 10^{11} (rms) over 10 seconds. A built-in nickel-cadmium-battery supply takes over automatically and operates the standard for 35 hours upon AC line failure. Available in rack and bench versions, it is priced at \$2050.

Circle 71 on Reader Service Card.

Improving Live Audio Control

(Continued from page 23)

tack, shelving-curve compressors belong in the transmitter, serving as peak compression units.

A Comparison of Two Board Layouts

A brief look at two radically different formats in mixing consoles will serve to provide both engineering and management with food for thought. While stereophonic audio is at present limited to FM, multi-channel mixing consoles for TV have real merit when tied in with cut-in studios, telecine, and VTR feeds, etc. Provisions for other flexible features such as individual microphone equalizers, echo feed pots, and bus switching should and must be considered for enlarged and flexible operations.

The console pictured in Fig. 4 illustrates a typical custom facility of two channels, utilizing rotary mixing pots and conventional lever keys for channels and hi-level input switching. By contrast, the console of Fig. 5 includes a much more comfortable, virtually horizontal control panel with vertical slide-type mixing pots; "glass-arm" effects are definitely minimized on a long show. The vertical pots afford both stepless mixing and instant visualization of relative settings. Three to four pots can be mixed simultaneously with each hand, since the knobs are finger wells and slide very smoothly. The technique of mixing with these pots is as easily learned as "Chopsticks" on a piano!

This console contains 12 microphone inputs, and a total of fifteen hi-level inputs connected to three separate mixing pots. All inputs can be switched via illuminated, color-coded push buttons to the three mixing busses. Compression is available on each output channel and is metered, as are the three isolated echo send facilities. Modular, in-line spacing of all important controls on $1\frac{1}{2}$ " centers allows these fairly extensive facilities to be encompassed in a main control panel only $32\frac{1}{2}$ " wide by 20" high. Every control on the console is within easy reach of the engineer. The possibilities for operational errors have been reduced to a minimum. ●

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Solid State Electronics for Telecommunications

Circle 11 on Reader Service Card

LITERATURE of INTEREST

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

"Traffaccounting" for radio and TV broadcasters describes LTV Continental Electronics' flexible tabulator-controlled traffic and accounting system in 6-p. folder. 125

CATV Equipment & Accessories pictured, described and priced in 30-p. catalog and 6-p. price list from Craftsman Electronic Products, Inc. Included are connectors, taps and transformers, line splitters, directional couplers, distribution amplifiers, aluminum-jacketed cable, etc. 126

TV Camera Cables for mono and color cameras of both U.S. and European make, including specs, physical dimensions and frequency response data in 4-p. brochure from Boston Insulated Wire & Cable Co. 127

Line Voltage Regulators of electronic-magnetic design (no moving parts) in 4-p. bulletin from Sola Electric Co. Contains full electrical and mechanical specs and prices. 128

Solid State Distribution Amplifiers, both video and pulse types, described in 2 bulletins from Vital Industries, Inc. 129

Interchangeability Guide for power tubes, plus specs on power tubes, tetrodes, pentodes, etc. from Penta Labs, Inc. 130

Solid State Computer Programmer for TV automation in 6-p. bulletin from Sarkes Tarzian Broadcast Eqpt. Div. Full description of operation, applications, specs of APT-1000 unit. 131

20 Dual Polarized FM Antennas with varying gains in new catalog from Jampro Antenna Co. 132

Special Microwave Issue of Electronic Research Labs 32-page catalog pictures and describes microwave equipment, waveguide components, test equipment, transmitting tubes, etc. 133

3" Image Orthicon—the Elcon—described in reprint of technical paper given by Walter Turk at IEEE Broadcast Symposium. Available from Visual Electronics. 134

50-Page Semiconductor Catalog from Amperex Electronic Corp. lists transistors, diodes and photosensitive devices. 135

Phase Meter, complete with remote antenna current meters, described in flyer from Vitro Electronics. 136

Passive Microwave Repeater—Engineering data on use of passive repeaters from Microlect Co., Inc. Also data on antenna mounts, stub towers. 137

High Band VTR standards described in 28-p. 4-color booklet, "The Turning Point in TV Tape Production" from Ampex Corp. 138

Time Announcer and multi-channel recorder/reproducer units which provide back-up recording in 8-p. catalog from Magnasync Corp. 139

CATV Time & Weather Channel—TMW-2B unit, which firm claims can equal 200 new subscribers, described in folder from TeleMaton. 140

Remote Control—Catalog from Trepac Corp. of America describes tone control and tone multiplex equipment. 141

Solid State TV Switching systems for composite switching, automation, double re-entry switching, etc. in literature from Ward Electronic Industries, Inc. 142

Eliminating Co-Channel Interference is explained in technical information from Scala Radio Co. 143

Headphone-Mics for radio, TV explained in 4-p. brochure from Roanwell Corp. 144

Upgrading of Camera performance is promised by use of deflection components made by Cleveland Electronics, Inc., and described in technical article. 145

MATV Equipment, including amplifiers, distribution equipment, converters, field strength meters, etc. in 16-p. booklet by Jerrold Electronics Corp. 146

"Advertising With Video Tape," fourth in series on "Concepts of VTR" from Magnetic Products Div., 3M Co. 147

Case History of solving voltage fluctuation problems by WBKV in 4-p. folder from Hevi-Duty Electric Co. Also 4-p. bulletin on firm's line of voltage regulators. 148

Cross Reference of Nortronics Co. Inc.'s tape heads to all leading brands of cartridge machines is included in new flyer 7208 on Quik Kit Nos. 114, 15, 16 head mounting assemblies. 149

AM Transmitter, AM-1000D by CCA Electronics Corp. described in 2-p. flyer. Unit uses two 4-400A tetrodes, silicon rectifiers, features automatic recycling, and is designed for remote control. 150

12-Page Price List on film transfers from videotape, VTR, tape to tape duplicates, etc. from Acme Film Labs. Includes footage conversion chart. 151

TV Monitors which can be easily field-connected for reduced scan in brochure from Ampex Corp. Included are professional TV, high-resolution, color TV, rack-mounted and regulated monitors. 152

Video & Distribution Amplifiers by International Nuclear Corp. fully described in 8-p. price and spec list. Also included is data on video crossbar switcher and camera amplifier. 153

Broadcast Mics and studio monitor speakers. Complete data including technical specs on Electro Voice's complete line of mics for broadcast use, and "Sentry" Series of studio monitor speakers. 154

42-Pages of Technical Specs, performance data, plus 16-p. catalog on electron tubes available from Machlett Labs., Inc. Includes graphs, charts, drawings. 155

2500 MC ITV service described in 6-p. brochure from Adler Educational Systems Div., Litton Industries. Includes full page of typical Q & A. 156

Tower Design & Construction—Review of services offered by Dresser-Ideco Co. in illustrated 12-p. brochure for all types of towers including over 1000' models. 157

Zoom Lens & Servo-Controlled camera mounting in three bulletins from TV Zoomar Co. 158

VSWR technical discussion and nomograph in 4-p. bulletin from Bird Electronic Corp. 159

DC Power Supplies—Performance features of 36 regulated DC power supplies in new catalog from Acme Electric Corp. 160

CATV "Foamflex" CATV Cable applications described in 4-p. catalog by Phelps Dodge Electronic Products Corp. 161

Audio Equipment, including program, mic, and graphic equalizers, high and low pass filters, attenuators, and amplifiers in 7 spec sheets and 4-p. brochure from Altec Lansing Corp. 162

Transistor Amplifier with separate bass and treble, plus specs on audio amplifiers, in technical bulletins from McMartin Industries, Inc. 163

Oscilloscopes with built-in and plug-in amplifiers described, with accessories, in 6-p. short form catalog from Data Instruments. 164

CCTV Products, including cameras, film chains, monitors, video modulators and distribution equipment in 14-p. of technical literature from Blonder Tongue. 165

TV Monitors, both transistor and tube models, in literature from Miratel Electronics, Inc. 166

FM Proof of Performance tests for stereo and mono with wide band FM detector described in technical sheets from Belar Electronics Lab. 167

Zoom & Interchangeable Lenses plus remote controlled lens in three spec sheets from Elgeet Optical Co., Inc. 168

Test Records, automatic peak and level controllers, etc. described in literature from CBS Labs. 169

Tape Cartridge System—New solid state self-contained desk top or rack mounted "Criterion" series automatic program control center by Automatic Tape Control described in 4-p. folder. Units available in mono or stereo versions. 170

Mic & Boom Stands, accessories, adaptors, paging and talk-back speakers, etc. in 8-p. catalog and price list from Atlas Sound. 171

Video Distribution Amplifiers of solid state, modular construction, described in bulletin from Dynair Electronics, Inc. 172

Antenna Equipment of Andrew Corp. described in 96-p. catalog No. 23 which includes product info, performance and engineering data on antennas, coax cables, etc. 173

Coax Cable, connectors and fittings for CATV use described and priced in over 50-p. packet of data from Superior Cable Corp. Includes technical and applications data, prices, construction practices. Includes stringing sags and tension charts. 174

CCTV Cameras of modular construction for ETV, ITV in 4-p. bulletin from Packard Bell Industrial Products. Performance specs, typical applications described. 175

Microwave-by-Wire via broadband VHF G-Line explained in brochure from Surface Conduction, Inc. 176

48-Page "Professional Products Manual" covering mics, disc reproducers and equalizers. Also technical data sheets. From Shure Brothers, Inc. 177

Audio Equipment—Complete Sparta Electronics Corp. line of turntables, audio consoles, equalized turntable preamplifiers, tapes, cartridge systems described in brochure. 178

CATV Public Relations Guide—16-p. booklet, "You, Your Cable System, and Your Public Image" from AMECO. 179

Tape Transport system, cartridge handler in special bulletins from Viking of Minneapolis. 180

Audio Components including program equalizer, mixer, attenuator set, console, tape recorder and reproducer, etc. in 4-p.

illustrated brochure from Lang Electronics, Inc. 181

8-Page Technical Paper on Network Audio Systems Amplifiers presented at IEEE Broadcast Symposium by W. J. Ka-brick, Mgr., Engr. Section, Gates Radio Co. 182

CATV & CCTV "Foam-Cel" coax cable described in 4-p. bulletin from Simplex Wire & Cable Co. Contains 4 performance characteristics graphs. 183

CATV Antennas described in several spec sheets from Technical Appliance Corp. 184

Mics & Accessories in applications notes and spec sheets from AKG of America. 185

"Newschief" portable transistorized cord-less TV camera-transmitter in 4-p. bulletin from Sylvania Home & Commercial Electronics Div. 186

Coax Switching Matrices & Relays in over 20-p. packet of literature from Trom-peter Electronics, Inc. Includes general data on video switching systems. 187

TV Waveform Monitors, oscilloscopes and scope cameras and accessories fully described in two catalogs and literature sheets from Tektronix, Inc. 188

Towers for CATV and broadcast use described in literature from Andrews Tower Co., Inc. 189

Connectors for broadcast use in bulletin from Switchcraft, Inc. 190

Audio Attenuators—"Lumitens Beam of Light" control described in literature from Fairchild Recording Corp. 191

New Bridge Method of sweep frequency impedance testing described in 8-p. technical newsletter from Jerrold Electronics Corp. 192

Kit or Assembled 1 kw FM transmitter with automatic power control in sheet from Bauer Electronics Corp. 193

Automatic Logging with "Autolog" ex-plainst in 28-p. catalog and price list from Rust Corp. of America. Also included are descriptions and specs of firm's FM trans-mitters, consoles, stereo exciters, multiplex generators, amplifiers, etc. 194

Disconnect Wiring System by means of Thomas & Betts' "Connecto-Blok" audio video panel described in 6-p. folder. 195

Planning Guide for 2500 mc ITV in packet from Micro-Link Corp. Included are typical cost estimates, 8-p. price list, 10-p. Guide. 196

4-Color Photos are used throughout 18-p. catalog from Stancil Hoffman Corp. on ex-tensive line of silicon mic preamplifiers, line, recording, play and power amplifiers, and bias oscillators, all priced under \$40. 197

Stereo & SCA FM Exciter LPE-10 from Moseley Associates, Inc. 198

Transistorized CCTV Camera for con-tinuous operation described in flyer from GPL Div., General Precision, Inc. 72

"JR Seizers"—Flyer lists Xcelite, Inc. tools for tight spots and close quarter work. 73

Light System—4-p. bulletin from Cine Electronic Systems, Inc. on projector lamps that provide more light than incandescents. 51

Robot With 3-D TV—You may not buy one of these, but you'll find this flyer on the Air Force's remote-controlled vehicle

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using 4 miniature Cohu Electronics TV cameras fascinating. 52

CATV Catalog of complete line of equipment from TV Cable Supply Co. 53

Studio Mic—Technical bulletin on dynamic studio mic from Sennheiser Electronic Corp. 54

Pushbutton Broadcasting with "Spot-master" cartridge tape systems explained in 8-p. catalog, plus price sheets from Broadcast Electronics, Inc. Also included are accessories, cartridge winder, turntable pre-amplifier. 55

Coax Cable for Microwave—9-p. technical bulletin from Phelps Dodge Electronic Products Div. discusses how to choose proper coax cable for microwave applications. 56

Technical Paper on use of the operating impedance bridge includes block diagrams, circuit schematics. From Delta Electronics, Inc. 57

"Cojax" Shielded Switching device for entering coax or shielded transmission lines, and offering thousands of possible circuit configurations, described in 4-p. brochure from Cooke Engineering Co. 58

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FM Transmitter and power amplifiers in spec sheets from Teletronix Engr. Co. 61

"Unifoam" CATV Cable described in folder from Rome Cable Div. of Alcoa. 62

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High Speed sound-film system described in literature from Eastman Kodak Co. 63

ROUNDTABLE

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is the telephone company's feed lines. But this is a problem we must depend on them to solve. As for ourselves—within limits—we're doing just fine.

William S. Orr, Chief Engineer of KHFM Albuquerque, N.M. has considerable status and recognition as a broadcast engineer with many years of experience.

As an engineer who has shared the growing pains of an independent FM station, and worked closely with management, I can appreciate the two points of view being considered. But I am first and foremost an engineer of quite a few years standing, and my primary aim both professionally and personally is to get the very best sounding signal on the air with the ultimate in reliability.

I believe the "quality and reliabil-

ity" angle in a competitive market must be considered. Will the increased quality and reliability make it easier to sell more accounts, especially such discerning firms as hi-fi stores, record shops, and firms wanting to reach, among others, the "higher class" audience? FM stations in many cases must cater to the "class" type audience rather than the "mass" type. In our own case we purchased a very good transmitter about 2½ years ago (with the advent of stereo), and have created an image and set a goal for other stations. We retired a 12-year old transmitter to auxiliary use. Ironically, though, because of the reliability of the new transmitter, not to mention a very stringent preventive maintenance program, we have used the auxiliary transmitter only one time. There is no doubt that the presence of a standby transmitter has a very good psychological effect on all staff members. I would venture a guess that in some instances the knowledge of a standby unit would favorably impress a potential sponsor.

I am not suggesting that the new transmitter will pay for itself in increased sales, but what major improvement will? It is difficult to set forth any kind of rule as to just when a transmitter (or any other piece of equipment) should be replaced—certainly not after it is literally falling apart.

We are a "fine music" station and certainly are not blessed with abundant financial sources. Our sales are reasonably good considering the market. Suffice it to say our sales manager does not feel that he can sit with his feet propped on his desk all day. Converting our old transmitter to stereo would have been out of the question. It is worth noting that our new transmitter, almost all solid-state and considerably more efficient than the old unit (both are the same power), resulted in a saving on the electrical bill. A further saving was noted in not having to change out transistors as we did tubes in the old unit. As a matter of fact, we have replaced only *one* diode in the solid-state high voltage power supply and *no* transistors. Although maintenance problems have been reduced, we are not taking the complacent attitude that the thing will just sit there and run itself.

I think it would be unrealistic in the eyes of management to attempt to justify the purchase of a new transmitter on the basis of savings due to the above mentioned reasons. But, on the other hand, I can't think of a better place to start. I do

think, though, that there is an alarming tendency on the part of management to think in terms of the color of this year's or next year's ledger rather than the overall result 5 or 10 years from now. This brings up one of the basic differences between engineering and management (sales) personnel. If the engineer took the same view of his equipment as the manager does of his books, then the technical state of the art would be a sorry mess. It is not a good engineer's basic nature to continue his thinking thusly.

Harrison W. Moore, Jr. has been manager of WRVC-FM Norfolk, Va. since 1961. Prior to that he was Sales Manager of WTAR Norfolk and WBSM-AM-FM New Bed-



ford, Mass. (operated for 6 months FM only before adding AM). As a "ham" since 1936 and a Lt. Col. in the Signal Corp. Reserve, he has sufficient background to talk to his engineers on a technical level.

The only full justification I've seen for dual transmitters is in a subcarrier background music operation. WRNL-FM Richmond and WGH-FM Newport News are examples; in both cases the subcarrier is more important than the main carrier. They can always make good on lost commercials, but have to make rebates and pacify irate subscribers when the subcarrier goes off.

At WRVC we have always been willing to provide "make-goods" at equivalent times later in the week. Our loss of revenue has been nil except for rare cases where a spot was part of a short term campaign promoting an event at a particular time (i.e., "last time tonight," or "sale ends 9:00 P.M. tonight!"). If technical adjustments require us to go off the air during our regular operat-

ing schedule, we always advise our listeners both before and after. During our 10 years on the air we have furnished the only full time classical music service (14 of the 17-hour broadcast day), and our listeners have learned to appreciate our problems.

Six other FM stations operate in our market, and all but one programs separately from AM. We are one of the two independent commercial FM's. We lose money as do almost all such operations throughout the U.S.

We plan to relocate and increase power, and will add stereo and vertical polarization. We have competing quotes on a new transmitter, stereo generator, exciter and associated monitor equipment, plus a new antenna. Further, we acquired all the studio equipment (stereo console, turntables, preamps, monitor speakers, and pickups) from defunct WYFI (FM) when they went bankrupt.

We anticipate that our new transmitter will be sufficiently reliable to enable us to dispose of our 15 year old 3-kw W.E. unit and the 10-kw standby we acquired from WRVA three years ago and never put on the air.

Bruce M. Glycagdis, Operations Manager, WJFM Grand Rapids, Mich., is a former engineer. His sta-



tion has received considerable notoriety as the most powerful commercial FM operation in the world.

As a chief engineer, I would feel that having a standby transmitter would be an ideal situation, but as a manager I would have to take into consideration the additional costs of equipment, building facilities, licensing, and many other factors.

Every chief engineer is in dread of the day with the transmitter stops functioning and the trouble source

can't be located right away. Then, having found the trouble, he discovers the needed part can't be obtained locally, and he tells management, "Sorry, we're going to be off the air for a couple of days." This, in my mind, could build up a very good case for a standby transmitter.

As a manager, on the other hand, I do not feel that it is good business practice to maintain standby transmitters. The company I work for does maintain standby transmitters in one AM plant and one TV plant. In both instances it was economical and practical to do so because it was necessary to update the equipment on hand. The value of the old equipment was practically nil from a standpoint of trade value; consequently, it became practical to keep the old equipment for standby purposes.

To sum up, standby transmitters become economically sound:

... when it is necessary for the station to move its present transmitting facilities into a transmitter building designed to contain two transmitters and the necessary switching equipment.

... when present equipment becomes obsolete, such as an FM transmitter that will not handle stereo.

... when operating on a 24-hour, 7-day-a-week schedule. In this case a standby transmitter is a necessity for maintenance purposes.

... and most importantly, in my opinion, when the major costs involved are a financial burden on the company. The costs to be considered include the transmitter purchase, licensing, housing, maintenance, and meeting FCC requirements for tube replacements.

I have always found that no transmitter breakdown is so serious that it cannot be repaired within a reasonable length of time, nor has our company ever suffered a loss of advertising revenues from being off the air due to transmitter failure. We have always found our advertisers to be very understanding and willing to accept make-goods. Of course, in the case of WJFM's transmitting facilities, it would be very very uneconomical to maintain two 50,000-watt transmitters.

One other instance in which a standby transmitter becomes a valuable asset is when operated remote. From long experience, we have found that a remotely-controlled transmitter located two miles from the studios can cause an outage of 40 minutes or more; it takes at least this long to contact an engineer and get him to the transmitter. ●

BM/E

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MANAGEMENT ROUNDTABLE

When is Standby Equipment Justified?

One of the continuing controversies between management and engineering concerns justification for standby equipment. Station managers have been known to restrict new equipment purchases to the point that resulting losses exceeded the cost of replacement equipment. Engineering management, on the other hand, sometimes leans too far in the other direction, ignoring the financial aspects in favor of setting up the best plant money can buy.

To help management-engineering teams resolve this problem, BM/E interviewed a station owner-manager and chief engineer who did not see eye to eye. Without revealing their identity beyond the point of stating that the station involved was an FM operation in a major market, we asked several well known managers and engineers to review the situation and give you the benefit of their thinking.

Manager: After 34 years in this business, I've heard all the arguments, pro and con. I've never met a Chief Engineer—or a Station Manager for that matter—who would not like to have an unlimited operating budget. The point is, there is a proper—hard, practical dollars and cents—business logic that keeps capital expenditures within bounds.

Chief Engineer: I believe I have an equally healthy respect for spending money. But there are trade-offs. A description of our FM operation is apropos. We radiate 15 kw out of a single transmitter and a stacked antenna. Both are holding, but they are old. We operate on a 21-hour day broadcast schedule. The remaining three hours do not leave much time to carry out the necessary and desirable routine maintenance schedule. Once a week we shut down early to take care of accumulated tasks.

The compounding of old equipment and long operational hours puts quite a strain on the equipment. Let me emphasize—I'm talking only about equipment, not people. About the only time real hard mechanical-electrical housekeeping can be done is when trouble hits, but under emergency conditions. At this time nobody's happy—not engineering, not management.

Manager: Now let's not make management a villain. Nobody's

out to exploit people or equipment. A radio station is a normal, legitimate business enterprise and follows standard, intelligent business procedures. Any business transaction must be evaluated on its justifications.

Engineer: The benefits of new equipment are obvious, but let me state them for the record. Not only is new equipment relatively trouble-free because of its inherent reliability, but it allows dual operation, assuring maximum air time—minimum down time. The old transmitter, used as standby, can be activated in a minute. Also, in a standby condition, proper maintenance can be effected without the pressure of emergency measures. This further enhances continued operation with a minimum of trouble.

A new transmitter will have a fully integrated stereo or sub-channel modulator driver, minimizing the interface problems required of an old transmitter. A new antenna will not only rectify whatever problems age has brought to the old, but a new installation can incorporate vertical polarization, effectively increasing our ERP. From an engineering point of view, the total technical operation is more efficient. Lower operating cost, minimum down time, stronger signal in an expanding FM-stereo market are resulting factors which should be attractive to management.

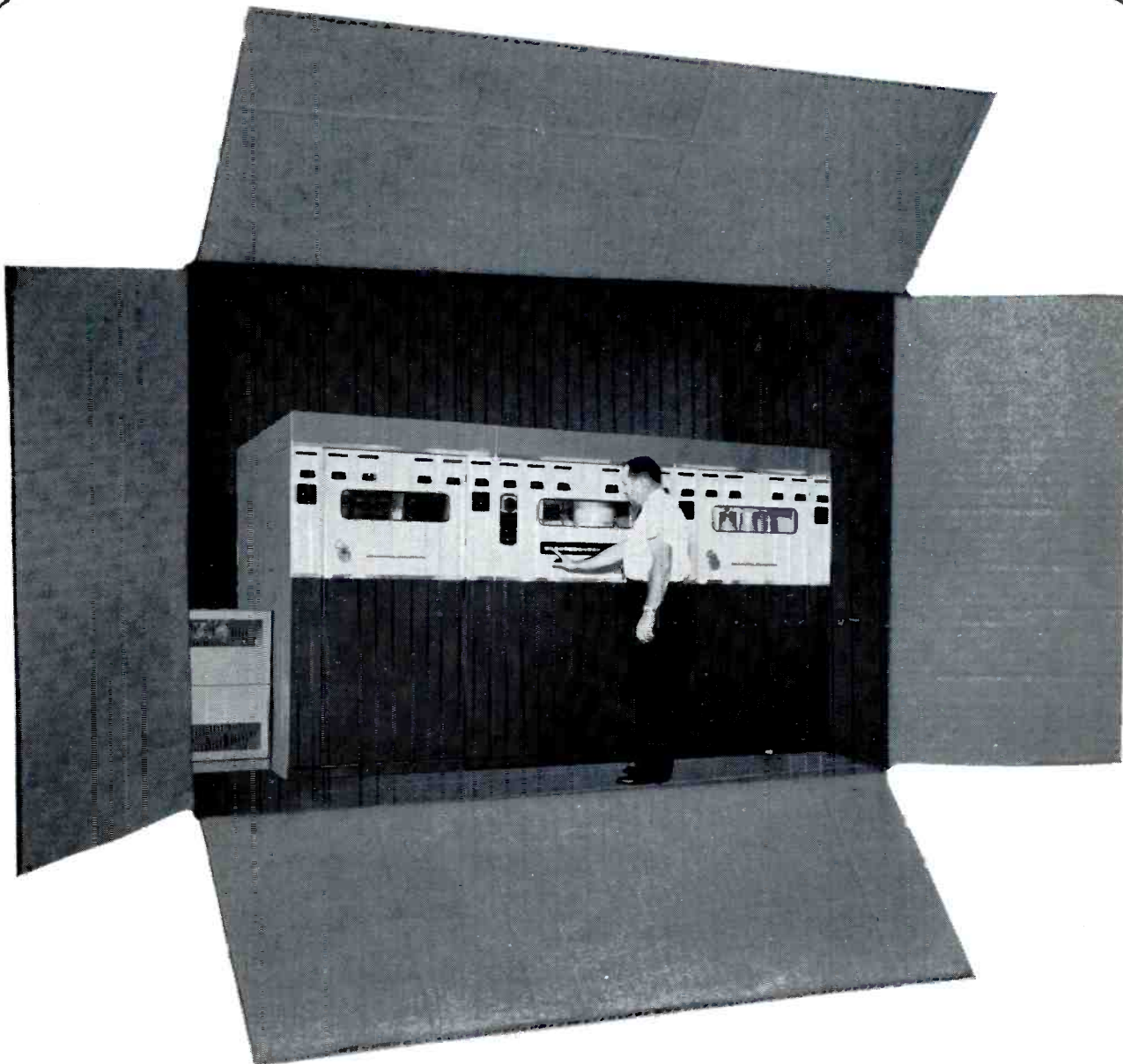
Manager: My chief engineer has

made a strong logical case. His several points take in a lot of ground. Let me place them in their realistic business perspective. About the "expanding FM-stereo market"—our contract with a background music supplier restricts us from using our sub-channel for stereo operations. About the better, stronger FM signal, I'm in favor of anything that is technically better. But from a revenue consideration, this kind of emphasis on FM simply is not warranted. There's practically no benefit on FM that I don't already get on AM. In fact, if I were forced into a situation where FM was my only media, I would give up my franchise.

In order to survive in broadcasting, particularly in the shadow of metropolitan programming, you literally have to be a service arm of the local community, as I think we have become. An interesting related sidelight will illustrate my point. Right now we put out a beautiful FM signal—not only to our community listeners, but also to others close by. In fact, we have a larger listening audience in other areas than we have locally. While I take justifiable pride in this, it doesn't make a significant entry on the black side of our bookkeeping ledger. Before I'm completely misunderstood, let me say I'm not arbitrarily against new equipment or replacement of worn-out equipment. If the antenna had deteriorated to a point where its performance is so marginal, it would certainly be replaced. If it were, I would certainly take advantage of adding vertical polarization. And, in fact, if there were some obvious manifestation of this increasing FM audience—such as a greater population of automobile FM radios—I would favorably consider an increased FM operation. But until such time that there is evidence of a stronger market, the FM operation must get along with the reasonable care and attention it is currently receiving.

My biggest headache right now

(Continued on page 42)



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