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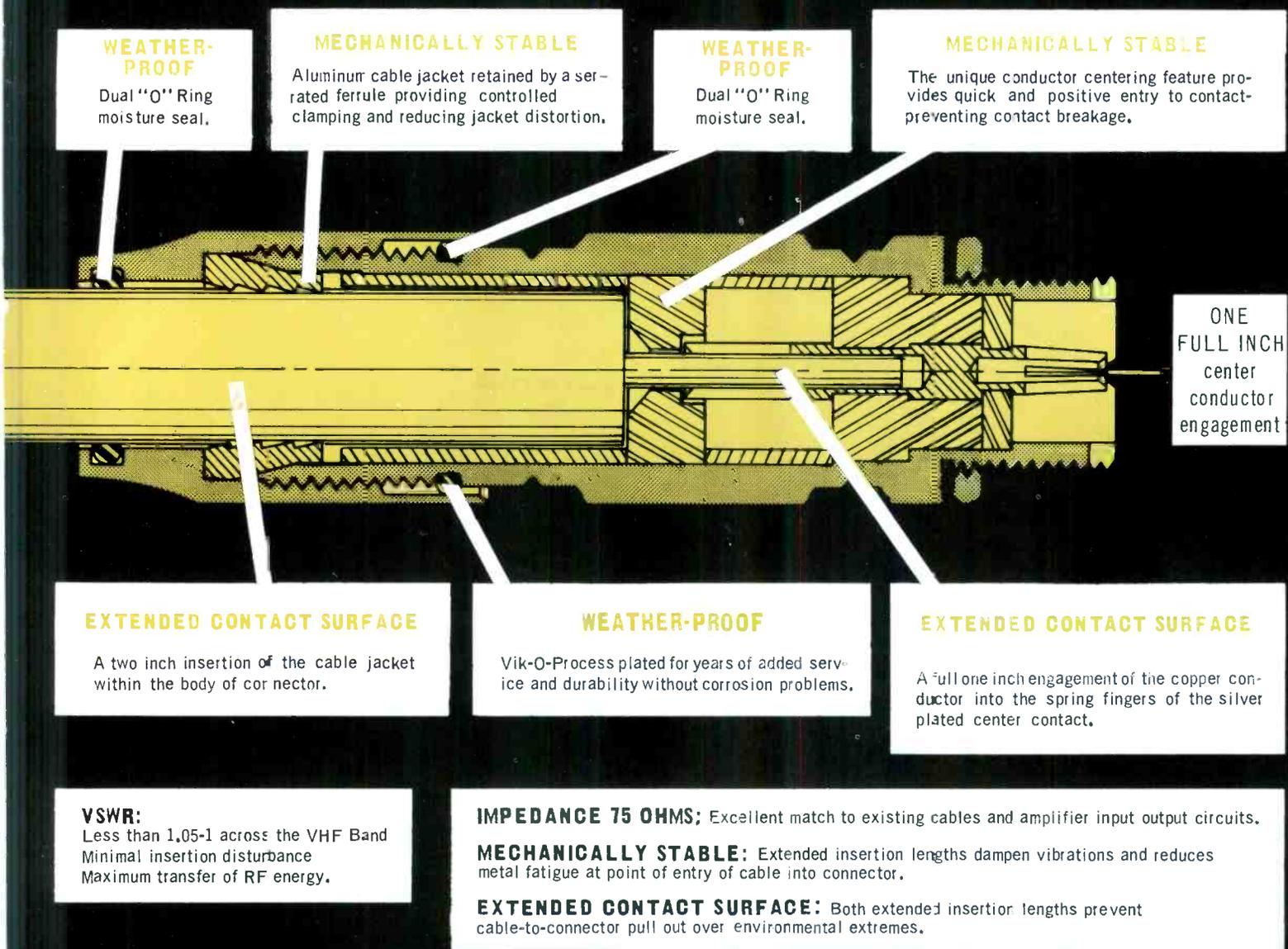
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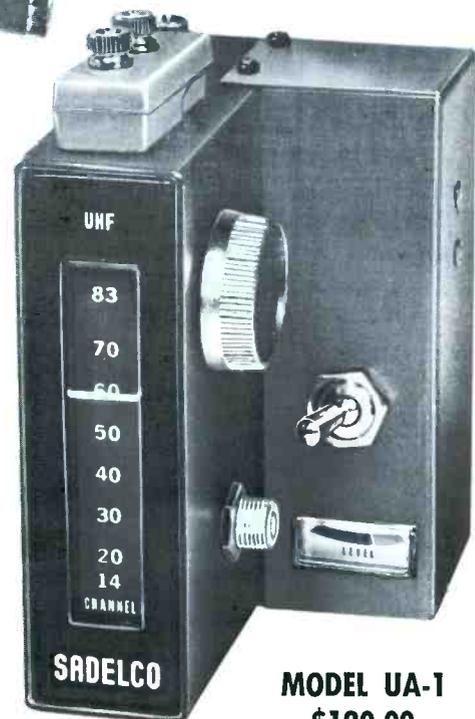
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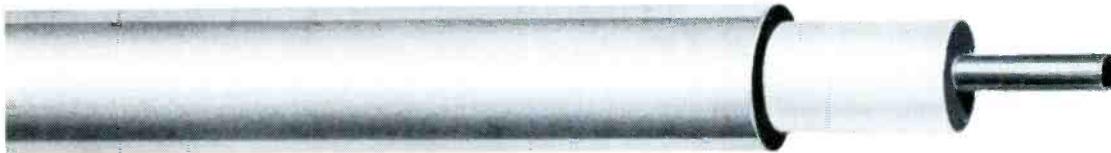
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TV & COMMUNICATIONS

THE PROFESSIONAL JOURNAL OF THE CABLE TELEVISION INDUSTRY



MARCH 1965

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STAFF

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- BPA Membership
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How much TV is “adequate”?

“CATV should be retained as a service to unserved areas, but should not be allowed in “adequately” served areas . . .”
 Quoted from a memorandum to the F.C.C.

When printing presses were few, and literacy low, a single publication was considered adequate. Adequacy can never be held still at a particular point in time and technology. For example, if a town of some 20,000 population is able to receive by cable 12 different channels of TV entertainment and information, would it adequately be served by one or two nearby broadcasters?

Technology is changing fast. Cable system builders are talking 18 and 20 channels, or more. Is there any reason for overriding the engineering capabilities of television receiving equipment? Everything about the history of American invention and enterprise runs contrary to the idea that a ceiling should be placed on legitimate services desired by large segments of the public.

The foundation of free speech lies in the First Amendment. Congress shall make no law . . . abridging the freedom of speech or the press . . .” (and television falls in the same category as the press in this relation.) This statement out of the Bill of Rights has been interpreted by the U.S. Supreme Court as meaning that:

- (a) The people have the right to get their information from a variety of competing sources.
- (b) They also have the right to expression of their own views.

If these two interpretations of the exercise of free speech clash, as legal rights often do, then a review is in order to determine which right has priority. Anybody in the United States can and should have access to as much opinion as is possible; and there are means through which a person can express himself.

There is a wide range of media. In many cases it is only because our means of communication are competitive that the citizen can make use of his ears, and voice to the greatest extent. If there is only one newspaper in town, then there are magazines that bring a wide range of opinion, often challenging the single local voice. Radio reaches every area, as do books, and newspapers from metropolitan centers. No official attempt is made to curtail the flow of a variety of information to the individual.

If the air waves belong to the people and the wave lengths are limited, then operators of stations must be selected according to public interest, convenience and necessity. Where few can be chosen, there is no need to provide economic protection for the license holder. Scarcity and near monopoly usually assure a profit. Under these circumstances, barring competition is tantamount to insuring economic success for a lucky few.

But how lucky is the public? In order to guarantee that a local telecaster maintain his financial position, the public is threatened with the loss of many competing television expressions.

Need a local station fear competition; If a station cannot command its audience, there is probably something wrong with the way it is doing its job. An axiom, in journalism, is the fact that people are most curious about what is closest at hand. The competent local station, in carrying neighborhood news and events, is most likely to get the greatest amount of attention. In studies that have been made of the stations that have left the air, the coming of a CATV system has never been shown, satisfactorily, to be the cause of such a demise.

It is wise, on occasion, to go back to beginnings. The constitution says that there shall be no law abridging the freedom of speech or the press. This newest medium, television, which is the closest thing to recreation of life itself in news, entertainment and information should go to the people in all the quantity and the quality that television technology allows. So we think, democracy is best served.

News SPECTRUM

NONDUPLICATION CONDITION CHALLENGED IN COURT

The 15-day nonduplication condition which the FCC has been attaching to microwave grants associated with service to CATV's has been challenged in the U.S. Court of Appeals for the District of Columbia. Constitutionality of the nonduplication condition is questioned by Idaho Microwave, Inc. and Cable View of Burley, Inc.

The CATV distributes signals relayed from four Salt Lake City stations. Under the conditions imposed on the microwave operation, the cable system is being required to carry the signal of KMVT-TV, Twin Falls, Idaho—but to refrain from duplicating programs carried by that station for days before and after local telecast.

Since late 1963 the Commission has been attaching such a provision to all microwave grants. However, Idaho Microwave was granted an unconditional construction permit in July, 1963, prior to the FCC's decision to impose the nonduplication condition during the interim period pending final decision in the matter of CATV protection of local stations. As a result of a petition for reconsideration filed by KMVT and KIFI-TV, the FCC added the condition to the license issued Oct. 28, 1964 to Idaho Microwave. The carrier returned the license and has since been operating on program test authority with its license still pending. The Commission has advised, however, that the "protection" of the local station must be observed.

Idaho Microwave and Cable View have asked the Court to stay the Commission order until a decision is reached on whether the nonduplication stipulation violates constitutional and Communications Act guarantees against censorship.

FCC-NAB-NCTA LEGISLATIVE DISCUSSIONS INCONCLUSIVE

Late last month the differences between NCTA and the National Association of Broadcasters had still not been resolved, even though NCTA/

NAB committee meetings were followed by a joint presentation before the full Commission. Top staff members and assistants were also at the Feb. 23 conference.

During discussions held the previous week, the NCTA panel, consisting of Fred Ford, Bruce Merrill, Fred Stevenson, Robert L'Heureux and Stratford Smith, had offered to present several proposed ideas to the NCTA Board for consideration.

Key points included: (1) Simultaneous nonduplication, upon request, (2) FCC authority through rule making to require 15-day protection between 6:00 and midnight for one station which delivers a "city grade signal" to the community in which the CATV is located. Further protection to be extended on case-by-case basis. (3) Deletion of requirement to protect Grade B signals, (4) Stipulation that alteration of a station's facilities which improve its signal in a particular area served by a CATV would not alter responsibility of system to carry or protect the station,

LATE BULLETIN

Dr. Martin H. Seiden, Economic Consultant for the FCC has released his six-month economic analysis of CATV systems and TV systems.

In his report, Dr. Seiden completely absolved CATV of any direct adverse economic impact on local television. He did, however, report that "indirect impact" does exist and attributed this primarily to national rating services who could not accurately reflect CATV audiences in their viewing surveys.

The Commission, Dr. Seiden noted, should avoid asserting general jurisdiction over CATV systems. He pointed out that, "These chores are being handled efficiently at the local level."

Editor's Note: An analysis of Dr. Seiden's study, and its apparent impact, will be reported in the March 22 issue of Cable Television Review.

and (5) Redefinition of "independent station" which CATV's would be required to receive—to exclude stations specifically programmed for special language or minority groups.

The NAB panel reportedly refused to present these proposals to their Board.

Following the all-day session with the NCTA and NAB representatives, FCC Chairmen E. William Henry indicated that the Commission would attempt to express an opinion with regard to the specific proposals heard and also relative to the apparent disagreements in general.

NCTA spokesmen gained the impression that the meeting with the Commission had been worthwhile and that the Commissioners seemed to have a far better understanding of CATV than they have had in the past.

TELEPROMPTER BLASTS CBS; CLAIMS NETWORK VIOLATES LAW

In an answer to a suit against it by CBS, Inc., TelePrompter Corp. denied that services performed by community antenna television systems infringe upon program copyrights. Furthermore, TelePrompter's answer suggested that CBS, Inc. may be violating both the Federal anti-trust laws and the Federal Communications Act by attempting to inhibit reception of commercial programs over CATV.

The TelePrompter filing was in reply to a test case brought last December 11 in U.S. District Court for the Southern District of New York, in which CBS and other plaintiffs are seeking to establish whether CATV systems must obtain permission and pay for copyrighted programs.

Attempts by a broadcaster to regulate or restrict the use of television receiving equipment, TelePrompter asserts, are contrary to the Federal Communications Act, which seeks to make broadcast signals available so far as possible to all people.

Arguing that no infringement of copyright is involved, TelePrompter's points out that two of the antenna systems named in the complaint, at Farmington, N.M., and Elmira, N.Y., were constructed in 1955 and the third, at Johnstown, Pa., in 1960. Failure of CBS to raise the copyright question in the intervening years, TelePrompter indicates that the network did not consider its rights to be violated or at best was derelict in protecting its position. In fact, the

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answer adds, the network actually participated in the benefits of CATV.

Alleging anti-trust violations by the network, the reply specifies that "CBS monopolizes, controls and dominates television program production and distribution by means of economic and other pressures on program suppliers, distributors, advertisers, broadcasters and other persons" and "by means of restrictive and unlawful affiliation agreements with television station licensees."

G-E STEPS UP CATV PLANS; NAMES HANNA TO MANAGE SYSTEMS

The General Electric Company says it is broadening its participation in the community antenna television field. At the same time, Robert B. Hanna has been named general manager of the General Electric Cablevision Corporation, a subsidiary company formed to develop and operate CATV systems.



Robert B. Hanna

Robert C. Wilson, president of the G-E Cablevision Corporation and general manager of the parent company's Consumer Electronics Division, said the CATV corporation would file for franchises in a number of communities across the country. In addition, he said, G-E plans to expand its CATV operations by securing systems now in operation.

The G-E Cablevision Corporation, chartered in late 1964, recently was awarded franchises in Schenectady and Colonie in eastern New York. The corporation has also filed for franchises in Cicero, Van Buren, and Camillus, New York.

Robert B. Hanna joined General Electric in 1929 after graduating from Butler University. Following a variety of assignments in advertising and public relations, he was named manager of the company's Schenectady broadcasting stations in 1948 and held that

post for nine years. During this period he was also a member of the Board of Directors of the National Association of Broadcasters. Most recently, he served as a consultant to the vice president and general manager of the Motor and Generator Division.

FORD CALLS FOR JOINT EFFORT IN THE PUBLIC INTEREST

Frederick W. Ford, president of the NCTA, last month called upon television broadcasters to "join forces" with CATV operators to work toward the "common goal" of serving the public interest. Addressing the International Radio and Television Society at the Waldorf Astoria Hotel on Feb. 19, Ford said that he is "convinced that both television and CATV will grow and expand and out of the conflict that exists today and out of the fair competition between stations which CATV fosters, will emerge a stronger total television system."

Mr. Ford told the IRTS group that, "since all of us in the TV industry have a common goal, we should join forces toward this long range objective and avoid the temporary clashes that would disrupt our progress toward that goal."

"There is and must be a natural alliance between the CATV industry and the broadcast industry," Ford said. "They are, in fact, both parts of the same entity. CATV cannot exist without a sound TV broadcast structure. And the broadcast industry cannot withstand the public demand for additional service.

"We owe it to the public of this country, which after all, supports both of our industries, to cooperate with each other and with the government in arriving at solutions to the problems attendant upon the growth of any new industry. We must, in this manner, assure through an orderly process, that CATV becomes an integral part of the over-all broadcast and communications structure of the United States which is so vital to our economic, social and political system."

As to alleged CATV effect on the growth of UHF television, the NCTA President stated that of 109 UHF stations that have left the air, only one (which later returned as a VHF station) ever claimed CATV as a factor. However, Mr. Ford said, the FCC found in 1959 "that there was insufficient evidence to indicate that the impact of CATV was serious enough

You may be the President,
Mr. Keys . . . but I say what
you're doing on page 37 is
unnecessary!



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		OK	OK			meas	pl	100 MCS		220 MCS		100				
		meas	/100 ft			meas	/100 ft	meas	/100 ft	meas	/100 ft					
225 B.9	1195	OK	OK	OK	OK	20300	17.0	6.7	.612	10.6	.888			79.8	74.8	OK
224 C.11	1205	"	"	"	"	20000	16.6	6.6	.547	10.4	.863			80.7	75.9	OK
225 C.7	1197	"	"	"	"	19900	16.6	6.7	.558	10.3	.86			80.7	75.8	OK
225 B.12	1197	"	"	"	"	20000	16.7	6.4	.535	10.4	.87			80.4	75.7	OK
225 B.2	1207	"	"	"	"	20100	16.65	6.7	.555	10.4	.862			81.3	75.3	OK
225 B.10	1185	"	"	"	"	19800	16.8	6.5	.548	10.3	.87			81.0	74.7	OK
225 B.8	1215	"	"	"	"	20300	16.7	6.7	.552	10.5	.864			80.6	75.7	OK
224 C.8	1225	"	"	"	"	20000	16.3	6.6	.538	10.4	.85			82.3	75.7	OK
225 B.4	1210	"	"	"	"	20300	16.7	6.7	.553	10.5	.868			80.4	75.7	OK
224 A.3	1190	"	"	"	"	20000	16.8	6.6	.55	10.4	.875			80.2	75.5	OK
225 C.2	1208	"	"	"	"	20100	16.65	6.6	.548	10.4	.863			81.2	75.2	OK
225 A.24	1198	"	"	"	"	19900	16.6	6.5	.542	10.3	.862			80.8	75.8	OK
223 A.5	1195	"	"	"	"	19600	16.4	6.6	.552	10.2	.854			81.5	76.0	OK
224 E.10	1185	"	"	"	"	19600	16.5	6.5	.548	10.3	.868			81.2	75.8	OK
225 B.6	1207	"	"	"	"	20200	16.7	6.6	.547	10.4	.862			80.6	75.5	OK
224 C.10	1218	"	"	"	"	19900	16.3	6.7	.55	10.3	.846			81.8	76.2	OK
225 B.5	1210	"	"	"	"	20300	16.7	6.7	.553	10.4	.862			80.5	75.6	OK
225 B.7	1210	"	"	"	"	20300	16.7	6.8	.562	10.5	.868			80.3	75.8	OK
225 A.8	1215	"	"	"	"	20300	16.7	6.7	.552	10.5	.868			80.6	75.5	OK
224 C.7	1215	"	"	"	"	20200	16.6	6.6	.543	10.6	.872			81.5	75.2	OK

Remarks: *Okle Punkte Duffly Maycock. et*

Inspector: *TM*

Eyebrows are raised whenever engineers see the outstanding performance data on Rome Unifoam* cable. In view of Rome's rigid manufacturing specifications, it's no wonder.

Take this test sheet from a recent production run of 1/2-inch cable, for example. It's like hundreds of others to come out of our Inspection Department, where every reel of Rome Unifoam is examined.

Record of each length The first column on this sheet gives the "Trace Number," which appears on the shipping tag and thus gives each length of cable an individual identity, both to our customer and to us. It gives us complete traceability of the length back through every manufacturing operation right from the beginning. From this trace number we can identify and locate the complete manufacturing history of the length, including drawing and inspection of the copper conductor, extrusion of the foamed polyethylene insulation, complete strip-chart records of extrusion conditions, application of the seamless aluminum sheath, and all of the test and inspection data on the finished cable. We are so sure this length is up

to standard or better that we print our name on the surface once every foot.

There are a couple of columns for recording the continuity test on the conductors. This isn't much (and a broken conductor is admittedly a remote possibility) but, after all, the validity of the electrical measurements is based on the assumption that the conductor is continuous. So why not be sure?

Checked inside and out The column marked "Visual and Dimensional" means just what it says. And an "OK" here means that the copper is smooth, bright, and clean; that the two are essentially concentric with each other; that the cell size of the foamed polyethylene is within tolerance; that all dimensions are correct. We tell you this is all true on every reel of Rome Unifoam CATV cable and we mean it. If the Inspection Report doesn't say "OK" here, the length won't be shipped to you. The same goes for the dielectric strength test and the insulation resistance test. Just because we never see a failure doesn't mean we should stop spending time on the test.

Capacitance, attenuation at 100 and 220 mc, velocity of propagation, and characteristic impedance are carefully

checked and recorded. You are interested in having these values within tolerance, so we have to be. Every length is given a sweep test, and is only given an "OK" if the deepest "hole" between 54 and 220 mc is less than 2.5% below the smooth curve.

Put it to the test Really, you don't need to test our cable before you put it up, because if it isn't right we won't ship it. But if you've got the time and are curious, we'd love to have you run your own tests. We promise you will be real happy with the results. While you are looking at this test sheet, don't overlook the uniformity and low level of attenuation values. Would Rome Unifoam CATV cable let you eliminate two or three repeaters in your system design? It's something to think about.

Get the word For a copy of our folder on Rome Unifoam CATV Cable, call your nearest Rome/Alcoa representative or write Rome Cable Division of Alcoa, Dept. 40-35, Rome, N.Y. 13440.

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

Rome Cable
 DIVISION OF ALCOA

to threaten a station's continued existence."

"Therefore," he said, "the past, the present and the future hold no threats for UHF insofar as CATV operations are concerned."

SCRAMBLE FOR CATV IN PITTSBURGH

The P-G Publishing Company, owners of the Post-Gazett and the Hearst Corp., operators of WTAE-TV, Pittsburgh, have joined the ranks of franchise applicants for a CATV system in Pittsburgh, Pennsylvania. Already in the contest are TelePrompTer, Westinghouse Broadcasting Company and Valley Cable TV Company.

According to Charles Sonnenberg of Valley Cable, his signal survey indicated that Pittsburgh has at least 10,000 homes which cannot receive the three local stations satisfactorily.

The Post-Gazett indicated that it "has not applied for a franchise but indicated an interest in the CATV situation." This is reportedly the same general type of statement issued by Westinghouse and WTAE-TV.

It has not been determined whether Pittsburgh will grant an exclusive franchise, nor has it been determined how franchise holders will be selected.

JACK WRATHER PURCHASES 12¼% INTEREST IN TELEPROMPTER CORP.

Jack Wrather, President of the Wrather Corporation of Beverly Hills, Calif. has acquired a 12.25 per cent interest in TelePrompTer Corporation by buying the Western Union Telegraph Company's holdings of 91,026 shares for \$10.125 per share.

Irving B. Kahn, Chairman and President of TelePrompTer Corporation, said, "I am delighted that Jack Wrather, a personal friend of long standing, has expressed his confidence in TelePrompTer Corporation through the purchase of these shares at substantially above the market price. Mr. Wrather's long-time interest in community antenna television and the broadcasting industry will make him an important asset as we continue to expand and develop our holdings in CATV, and I hope that he will consent to join our board of directors in the near future."

Wrather formerly had an interest in the Jerrold Corporation and was controlling stockholder in TransContinent Television, a group owner of stations.

He stated that he "believes strongly in the future of community antenna

television." He added that "under Mr. Kahn's management, TelePrompTer has established an outstanding record as a leader in this exciting growth industry."

SPECIAL BULLETIN SERVES CATV

"A comprehensive view of the rapidly changing CATV scene" is promised in the new *CABLE TELEVISION REVIEW*, a new weekly news service of *TV & Communications* magazine. Detailed coverage will be devoted to activities of Congress, FCC, NCTA, NAB, and individual system operators across the country. In addition, pole line problems, tax and investment considerations and various anti-CATV activities will be covered in the weekly news service.

CATV franchise grants will be reported each week. Stan Searle, editor of *CABLE TELEVISION REVIEW*, indicated that franchise applications will not be reported in the new publication. The decision to exclude information on applications stems from the problems which have resulted from publicity given franchise applications by broadcast-oriented media.

Subscription price of the news service is \$50 per year, with a trial offer of thirteen issues for \$15. Requests should be sent to: *CABLE TELEVISION REVIEW*—Dept. E, P.O. Box 63992, Oklahoma City, Okla.

PNCTA SPRING MEETING

The Pacific Northwest Community TV Association is holding its 10th anniversary spring meeting in Spokane, Washington March 29 and 30.

According to Mrs. Pat Hughes, President, PNCTA, guest speakers for the meeting include Fred W. Ford, President, NCTA; Bruce Merrill, NCTA National Chairman, and Bob L'Heureux, NCTA Counsel, among others. In addition, Miss Spokane, 1965 (Miss Sharron Ann Sweeny) will formally welcome attendees.

The program will cover such topics as Micro-Wave Services," "Pole Line Agreements," "Translators" and "ETV." The final day of the two-day meeting will consist of a technical meeting with panel discussions on Coaxial Cables and Transistor Amplifiers. "Associate" displays will be exhibited during the meeting.

NAMCC HOLDS ANNUAL MEETING

The National Association of Microwave Common Carriers held its annual meeting February 7, 8 and 9 at

That's a good argument . . . but I'm only half convinced that what you're planning on page 37 is necessary . . .





the Sands Hotel, Phoenix, Arizona. The first day of the gathering was taken up with registration, getting acquainted and visits to the hospitality suites of equipment manufacturers. The following day was devoted to a discussion of the progress of NAMCC and NCTA regarding comments and engineering studies of FCC Docket 15586, the proposed microwave rule-making.

Participating in the program were: Victor Nexon, Microwave Services International, Denville, New Jersey; A. Earl Cullum, Jr. Associates, Dallas, Texas; John P. Cole, Jr., Smith & Pepper, Special Counsel, NAMCC; Robert L'Heureux, NCTA General Counsel; Bruce Merrill, president of Ameco, Inc. and chairman of NCTA, and Max H. Kraus, Manager, Communications System Division, Jerrold Electronics Corp.

Closing sessions Tuesday included a business meeting at which new officers were elected. They are: Clifton Collins, president and secretary; War-

ren Fribley, vice president and treasurer. Board members are: William Lastinger, Robert Clark, William Cal-sam, James Klungness, Brown Walker, Robert Magness, Jack Crosby and Frank Valentine.

The afternoon sessions consisted of technical papers from Max H. Kraus, manager, Communication Systems Division, Jerrold; Paul Hertel, director of research and development, microwave and scatter, Collins Radio Company; Milford Richey, engineering director, Ameco, Inc.; J. B. Nangle, industrial sales manager, Lenkurt Electric Co., Inc.

The NAMCC meeting closed with an association dinner Tuesday evening. Featured speaker at the dinner, as shown in the picture, was Frederick W. Ford, president of NCTA.

SENATORS QUESTION COMMISSIONERS ON PLANS FOR CATV, UHF

FCC Commissioners concluded a very busy month in February with an extended appearance before the Senate Communications Sub-Committee, chaired by Senator John O. Pastore (D-R.I.). Number one item of senatorial interest: CATV. (When put on the spot by the senators with regard to commission plans for resolving the CATV hassle, Chairman Henry said that the commission will decide before the end of March whether it has jurisdiction over community antenna systems under existing legislation.

A matter of considerable concern to both the commissioners and the Communications Sub-Committee members seems to be the fate of UHF television. FCC Chairman Henry contended that "marginal" UHF operations in large cities could be forced out of business by a CATV with a 20% saturation. Dr. Seiden, although reported to rate CATV as an incon-

clusive factor in the large markets, feels that their existence in smaller markets would have a relatively greater impact upon UHF outlets.

JERROLD CORP. LOSES APPEAL

The U.S. Court of Appeals in San Francisco has upheld the \$325,000 treble damage anti-trust suit won last year by KPQ, Wenatchee, Wash. The litigation originally grew out of the sale of the KPQ-owned Wenatchee system in 1954. KPQ claimed that the sale was forced by Jerrold in restraint of trade. Jerrold-Whitney acquired the CATV but later sold the system to H. & B. American Corporation.

CATV DEBATE ANNOUNCED

Billed as one of the "Great Debates" of the Business Forum in connection with the electronic distributors Parts Show, will be a formal debate on the problems of CATV. Three participants will attempt to prove that CATV offers sales and profit opportunities for the distributor. They are James P. McGoldrick of Northwest Electronics, Inc., Spokane; Frederick W. Ford, NCTA President, and Charles A. Meyer, President, Mountain Electronics, Inc., Charleston.

Attempting to cast a negative light on CATV will be H. A. Graham, Warren Radio, and John Knight, Vice President and General Manager, Womack Radio Supply Company, and Mort Leslie, Acting Chairman, Television Accessory Manufacturers Institute. The debate will be monitored by J. A. Milling, President, Sams Division, Howard W. Sams and Company, Indianapolis.

BENCO SOLD TO CANADIAN FIRM

Blonder-Tongue Laboratories, Inc. and Benco Television Associates, Ltd., Toronto, have announced the sale of Benco to Neighbourhood Television, Ltd., of Guelph, Ontario.

According to Harry A. Gilbert, Blonder-Tongue vice president and general manager, Neighbourhood Television is acquiring 100 per cent interest in Benco. B-T purchased controlling interest in Benco in 1961.

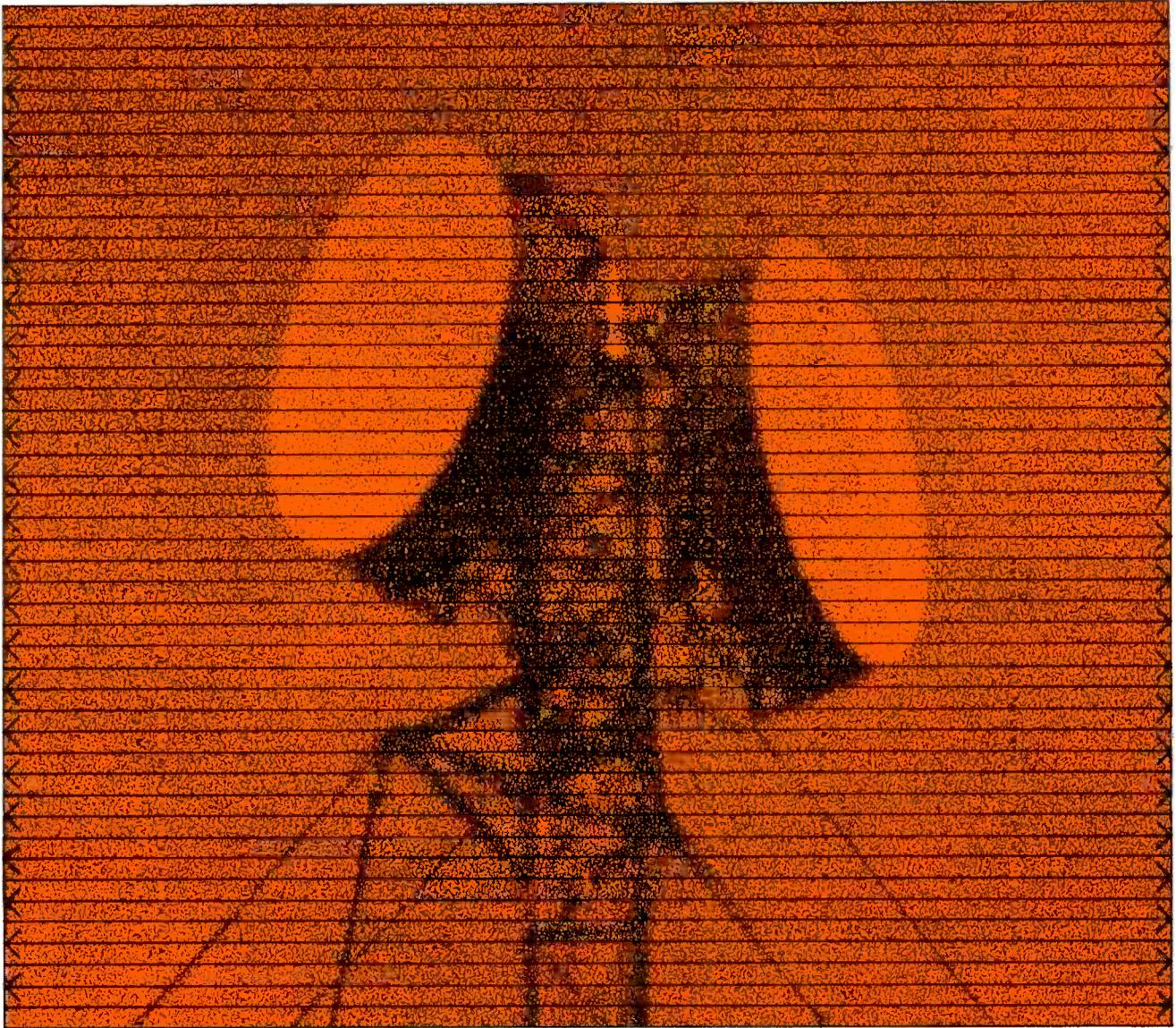
Benco's key executives, Philip Freen, and Harry Gray, will remain in top managerial posts with the Canadian operation.

Benco manufactures a line of CATV and translator equipment. Neighbourhood Television owns and operates CATV systems in Canada.



OUR COVER

The cover photo shows members of the Ameco, Inc. Design Department with the system map for Waco-Temple-McGregor, Tex. This CATV system is reportedly the largest system in the United States in terms of cable miles. Story on page 32 of this issue.



Collins Universal Microwave Group: A unique systems concept for microwave communication

Collins Universal Microwave Group — U/M/G — now in all frequency bands from 3.7 gc to 11.7 gc — is based on the concept of commonality — commonality from modules through layout, cabling and powering, for both remodulating and i-f heterodyne equipment. This unique flexibility now allows you to efficiently overcome the ever-increasing problems of frequency congestion.

The basic system has long haul capability of

1200 channels, or color TV, using i-f heterodyne techniques. Economical U/M/G remodulating systems provide a high quality of performance for shorter haul applications, or for long haul applications with more limited channel loading. All systems are fully transistorized, except for klystrons and TWTs. For unexcelled performance and reliability, consider Collins U/M/G.

For further information call or write today.

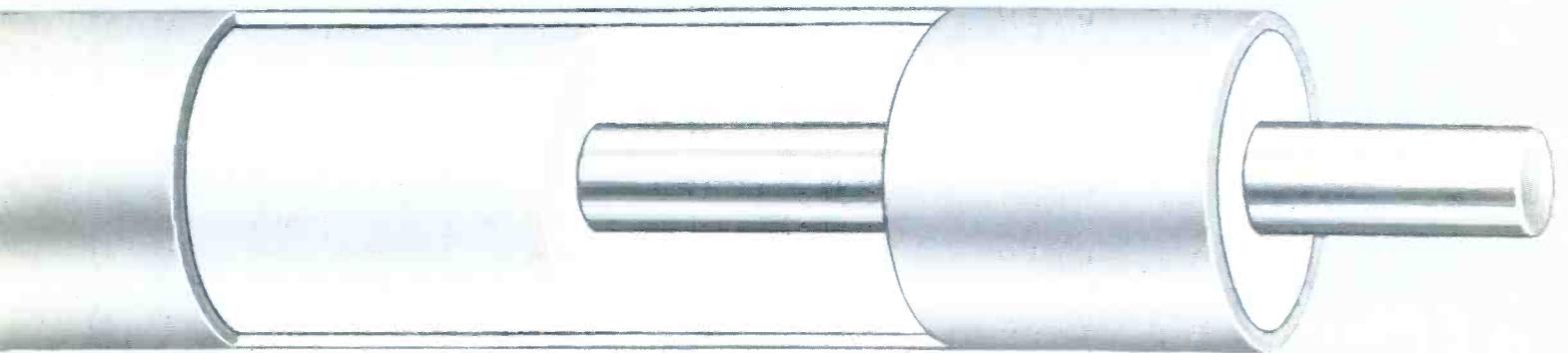
COLLINS RADIO COMPANY • Microwave Marketing, Dallas, Texas, Area Code 214, AD 5-9511 • Collins Radio Company of Canada, Ltd., Toronto • International, Dallas



FOAMFLEX

SEMI-FLEXIBLE, ALUMINUM SHEATHED, AIR DIELECTRIC
COAXIAL CABLE

FIRST... TO MEET ALL THE NEEDS OF CATV



■ Now, the availability of 75 ohm Foamflex coaxial cable in four diameters — .412", 1/2", 3/4" and 1 5/8" — fills the needs of all-band CATV systems for rugged, high-performance cable in all required sizes. Foamflex, the original foam polyethylene dielectric cable, offers unequalled low loss for superior operation in community antenna and closed circuit television. Foamflex has a proven record in demanding applications in telemetry, missile guidance and microwave in addition to CATV.

Excellent uniformity of impedance with an average VSWR of 1.05 over all channels, and low attenuation, result in remarkably good video reception for tomorrow's color TV and auxiliary service. Surprisingly, this semiflexible, air dielectric cable is competitively priced with cables covering only the low-band frequencies.

Construction consists of a copper inner conductor, foamed polyethylene dielectric, and thin wall aluminum outer conductor providing a permanent moisture vapor barrier. Foamflex is superior on the basis of operational characteristics over long use and under extreme environmental conditions. For underground use, a Habirlene jacket can be furnished.

■ average VSWR of 1.05 on all channels ■ uniform electrical properties over wide temperature variations ■ low loss, no radiation, high phase stability ■ stable attenuation at high band frequencies ■ lighter weight for easy installation ■ modified pressure taps or multi-tap distribution may be utilized ■ long term operating life

NEW!

Send for new Foamflex CATV Bulletin CA Issue 1 with full engineering data.

PHELPS DODGE ELECTRONIC PRODUCTS
NORTH HAVEN, CONNECTICUT

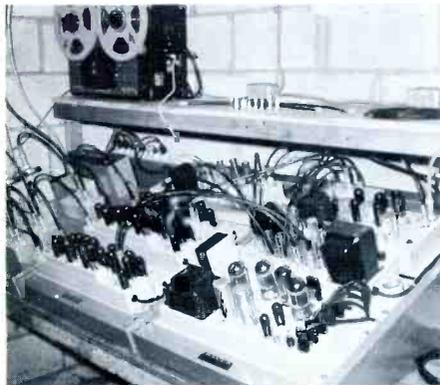


FOCUS

... On Progress

MISSISSIPPI SYSTEM GETS NEW HEAD-END

A new functional design head-end installation has been completed for Grenada Video, Grenada, Mississippi according to *Jim Davidson*, President of Davco Electronics. *Mr. Frank Evans*, executive for Grenada Video reports that the improvements are being made and extra services added to "further enhance his service and to improve the quality" of reception.



The new head-end delivers five TV channels plus two FM channels including tape background music. The system went into operation in November 1956 and presently serves 1,000 subscribers.

TELEPROMPTER CORPORATION NAMES SCHLAFLY SENIOR VP

TelePrompter Corporation has announced the advancement of *H. J. Schlafly, Jr.*, to Senior Vice President.

Mr. Schlafly, who is rejoining TelePrompter Corporation following a year's leave of absence, formerly was Vice President for Engineering. He was one of three founders of TelePrompter Corporation in 1951.

Irving B. Kahn, Chairman and President said that *Mr. Schlafly* will have expanded responsibilities in the areas of administration and special projects as well as engineering.

Prior to the formation of TelePrompter Corporation, *Mr. Schlafly* was associated with the Advance Development Group, Electronics Division of General Electric and was Director of Television Research for Twentieth Century-Fox.

TV & COMMUNICATIONS

TelePrompter Corporation is an owner-operator of community antenna television (CATV) systems. It also provides live and closed-circuit television production.

FLORIDA CATV SETS RECORD

A new sales record for Ameco, Inc. affiliated community antenna systems was set in January by Florida Antennavision, Inc. of Panama City, Florida. During the one month, the Florida cable company added 405 new customers to its system!

Helmut Dieter, district manager for Ameco systems in the East and Southeast, who made the announcement, congratulated the manager of Florida Antennavision, *Mr. J. E. Keeton*, on the new record and stated that the Panama City operation is now the fastest growing system in the United States. *Mr. Dieter* further congratulated Decatur Cable TV, Inc. of Decatur, Alabama, who was runner-up for growth honors in January. *Johnston and Associates*, advertising and sales promotion specialists of Decatur, handle sales and promotions for both the Panama City and Decatur systems.

COOK NAMED AS SALES MANAGER

The appointment of *Jerald (Jerry) Cook* as Distributor Sales Manager of Columbia Wire and Supply Company has been announced by *F. F. Florshheim*, President of the Chicago firm.

In this capacity, *Mr. Cook* will be responsible for all sales, sales promotion, and advertising activities pertaining to Columbia Wire's Sales Representative Organization and national network of electronic distributors.

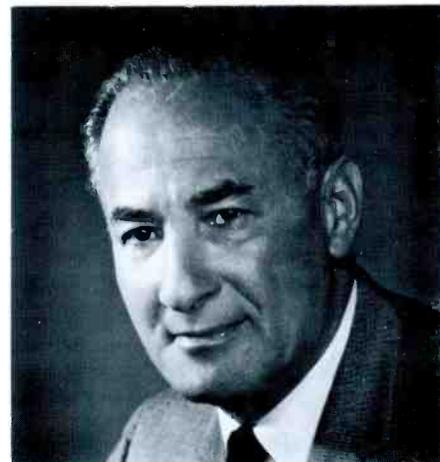


Prior to joining Columbia, *Mr. Cook* was hard lines merchandise manager of Western Tire Stores in Chicago. He has also served as a merchandise buyer for P. A. Bergner, Allied Stores, Kresge Department Stores and Davega Stores.

Mr. Cook is a native of Brooklyn, New York and a graduate of Syracuse University.

JERROLD APPOINTS DAVID BRODY TO CATV COMMUNITY OPERATIONS DIV.

David Brody has been appointed Operations Manager of the Community Operations Division of Jerrold Electronics, according to *Joel P. Smith*, Community Operations Division Manager.



In this newly-created post, *Mr. Brody* will be responsible for Jerrold's Community antenna television systems.

Mr. Brody formerly was Vice President and General Manager of Philco Distributors, Inc. in Philadelphia. Prior to that he had broad experience in appliance sales and consumer products.

Mr. Brody attended Drexel Institute of Technology, Philadelphia, where he majored in Electrical Engineering. He also attended engineering courses at the General Electric Company School, Bridgeport, Connecticut.

COLLINS SELECTS V-P

John M. Whalen has been elected vice president of Collins Radio Company for operations, Dallas Division. He replaces *R. C. Mullaley*, who is now vice president, operations, in the Cedar Rapids Division.

Whalen has been assistant vice president, administration, since 1962. He joined the company in 1946, serving in a number of executive capacities in the Cedar Rapids Division prior to moving to Dallas in 1962.

Would you like to have all the facts about CATV, all the news - every week?



That's precisely what you'll get
in the new weekly news service.

CABLE TELEVISION REVIEW

The FIRST weekly news publication to bring you in-depth reporting on all major developments affecting cable television. A totally NEW reporting service, prepared each week by the industry's most experienced editors and news analysts. More extensive coverage of vital cable television facts than ever before available . . . from detailed reports on franchise activity, to day-by-day developments in Congress and the FCC.

When CABLE TELEVISION REVIEW reaches your desk each Monday morning, you will have a *complete* up-to-date summary of events of the preceding week. An accurate report and analysis of every development which could affect your industry — and *you personally!*

CABLE TELEVISION REVIEW has been created at the urging of operators, investors and manufacturers, to meet a rapidly growing need for *weekly* news coverage from the *system operator's point of view*. You will always be well informed, as each week brings exciting news of

new franchises, CATV transactions, NCTA activities, important legal actions, personnel moves . . . plus new anti-CATV and pro-CATV activities in Washington and across the nation!

CATV owners, operators and investors have expressed their urgent desire for a non-broadcast oriented medium which reports objectively and in full on matters affecting cable television. CABLE TELEVISION REVIEW has been specifically designed by the experienced editorial staff of TV & Communications to fully meet this pressing need. Whether you are an established cable television operator, a potential investor, broadcaster or equipment supplier, you need the weekly

CABLE TELEVISION REVIEW to be well informed and fully advised on every aspect of CATV. Your satisfaction is unconditionally guaranteed. Subscribe now by simply returning the convenient order card located at the lower right hand side of this page.

**CABLE
TELEVISION
REVIEW**

**Subscription price of only \$50.00 per year includes your
copy of the big "Annual CATV System & Equipment Directory"**

SPECIAL INTRODUCTORY OFFER: 13 Issues for \$15.00

USE HANDY
ORDER FORM
AT RIGHT

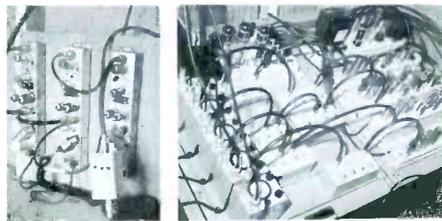
Mullaley has been with the company 13 years and has been vice president, operations, Dallas Division, since 1964.

VIKING NAMES SWITZER

Paul D. Switzer has joined Viking Cable Company, Inc., Hoboken, New Jersey as Director of Advertising and Merchandising. Mr. Switzer was formerly Director of Merchandising at Newmark, Posner and Mitchell, Inc., a well known Madison Avenue Advertising Agency.

At Viking, Mr. Switzer's responsibilities will include all advertising, public relations, marketing and merchandising.

Mr. Switzer has had extensive experience in increasing sales and in developing new products.



COLLINSVILLE GETS MORE CHANNELS

The small Alabama town of Collinsville recently became a five-channel market—all in one day, according to Jim Davidson, President of Davco Electronics, Batesville, Arkansas.

Mr. Davidson and J. D. Pierce delivered a Davco custom-designed functional head-end via Davco's Aztec. They installed the unit in less than one day, converting the previous head-end to the new channel 2, 4 and 6 strip amplifier. The previous head-end would receive only three signals.

An interesting sidelight to this occasion is that this town has many CB (Citizen's Band) radio hobbyists who are quite active. Mr. Howard Pendergass, owner of the system, was on the mountain top with Davidson and Pierce during the installation. . . . As soon as it was complete, Mr. Pendergass (who had his portable CB unit along) was deluged with congratulatory calls from friends and subscribers from the town in the valley. Dozens of subscribers awaited their turn, then called via CB radio, with messages such as "All Channels Bright and Clear" . . . "Best TV we've ever seen."

ENTRON NAMES JAMES

George F. James was appointed Southeastern sales manager for En-



tron, Inc., CATV manufacturers, announced Edward Whitney, Vice President.

Mr. James has 19 years' experience in the sales, installation and maintenance of electronic equipment; including, radiotelephone communications, radio and television broadcasting, microwave communications and radar.

Headquartered in Huntsville, Alabama, James will be responsible for Florida, Mississippi, Alabama, Georgia, North Carolina, South Carolina, and Kentucky.

He has been a senior engineer in General Electric's Computer Department; Southeastern sales representative for Thiokol Chemical Corp.; a senior engineer with Brown Engineering Co.; and Eastern regional sales manager for Ameco.

SUPERIOR CABLE PROMOTES WILFONG

L. J. Styles, Vice President in charge of manufacturing for Superior Cable Corporation, recently announced the appointment of Glenn R. Wilfong as Plant Manager of Superior Cable's Hickory Division. In his new position, Wilfong will be in charge of production control, work scheduling, and inventory control; and working directly with Styles, will be responsible for the division's plant and production facilities.

Wilfong joined Superior Cable Corporation in February, 1961 and participated in the company's engineering training program. In early 1962, he was promoted to the position of time standards supervisor and in 1964 was named production control manager.

He is a graduate of Clemson University, Clemson, S.C., where he earned his degree in industrial engineering; a charter member of the Catawba Valley Chapter, American Institute of Industrial Engineers, and has studied at N.C. State College in Raleigh.

STREET FORMS COMPANY

S. S. Street, formerly with TeleSystems Corporation, Glenside, Pa., as Director of Advertising and Public Relations left that company to form his own CATV Consultation Company.

Street will specialize in CATV advertising and promotion, franchise procurement, and economic evaluations. His offices will be located in Southampton, Pa.

KAISER CATV EXECS IDENTIFIED

Fortunately, for the staff of TV & Communications, the two executives heading Kaiser's CATV operation are men of good humor. In last month's issue, photographs of J. E. Hickman



Hickman and Gay C. Kleykamp were transposed. And, as if that wasn't bad enough, our typesetter and proof readers combined talents to spell Mr. Kleykamp's name incorrectly!

Hickman is manager of the Phoenix-based Kaiser Aerospace & Electronics plant. Kleykamp is the firm's marketing manager. Both have been active in the development and marketing of Kaiser's CATV equipment line.

MOXON TO REPRESENT FAIRCHILD

The appointment of Moxon Electronics as field engineering representatives for Fairchild's Scientific Instrument Department in the southwestern area has been announced by Fred L. Katzmann, department manager. Moxon will represent Fairchild in sales engineering of oscilloscopes, signal generating equipment in the states of California, Nevada, and Arizona.

VIKING EXECUTIVE WEDS

It has been announced that the former Patricia Ann Pearson of Philadelphia, Pennsylvania was married to Robert E. Baum of Teaneck, New Jersey in New York City on February 14, 1965.

The new Mrs. Baum was an airline stewardess with United Airlines. Mr. Baum is Vice President in charge of Sales at Viking Cable Company, Hoboken, New Jersey. They will reside in Tenafly, New Jersey.

LETTERS

Dear Sir:

As a CATV owner, I have been interested in your editorials concerning TV Guide.

I also feel as you do, that the TV Guide Magazine in articles written by Mr. Harding has a tendency to discredit CATV systems to the public.

To add to your original theory that Triangle Publications are hurting themselves in their Anti-CATV policy, the following observations are made.

I now provide our customers 12 channels of television at a rate which competes closely with the cost of an all-purpose antenna. We also carry numerous FM stations. Of the 12 TV channels, two are owned by Triangle Publications, Inc., consisting of WFBG, Altoona, Channel 10 and WHYL, Lebanon, Channel 15 plus WFBG-FM.

I now have a letter from WFBG-FM offering a service to my customers who listen to their FM station; stating how good their programming is, and that we should want to offer this station to our subscribers, and that if we now carry their stations on our cable, we should advise them to this fact. The FM station will then supply subscription forms for mailing literature to these customers.

We have had advertising folders and other items from both stations, which we gave to the public from our office.

I personally feel that some decision should be made as to whether Triangle Publications is embarking on a policy to degrade CATV. If so, I think steps can be taken to oppose this type of thing by individual CATV owners.

Edgar J. Rosenberry
Shippen TV & Cable Co.
Shippensburg, Pa.

Dear Stan:

I would like to compliment you on the great improvement "TV & Communications" has made in general appearance and editorial quality in the past year.

You have firmly established yourself as the "voice of the CATV industry" and can be especially proud of the 1965 annual directory.

I was wondering . . . have you had a reply to your two excellent editorials directed to the editors of TV Guide?

Robert H. Huston
Director of Public Relations
Ameco, Inc.
Phoenix, Ariz.

• *Bob, the "explanation" offered by TV Guide's publisher is printed below.*

Dear Mr. Searle:

To clarify for you the seeming contradictions between the editorial position of TV GUIDE and the position of Triangle's television division, it is the philosophy of Walter H. Annenberg, President of Triangle Publications, Inc., to have each division of Triangle Publications, Inc. operate independently according to its own best judgment. The fact that the television division may be operating in an area TV GUIDE is critical of is not inconsistent with the corporate philosophy of the company. Indeed, within TV GUIDE itself, the editorial department operates independently of the advertising and circulation departments.

Just incidentally, our editors inform me that the Henry Harding material you quoted was by no means an editorial, but a news report on the CBS suit and background material so that readers would understand the suit.

James T. Quirk
Publisher
TV Guide Magazine

• *Thank you for your explanation, Mr. Quirk. Although we fully recognize the right of Triangle Publications to formulate its own editorial and management policies, we do take exception to some of the ideas you have expressed editorially.*

On behalf of the CATV industry we still disagree with your statement that the NAB study "seems to bear out" the contention that CATV systems are detrimental to local broadcasters. And, frankly, we can't help but wonder about a company policy which fosters criticism of CATV entry into big cities while your own company is competing for a franchise in Philadelphia!

Dear Sirs:

It was ascertained from Mr. Richard MacLennan, manager of WGHM Radio, Skowhegan, at the recent meeting of the news media, which I attended at "Sugarloaf," that the Maine

Broadcasters Association is attempting to put a bill into legislature that would outlaw CATV in the State of Maine.

Since this is of the utmost importance, you, like myself, will no doubt follow the possible introduction of this proposed legislation and . . . oppose this group attempting to strangle 'free enterprise' in Maine.

William David Savoy
Telstar-State Enterprises, Inc.
Madison, Maine

Sirs:

We are operating a community television antenna system and your publication has been recommended as an indispensable tool for our company in the CATV industry.

Will you please send us a copy of your publication with a subscription application form.

A. Chagnon
Videotron Div. of
E. R. Chagnon, Ltd.
Montreal, Quebec

Gentlemen:

Our firm has CATV franchises for Aspen and Rifle, Colorado, and hope to begin construction this Spring.

We have read your magazine with interest and would like to be added to your controlled mailing list.

William R. Dunaway
President
Canyon Cable TV Corp.
Aspen, Colorado

• *A subscription form has been mailed to you. Although some sample copies were mailed during our first year of operation this practice has been discontinued (See subscription prices on special card following page 18.)*

Dear Sir:

We read your publication, TV & Communications, with interest and find it a very well completed magazine.

We would be pleased to have you send us three extra copies of the January issue. Kindly advise us of the charges involved so that we may compensate you for your trouble.

L. E. McBride
CKCK - Ch. 2
Regina, Saskatchewan

• *Thanks for your interest. The extra copies have been mailed. The charge for back issues, when available is 50¢ each, except for the Directory issue which is \$1.00 per copy.*

What's the big deal about **Times' new** **2000 ft.** **seamless** **sheath** **CATV** **cable?**



Plenty! It not only saves you money in installation and maintenance. It performs better throughout the life of your CATV system . . . and actually increases system profits.

1. **Easily saves you 10% on installation and shipping costs.** 2,000 ft. lengths mean fewer splices. This saves you 8% in the cost of labor and splice connectors. Only 1 reel needed for 2,000 ft. of cable instead of 1 reel for each 1,000 ft. saves you an additional 2% in handling and shipping.

2. **Increases profit.** The fewer the splices, the less maintenance needed. Every splice is a potential trouble-expense point. Less maintenance means less labor cost and more profit over the life of the system.

3. **Improved electrical performance.** Times JT-1000 cable, in 2,000 ft. lengths, is manufactured with a guaranteed 26db minimum return loss—a must for minimum ghosting. Seamless tube sheath gives you the radiation protection you need when high power level amplifiers are used. And because it's seamless, Times JT-1000 cable won't let in moisture vapor that stops your signal short of target.

And don't forget . . . long after so-called economy cable has been replaced, Times JT-1000 cable will still be a top performer.

It's a fact: Re-installing a cable system costs more than the original installation. With a so-called economy system, your system starts deteriorating the day you put it in. But Times' JT-1000 cable keeps pace while you're upgrading your system and lives up to your system's planned potential. Why not take advantage of this direct way to improve your system's profits?

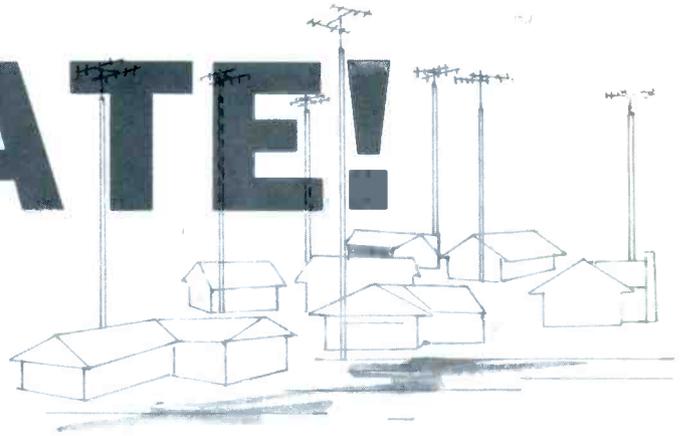


TIMES
WIRE AND CABLE

Division of the International Silver Co.

IS A SYSTEM NEEDED?

EVALUATE!



Judging the potential of a community antenna system a few years ago was an easy task. If the town to be considered had no off-the-air TV reception, either very limited, or poor reception, cable television belonged there.

The closer together that the houses were grouped, and the greater their number, the better the prospects for the system.

But that has changed. Now, sizable cities that have one and two stations within their borders are prospects for cable systems. And, CATV applications are being pressed even in cities served by all three networks. Witness Philadelphia, Pa. and its suburbs within the "A" contour of three networks and an Educational Television Station. At least six applicants are competing for the privilege of building CATV.

What will they offer subscribers? New York and its commercial outpouring from four independent chan-

Will he subscribe? At least six large and sophisticated independent business enterprises in the Philadelphia transaction think that subscribers will come flocking to the new reception service. Why not? Doesn't everything in the history of CATV point to a widespread acceptance by cable of more programs and better quality pictures? The automobile manufacturers offer more chrome trim on a car at a higher price, and get it. Cable TV is very similar. It offers more TV channels for a monthly service charge.

The appeal of more TV must be rooted deep in the nature of people. Where residents were previously able to receive two channels off the air, successful cable systems were developed merely by providing a single additional channel. Going back to the old DXing days, many a man sat hunched over his primitive radio set, ranging with his dials as far as he could travel electronically to hear

sent additional choices of programs. Then a person has a better chance of matching his tastes with what is available. Too, there is the undisputable fact that the set in position to receive more channels has added value built into it. The set on cable TV capable of bringing into the home programming from 8, 9 or 10 channels is more valuable to its owner than the set picking up only two signals.

How much more value is to be ascribed to the TV set on the cable is a matter of judgment. And, this value judgment can determine the success or failure of a cable system in a particular community.

Several elements must be evaluated in order to establish the value of a cable system. First, a listing should be made of channels and the quality of reception available on a home antenna. Measure this against what the cable will offer. This will bring in other factors: how high do off-the-air antennas have to be? Are rotating devices required? How about possibility of storm damage or roof hazards with home reception antennas? Naturally, the more favorable cable TV appears in comparison to individual reception devices, the more likely it is that the cable system will reach total saturation.

A check-off list should include an investigation of TV dealers' and servicemen's attitudes toward CATV. Antagonism here can cancel out many of the advantages superior reception normally gives to cable systems. Once dealers and servicemen are at odds with the local cable system, the process of reversing this feeling, even by

TELEVISION EVALUATION CHART

1. Improvement in TV reception in quantity and quality by cable over off-the-air pick up.
2. How does cable rate against antenna hazards?
3. Are more local stations due to come on the scene?
4. What is attitude of community to cable? Of the leaders, of TV servicemen and dealers?
5. Is the community economically sound today and for tomorrow?

nels stands tantalizingly close to the Philadelphian, only 90 miles away. Just add the miracle of CATV techniques to the means of broadcasting, and the Philadelphian will find his dial filled with as many program choices as are available to his New York neighbor.

some announcer give the call letters of a distant station.

Basic is the fact that television fills an important place in people's lives. It is important to note too, that no one station can usually fill all of a person's television desires.

Let more places on the dial repre-

TELESYSTEMS is people...



Jack Crosby, Executive Vice President, is a dynamic pioneer in CATV. Being one of the first people to introduce CATV in Texas, his cable TV interests soon spread throughout the country. In 1964, Crosby merged his cable interests with Fred Lieberman to form TeleSystems Corporation. As an integral part of TSC, Jack is a key decision maker, and has enabled TeleSystems to maintain its unprecedented growth.

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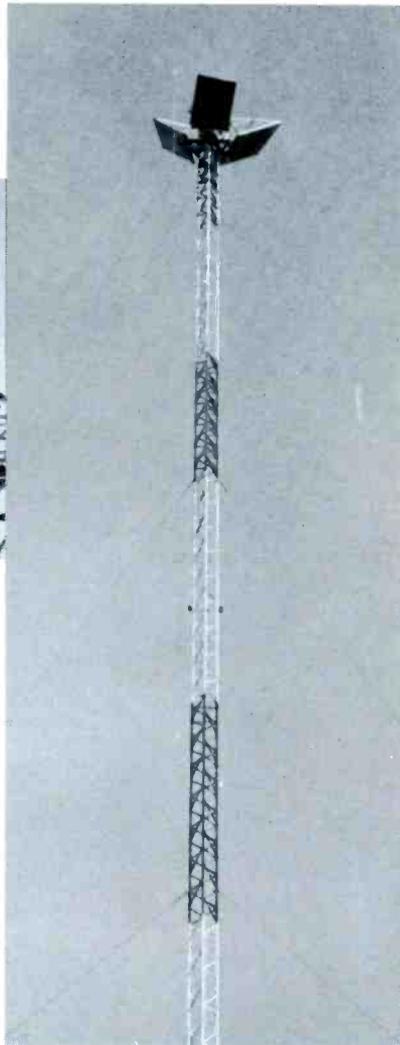
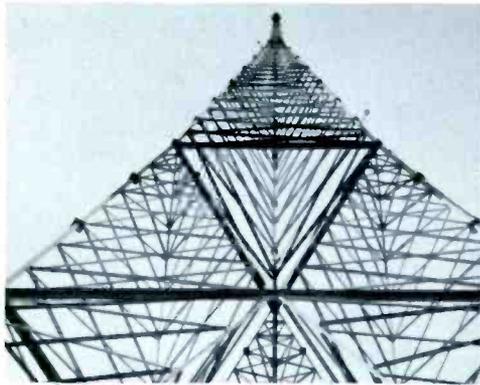


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new management becomes difficult. It can be done, however, by a continued show of good intentions.

The past public relations program should be checked. How well is the system regarded by the public; by its leading citizens and governing people; by the mass media such as local television stations, radio, the newspaper? Is there any danger of unfavorable legislation?

Lifting the curtain into the future should include a check on TV channels not now on the air but which have been allocated to the area. While systems do grow in the face of new channels, experience shows that a temporary loss of subscribers can be expected after the opening of a local broadcast station. Experience also shows a recovery in numbers of subscribers after the initial drop; proof that greater choice of channels, where pictures are good, is a promising base for system growth.

Now for a look at the community itself. Where does it stand economically and where is it headed? Investing in a cable system is a long range, expensive project and, therefore, calls for caution in the area of economic forecasting.

Is it a one industry town? Or one limited to a single military facility? Call on the Chamber of Commerce. Ask them for their figures and predictions. Expect the Chamber to be optimistic. After all, its business is one of promoting the town's economy. If there is a U.S. Employment Office, ask for employment and unemployment figures. Find out where the problems are, so that you can spot a trend that may affect the future of the system.

Chances are that population in the cities will grow in keeping with the movement of people from rural to more urban areas—population growth attracts industry—usually the larger the community, the safer, as far as its economics, you can feel.

A way of charting your findings is to set up a questionnaire with a scale for each important category as listed in the sample shown. Rate the questions Poor - Fair - Good. Then check right down the line.

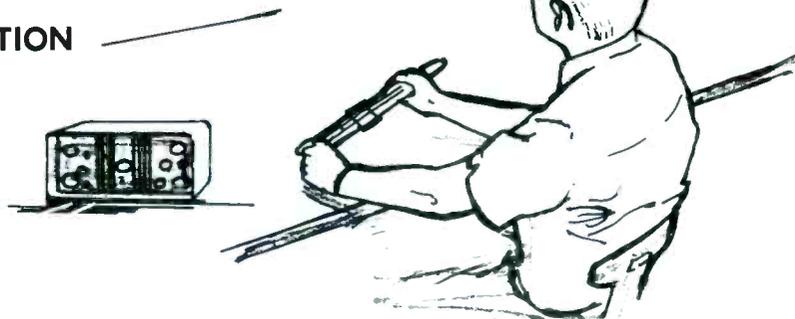
If most of your check marks land in the good column, you've got the go-ahead signal — The System has passed its exams! □

MAXIMAL-RATIO COMBINER

FOR HIGH ORDER RELIABILITY

DIVERSITY RECEPTION

R. R. MacMillan,
Kaiser Aerospace & Electronics Corp.



Many articles have been written on amplifier and system design based on fundamental theoretical concepts. How then do these affect the system operator, and how may the system operator apply some of the theoretical results to design a practical system? The following discussion is confined to broadband repeater or trunk line transistor amplifiers; discussing amplifier input performance, amplifier output performance and amplifier gain leading to a method of calculating optimum input and output levels for a system.

The theoretical minimum input noise introduced into a typical television channel of 4 mc bandwidth

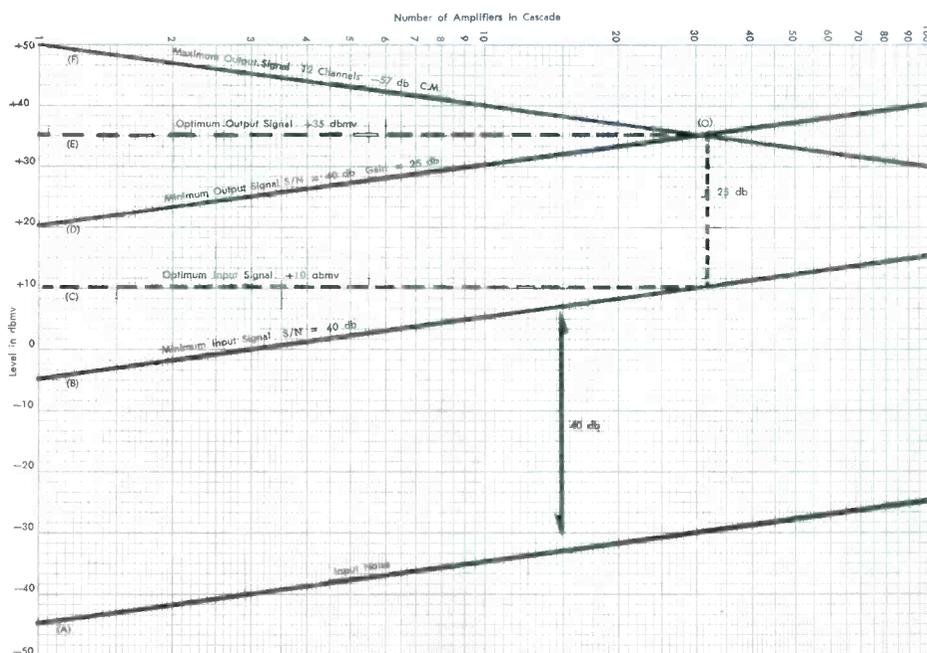
(typical TV receivers) by a perfectly matched amplifier of 75 ohms resistive input impedance is equivalent to an unwanted signal of approximately -60 dbmv level. Practical considerations (input matching circuits, the input transistor and the operation of the input transistor for gain and immunity to input overload) determine how close to the theoretical noise level can be realized in practice. With modern transistors, noise figures of 10 db. which result in input equivalent noise of -50 dbmv, can be achieved practically and economically. There is no theoretical limit on output capability, but again, the practical limitation is found in the output transistor as to

the gain-bandwidth, linearity and matching circuitry.

It should be noted at this time that some manufacturers specify a maximum output level without specifying the cross-modulation at that level. For proper amplifier and system evaluation, the cross-modulation percentage or cross-modulation level below the signal level should be known.

The matter of amplifier gain has been subjected to much controversy, and for good reason. Analysis of a single stage (one transistor) amplifier shows that for maximum cascadability the gain of each stage should be 8.7 db. It must be remembered that this is for a single stage with little thought given to input matching, input overload levels, input noise figure, tilt and output matching. Most manufacturers seem to agree that practical amplifier gains for all-band use are between 20 and 30 db.

Cascaded trunk line amplifier output levels must be lower than the rated output of a single amplifier for a given degree of cross-modulation, since cross modulation products are additive. Similarly, the signal-to-noise ratio of a single amplifier must be higher than the desired cascaded system signal-to-noise ratio, since noise products are also additive. Output levels must be derated by $10 \log_{10} N$, expressed in decibels where "N" is the number of amplifiers in cascade. Likewise, the signal-to-noise ratio of each amplifier must be greater than the desired system signal-to-noise ratio by $10 \log_{10} N$, expressed in decibels.

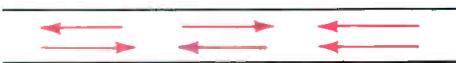


Let's talk about **TRUE** directional couplers

Multitap is an electrically superior directional coupler... a compact printed circuit tap and tap adder combination

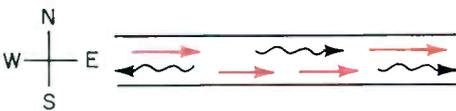
The response of the Multitap is shaped across the VHF-TV bands to compensate for loss characteristics in the service drop cable, so that proper signal levels are delivered at all channel frequencies.

As every technician knows, a coaxial cable is an indiscriminating, bi-directional electrical conductor, capable of transmitting signals from DC to roughly 1000 mc in both directions simultaneously. Its capability can be expressed pictorially something like this:



Coaxial cable is an indiscriminating, bi-directional conductor

The cable itself is, of course, quite indifferent to the source of the signals; to whether they are introduced by intent for transmission to a specific destination for a specific purpose (desired signals), or whether they are spurious in nature, introduced from a foreign source or generated within the cable itself as a result of structural or other man-made discontinuities (unwanted signals). If we represent a desired signal with the symbol \rightarrow , and an unwanted signal with the symbol \rightsquigarrow , then the capacity of coaxial cable for carrying both, indiscriminately, could be pictured thus:

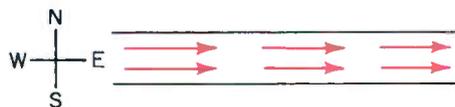


Coaxial cable carries wanted (\rightarrow) and unwanted (\rightsquigarrow) signals indiscriminately

Since the desired signals in this illustration are flowing east, the system amplifiers will, of course, be so placed as to receive and reamplify these signals and forward them on their way. Within its pass band the amplifier is just as indiscriminating as the cable, and it will reamplify undesired as readily as desired signals, as long as they

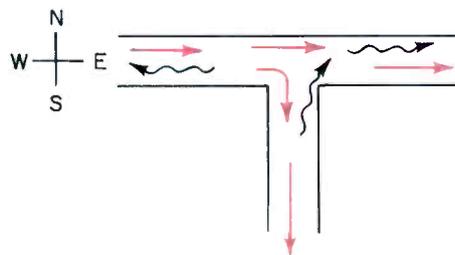
are east bound. Such undesired signals as are west bound, however, since in this illustration they receive no reamplifications, will eventually dissipate themselves from cable loss.

The transmission capability of coaxial cable has properly been likened to a super highway—a particular kind of super highway with access limited by the cable shield, but with no defined traffic lanes or “center strip”. “Desired traffic” is introduced at the beginning of the highway (west) and flows east with little or no undesired traffic in either direction if the highway is smooth.



Coaxial cable is like a limited access highway

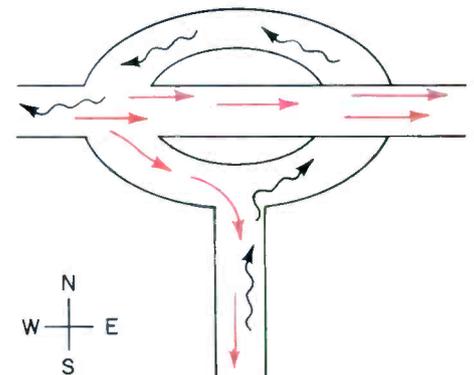
Tapping a feeder cable to provide a customer drop is very like building a side road from a super highway. If the old-fashioned kind of side road is constructed, and not controlled, it will provide not only the necessary egress from the highway but also uncontrolled access to it, and the flow of traffic would look like this:



Nondirectional taps admit unwanted traffic to the super highway

In the case of a CATV system, unwanted signals may originate in the TV receiver or from drop line mismatches. The undesired traffic entering from the tap road

turns east and west at will; the east bound continues the full length of the highway, as described above, doing vigorous damage to the desired signals as it goes; the undesired west bound traffic will eventually disappear, but it can find its way into other more westerly side roads with resultant damage. What is needed, obviously, is a side road so designed that it will receive from the highway only east bound traffic, and will simultaneously divert all traffic originating on the side road toward the west when it reaches the highway. To the highway engineer, such a design presents no problem and the resultant tap road would look as follows:



Directional taps screen off unwanted traffic

The undesired traffic (\rightsquigarrow) entering from the side road is diverted to the west and eventually disappears. It cannot enter an earlier side road, since all side roads from the highway are designed, as above, to receive only east bound traffic. Thus, the continuing traffic along the highway east bound is *all* of the desired kind.

This perhaps oversimplified analogy is intended to illustrate the basic principle of directional coupling of RF signals. A full discussion of the technology involved is available in a paper by Dr. Jacob Shekel which appeared in the July 1962 issue of *TV Horizons* (now *TV and Communications*). Reprints are available through Spencer-Kennedy Laboratories, Inc.

EXPERTS SAY:

“For best results, directional coupler tapping should be used in all systems; it is a must in wideband systems.”

Charles E. Clements
Consulting Engineer

“We have more than 4500 directional coupler taps in the systems which we have engineered and will recommend nothing else.”

D. J. MacKenzie, Chief Engineer
Master TV Systems, Inc.

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- *Easy Installation*
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- *Economy*

The new SKL Multitaps combine the unquestioned superiority of the directional coupler principle with a unique economy of through line loss per tap.

Multitap applies the same principles of customer service as utilities and also solves common CATV tap problems with its excellent impedance match, flat frequency response and high isolation characteristics.

The distribution lines of any CATV system form its front line of revenue. In fact, the entire investment in tower, receiving equipment and trunk lines is made to create these feeders and to deliver clear, high quality signals to their inputs. It is illogical to jeopardize such an investment by lowering quality standards at customer service points with taps having poor match, frequency response irregularities and inadequate isolation.

APPLICATIONS

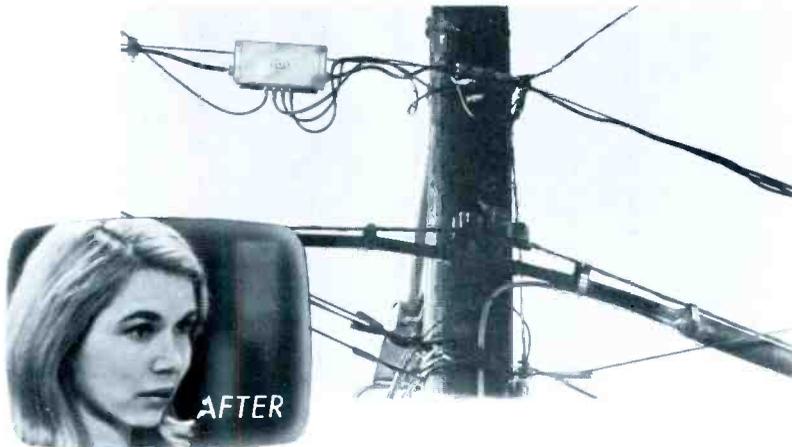
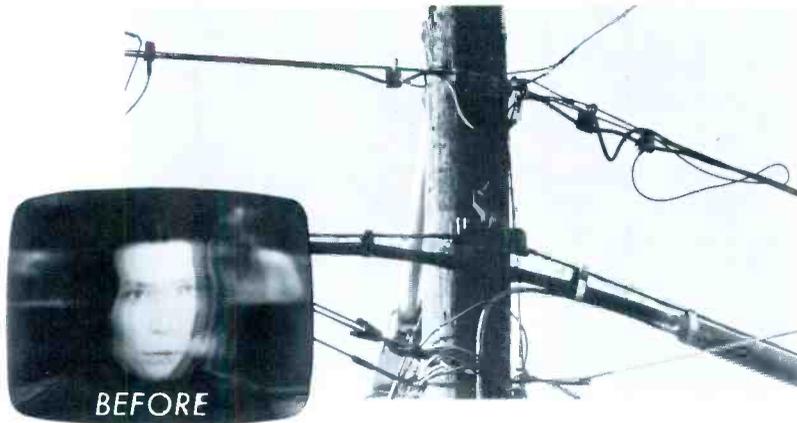
In New Construction

One convenient time to prepare for customer tap service is when the distribution lines are placed. SKL Multitaps should be installed on messenger strand at locations indicated by the density of potential customers. In this manner the distribution network is ready from the outset to meet full saturation requirements without line cutting or puncturing, and with no interruption of customer service.

In Existing Systems

A single Multitap with a four-output insert plate should be installed to replace four adjacent resistive or capacitive taps. It should be located centrally to accommodate the four service drop cables involved. Where resistive or capacitive taps occur in clusters, their mismatch frequently causes cumulative reflections which visibly degrade the picture. Replacement with SKL Multitaps will correct this condition and at the same time will cure interference entering the line from customers' television receivers.

Call or write for Multitap specifications and prices



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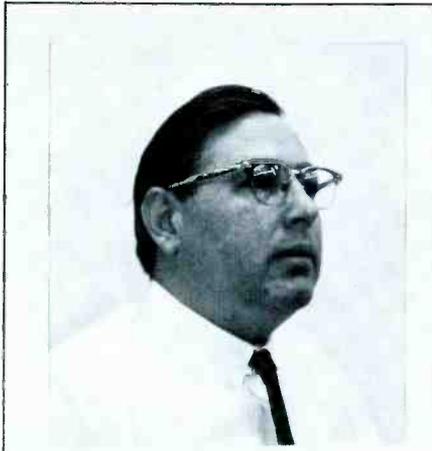
With the above information it is possible to plot the system performance capability of a cascaded amplifier system.

Let us assume the following amplifier characteristics:

- 1) Input noise figure 15 db
- 2) Output level for 12 channels (at a cross-modulation of -57 db) +50 dbmv
- 3) Amplifier gain of 25 db
- 4) Signal-to-noise ratio 40 db for over-all system

As seen in Figure I:

- Input noise derated by $10 \log_{10} N$ is shown on Curve (A).
- Since it is desired to maintain a signal-to-noise ratio of 40 db, the minimum input signal for this condition is shown (Curve B) 40 db above the input noise.
- The amplifier has a gain of 25 db, therefore, the minimum output signal to maintain 40 db signal-to-noise is shown (Curve D) 25 db above the minimum input signal.
- The single amplifier output capa-



The author of this article is Richard R. MacMillan, project Engineer at the Kaiser Aerospace & Electronics plant in Phoenix, Arizona. Mr. MacMillan has had 13 years experience in advanced electronics design and development, involving most recently solid state circuit design for automatic checkout of video display.

He holds a B.S.E.E. from Tufts University, did graduate work at Northeastern University, in Boston, Massachusetts, and is the author of the Power Converter section of "A Handbook of Selected Semiconductor Circuits" for the Navy Department.

bility derated by $10 \log_{10} N$ is shown on Curve F.

● The intersection of Curve (F) and Curve (D) establishes the maximum number of amplifiers that can be cascaded for the original specifications given.

● The intersection (point O) for this example, indicates the maximum number of amplifiers in cascade to be thirty-two (32) with an output level on the highest channel to be +35 dbmv. Since the amplifier has a gain of 25 db, then the input level will be +10 dbmv.

For operation of less than the maximum number of channels, it is recommended that the optimum output level still be used since this level is equally spaced between the maximum overload level and the minimum output signal for the desired signal-to-noise ratio. As long as the output level versus the number of amplifiers in cascade is maintained within the limits of Curves (F) (O) and (D) (O) of Figure I, the required limits of cross-modulation and signal-to-noise ratio will be met.

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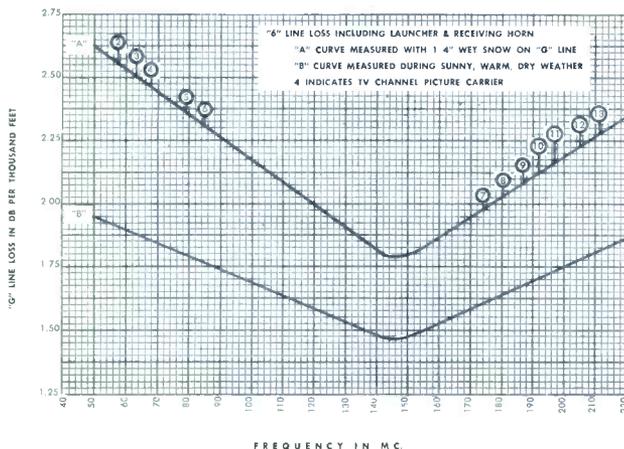
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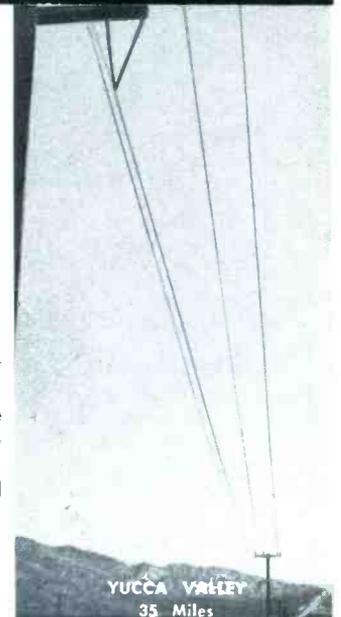
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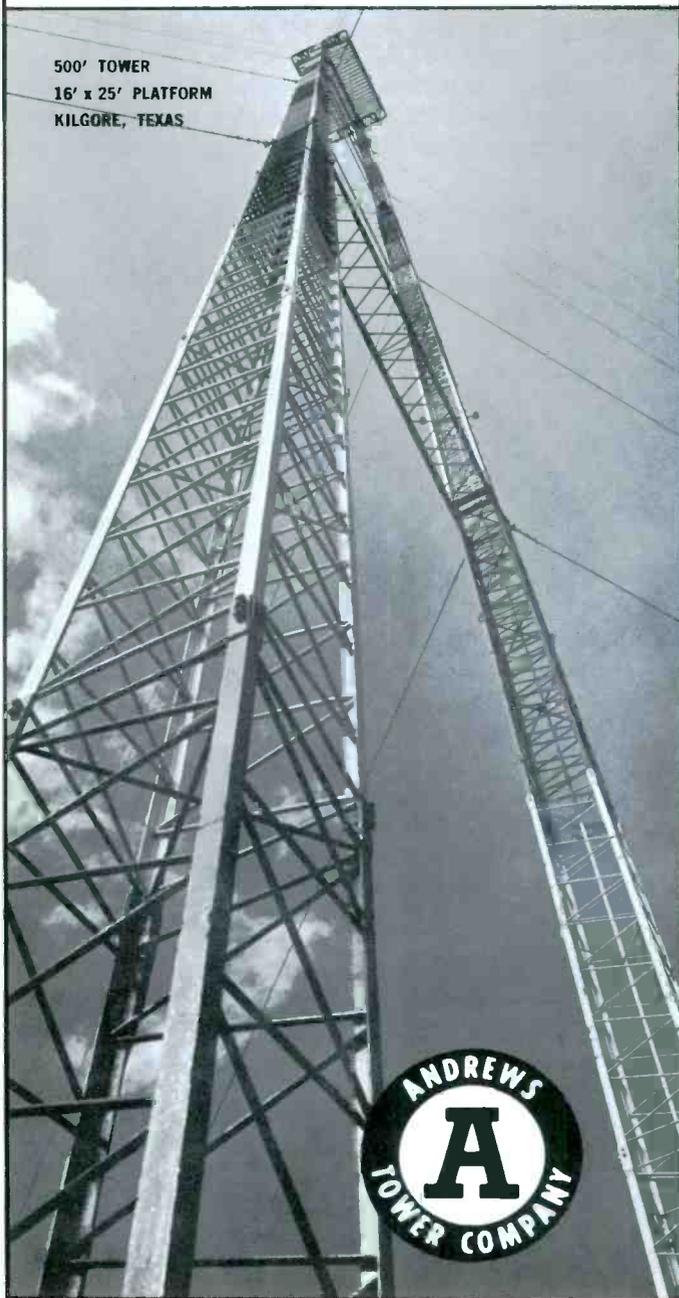
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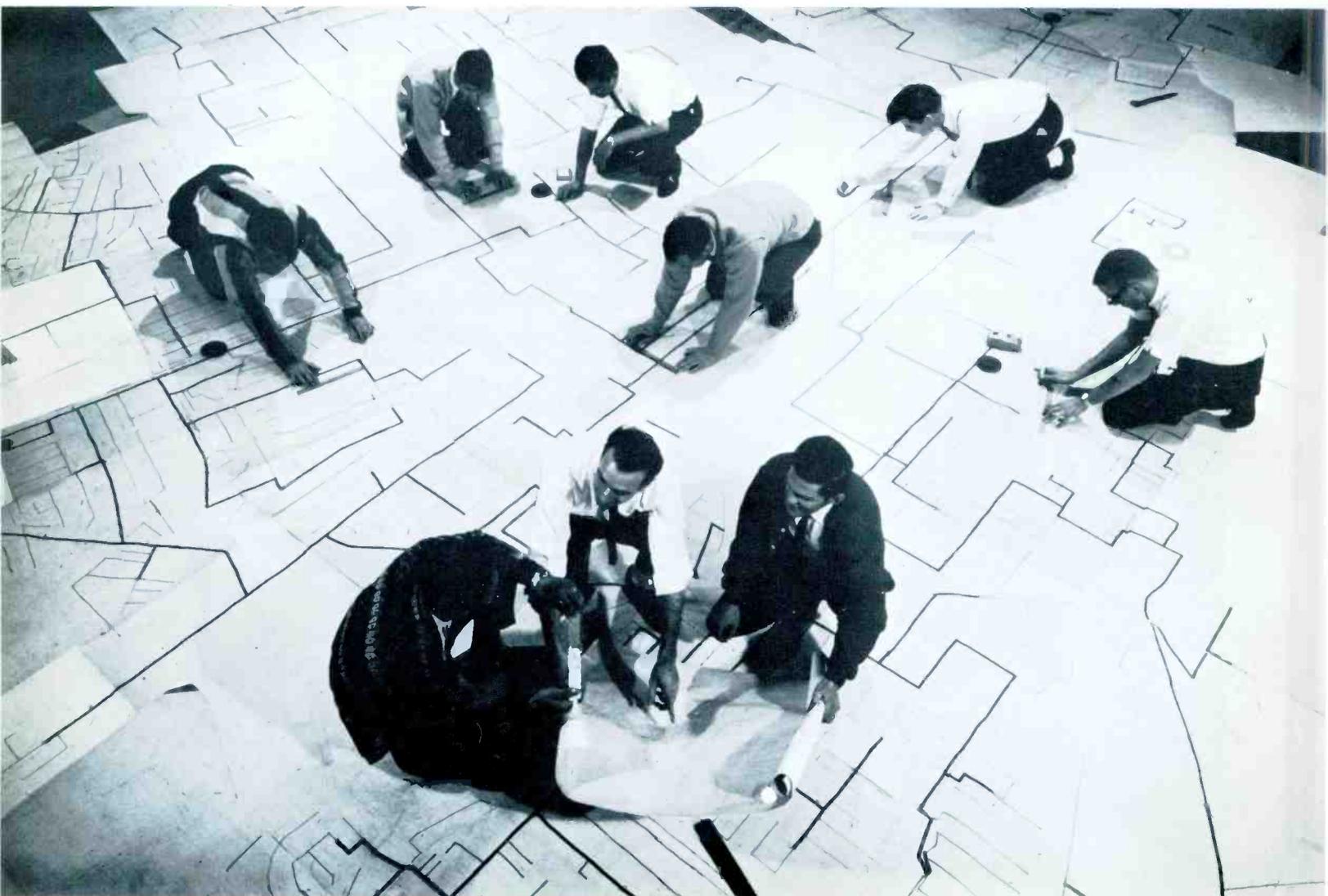
SYSTEMS ARE . . .

GETTING BIGGER!

CATV growth is making more and larger demands on manufacturers of systems and components. New developments in equipment for cable television require increased technical knowledge and skill for successful design. And the increase in size of many CATV systems now under construction make system design a real undertaking, re-

quiring hundreds of man hours in preparation. Even the physical size of system layouts on paper has created some unique problems for CATV construction companies.

The system layout pictured on the cover of this issue, for example, shows how many engineers and draftsmen sometimes "get into the act." This particular system is now



under construction for Waco-Temple-McGregor, Texas. In terms of miles, this cable system is perhaps the largest single CATV system currently planned for the United States . . . some 460 miles of plant! It was designed and is being constructed by Ameco, Inc. of Phoenix, Arizona.

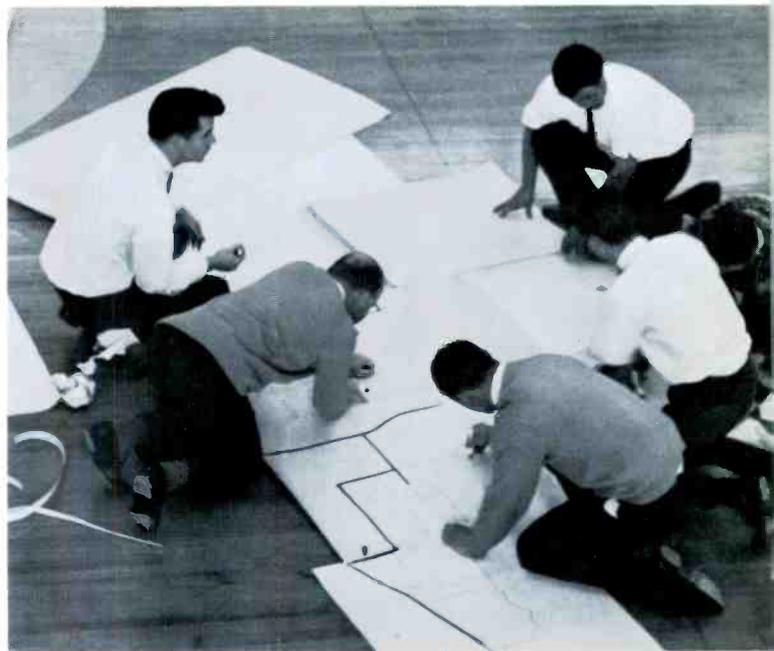
Utilizing a design scale of 1 to 200, the Waco portion alone required a floor area 60 by 40 feet for complete layout. Phoenix College volunteered the use of their gymnasium floor, interrupting a busy physical education program to do so. Ameco spread 83 separate pieces of system map over more than half of the gym floor.

Joe Derocher, head of Ameco's System Design Department says, "No longer can we design a system without visualization of the many aspects of the whole system. When layouts were small enough to be contained on one drafting table, design was relatively simple. Much more time must be spent in engineering, cable routing, feasibility studies, and site inspection with the larger layouts."

To graphically illustrate the tremendous amount of time and manpower involved in the design of a large CATV system, further reference to the Waco-Temple-McGregor system should be made. Nine men from the design department at Ameco spent some 500 man hours in original layout, 48-plus hours in checking and verification of the system's technical features and accuracy, plus two weeks to prepare the bill of materials needed for construction.

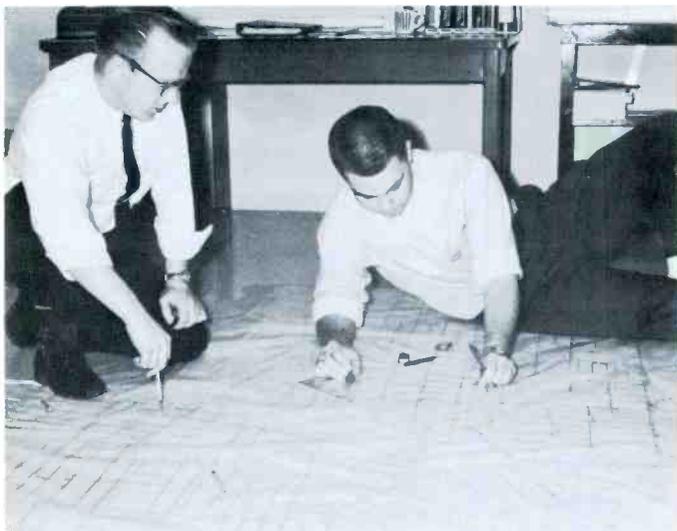
This is a vivid demonstration of some of the complexities which go along with the development and growth of the CATV industry. And these characteristics will be more and more in evidence as larger systems are designed and built.

It is not inconceivable at this time to consider systems of well over 500 miles in cable length; even one of 1,000 miles! System designers must plan now to be able to handle such an assignment. Such a large system could, and no



doubt will, require further improvements over present design techniques. Already, the larger systems in operation demonstrate the need for a central location of the receiving site, or in some cases, multiple receiving sites fed by intra-city microwave. Many CATV operators are demanding systems planned for ease of maintenance, shorter cascades, and with greater operating safety margins than were required even a year ago. These designs naturally include the latest in techniques, construction practices, engineering advancement, and solid-state technological advances.

The CATV industry has reached the stage where it no longer thinks small. With today's fevered activity in the large metropolitan areas, techniques now in use will be subject to constant and continued upgrading as systems inevitably grow larger. Who knows how large a system will be common in the industry in the next five years? Perhaps even larger gymnasiums will be required for the system layouts of tomorrow! □



Scene above shows Entron, Inc. draftsmen laying out 300 mile Utica, N.Y. CATV system. Layouts spreading across the floor have become a common sight in engineering departments of major manufacturers supplying "turn-key" design and construction services.

Photo at left shows one section of the Waco-Temple-McGregor, Texas system. Design department personnel are checking to make sure each separate, numbered section of map is in correct position, and are tracing the trunk lines from section to section. The total Waco section is made up of 83 separate sections.



Practical Amplifier Cascading Calculations

By Gideon Rath
Jerrold Electronics Corp.

With the growing use of microwave links in all types of communication systems, the reliability of such systems has become of paramount importance.

It is known that one of the important factors in system reliability is the system signal-to-noise ratio. One customary method of optimizing the signal-to-noise ratio in a microwave system is to employ two independent communication channels in some form of diversity transmission and reception. Then both channels are fed through a device designed for passing the channel which has the best signal-to-noise ratio. Whenever the s/n ratio

of one channel equals that of the other, such a combining device usually is capable of delivering an output with a ratio better than that presented by either channel to the combiner input terminals.

The advantage of a diversity system is that, if the signal in one channel deteriorates or fails, there is a high probability that it will improve, or that the fault can be detected and repaired, before the other channel too becomes unreliable.

A prerequisite for any combiner design is that system reliability must not suffer from a failure in the combiner itself. Some of the circuitry of

a combiner necessarily falls in the signal path; these circuit stages should have built-in redundancy so that, for example, a single tube failure will not cause loss of signal.

Another necessary design aspect is the inclusion of a special switching circuit which, in case of complete combiner failure (absence of B+, or fuse blow-out), permits the microwave signal to completely by-pass the combiner for unimpeded onward transmission. Fig. 1 shows a simple block diagram of a single-hop microwave system employing a combiner for space diversity reception.

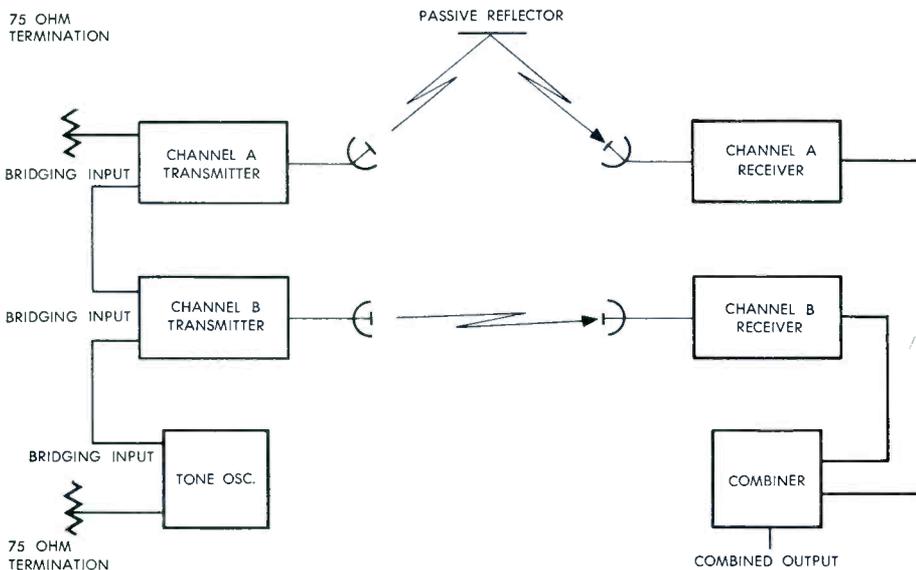


FIGURE 1 TYPICAL SINGLE-HOP SPACE DIVERSITY SYSTEM



FIGURE 2 VIDEO COMBINER MODEL JVC-65

Combiner Logic

The combiner logic is based on noise power measurements in that portion of the baseband spectrum of each receiver, where there is no signal from the transmitters.

An important requirement for the proper operation is the careful adjust-

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CHANNEL CONDITION				COMBINER CONDITION										
TONE A	TONE B	NOISE B	NOISE A	COMBINED OUTPUT	FRONT PANEL LIGHTS						RELAY READOUT			
					VIDEO A + B	TONE A + B	A VIDEO ONLY	B VIDEO ONLY	A TONE LOSS	B TONE LOSS	HIGH NOISE A	HIGH NOISE B	TONE LOSS A	TONE LOSS B
PRESENT	PRESENT	EQUAL TO B	EQUAL TO A	EQUAL CONTRIBUTION	ON	ON	OFF	OFF	OFF	OFF	NORMAL	NORMAL	NORMAL	NORMAL
PRESENT	PRESENT	UP TO 30 DB DIFFERENCE IN BASEBAND NOISE POWER		CONTRIBUTION INVERSELY PROPORTIONAL TO NOISE POWER	ON	ON	OFF	OFF	OFF	OFF	NORMAL	NORMAL	NORMAL	NORMAL
PRESENT	ABSENT				ON	OFF	OFF	OFF	ON	ON	NORMAL	NORMAL	ACTIVE	ACTIVE
PRESENT	PRESENT	NOISE POWER IN A 30 DB GREATER THAN B		FULL OUTPUT FROM CHANNEL B	OFF	ON	OFF	ON	OFF	OFF	ACTIVE	NORMAL	NORMAL	NORMAL
ABSENT	ABSENT				OFF	OFF	OFF	ON	ON	ON	ACTIVE	NORMAL	ACTIVE	ACTIVE
PRESENT	PRESENT	NOISE POWER IN B 30 DB GREATER THAN A		FULL OUTPUT FROM CHANNEL A	OFF	ON	ON	OFF	OFF	OFF	NORMAL	ACTIVE	NORMAL	NORMAL
ABSENT	ABSENT				OFF	OFF	ON	OFF	ON	ON	NORMAL	ACTIVE	ACTIVE	ACTIVE
PRESENT	PRESENT	ANY VALUE NOISE DIFFERENCE		FULL OUTPUT A	OFF	OFF	ON	OFF	OFF	ON	NORMAL	ACTIVE	NORMAL	ACTIVE
ABSENT	PRESENT				OFF	OFF	OFF	ON	ON	OFF	ACTIVE	NORMAL	ACTIVE	NORMAL
COMBINER MALFUNCTION				COMBINER CONDITION WITH CHANNEL CONDITIONS NORMAL										
FAILURE OF CIRCUITS COMMON TO TONE AND NOISES CONTROL				EQUAL CONTRIBUTION	ON	OFF	OFF	OFF	ON	ON	NORMAL	NORMAL	ACTIVE	ACTIVE
FAILURE OF CIRCUITS COMMON TO TONE ONLY				EQUAL CONTRIBUTION	ON	OFF	OFF	OFF	ON	ON	NORMAL	NORMAL	ACTIVE	ACTIVE
FAILURE OF CIRCUITS COMMON TO NOISE ONLY				EQUAL CONTRIBUTION	ON	ON	OFF	OFF	OFF	OFF	NORMAL	NORMAL	NORMAL	NORMAL
FAILURE OF A VIDEO BEAM TUBE				FULL OUTPUT B	OFF	ON	OFF	ON	OFF	OFF	ACTIVE	NORMAL	NORMAL	NORMAL
FAILURE OF B VIDEO BEAM TUBE				FULL OUTPUT A	OFF	ON	ON	OFF	OFF	OFF	NORMAL	ACTIVE	NORMAL	NORMAL
FAILURE OF DIFFERENTIAL AMPLIFIER				EQUAL CONTRIBUTION	ON	OFF	OFF	OFF	ON	OFF	NORMAL	NORMAL	NORMAL	NORMAL
FAILURE OF POWER SUPPLY, OR B+ FUSE				EQUAL CONTRIBUTION RESISTIVE MIXING	OFF	OFF	OFF	OFF	OFF	OFF	ACTIVE	ACTIVE	ACTIVE	ACTIVE

FIGURE 4 COMBINER LOGIC

ment of the transmitters and receivers during initial installation to produce in both channels signals that will be of equal amplitude at the combiner input terminals. Then, if propagation fade or RF power loss cause one of the channels to fail, the noise power

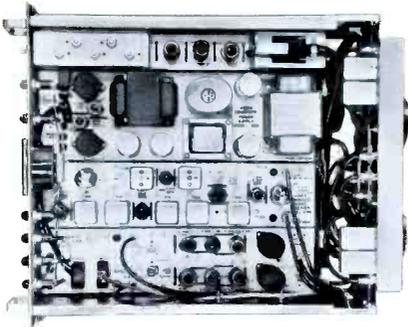


FIGURE 3 VIDEO COMBINER MODEL JVC-65 TOP VIEW CHASSIS SHOWING MODULAR CONSTRUCTION

in the baseband of that channel increases, which is interpreted as a decrease in reliability of that channel. The combiner then passes the channel with the better signal-to-noise ratio. Figures 2 and 3 show a Jerrold Combiner (Model JVC-65) that is compatible with these requirements.

Customary combiners have two noise receiver-amplifiers, detectors, and DC amplifiers, the outputs of which are then presented to the combining circuit. These internal circuits too have to be carefully balanced during initial set-up.

The disadvantage of this approach

is that any internal change in one of the two noise receivers (e.g. unequal tube aging) will be interpreted by the combiner as a change in the s/n ratio of the channel concerned, even if there has actually been no such change in the channel itself.

The prime objective in the design of the combiner described here was to overcome both this disadvantage and the necessity for dual circuitry as well as cumbersome initial balancing. This was achieved by introducing a chopper modulator in front of a single noise receiver. The chopper samples both channels at a 60 cps rate,

alternately presenting the output of each channel to the combining circuitry.

For certain types of reception failure (component failures in one of the microwave receivers) the baseband noise may decrease. To prevent the combiner from misinterpreting such failures, a pilot tone of 7.0 mc is inserted in the unused part of the baseband spectrum at each transmitter. The combiner then senses both noise power and tone before selecting the better channel. Further, the JVC-65 has been designed so that when both channels arrive with equal noise

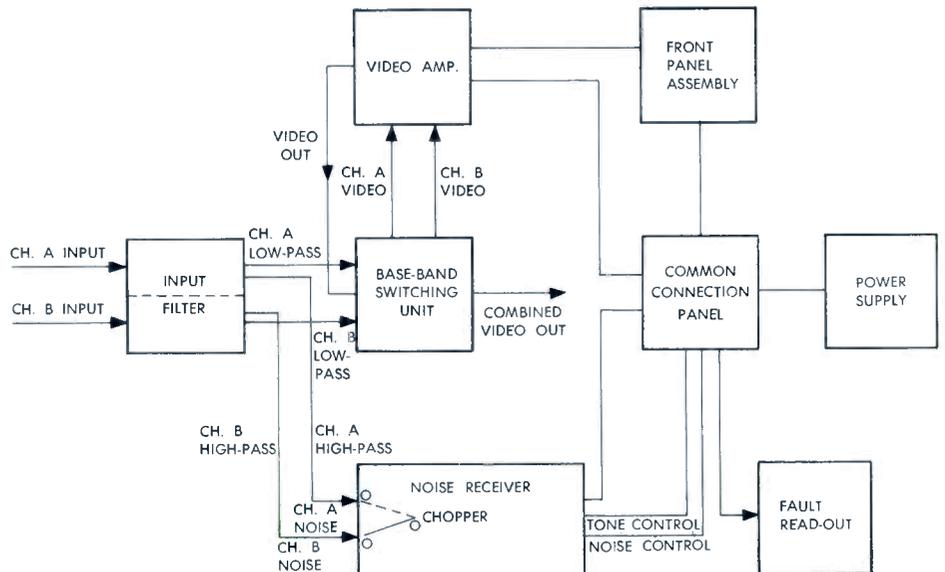


FIGURE 5 COMBINER MODEL JVC-65 . . . FUNCTIONAL BLOCK DIAGRAM

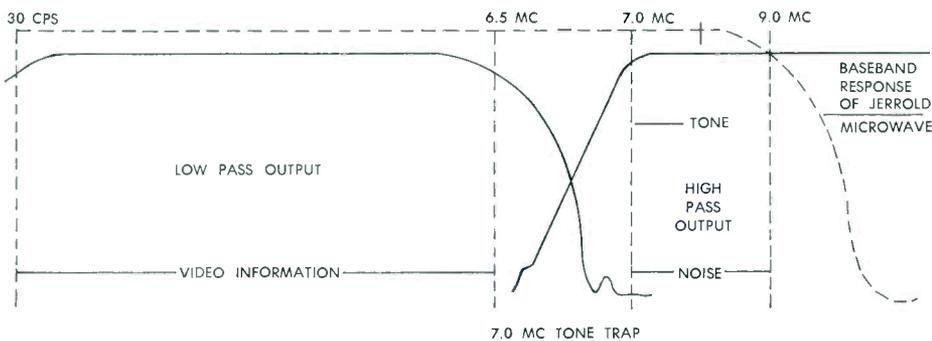


FIGURE 6. TYPICAL FREQUENCY RESPONSE OF SPLITTER FILTER NETWORK

power, the s/n ratio of the combiner output will be better by at least 3 db over that of either channel.

Fig. 4 presents a summary of the combining logic.

Combining Speed

In case of signal loss in one channel, it is important to know how fast the combiner will react to deliver a usable signal from the other channel. For certain parts of the receiver circuitry (for example, the video amplifier stage) a tube failure is not

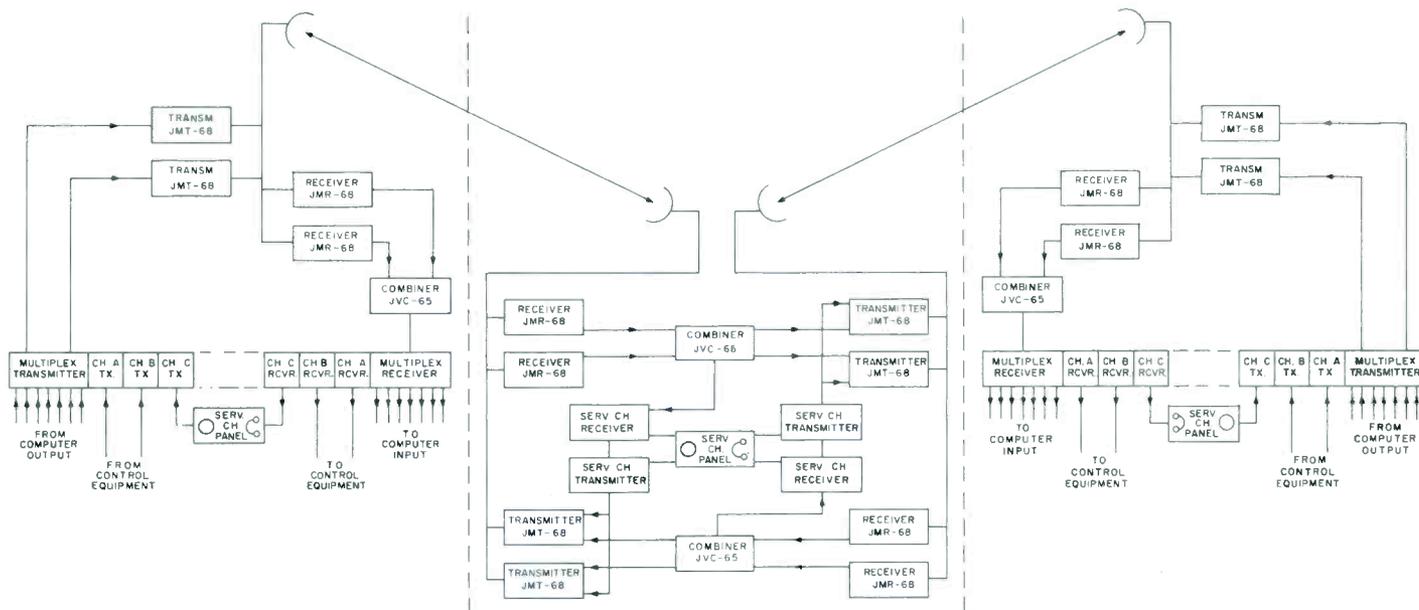
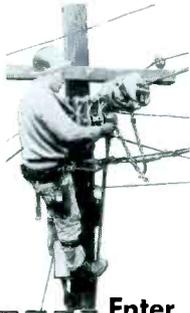


FIGURE 7. TYPICAL MULTIPLEX DATA TRANSMISSION SYSTEM WITH COMBINERS FOR FREQUENCY DIVERSITY RECEPTION



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followed by an increase of the noise level; failures of these circuits are taken care of by the combiner requiring pilot tone input before it will pass the channel from that receiver. However, for most types of failures the combiner will experience a gradual increase in the noise level of the deteriorating channel. The rate of that increase, as the signal passes through the receiver, is governed by the time constant of the receiver's automatic gain control circuit. For most types of failure—propagation fades, IF tube filament burn-outs, etc.—the noise level will increase fast enough to assure combiner reaction before the signal is lost entirely. In such cases the maximum degradation of the signal delivered by the combiner will be a 3 db to 4 db fade in level, lasting approximately 33 milliseconds.

The worst failure case is found when one channel is better than the other by 15 db or more and then sud-



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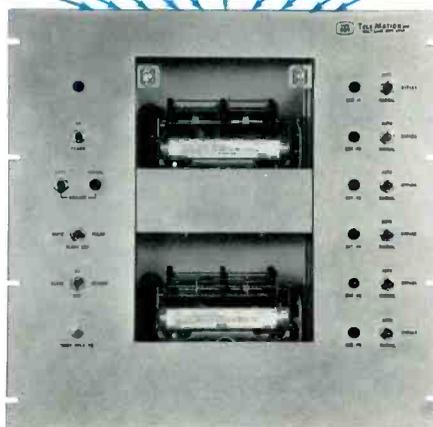
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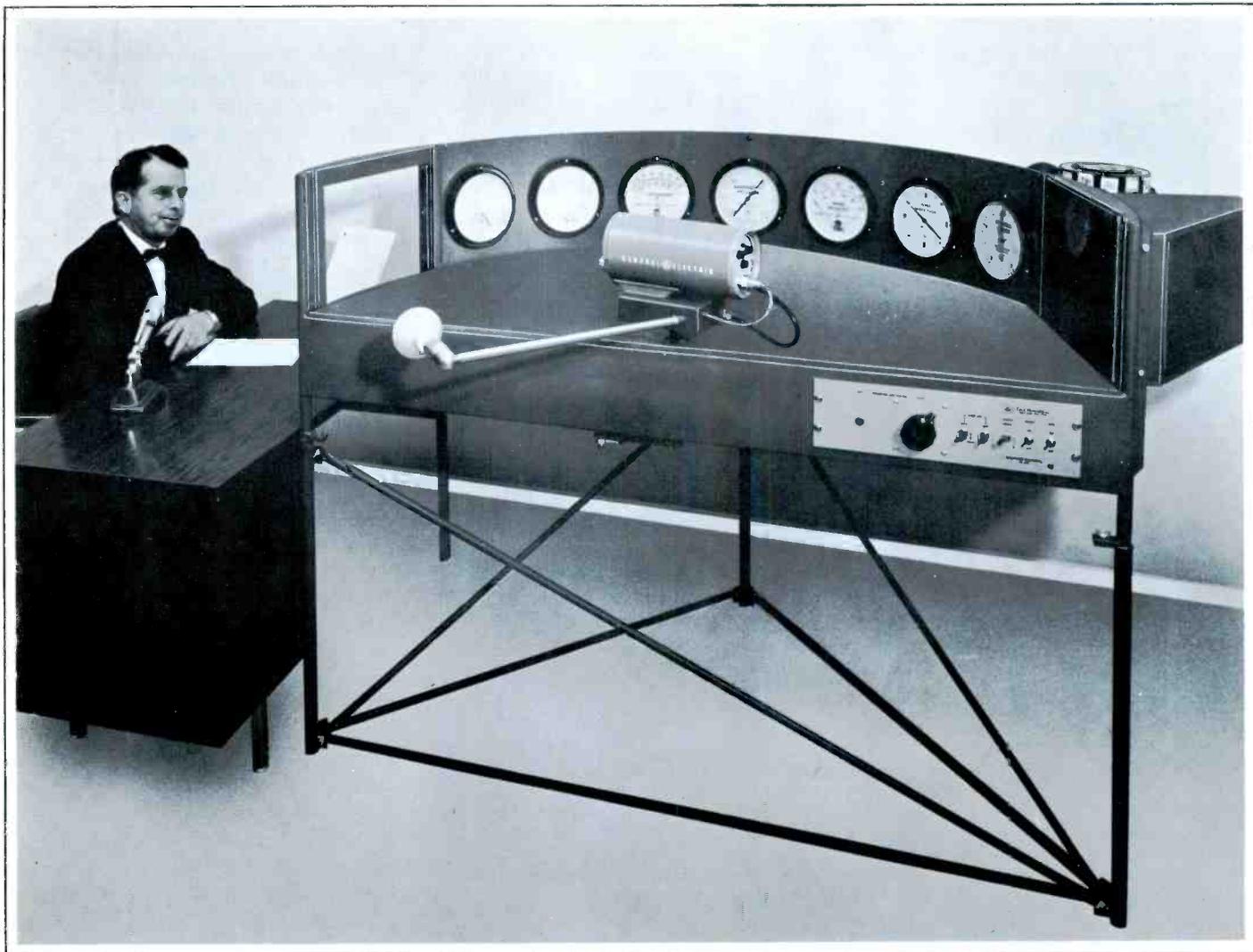
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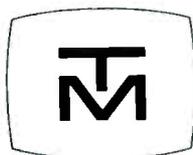
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denly fails (for example, by a wire breaking). This causes a loss of pilot tone and in such cases the combiner makes a complete transfer. Such unusual types of failure may result in a signal loss lasting up to 300 milliseconds.

Combiner Circuitry

The combiner has a built-in 115 vac regulated power supply, an input fil-

ter stage, a noise receiver, a video amplifier, a baseband switching circuit, and a common connection panel. These circuit stages are accommodated in four sub-chassis modules, the front panel, and the rear panel assembly. The tone oscillator required for generating the 7.0 mc pilot tone is a separately housed crystal-controlled transistor oscillator, mounted on and energized from the associated transmitter.

Fig. 5 presents a functional block diagram of the combiner circuitry.

The input filter stage comprises two identical networks, one for each channel. Each network has a low-pass filter, a high-pass filter and, included in the low-pass filter, a bridged-“T” pilot tone trap. The function of this stage is to provide separate video and noise outputs from each of the incoming channels. These output are then processed independently of each other. Fig. 6 shows the video and noise response curves in relation to that of the microwave baseband.

The function of the noise receiver is to translate the relative magnitude of out-of-band noise into control voltages suitable to proportion the video combining. This is achieved by sampling and heterodyning the inputs from both channels via a 60 cps chopper modulator, an amplifier and filter stage, followed by a mixer with a crystal-controlled 9 mc oscillator. From there on the noise signals and the tone signals are processed independently. They are brought out through a tone detector, a noise detector and a synchronized chopper demodulator, and then fed to the video amplifier stage. A tone control voltage and a noise control voltage are fed to front panel pilot lights as well as to barrier strip terminals at the rear panel for connection to remote control indicators.

The video amplifier stage employs beam deflection tubes for combing the two channels and passing the combined output through parallel amplifiers for onward transmission. The circuitry employs inverse feedback in order to maintain a constant output level in the event of tube failure. A relay in each channel provides contact closures for grounding the video signal of the noisy channel when ever the voltage difference between the two channels corresponds to a difference of 30 db in noise power. As soon as the noise power difference returns to a level of 22 db, the relay opens and normal combining action is resumed. The paralleled amplifiers constitute a redundant circuit so that a component failure in one leg will not impair the signal flow.

The baseband switching circuit employs a resistive mixing network and two relays connected in series with the B + from the power supply. Its function is to route the microwave

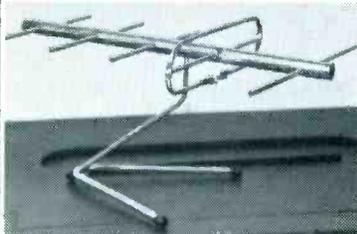


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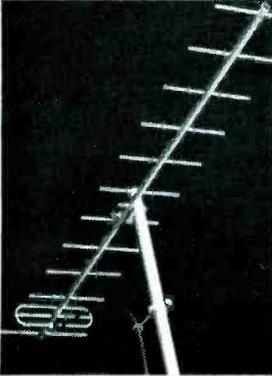
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signal past the combiner in case the combiner itself fails completely. In normal operation the relay contacts are held closed by the B+ current. In case of failure, the relays become de-energized and connect both combiner inputs to the resistive mixer which passes the combined output for onward transmission.

The common connection panel houses a differential amplifier which controls the beam deflection of the combining tubes in the video amplifier module and supplies operating voltages to the relay driver. The panel further incorporates the control circuit for tone loss indication, the switching circuitry for the metering selector, and also distributes the operating voltages for the other sub-chassis. The metering circuitry permits front panel metering of all vital operating voltages without interrupting combiner operation.

Fig. 7 illustrates a typical duplex microwave data transmission system with electronic repeater station for 7 high-speed data channels, 2 control channels and one service channel, operating on the frequency diversity principle to achieve high order reliability.

It has been calculated for example that in a typical 15-hop microwave system, with combiners installed at each hop, outage time would be cut drastically from 72 hours per year to a mere 45 minutes per year. This represents an improvement in system reliability of almost one hundred times.

Conclusion

A diversity system using a fail-safe combiner such as described will increase system reliability by contributing to a better system noise figure, by keeping down-times to a minimum through built-in redundancy and, in case the combiner itself fails completely, by unimpeded baseband transmission through a built-in switching circuit. Reliability is further enhanced by the special sampling circuitry which eliminates possible error sources inherent in dual components used in customary designs and the necessity for their careful balancing in initial set-up.

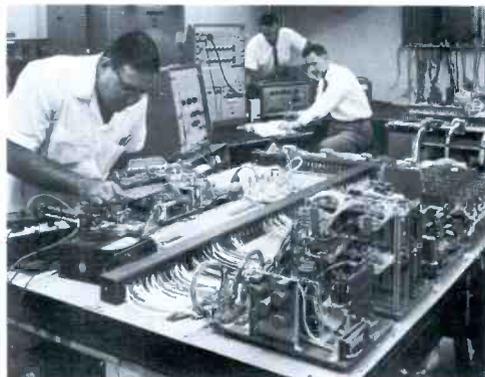
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The writer wishes to express his appreciation to Mr. John Nardontonio, Project Engineer at Jerrold Electronics, whose engineering design notes constituted the basis for this article.

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Guest Editorial

A ROSE IS . . .

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By Charles Wigutow

If you use the terms "CATV" and "Pay TV" in the same breath to some broadcasters or television viewers, you have automatically equated the two.

Once this is done, protests from the CATV operator to the effect that there is no relationship between the two become ineffective. Those who are interested in establishing such a linkage "got there first."

What chance does the CATV man have who is opposed to Pay TV, as many in the cable TV industry are? Cable men have as many reasons to be opposed to Pay TV as do the broadcasters. Pay TV can function through the air as well as over cable.

Cable TV is essentially an efficient pipe line through which all broadcast matter coming from stations carried on the cable is conveyed to the subscriber's set. Pay TV originates or chooses certain selected broadcast products which it merchandises to its customers. Cable television has no more in common with Pay TV than has any one in commercial broadcasting.

What should be the reaction of the cable man who is invited to a meeting, labeled as a discussion of CATV and Pay TV? We think that a request is in order to limit the meeting to one's own industry. CATV. Failing to limit the discussion to your own preserve, we think the meeting should be boycotted.

Better under such circumstances to leave this closed broadcasting group to dig around its own bases where it can have little effect on the industry it may be opposing. Whatever energy a group like this expends, it will be bottled within its own circles. That's much better than giving the appearance of legitimacy to propaganda against us by being part of a group that has fused cable TV and Pay TV into the likeness of a single topic. □

The Art of Cable System Management

Robert Huston
Ameco, Inc.



Cable television is an explosive, expansive industry. As a result, several hundred men became cable system managers for the first time last year. Several hundred more will join their ranks this year.

Maybe you are a new manager. Maybe you are an "old-timer" with two or three years of experience tucked under your belt. Or maybe *your* managerial job is still on the horizon. Chances are there will be something in this article for you.

Perhaps nothing really new. Nothing earth-shaking. Nothing you didn't already know. But rather some "thing" or "things" you had forgotten. Something in the art of management that could make you a better cable manager.

Let's examine some of these things. Let's face some of the basic problems of being a manager. Let's see if we can't make your job just a little bit easier; your future just a little more secure.

In a hypothetical case, let's assume you have just moved up the ranks and are seeking a clearer definition of your new title . . . "manager."



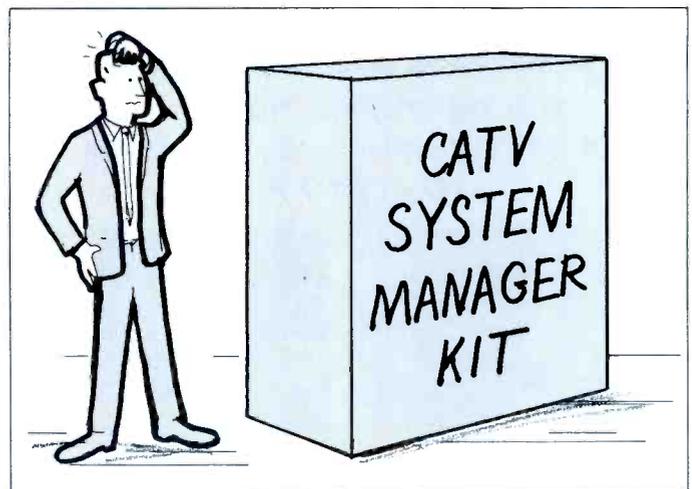
But keep one thing in mind, *titles do not make a manager*. To be a successful manager, you must function as a manager. So before we get thoroughly confused by titles, let's define the job of a manager.

First, a manager directs the work of others instead

of doing the work himself. Second, he makes policy decisions which his subordinates, rather than he, execute.

Or to put it another way . . . you, my friend, are now "the boss." *Now* the problems are yours. Management has shown its faith. Management now has its eyes focused on you. So what's the problem?

Well, there's only one problem. It isn't a profit problem. You can solve profit problems by close cost control. It isn't a sales problem. You can solve sales problems by promotion efforts. It isn't a maintenance problem. You can solve maintenance problems by updating your equipment. *It's a people problem*. People will either give you ulcers . . . or solve *all* of your problems.



But anytime you start to solve any of these problems . . . you find yourself right smack dab in the middle of "people problems." People will be needed for accounting, sales, and maintenance. *Your success, therefore, depends on others*.

How much easier it would be if you could only "do it yourself" instead of delegating it to a subordinate.

However, when you are a manager, you can no longer attempt to do everything yourself. You're too busy. Your job is too big. Attempt to solve each crisis yourself and a dozen others will arise while you try to solve the first one. It's better to train your staff to do the job correctly, promptly, and well.

Don't concentrate on "getting the work out." Instead, concentrate on the people who will do the work. Here is both the root of your problem and its answer. And as we said before, it's a "people problem." Help them, guide them, advise them, teach them, but it's *their* job, not yours, to carry out the decisions you make.

The first rule of successful management: *help other people to do the job themselves.* Forget this rule and you cease to function as a manager.

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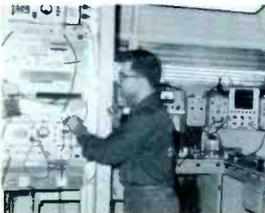


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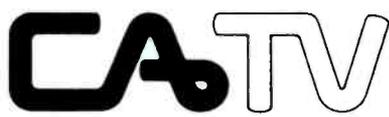
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"Of CATV People . . . By CATV People
. . . For CATV People"




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The knowledge gained through a decade of successful system design and operation is now available to you. We feature the best of all major equipment lines—as well as complete layout and installation service. Call us!

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One of the most brilliant managers we have ever had the pleasure to know is J. Leonard Reinsch, President of Cox Broadcasting Company. But the managerial job we are thinking of at this time does not concern Cox Broadcasting. It is Leonard's "hobby job" of being executive director of the Democratic National Convention every four years.

He starts six months prior to the convention with a staff of one. The past two conventions, it has been capable Gloria Kline of the expanding TelePrompTer chain.

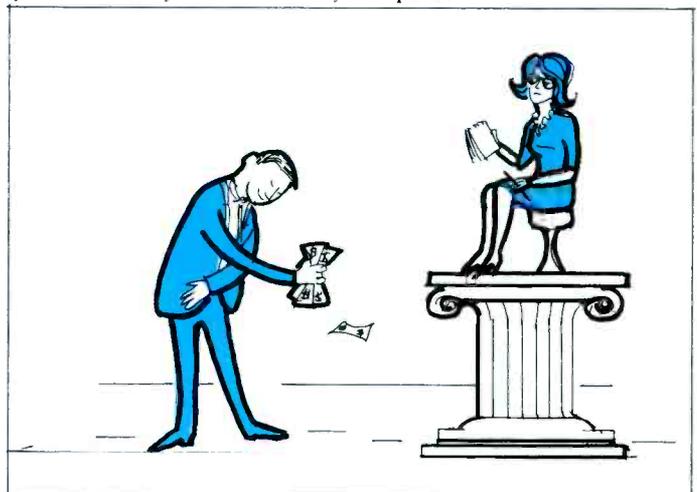
From this staff of one, he develops a crew that numbers in the neighborhood of six hundred by convention time. Some are paid workers, some are volunteers, but all must be managed properly if the convention is to come off with clock-like precision.

What's the secret to Leonard Reinsch's "formula" of successful management? Just about 18 hours of work a day making decisions the last two weeks before the convention starts. But here is the important thing: Leonard makes the decisions *one at a time* . . . delegates the problem to *someone else* . . . then moves on to the next decision without hesitancy or without looking back.

His success depends on how well the people working under him are trained, how well they perform, and how well he explains the assignment. But he alone is the manager and the convention could never come off if he were not a good manager . . . a manager who does not try to do *everything* himself.

People are his problem, but people also solve his problems.

You may not have six hundred people in your cable system. You may only have six. But they are the six whom you must rely on to solve your problems.



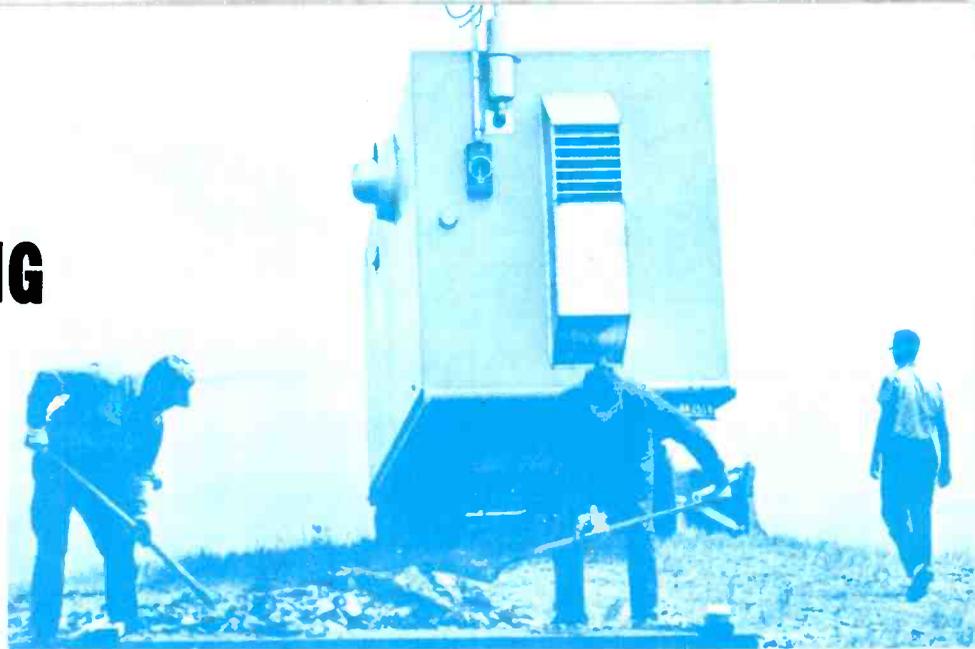
Paying them high wages or treating them like prima donnas won't help. The average person is conscientiously trying to do a good job (and if this is not the case, the sooner you weed this employee out, the sooner your problems will be solved), and the average person will do a good job if properly managed.

You can hire them. You can fire them. But neither of these moves alone will solve your problems. It's what goes on in between that counts. Your only hope in the long run is to train them and then properly manage them. Because you, my friend, have people problems.

But then don't we all? And the higher we go up the ladder of success, the more people problems we have!

SELECTING A HEAD-END BUILDING

By RICHARD OBARSKI
CATV Consultant



Having selected a suitable head-end site, whether it be for microwave or off-the-air reception, we will need an antenna supporting structure and building to house our electronic processing equipment. With certain minor exceptions, microwave repeater locations require the same considerations as the head-end site. It is the intent of this article to describe in general terms some of the types of buildings presently used for CATV and microwave installations. We will not attempt to prove the merit of one over the other except that where experience has proven certain features or faults we will point out these particulars.

In most cases the building should have no less than 100 square feet of floor space. In fact 150 to 200 square feet is not too large. This area allows for a couple of racks of CATV equipment, microwave racks, weather channel, background music, work bench, and storage. The ceiling height should be a minimum of 8 feet. Some microwave racks measure exactly 8 feet so a little more height or a sharp hack saw will be needed if this type of rack is used. The walls and ceiling should be of double construction with no less than 3" of insulation or equivalent throughout. It should have no windows and one door. A steel (or equal) frame and door is preferred. The door should be on the lee side according to prevailing winds. A room type air conditioner of about 10,000 B.T.U. should be installed about 5 feet above the floor on the wall that gets the least amount of direct sun. This size may be varied according to climatic conditions and the ambient temperature desired for the electronic equipment (tubed or solid state) that may be installed or proposed. A 1500 or 3000 watt thermostatically controlled heater with blower is suggested. Where winter temperatures get extreme a higher wattage or butane unit may be needed. Except for drainage or terrain problems, orientation of the building for off-the-air reception is not important. For microwave operation when the building roof is to be used to support dishes, the building should be positioned so that the dish reflector angles suit the microwave signal azimuths.

The roof and structural members should have adequate bracing if microwave dishes are to be mounted on the building. Sheathing materials for both interior and exterior are pretty much optional except that the following should be considered: durability, fire, resistance, and cost. More

durable and fire resistant buildings cost more. Conversely they require less maintenance and fire insurance. The concrete slab if used should be a minimum of 3½" thick, reinforced and trowl finished plus whatever footings are required.

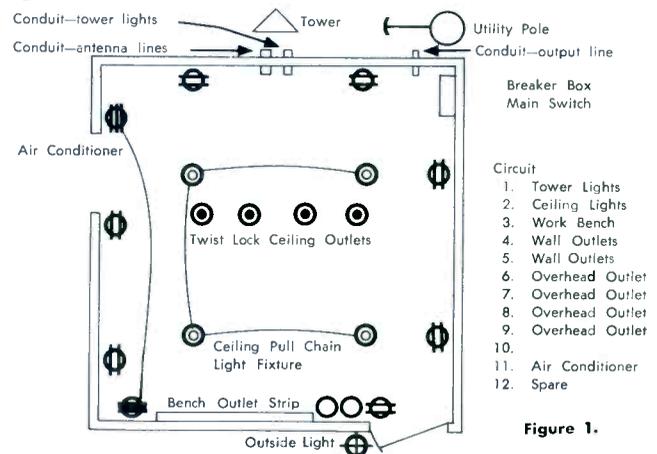


Figure 1.

The diagram (Fig. 1) shows a typical building layout with a breakdown of electrical requirements. In general the main service should be 100 amp. 3 wire 110-220 volts in accordance with the requirements of the utility company. A "main" switch, and a 16 to 20 circuit breaker box should be installed. All wiring should be No. 12 except where larger wire is required for air conditioning, heating, etc. Romex, BX, or conduit is optional and their use is based on local code requirements. A check of the line voltage and

	MASONRY	FRAME	PACKAGE	PREFAB
Cost*	\$1500	\$1300	\$2000	\$1000
Durability	Excellent	Good	Excellent	Excellent
Fire Resistance	Excellent	Fair-Poor	Good-Excellent	Good-Excellent
Maintenance	Good	Fair-Good	Excellent	Excellent
Weather Proof	Excellent	Excellent	Excellent	Excellent
Transportation	Excellent-Poor	Excellent-Fair	Excellent-Fair	Excellent-Fair

*Cost is approximate and does not include electrical.

regulation is important. A lot of tubes can get old fast if the power company maintains an average of 130 volts. This really hurts if the electronic equipment has no or poor filament regulation.

Figure 2 lists four type sof buildings, six factors to be considered, and our opinion of the relative merit of

DELTA

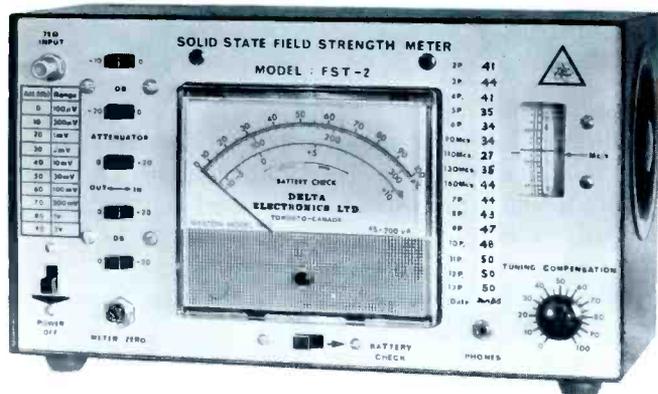
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Delivered

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Bandwidth	Lo-Band 54-108	Hi-Band 175-216
Gain	22 db	24 db
Tilt control	6 db	6 db
Gain control	6 db	6 db
Output level 12 ch.	36 db	37 db
Test points	-20 db	-20 db
Power	15-30 V.A.C.	
Power Feed Thru	Switchable	
Input pads (0-3-6 db)	Switchable	
Fittings	For all cables	
Housings	Tubular anodised aluminum	

Unique split band design for lowest intermodulation figures in the industry

each. This opinion is based on the following brief descriptions.

The masonry block building is as the name implies, constructed of blocks that are usually 8" x 8" x 16" and hollow. The material that they are made of depends on what is available locally, e.g. cinder, concrete, etc. The roof can be wood-joint, pre-stressed concrete, or blocks and steel rods covered in the usual fashion with paper, tar and gravel. The walls are built on a reinforced concrete slab. Because of the porosity of the material used, both interior and exterior walls are usually painted or treated to make them

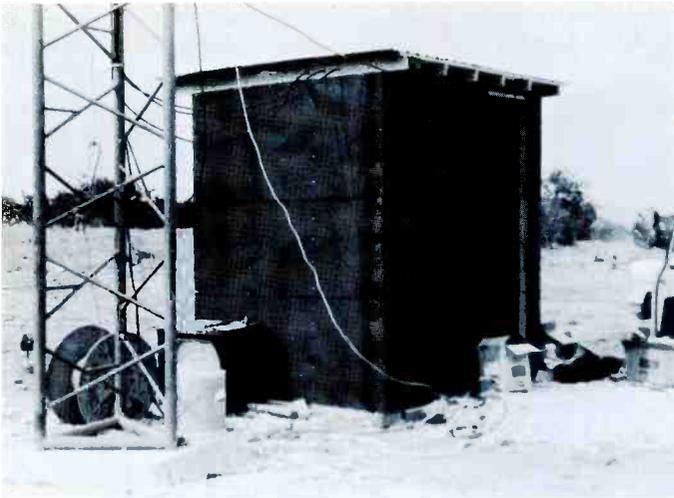


Masonry block units requires very little maintenance but may prove too expensive to transport to site.

waterproof. It is durable, fire-proof, and requires little maintenance. Cost is based on local availability of materials and skilled labor. Transportation to a remote site could be prohibitive or impractical with this type building.

The frame building constructed on a concrete slab with 2 x 4 studs on 16" centers lends itself to a variety of interior and exterior sheathings. Exterior—plywood, asbestos, enameled steel, aluminum, tar paper, etc. Interior—sheetrock, plywood, asbestos, cardboard, etc. The durability and fire resistance of a frame building can be improved by using the fire proof materials and while increasing the cost, the maintenance situation will be improved. Transportation costs and installation problems for a remote site are similar to those of masonry building.

The "packaged" building is completely assembled at the factory to the customer's specifications and shipped to the site as a unit ready for use. The wall, roof-ceiling and floor construction is of a sandwich type whereby some sort of insulating material (either honeycomb which provides structural strength or fiberglass bats) is sandwiched between two exterior and one interior layers of sheathing. Framing members on 24" centers add strength. The types of sheathing can be of any material desired depending on who the manufacturer is and how much the customer wants to spend. For example, the exterior can be fiberglass, steel, aluminum, plastic, etc. with a backing of plywood or asbestos. The interior can be fiberglass, plywood, steel, asbestos, aluminum or plastic. Factors regarding durability, fire resistance, and maintenance are pretty much the same as those considered in a "frame" building. It depends on which materials are specified. Transportation costs in the true sense of the word "freight" mean more here due to factory-to-site hauling but are usually offset by the convenience factor of having a complete ready to operate building delivered to the location. There is no requirement for a slab and



Although not recommended, this frame structure with a tar paper cover is easily constructed and very inexpensive.

only a minimum foundation. Electrical wiring is usually done to specifications as part of the package.

The pre-fabricated building is essentially the same as the packaged building from the standpoint of offering a variety of materials for fabrication. Unlike the packaged building, the pre-fabricated walls, roof, structural members, hardware, etc. are shipped as modular sections ready for assembly at the site. Ordinary hand tools and a couple of man-days work are the only things needed to erect this type building. It seems reasonable to assume that if similar type materials are used, durability, fire resistance, weather-proofing will be equal to other type structures.

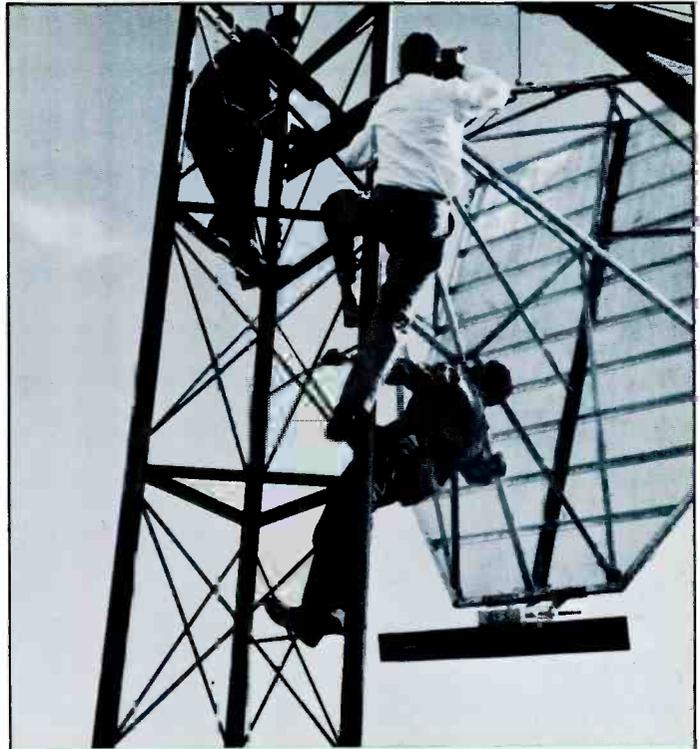
If we need one or several buildings of the same type a set of specifications should be drawn up. We should list our requirements, make a sketch showing dimensions and openings, outline the electrical and decide on how much durability, fire resistance and weather-proofing we want or need. With this information in hand we can contact several manufacturers or contractors and ask for bids. It is amazing how much the cost will reduce itself when being specific. The cost of a building will vary directly with the accessibility of the site, type of material chosen and how much guessing the contractor has to do.

We can summarize by saying that our building interior can be paneled in African Mahogany or old ping-pong tables. The roof can be peaked, pitched or flat. The shape can be oblong or square. For a series of remote microwave repeater locations we may want a packaged unit complete with the electronic equipment pre-tested and ready for operation. We may have to haul pre-fabricated sections up an 8000' mountain by cables. We can be the general contractor, do our own construction, or let someone else handle the entire project.

If you ever had to stand behind the door with rain or snow blowing in, just to let another person in, if you have had dust blowing in your eyes while testing equipment, if a grass fire put you out of business for a week, if snakes and mice curled around the amplifiers to keep warm, then you know the importance of having a durable, weather-proof, fire resistant structure with adequate space. Remember, now and more so in the future the equipment at the site represents a sizable investment. Protect it!

Our little son got a set of Lincoln Logs for Christmas, now if we bought enough sets we could . . . □

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SPECTRUM

READING HABITS REPORTED

A marketing survey recently released by a broadcast industry publication shows that TV & COMMUNICATIONS is the most popular magazine among CATV management and engineering personnel. In response to a question asking which magazine is read completely, TV & COMMUNICATIONS led the second place publication by 164%.

The readership survey which was taken by BM/E, "The magazine of broadcast management/engineering," indicated the following preference among CATV executives: (1) TV & COMMUNICATIONS; (2) BROADCASTING; (3) TV DIGEST; (4) BROADCAST ENGINEERING; (5) TELEVISION. According to Mal Parks, Jr., publisher of BM/E, the survey also indicated that 7.1% of broadcasters plan to enter the CATV field. And 59.8% of the CATV systems responding to the survey plan to establish additional CATV facilities. BM/E which is published by Mactier Publishing Corp. is a re-

cently established monthly magazine serving the television broadcast industry.

NEW LOUISIANA CATV GROUP FORMED

The newly-organized Louisiana Association of Cable TV Operators has elected an ex-broadcaster and an active broadcaster to its two administrative offices. The formation meeting was held in Alexandria, La. on February 25th.

Virgil Evans, former long-time General Manager of Radio Station KSYL in Alexandria, also a former member of the Board of Directors of National Community Television Association was elected to the Presidency. Evans is presently Vice-President and General Manager of Alpine Cable TV Company of Alexandria, La., the oldest and largest CAATV system in the state.

B. Hillman Bailey, Jr., co-owner of Radio Station KNOC-AM, KNOC-FM and the KNOC TV Cable Company, Inc. of Natchitoches, La. was elected to serve as Secretary-Treasurer.

NAB POLICY ON CATV IS TOO SOFT, SAYS TAME

TAME, the Television Accessory

Manufacturers' Institute, "applauds NAB's position approving certain basic principles for regulation of CATV" as a "step in the right direction." But according to an official TAME announcement, "NAB proposals do not go far enough and . . . regulation should be more comprehensive."

NEW TV TRANSLATOR RULES

The FCC is proposing the amendment of existing TV translator regulations to permit the licensing of high powered translators of up to 100 watts output. Stations would be assigned to UHF and VHF channels already in the TV table of assignments. The Commission indicated that the purpose of the translators would be to reach isolated communities not now receiving a regular TV broadcast service. The Commission noted that the 100 watt translator stations, which would cost an estimate of \$6,000 or more, could later be converted to regular TV stations.

CATV INVESTMENT GUIDE

Edward Shafer, CATV consultant, is now providing a series of booklets on investment practices and procedures in the cable television industry.

The "CATV Investor Series" will

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provides: Direct Sales-Service in the United States

- ★ Benco Television Associates are pleased to announce the opening of new sales-service facilities in Buffalo, N.Y.
- ★ Effective Feb. 15th, Benco will provide fast, prompt shipment to customers in the United States by shipping direct FOB Buffalo, customs duty paid.
- ★ Also effective Feb. 15th, a Benco factory service department will provide efficient equipment service in Buffalo, N.Y.
- ★ Benco manufactures a complete line of CATV-MATV and related equipment. Electronic equipment of uncompromising design.

Distributor Inquiries Invited.

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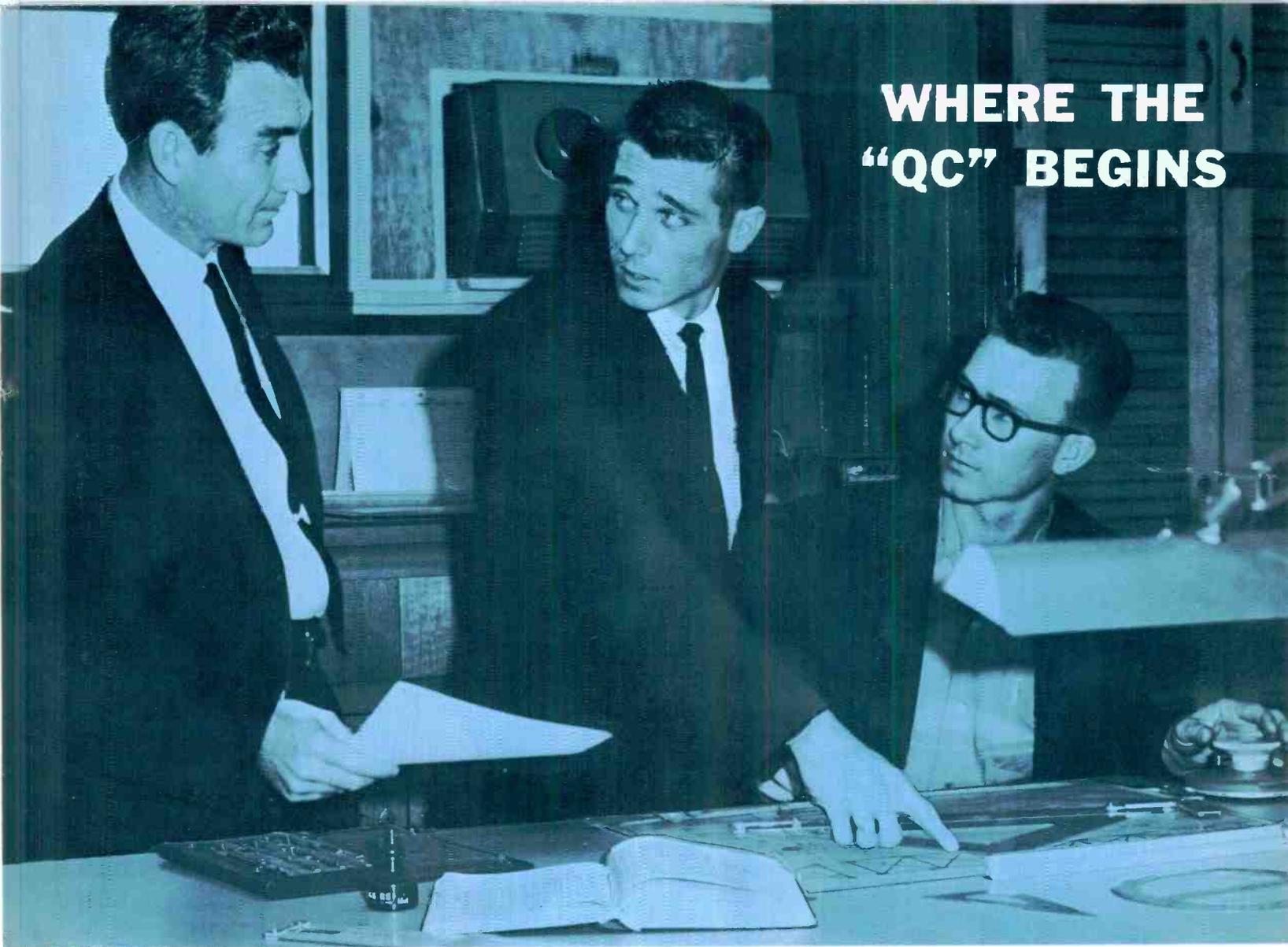
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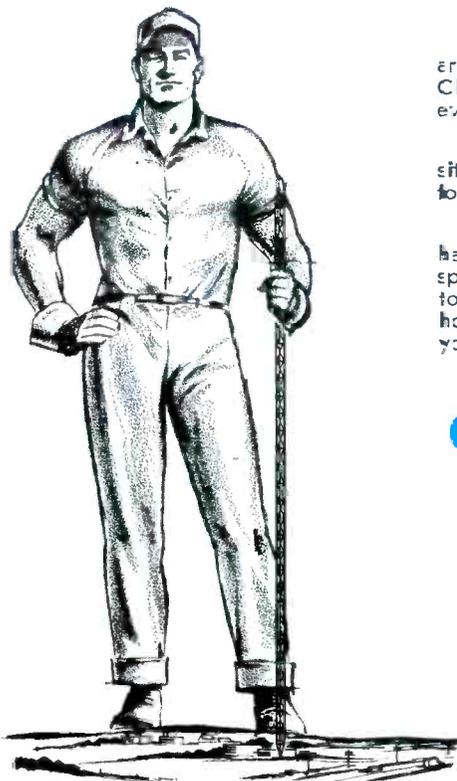
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Every step—from the drawing board, to manufacture, to erection on your antenna site—adds extra margins of dependability to your "Quality Certified" tower. You get more for your money when you specify the tower with "QC".

Utility Towers are available in several designs to meet diversified requirements. All have Quality Certified engineering and workmanship and always meet or exceed EIA specifications. In the seven standard models, round members are welded together in 20-foot sections except for top section which is made to your measurement. Your choice of hot dip galvanized or rust-inhibitive primer finish. Call us for a complete quotation on your next CATV, microwave or other tower requirement.



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TRA-220S	Deluxe 25 DB High-level CAS-cader (Cast aluminum, No. 220 housing)
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Because of the growing demand for CAS all-transistorized, all-band CATV equipment — most reliable in the industry — we are now moving into a new and larger plant, specifically designed to manufacture the finest CATV equipment at economy prices. Our new location is 3301 Royalty Row, Irving, Texas (just outside of Dallas).

Write for free brochure describing the complete CAS line of CATV equipment — transistorized from Head End to TV set.



Our new mailing address: P. O. Box 47066 Dallas, Texas

“provide a periodic review of various aspects of the CATV industry which are of special interest to the investor,” according to Mr. Shafer. He reports that the series will cover investment requirements, depreciation schedules, cash flow, markets for CATV, legal problems, personnel requirements, etc.

Entitled “Community Antenna Television: A Guide to the Investor,” the initial issue covers investment research, signal surveys, CATV franchises, system construction and personnel requirements. Copies are available from Mr. Shafer at 705 Lamber-ton Drive, Silver Spring, Maryland.

CABLE, INC. SELLS SYSTEMS

CATV Systems owned by Cable, Inc., located in Rochester and Brainerd, Minn., serving 8,695 subscribers have been sold to American Cablevision Company. American Cablevision is a division of Jack Kent Cooke, Incorporated, Beverly Hills, California.

The transaction between the two companies was for \$2,500,000. Jack Kent Cooke, Incorporated was represented by Jack Kent Cooke, President and Cable, Inc., was represented by Paul J. Schmitt, President.

American Cablevision Co., presently owns systems in Casper, Wyoming; Perryton, Texas; Moab, Utah; Gallup, New Mexico; Independence, Kansas; Berlin and Ocean City, Maryland; Lewiston, Idaho; Clarkston, Washington; Laguna Beach, Barstow, Camarillo and Trousdale, California; Palestine and Graham, Texas; Keene, New Hampshire; Winona, Minnesota and La Crosse, Wisconsin, serving over 42,000 subscribers.



SOLID-STATE TECH SCHOOL

Ameco, Inc., has just completed another Solid-State Technician’s School. Shown here is Victor Tarbutton, of the Technical Operations Department in Ameco, instructing the class, which is made up of technicians in the cable TV industry from all over the coun-

try. Attending this session of the school were men from New York, California, Washington, Texas, Kansas, Alabama, Ohio, Missouri, Oklahoma, Arizona, Pennsylvania, Michigan, New Mexico, Louisiana and Mississippi.

With the addition of the Rochester and Brainerd systems, American Cablevision Co. now owns 20 systems serving over 51,000 subscribers.

JERROLD GETS CATV FRANCHISE

The Jerrold Corporation, Philadelphia, has been awarded a franchise for the installation and operation of a community antenna television system in Upper Darby, Pa.

The Upper Darby Township Commissioners have announced adoption of an ordinance authorizing the CATV system, which will eventually have a potential of 30,000 homes. Upper Dar-

by is the largest township in the United States, with a population of approximately 100,000.

It is anticipated that this new system will be the nucleus of CATV systems to serve many additional areas in the Delaware Valley.

Initially, the system will provide the area with reception of the three Philadelphia channels, plus three independent New York City channels, one New York City educational channel, one Wilmington channel, and a locally originated time-weather and background music channel.

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To men with Manager or Chief Technician potential who may have pushed past the limits of their present opportunities and are seeking advancement in the exciting industry, we offer our service.

TeleSystems Corporation will help bring you together: System Owner—and job seeker.



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PRODUCT REVIEW

NEW AMPLIFIER FROM VIKING

Viking Cable Company's engineering department has produced the new Viking single channel amplifier No. 945. Designed for CATV or MATV systems, the unit features matched input, matched bridging outputs; high gain with 17 db gain control, and "ultra" low noise cascade circuitry.

According to Paul Switzer, the Viking Model No. 945 amplifier has high rejection of adjacent channels which will eliminate most adjacent channel interference. All of these features have been achieved with only two frame grid tubes in conservative operation.

The amplifier may be powered with 12.6 vac duplexed on cable with a Viking No. 949 remote power supply.

For further information write **Viking Electronics, 830 Monroe Street, Hoboken, New Jersey.**

ENTRON OFFERS NEW TRANSISTORIZED EXTENDER AMPLIFIER

A new remotely powered, fully transistorized amplifier designed for use as an extender in CATV distribution lines is being offered by Entron, Inc., community TV manufacturers, according to Heinz Blum, Vice President, Engineering.



The new unit is designated as Model E-1. With its strand mounting feature and weatherproof design, it is installed at any point where TV and FM signals require amplification. The unit also employs silicon semiconductors and is powered by an Entron remote power transformer through the coaxial cable.

The circuitry permits the amplifier to accept remote power either from the input terminal or from the output terminal; plus the added feature of feeding remote power through the amplifier.

Write Mr. Blum at **Entron, Inc., Silver Spring, Maryland** for prices and details.

JERROLD ELECTRONICS HAS NEW LINE OF AMPLIFIERS

A new line of solid state amplifiers has been introduced by **Jerrold Electronics Corporation, 15th and Lehigh Avenue, Philadelphia, Pennsylvania.**

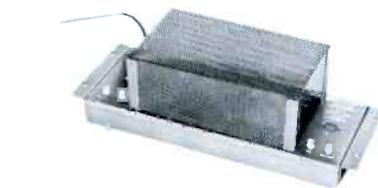
Heart of the system is an all-band mainline amplifier. Extremely flat and cascable, this solid state unit (Model TML-1) features a gain of 24 db (22 db operational) and 44 dbj output.



The Model TBA-1 is a bridging amplifier, designed to establish four feeder lines at main amplifier locations. It provides at least 14 db gain to each feeder line. Maximum output capability is 40 dbj for twelve channels. Response flatness is plus or minus 0.5db.

The Model TBA-2, an intermediate bridging amplifier, is used to set up feeder lines at locations between mainline amplifiers. It provides two feeder outputs with 26 db gain to each. Output capability is 42 dbj per channel for 12 channels.

All of the above units are cable powered by the Model RPS-30 power



supply. The RPS-30 supplies up to 12 amperes at 30 volts AC to power a fully loaded typical section in the distribution system. Voltage output is regulated to plus or minus 1 percent for input line voltage variations between 95 and 130 volts. Current load changes between 4 and 12 amperes cause less than 2% variation of 30 volt output.

Complementing the new equipment is a complete line of head-end equipment, equalizers, tapoffs, carrier control generator, etc. For specifications and prices contact Lon Cantor at Jerrold.

AMECO HAS A NEW SOLID-STATE MODULATOR

The Ameco II Solid-State Modulator is transistorized throughout with circuitry mounted on five modular etched circuit boards. Because of its optional circuit boards this Modulator can be quickly adapted to either a signal source having separate audio and composite video inputs or a source with combined video and 4.5-mc FM carrier signals. The modulated RF output can then be directed through coaxial cable to CATV customers. The output levels of the audio and video are independently variable.

Because it is solid-state the Modulator takes less power and offers many outstanding features including a built-in Modulation Meter. It features a heavy-gauge aluminum case in a standard 19 inch rack.

For additional information on the Ameco-Tran II Solid-State Modulator write to: **Ameco, Inc., P.O. Box 11326, Phoenix, Arizona 85017.**

PREFORMED DEAD-END

A new helically formed dead-end developed especially for primary, secondary, and short-span feeders is being produced and marketed by Preformed Line Products Company.

Called the "Distribution-Grip" dead-end, the new product is designed for

CALENDAR

March 24-26—**Southern CATV Association** meeting. Will be held at the Broadwater Beach in Biloxi, Mississippi.

March 24-26—**New York Community Television Assoc.** annual meeting. Scheduled for Syracuse, New York.

March 29-30—**Pacific Northwest Community Television Association** Spring Convention. 10th Anniversary event at the Davenport Hotel, Spokane, Washington.

March 31-April 1—**National Electronics Week.** Electronic Parts Show at New York Hilton Hotel. Frederick Ford, President, NCTA will participate in a debate on CATV.

April 11-13—**NCTA Legal Seminar** Annual meeting to be held in Scottsdale, Arizona.

May 19-21—**Texas CATV Association** annual meeting will be held in Dallas Marriott Motor Hotel, Dallas, Texas.

July 18-23—**National Community Television Association** annual meeting. Denver Hilton Hotel is site of 1965 NCTA convention in Denver, Colorado. (1966 convention is scheduled for June 26-30 in Bal Harbour, Florida.)

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Rate for classifieds is \$1.00 per line or fraction thereof for advertising which, in our opinion, is obviously of a non-commercial nature. A charge of \$30.00 per column inch (2 1/4" col.) is made to all commercial advertisers. Deadline for receipt of copy, 1st of preceding month.

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Established, growing company offers excellent opportunity for construction superintendent with extensive experience in CATV system construction. Single man preferred, willing to travel extensively, able to meet and work with people. Send photo, full details in resume with first letter. Box 31, TV & Communications.



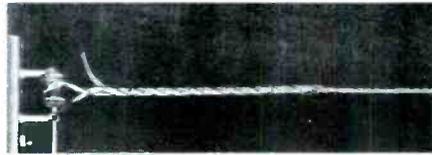
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application to bare ACSR, all-aluminum, aluminum-alloy, and compacted conductors in sizes from No. 4 to 4/O.



Rated holding strengths equal or exceed the actual slip strength of many types of strain-type fittings made for distribution applications. Aeolian vibration tests proved the fatigue life of the grip to be excellent.

Detailed information including application procedures, about the new Distribution-Grip dead-end may be obtained from **Preformed Line Products Company, 5349 St. Clair Avenue, Cleveland, Ohio 44103.**

NEW TAP FROM VIKING

Ultra Flat Directional Tap No. 524 is engineered for "high quality" trunk cables, reports Robert E. Baum, Vice President of **Viking Cable Company, 830 Monroe St., Hoboken, New Jersey.** Only the desired signal coming from the amplifiers is selected by the tap while reflections and interferences from the tap line are blocked by over 23 db.

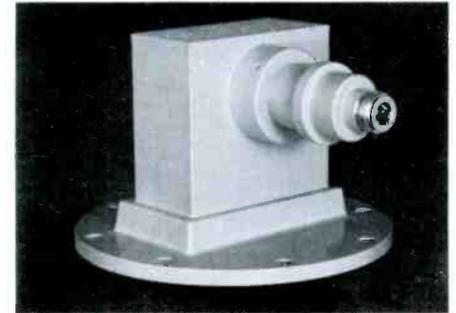
The No. 524 can be used for sub-trunks or distribution amplifiers. All

models permit up to 2 amperes AC or DC power feed. The tap flatness is plus or minus .25 db max. and the VSWR, all terminals is 1.22:1. The No. 524 is available in tap-off attenuations of 8 db, 12 db, 16 db, 20 db and 24 db (plus or minus 1 db Tol.).

Mr. Baum will provide additional information on request.

WAVEGUIDE ADAPTER CONNECTOR - UG 400/U

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In addition to compliance with MIL-A-26442, this Connector now meets the pressurization and VSWR Requirements of MIL-A-26441.

To obtain full specifications, contact Harry Watson at Kings. □



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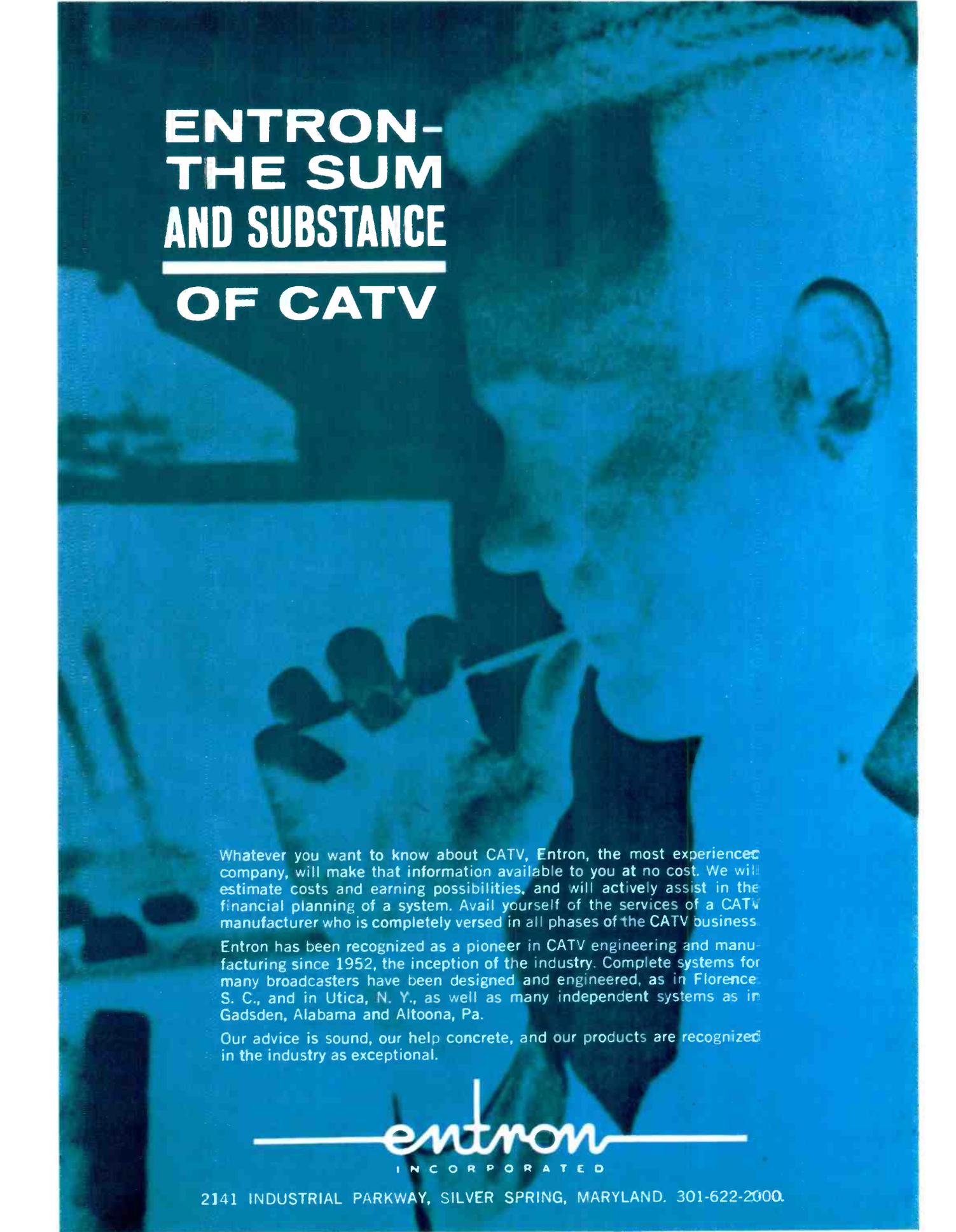


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