

TV & Communications

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IN THIS ISSUE

- NEW PUSH FOR REGULATION
- SCHOOL FOR TECHNICIANS
- LOCATING HEAD-END SITE

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Lee Zernick, Manager
Community Systems Division

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ELECTRONICS

TURN TO THE CENTER PAGES OF THIS ISSUE FOR THE STORY BEHIND
JERROLD'S SOLID-STATE EQUIPMENT—THE NEW QUALITY STANDARD FOR THE CATV INDUSTRY

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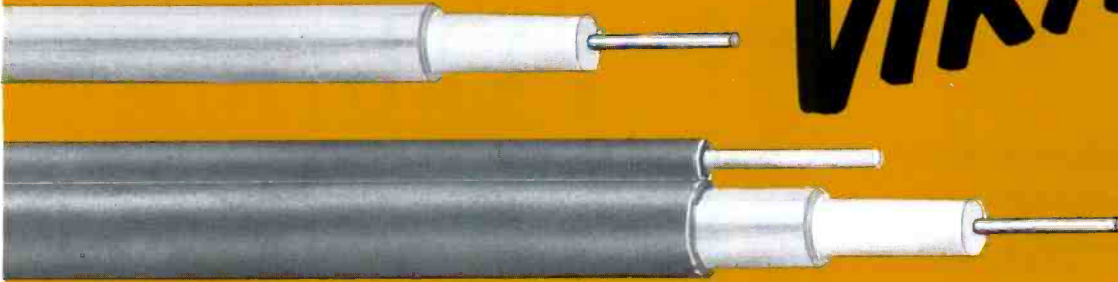
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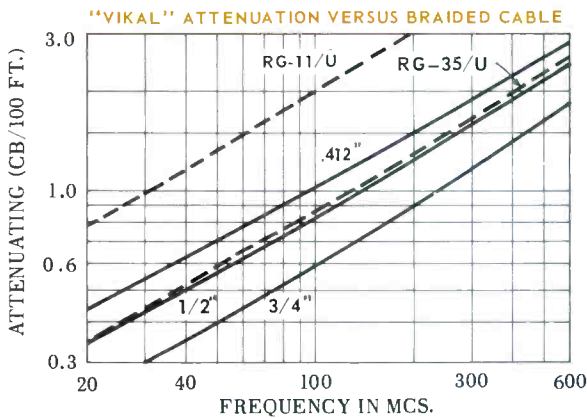
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TV & COMMUNICATIONS



NOVEMBER 1964
Volume I — Number 11

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CIRCULATION: TV & Communications is circulated through United States and foreign mails on the tenth day of each month, to individuals and firms dealing in products and services for closed circuit and community antenna television, television broadcast, and microwave. Circulation is both paid and controlled. A detailed circulation breakdown by reader occupation is available upon request.

SUBSCRIPTIONS: TV & Communications subscription rate in the North American Continent is \$5.00 per year for surface mail. Subscriptions outside continental North America are \$7.00 per year, remittance to be made by bank money order or check, acceptable in United States banks. TV & Communications is published 12 times per year.

ADVERTISING: Commercial display advertising is accepted from manufacturers and suppliers of electronics equipment and allied services, at the discretion of TV & Communications management. Advertising rate card and circulation breakdown are available upon request.

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TV & COMMUNICATIONS (title registered at US. Post Office). Second-class postage paid at Oklahoma City, Okla. Subscribers should allow six weeks for change of address.

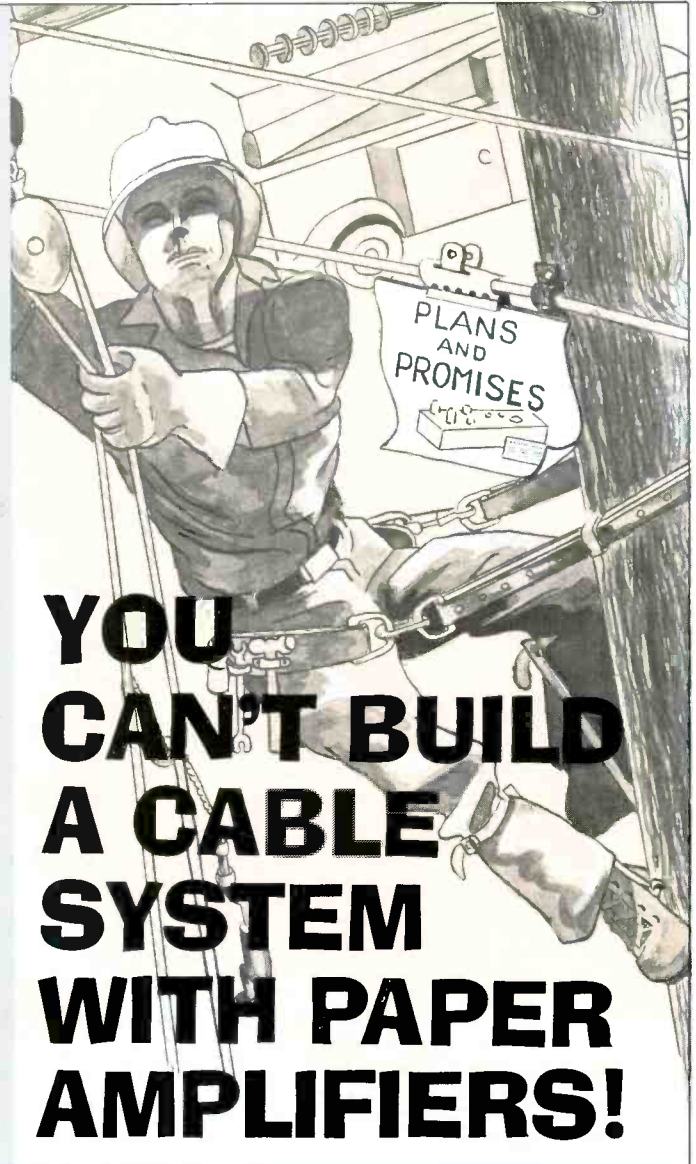
PUBLISHERS: Patrick T. Pogue and Stanley M. Searle.

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Pole Line Pressure

A new threat to CATV looms ominously in possible Telephone Company pressure to monopolize CATV, directly or indirectly. Through refusal to grant pole attachment agreements, Southern Bell Telephone and Telegraph Co. is attempting to sell CATV operators a high-priced lease-back proposition. (See page 11.)

It goes something like this, "Mr. CATV'er, we won't allow you to rent space on our poles. But if you will put up the cash we'll build the cable plant for you . . . and then lease it back to you for only 30% more than it would cost you to own the system outright." How's that for a bargain?

AT&T firms have been trying to get into CATV for ten years. The only new twist to the story is the point-blank refusal to grant pole rental agreements. Southern Bell is apparently the only system to issue a strict "prohibition" policy statement thus far but CATV tariffs have been filed in a total of 14 states by four Bell companies.

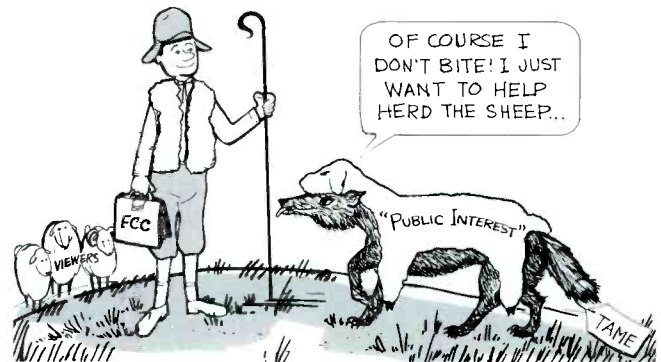
Many CATV operators would consider the lease-back arrangement quite seriously if a realistic rate schedule had been presented. However, many cable owners suspect that the AT&T officials are not so much interested in a realistic approach to pole use as they are in bringing the CATV operator under subjection to the phone company.

This may be a groundless fear but in view of the high-handed, domineering approach of Southern Bell, we can't blame CATV men of suspecting the worst.

Last week we inspected a cable system using its own poles. They are slightly more than half the length and diameter of the telephone poles which they parallel. Installed cost is considerable, reportedly \$15-\$20 per pole. But many systems have already proven the feasibility of setting their own poles. And it is likely that many more will be exploring this route very shortly.

In view of the "hand writing on the wall" we recommend that operators have the right to set poles included in their CATV franchise in every possible instance. And, furthermore, if you are preparing to construct a cable system *anywhere in the country* we urge you to consider the possibility of setting your own poles. The extra initial cost will buy full insurance against an "eviction notice" or drastic rental hike by the telephone company. On the other hand, experience with independent telephone companies and power companies has been generally favorable. If you are able to secure a pole rental arrangement with one of them you can probably count on fair and consistent treatment.

Whatever the motives of the Bell System, the community antenna operators' best course is to demonstrate their ability to conduct business, if necessary, without the cooperation of AT&T. Chances are that Bell Telephone will either forget the ultimatums or submit a realistic CATV tariff schedule if the cable television industry can prove itself truly self-sufficient.



The Manpower Squeeze

A problem that is reaching serious proportions in the CATV business is the shortage of qualified men. Experienced management and technical personnel are now in extremely short supply—due to the spiralling growth of existing systems and the boom in CATV construction.

In fact, the manager of a well-known systems operating firm recently told us that he now hires alert high school graduates *regardless of technical knowledge* and then trains them as CATV technicians and construction workers.

But there *is* room for some optimism on the subject of manpower. At least two CATV personnel placement services have been announced and one of them, sponsored by TeleSystems Corp., is operating in high gear. This challenging project will undoubtedly aid the entire industry and deserves the cooperation and support of every opera-

tor, supplier, and manufacturer. As new men are attracted to the industry everyone will benefit.

Another worthwhile contribution to the industry's human resources is the sponsorship of technical schools by manufacturers. Notably active in this area are Jerrold Electronics Corp. and Ameco, Inc. (See page 25 for story on Ameco's Solid-State School).

Since we recognize the need for additional high-caliber men in every phase of CATV management and technical endeavor, "TV&C" will offer all possible support and encouragement to any company or individual working to alleviate our industry "manpower squeeze". We commend those who have already tackled the problem.

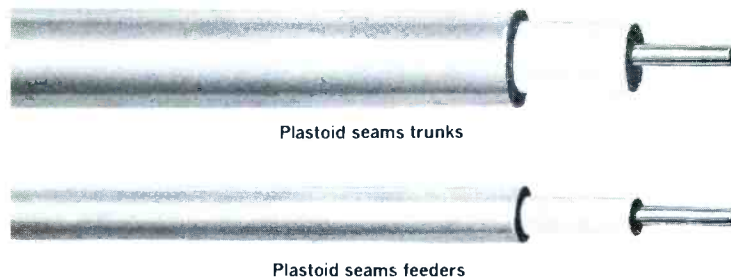
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FREEZE ON CATV APPLICATIONS URGED

Immediate freeze on new Community Antenna Television System applications was urged upon the Federal Communications Commission by the Television Accessory Manufacturers Institute (TAME). Although insisting that the FCC already has sufficient powers to regulate community systems (CATV's), the TAME group asked FCC to advise all city and town authorities to withhold action on franchises until either the FCC lays down its own rules and regulations, or obtains new legislation from Congress.

The action, filed with the FCC by Benedict P. Cottone, legal counsel for TAME, agreed in substance with a motion recently entered by the American Broadcasting Company, except that TAME does not agree with ABC's suggestion that the FCC urge local authorities to give preference to television broadcasters for CATV franchises. This would be an open invitation, TAME said, to broadcasters to go into CATV, and would be interpreted as a confession by the FCC that it was unable or unwilling to protect the present system of free off-the-air television.

In its petition, TAME urged the Commission to "issue appropriate orders or rules providing that, pending the determination of a national policy with respect to CATV operations, either by Commission assertion of direct jurisdiction over CATV systems, or by Congressional enactment of jurisdictional legislation, action be suspended upon (a) all applications and proceedings involving facilities to serve CATV systems, and applications involving common ownership of broadcast facilities and CATV systems or of facilities serving CATV; and (b) all pending rule-making and investigative proceedings involving CATV operations."

TAME agreed with ABC that

"CATV systems are moving into all areas of the country." The organization argued that CATV's are seeking to become entrenched in cities with an abundance of local TV services, and in communities in which they constitute a serious threat to the establishment and successful operation of UHF stations.

TAME contended that, in "desperation" over the absence of any protection against such unregulated CATV competition, regulated broadcasters "by the scores" are being "forced" to seek CATV franchises "in the interests of self-preservation." "At present", the antenna manufacturers group said, "hundreds of city councils are being deluged with requests for CATV franchises. These local officials are (understandably) ill-equipped to determine the public interest justification for such franchises."

According to TAME, the logical solution, since it is inevitable, is broader federal regulatory control. That group urged immediate action by the Commission to stop CATV from continuing to spread. The methods suggested by TAME are for the Commission to: "(a) suspend until further notice, action in regard to all applications and proceedings involving the use of facilities for, or in connection with, CATV operations; (b) continue to suspend action on all applications which involve common ownership of broadcast and CATV facilities; (c) give widespread circulation of the Commission's notice and order accomplishing the foregoing, to state and municipal agencies and officials before whom applications for CATV franchises, ordinances or licenses may come, in order to alert them to the likelihood or possibility of future broad federal regulatory control of CATV operations, so that they may act accordingly in considering such applications."

ABC NETWORK URGES FCC TO ASSERT CONTROL OVER CATV SYSTEMS

In a move that established the first policy proposal to control CATV by a major broadcast network, the American Broadcasting Company filed a pleading with the FCC. Entitled "Petition for Commission Regulation of the Carriage of Television Signals by Community Antenna Television Systems", the proposal, if approved, would severely deter future CATV development.

ABC cited the Communications Act as authority for the Commission to assert control over CATV to provide a "coordinated development" of both "free" television and CATV systems. The network argued that the commission has the authority to define and establish the zones of coverage of a broadcast station.

According to ABC, CATV's should be permitted to exist only in communities that receive less than a specified number of signals and *when the system would not affect the establishment or continued existence of a local station, translator or satellite.*

Citing the rapid growth of CATV, the network urged adoption of the proposals to control what started in 1949 as a means of bringing service to sparsely populated portions of the country. ABC argued that CATV "now threatens to expand to the major population areas of the country and, if it remains unregulated, to stifle or even replace in a major part free television."

The petition warned that unregulated CATV would "kill the development" of UHF, threaten local television and would cause economic injury to stations by fragmenting their audiences. ABC claimed that this would result in a loss of revenue from national, regional and local advertisers.

Also included in the petition was a request by ABC that the Commission issue a statement as promptly as possible advising communities (where CATV franchises are now being sought) to give preference to broadcasters. ABC argued that broadcasters are subject to FCC control and as a result would give greater assurance that the CATV system would be operated in the public interest.

SOUTHERN BELL TO REFUSE POLE RENTALS FOR CATV

A recently announced policy will discontinue the granting of CATV pole rental agreements by Southern Bell Telephone and Telegraph Co. Instead, Southern Bell has proposed that community antenna operators lease transmission facilities from the telephone company.

While refusing to write new pole attachment contracts, Southern is offering its signal conveying services on a "lease back" basis at rates generally regarded by CATV men as prohibitive. Reportedly, Southern's monthly rates are \$18 for each quarter mile of feeder and distribution line; \$155 per system for input equipment at the head-end; \$75 for head-end input equipment for auxiliary services (music or weather); \$10 installation charge, per tap, and 50c a month for first receiver; \$10 installation charge and 25c per month for each additional receiver.

Southern Bell will require that cable operators either put up the cash required for system construction or post bond to protect the telephone company's capital outlay. The bond is to assure the telephone company of "termination charges" in the event that service is discontinued in less than ten years, the minimum contract term.

According to initial reports, CATV

operators unanimously agree that Southern Bell's lease rates are excessive and would necessitate a substantial increase in subscriber rates. Many systems now contemplated would become unfeasible, based upon the substantially higher line costs.

In Arkansas, where Southwestern Bell has filed a CATV tariff but still permits pole attachments, one operator recently chose to set his own poles. His apparent reason was to escape possible future restrictions or pole rental increases. Other operators have expressed the hope that Bell would "back down" and permit pole attachments, as the New York Telephone Company did two years ago.

No operator has thus far agreed to the new Southern Bell terms, so far as TV&C has been able to learn.

CATV tariff schedules have been filed by four Bell systems, including Southern Bell. Involved are Southwestern Bell serving Oklahoma, Texas, Arkansas, and Missouri; New England Telephone Company in Maine; Southern Bell serving Alabama, Georgia, Kentucky, Mississippi, Louisiana, Tennessee, and North Carolina; The New York Telephone Company in New York; Southern New England Telephone Company serving Connecticut; and Pacific Telephone & Telegraph for California.

REEVES EARNINGS UP

Reeves Broadcasting Corporation has announced earnings for the first 9 months of 1964 of 14.6 cents per share, which exceeded those of the similar 1963 period by 41% or \$206,000. This increase does not include a special credit of 26.1 cents per share earned in 1964 on the sale of KBAK-TV, Bakersfield, Calif. Cash flow from operations for the 9 months of 1964, excluding the above-mentioned special credit, amount to 41.6 cents per share, likewise exceeded the amount for the similar period of 1963.

During this period, Reeves continued its expansion program with the purchase of community antenna systems in Grundy, Va., Tazewell, Va., Richlands, Va., Opelika, Ala., and Gadsden, Ala. It has obtained permits to construct several systems in Penn-

sylvania and three in South Carolina, with several other permits currently pending.

JERROLD ELECTRONICS AIMS AT RECORD YEAR

Jerrold Electronics sales for fiscal 1964 will top 1963 by at least 30%, according to Robert H. Beisswenger, Vice President and General Manager.

"We are enjoying an upswing in all our departments," said Mr. Beisswenger, "with the best sales months yet to come."

Last May, 15,000 square feet of space were added at the Jerrold B and Clearfield plant in Philadelphia. And in September, another 13,000 square feet were added to the Jerrold Building at 15th & Lehigh, Philadelphia. Improved production techniques have further added to the Jerrold production capability.

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new techniques have helped all our divisions.

According to Mr. Beisswenger, "the most outstanding progress has been made by Community Systems and Distributor Sales."

"Jerrold Electronics sales have steadily been increasing through the years," continued Mr. Beisswenger, "but the picture has never looked quite this rosy before."

Mr. Beisswenger reports that as a result of these increases, Jerrold has had to expand production facilities.

FCC CHAIRMAN ADDRESSES OKLAHOMA CITY NAB FALL CONFERENCE

Addressing more than 200 mid-west broadcasters, Federal Communications Commission Chairman E. William Henry discussed "clear channel super power", "Regular hours for day-timers", "Multiple ownership" and "Whether to regulate CATV". Mr. Henry's talk was featured on the final day of the 1964 National Association of Broadcasters' Fall Conference in Oklahoma City during October.

The two-day meeting was number three in a series of NAB regional conferences held in major cities throughout the country.

The Chairman told broadcasters that the FCC will probably introduce CATV legislation early in the next session of congress. He noted that it is "Time and past time for the government to do something about it (CATV)." He further explained that he doesn't mean to do away with CATV/Pay-TV.



On the non-duplication issue (microwave transmission), Mr. Henry announced that most comments were in and that rule-making is almost complete. He noted the "great deal of difference of opinion" at the FCC on microwave for CATV.

According to the Chairman, the Commission believes Pay-TV deserves a chance in the market place—the people will decide whether or not it succeeds. He also indicated that television translator rules are being considered. He expected higher power and some origination of programming in this area.

During the Question and Answer session one broadcaster asked, "How about freezing license grants to microwave/CATV operations?" The commissioner stated that this would not be a good idea in as much as the subscribers of CATV are willing to pay for television service. He argued that those services, therefore, should not be hampered. Mr. Henry noted that the present non-duplication freeze is a compromise measure.

The Commissioner was further questioned on why present microwave/CATV licensees can't be included under the non-duplication freeze since CATV microwave is a common carrier. In answering this question the FCC Chairman pointed out that the freeze, as it was established, is non-retroactive. Therefore, since present

licenses were issued prior to the effective date of the freeze, these licensees are immune. He noted that their immunity will cease when they apply for a license renewal or alteration.

BLONDER-TONGUE SUES VIKING, CLAIMS PATENT INFRINGEMENT

Blonder-Tongue Labs, Inc., has filed suit against Viking Cable Company, Hoboken, for alleged patent infringement on an electrical outlet attachment used in television master antenna systems.

Viking Cable Company, a wholly-owned subsidiary of Rego Industries, Inc., Hoboken, has advised TV & Communications that the device in question is their Model 963 Lock Jack Cover.

Blonder-Tongue's complaint further demands "injunctions against further infringement" by Viking and requests an assessment of costs for three times the amount of actual damages.

LOUISIANA CATV INC BUYS SYSTEMS

The CATV system located in Monroe and West Monroe, Louisiana, previously owned by Mr. Dave Winer, Ellenville, New York and Mr. Max Rhulen, Monticello, New York has been sold to Louisiana CATV Inc.

The existing cable system presently serves only a portion of the cities and has approximately 600 subscribers. The purchase price was in excess of \$250,000 and over 125 additional miles of plant will be constructed to serve the potential market of 20,000 homes.

The Monroe transaction was handled by Daniels & Associates, Denver, Colorado, bringing their total sales in six years to over \$75 million

STV DOWN BUT NOT OUT

Subscription Television, Inc., Santa Monica, Calif. will appeal to the courts according to STV President Sylvester L. (Pat) Weaver, Jr. Following an overwhelming defeat at the hands of California voters during the November 3 election, Mr. Weaver announced the suspension of operations in California pending outcome of their "all-out legal battle". He branded the Proposition 15 law as "unconstitutional and a violation of the First Amendment."

Mr. Weaver said that "STV intends not only to go to court, but also to seek redress through the Department of Justice, the Federal Communications Commission, and the Congress, so as to protect not only our stockholders, but also the public, both of whom are victims of this vicious conspiracy."

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"During the past 12 months we have installed more than 1,600,000 feet of Superior 4920 Coppergard Coaxial. Of the total footage you supplied, no reels were rejected because of electrical integrity or cable quality or workmanship. You will be interested to learn that 4920 delivers far more in performance than you ever claimed for it."



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AND CABLES

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SUPERIOR CABLE

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Weaver stated that the voters of California were "duped" into defeating their own best interests by a "powerful and wealthy lobby of theatre owners' aided by some broadcasters, through a most fraudulent campaign." He noted that the "greatest communications innovation of our lifetime" must not be denied the people through "manipulation by the vested interests."

"We are considering plans to set up our service in other states," Weaver said, "where we will complement their present television programming with the marvelous world of additional programming that subscription TV offers."

CORRECTION

In an article last month announcing the plans for a new UHF station in Austin "TV & Communications" in-

correctly stated that Texas Broadcasting Company had signed an agreement to purchase TV Cable of Austin. The purchase agreement was in actuality made between that cable company and Capital Cable of Austin. Texas Broadcasting currently holds an option to acquire 50% of Capital Cable.

CALIFORNIA CATV MEETING

The Edgewater Inn Marina Hotel was the site of the semi-annual meeting of the California Community Television Association last month. CCTVA President Franklin Williams opened the meeting by leading the group in the pledge of allegiance to the flag. Reports by Secretary John Thomas and Treasurer Howard L. King reflected a healthy financial situation and a membership of 45 member systems plus twelve associate members.

Serious "shirt-sleeve" sessions covered topics of interest to operators, such as franchise agreements, pole attachment rentals, CATV participation in educational television and system labor relations.

Featured speakers were Bruce Merrill, NCTA Chairman; Roger Wilson, Lear Seigler; and George Greene, Boothe Leasing Corporation.

In his report Mr. Merrill indicated that the "NAB is mellowing in its attitude toward CATV ... and recently has taken a different tack," looking for common ground for CATV legislation. He mentioned that broadcasters "don't fare well" when they have to open their books. Therefore they are "getting away from the economic impact argument".

On the subject of telephone poles, Merrill predicted a "restatement by AT&T affiliated companies with regard to lease-back facilities" as AT&T "takes a long look at the industry which is creating so much stir in financial circles."

The various financing techniques and resources available to community television operators were reviewed by George Greene in his address at the Saturday luncheon.

Art Baum, President of Viking Cable, hosted a party on the evening of October 9, the first day of the two-day meeting.



John Thomas, Santa Cruz, William McPheeters, Carmel, and Harry Butcher, Santa Barbara (l to r).



H. W. "Mac" McClure, secretary-treasurer of the Pacific Northwest Association (l) enjoys the Viking Cable party with daughter, Mrs. Colleen Rennick, Mrs. Edith McClure and Harley Rennick.



William Gentry (l) of Television Microwave, Martinez, with Troy Allen and Phillip Zonne of Oroville Communications.



Mrs. Don Atwell (l) with Grace and Jack Pruzan



George Greene



Roger Wilson



Leon Papernow (l), with Ben Preece of TeleMation.



Bruce Merrill addresses CCTVA

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Bill Karnes, Field Engineer, is a "shirtsleeve" CATV engineer. He knows the difference between CATV theory and practical working solutions for best system performance. Bill has been engineering CATV systems for over eight years, and is aware of the individual needs and situations that occur in different localities.

When you need a CATV system that incorporates the latest technical advances and is conservatively designed for long range dependability, you can depend on Bill Karnes.

Technical efficiency, practical analysis, determined follow through, these are more reasons why it's smart to work with **Bill Karnes** and TeleSystems Corporation.

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Merrill Answers Broadcasters...



"It seems that every time broadcasters get together these days they automatically try to tie the knot of nuptial bliss between Pay-TV and CATV.

"For example, my benignant friend, Bill Carlisle, started a recent speech to the Maine Association of Broadcasters with a jam in the back with what he termed 'two strongly related subjects, Pay-TV and CATV. Believe me . . . Pay-TV and CATV have no common relationship. CATV has neither encouraged nor promoted Pay-TV. Most cable system operators have taken a strong stand against it. And frankly, we resent and resist your continuing to hang the Pay-TV label on CATV. There is just no justification for this.

"You seem to be concerned over what you called CATV's potential impact on radio stations. One might have thought you had an ominous and prodigious case against CATV on the behalf of radio. Yet in the next 2,500 or so words, you failed to cite one concrete case where CATV has had any measurable effect on any radio station. This was really a wild one! This is trial by innuendo!

"Another statement made at the Maine meeting and I quote (Carlisle), 'Broadcasters by the dozens . . . radio as well as TV . . . are getting into the CATV business. Some are doing so reluctantly, trying only to protect their investments.' In the very next paragraph, you paint a very glowing picture of the alleged fantastic profits being enjoyed by the CATV industry. It would seem to me as a business man that if these profits do exist as you have outlined them, any broadcaster would be glad rather than reluctant to enter our field. One of these statements must

be wrong since they are in contradiction with each other. Perhaps both statements are wrong. I know from personal experience that a cable system is not a gold mine above the ground as you would have others believe. It is a good, sound, solid business venture and a natural for a successful broadcaster.

"Your refulgent and nostalgic picture of a man of modest means connecting an antenna atop a mountain, running a cable down the mountain side and then setting back to enjoy the fruits of his labor for the next ten years can be nothing more than a figment of a dream. The fruits have been relatively meager. Most cable systems have been rebuilt at least three times during the past decade and most need to be rebuilt yet again. These costs are substantial but necessary since the principle ingredient of any cable system is service not programming.

"And your rosy picture has other aspects that change the hue of the rose considerably. From the very beginning we have had to fight for our existence. In many areas, where the cable system had produced enough sets in the town, a television station moved into a market the cable had created. This happened in places such as Casper, Wyoming; Clarksburg, West Virginia; and Tyler, Texas. And there are others. Inevitably, the new broadcaster was born an implacable foe of CATV and immediately began spreading the gospel of hate about it. In addition to these lovely children we helped sire, the cable industry has had vociferous competition from boosters and translators. Hardly a bed of roses.

"Let me assure one and all that survival and growth of the cable industry was due to one thing . . . we

gave the public something it did not have . . . we gave the public something it was very happy to have . . . we gave the public something it was glad to pay for . . . decent TV reception. And we have consistently fought for our right to do this.

"But the biggest puzzle of all is the consistent refusal to document the wild statements made about CATV's impact (alleged or otherwise on broadcasting). The inference is clear that our history is studded with instances where CATV has dealt shattering blows to the broadcast economy. This simply is not so. There have been very few cases where the interest of the two industries has appeared to clash. And most of these have been settled long ago.

"Does the NAB seek monopolistic guarantees through government control that the broadcast industry must be protected so that there can never be a dollar lost by a broadcaster? It would sometimes seem that this is the case. Too often the case has been built around the financial welfare of a station and the interest of the public held in contempt.

"Again in your Maine speech, Bill, you made the following statement and I quote . . . Indeed, there is a CATV in Phoenix, a city with four local television outlets. I believe that if you will check your figures on this, there are five television outlets in Phoenix. And again, if you do a little checking, Bill, in your next speech you can add the fact that the CATV system is situated in Paradise Valley, a suburb of Phoenix that is surrounded by mountains and receives extremely poor off-the-air television reception. I know, I live there, and I own the cable system in Paradise Valley which provides reception for the five local television outlets.

"I challenge the broadcasting industry in general to start giving the public the complete facts when it quotes statistics and figures. I also challenge the broadcasting industry to face up to the fact that it has a reception problem of mammoth proportions. The CATV industry has solved many of these reception problems, and it will solve more. So take your choice, ladies and gentlemen . . . condemn us or join us. But please . . . tell the truth about us.

"To return to the attempt to align
Continued on page 36

CEP

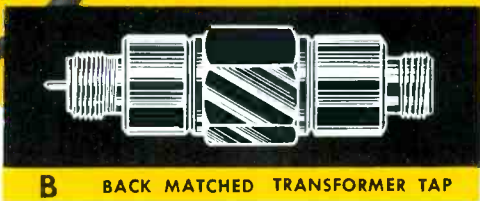
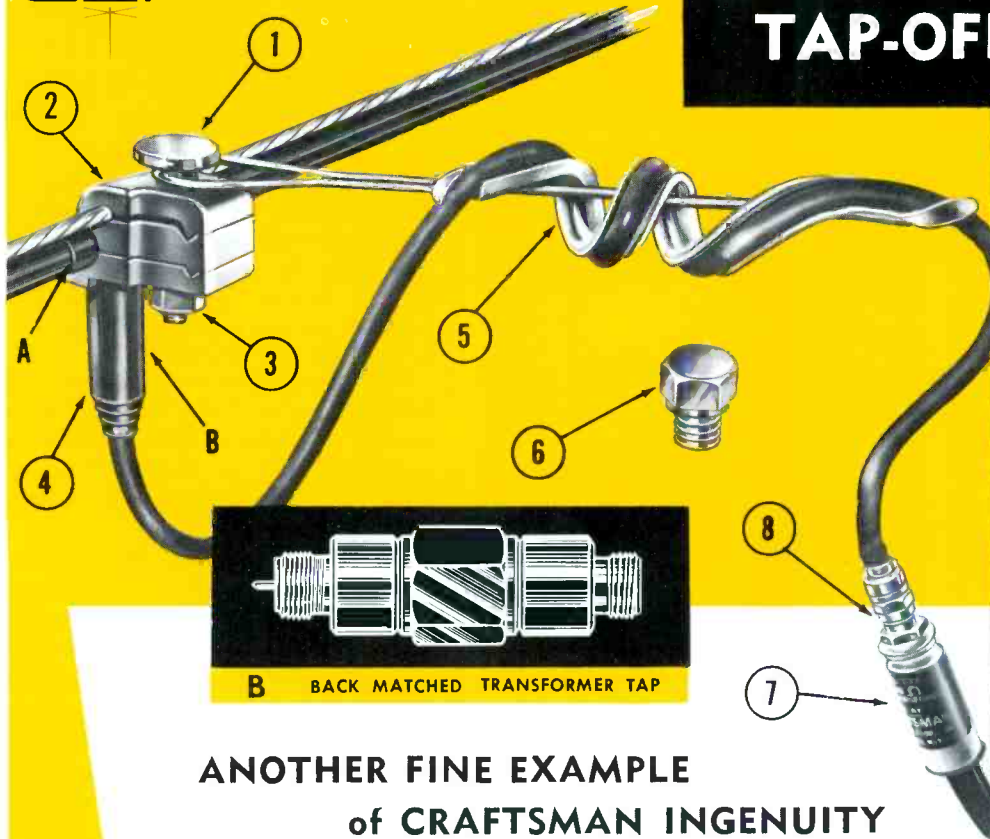
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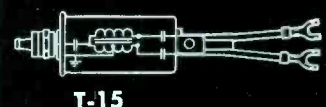
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JOSEPH MURPHY

Mr. Joseph P. Murphy of Menlo Park, California, formerly a Contract Sales Representative, has been named Director of Marketing for Ameco, Inc.

Born in San Francisco, California, Mr. Murphy attended San Rafael Military Academy, Oakland High School, Stanford University, the University of California at Berkeley and obtained a degree in Electrical Engineering from the University of Maryland. He also studied finance and banking at the American Institute of Banking, San Francisco.



In 1948 Mr. Murphy attended a six week Seminar at Northwestern University on Merchandising and Business Ethics. In 1961 he attended the University of Illinois, Antenna Research Laboratory.

Prior to coming with Ameco, Inc., Mr. Murphy was with JFD Electronics Corporation, Brooklyn and the Admiral Corporation, Chicago, Illinois.

ENTRON NAMES ANTHONY VENDEMIA AS MANUFACTURING MANAGER

Anthony Vendemia has been appointed manufacturing manager for Entron, Inc., manufacturers of community, master and educational TV equipment.

Mr. Vendemia will be responsible for production and related activities.

Before joining Entron, Mr. Vendemia was assistant to the president of the Ravenswood Corp., Annapolis, Maryland and prior to that, he was manager of manufacturing services



with U.S. Industries in Silver Spring.

A graduate of the University of Baltimore, he holds an LLB degree and resides in Silver Spring, Maryland.

ENNIST JOINS REEVES

It has been announced by J. Drayton Hastie, President of Reeves Broadcasting Corporation, that Robert F. Ennist, formerly Chief Engineer for Telco, had joined Reeves as Chief Engineer for Reeves' Community Antenna Television Division.

A pioneer in the CATV field, Mr. Ennist's experience dates back to 1951 when he built the Lewistown, Pennsylvania system as an associate of the Pennwire Television Company. In 1952 Mr. Ennist constructed the Reedsville, Pennsylvania system which he owned and operated until 1954. In 1954 Mr. Ennist became Chief Engineer for Pennwire Television as well as Television Electronics Service Corporation. He held these positions until 1962, during which period he designed and built systems in New York, Pennsylvania, Maryland, West Virginia, Virginia, and Ohio. In 1962, upon the sale of Pennwire to Cox Broadcasting, Mr. Ennist continued as Chief Engineer for Telco. In this capacity, in addition to engineering duties, Mr. Ennist has been acting in management, financing, franchise acquisition, and system sales.

In his new capacity, Mr. Ennist will oversee the construction and operation

of Reeves' several recently acquired operations and franchises, reporting directly to Walter M. Nelson, Reeves' Chief Engineer, in Charge of Broadcasting.

DAVIS IS NEW TECH REP

A new Technical Sales Representative for the Viking Cable Company has been named by Arthur Baum, President. Ray Davis will coordinate the Hoboken, New Jersey company's sales and engineering efforts in the mid west. He will operate out of offices in Omaha, Nebraska.

MARVIN KRANTZ DIRECTOR OF PERSONNEL AT JERROLD

Newly appointed as Director of Personnel for Jerrold Electronics is Marvin J. Krantz. The appointment was announced by Robert H. Beisswenger, Vice President and General Manager.

Mr. Krantz had previously headed the Personnel Department under the title of Staff Assistant for Personnel. According to Mr. Beisswenger, "the rapid growth of Jerrold Electronics necessitates increased emphasis on our Personnel Program. During the last eight months, we have increased our personnel complement by more than 35 per cent."



Before joining Jerrold, Mr. Krantz had extensive experience in the field of military electronics. He served as liaison between military and civilian personnel on the Missile Master project, which consists of radar, computer and communication links for U. S. Army and Air Force defense command and control systems.

Prior to that, Mr. Krantz was Field Engineering Director of a U.S. communications agency in Japan, where he directed the installation of a huge microwave VHF radio and telegraph carrier communication system.

Continued on page 36

WHAT MAKES THIS CATV CABLE DIFFERENT?

There's a lot more to CATV cable than is revealed by nominal attenuation figures. Factors that these figures don't show can cause subscriber complaints, added expense for extra repeaters, other problems. Read why.

Nominal attenuation is not a guarantee.

Because electrically uniform CATV cable is more difficult to make than many people know, the cable you buy may cause *actual* losses a good deal higher than the "nominal" the manufacturer was shooting for. Unless it's Rome *Unifoam** cable. Only Rome can assure you of typical figures like these (actual losses in db per 100 feet in tests of 100 standard lengths of 1/2" 75 Ω cable in a recent production lot):

	at 100 mc	at 220 mc
average attenuation, all cables	0.81	1.25
maximum attenuation	0.85	1.30
attenuation in 97% of cables	below 0.84	below 1.28
attenuation in 84% of cables	below 0.83	below 1.27

Bearing in mind the cost of repeaters, it's obvious that performance like this makes a real difference in installation cost.

The uniformity these figures show makes a big difference, too. You don't have to test your cables and pick the best lengths for the difficult runs: *every* length of Rome *Unifoam* cable will give you the transmission efficiency you expect.

HOLES IN THE SPECTRUM Attenuation at 100 and 220 mc isn't the whole story. What goes on over the whole spectrum? Plenty.

You call them "holes in the frequency spectrum." We call them *attenuation peaks*: discrete frequencies at which the cable, for various reasons, causes much greater loss than at other frequencies. Result: bad picture. Or poor sound. Or no sound at all.

90% of Rome *Unifoam* cable shows no measurable attenuation peak at any frequency from 54 to 220 mc. And no length leaves the plant (in the unlikely event it ever got produced) with attenuation peaks—at any frequency—greater than a 2.5% deviation from a smooth curve (at 220 mc, with 1/2" 75 Ω cable,



this would be 0.3 db per 1,000 feet). You can be certain every frequency will come through just as you want it to.

FORGET ABOUT MISMATCH: the uniformity of the capacitance and characteristic impedance of Rome *Unifoam* cables, length after length and lot after lot, eliminates any loss of signal strength due to mismatch between lengths. And the uniformity of physical dimensions makes it possible to get consistently reliable and efficient splices, taps and terminations.

UNCLE SAM may have had something to do with the remarkable quality of Rome *Unifoam*. We've been making ultra-precise high-frequency cables used for missile tracking sites since the beginning. We've learned more than a little about what it takes in manufacturing equipment and procedures to make cable that's more uniform than engineers dreamed was possible only a few years ago.

Rome mixes its own foamable polyethylene on an as-needed basis, eliminating the problems of contamination or moisture pickup encountered in shipping and storage. The quality and uniformity of the foam insulation determines in great part the electrical uniformity of CATV cable.

Elaborate, electronically-monitored equipment continuously patrols every phase of the insulating operation. Critical parameters—including capacitance, insulation diameter, process temperature and others—are controlled and chart-recorded automatically. A complete record of every foot of Rome *Unifoam* produced is always available.

WHAT'S IN IT FOR YOU: the best CATV cable possible... in a full range of sizes. Rome *Unifoam* CATV Cable transmits every frequency you want with minimum loss. And the price is right. Competitive.

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. 40114, Rome, N. Y. 13440.

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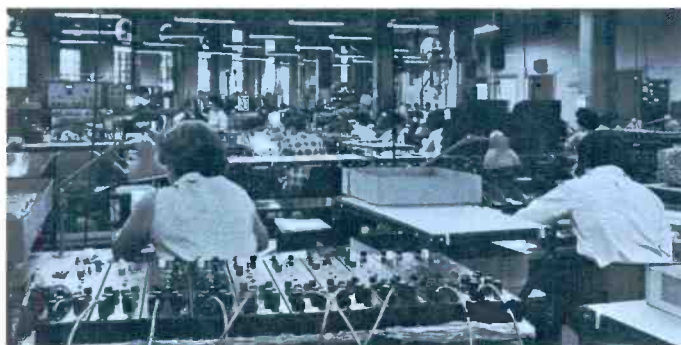
Between 1961 and 1964, our top engineers devoted 50,000 manhours of hard, relentless design work to this program, always insisting that Jerrold solid-state channel preamplifiers, super-cascader mainline amplifiers, bridging amplifiers, and line extenders *must* possess 12-channel capability, with picture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

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



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



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

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



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



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AIRLINE USES CCTV

Closed circuit television—a valuable new tool of modern business—is playing a key role in day-to-day commercial airline operations.

Fast and accurate relaying of flight information to customers, and to operating departments of the airline, is the primary job of United Air Lines' closed circuit TV. United also uses CCTV for security purposes, to expedite airplane fueling, to speed freight handling, for pilot training, and even to aid in preparation of in-flight meals!

One of the largest users of Industrial television, United first installed a televised flight information system at New York's Idlewild (now Kennedy) International Airport. It worked so well, similar systems have since been installed in United terminals at Chicago-O'Hare, Los Angeles, San Francisco, Denver, Seattle, Cleveland, Washington, D. C., Pittsburgh, New York-LaGuardia, Philadelphia, Atlanta and Newark. A system is currently being installed at Portland, Oregon.

CCTV systems used by United are leased from three major suppliers—American Microwave and Television Corp., Redwood City, Calif.; General Precision Laboratories, Inc., Pleasantville, N. Y., and Motorola, Inc., Chicago. Industrial Television Service, Inc., Chicago, supplies the equipment at United's O'Hare Airport freight terminal.

The other 45 monitors are for internal company use.



Closed circuit television system helps in security and surveillance at jet freight terminal. Two cameras outside the building, and two inside, sweep the area giving air freight coordinator, shown watching dual monitors, picture of the entire facility. Television system also helps coordinate sorting and processing of freight.



United's largest TV hookup provides flight information at Chicago-O'Hare—hub of the airline's 18,000-mile nationwide system. Four cameras and 69 TV monitors are located throughout the sprawling terminal and in United's operating departments. Here's how the O'Hare system works:

TV cameras "read" the big electronic flight information board (built by General Precision Indicator Corp.) in United's terminal lobby, transmitting this data to the 27-inch monitors. Of 69 monitors, 24 are for public viewing, located in corridors, at connection counters and near the aircraft boarding rooms.

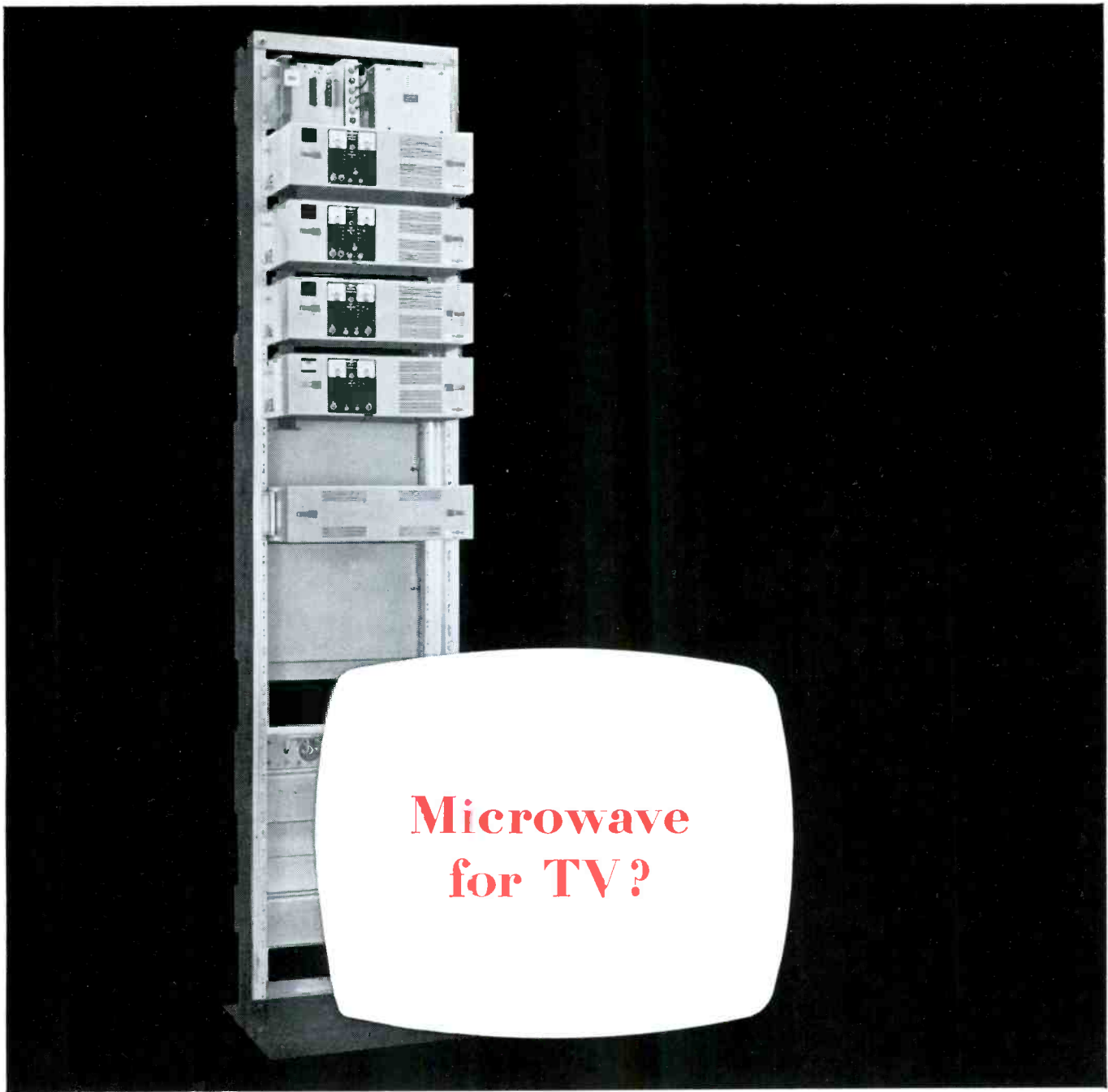
The other 45 monitors are for internal company use. They feed the vital flight information to United passenger service, dispatch, flight planning, load planning and flight crew personnel located in the terminal, and to ramp servicemen, airplane fuelers, and mechanics in ready-rooms on the airport ramp.

Key to operation of the O'Hare flight information system is the ground operations planning center. From here, the flight information board is posted by means of an electronic keyboard console. The board is constantly updated as planes arrive and depart, or as changes are made in schedules. Current information is flashed via the cameras trained on the big board to the monitors.

Another closed circuit TV network transmits fuel load information from flight planning to airplane fuelers on the ramp, telling them the amount of fuel to be put in each tank of the airplane.

Closed circuit television also plays an important role at the new O'Hare jet air freight center. Two cameras outside the terminal, one on the airport ramp where the freighters taxi in, the other near the vehicle access road, keep constant surveillance day and night. Monitors are in the freight planning control center inside the terminal, and in the guard room near the property entrance, manned 24 hours a day.

Inside the bustling terminal, two men monitor the scene outside the terminal and inside—where two more cameras constantly sweep the entire 62,500 square foot area. The cameras inside not only aid in security and surveillance, but also help in sorting and processing of freight.



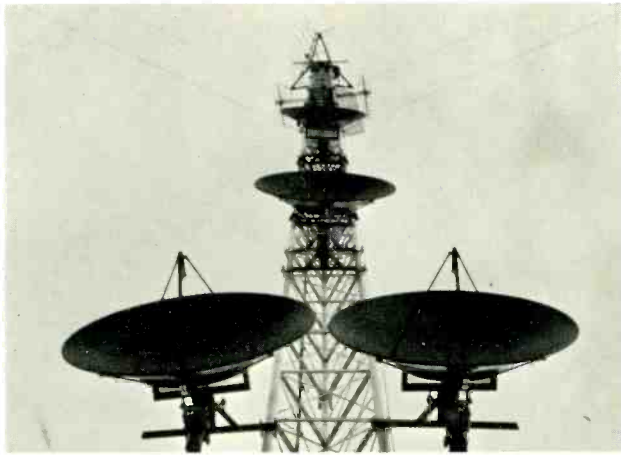
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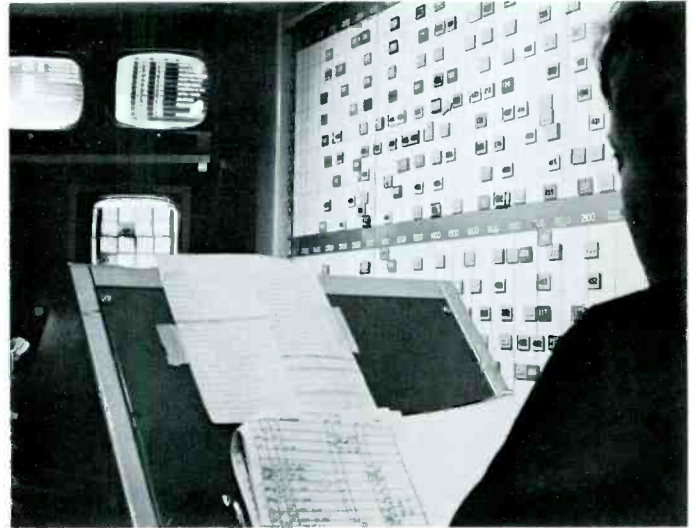
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One of the most interesting uses of CCTV is at United's pilot training center in Denver. Here flight crews checking out in United jets "fly" practice missions without leaving the ground in an electronic DC-8 flight simulator.

Closed circuit television is used to project runway and terrain features directly on a screen fronting the flight simulator cockpit. This is achieved by a large camera which moves on tracks past a large mural depicting the runway and terrain. The TV system is tied into the simulator's electronic computer brain to provide realistic visual features upon takeoff and landing.



United Air Lines ground operations planning center at O'Hare International Airport is key to televised flight information system at the busy terminal. Flight information, shown on two television monitors at top left, emanates from planning center, is posted by electronic keyboard (lower right) on large information board in terminal lobby, and then flashed via cameras trained on the big board to the closed circuit monitors. Lower television screen is part of separate TV system which sends fuel load information from planning center to airplane fuelers on the ramp. Board at right indicates gate positions assigned to a particular flight.

The many varied uses to which United Air Lines puts CCTV illustrate the rapidly developing versatility of modern closed circuit equipment. There are now hundreds of jobs in industry which can be profitably performed by television . . . and alert businessmen are finding new CCTV capabilities every day! □

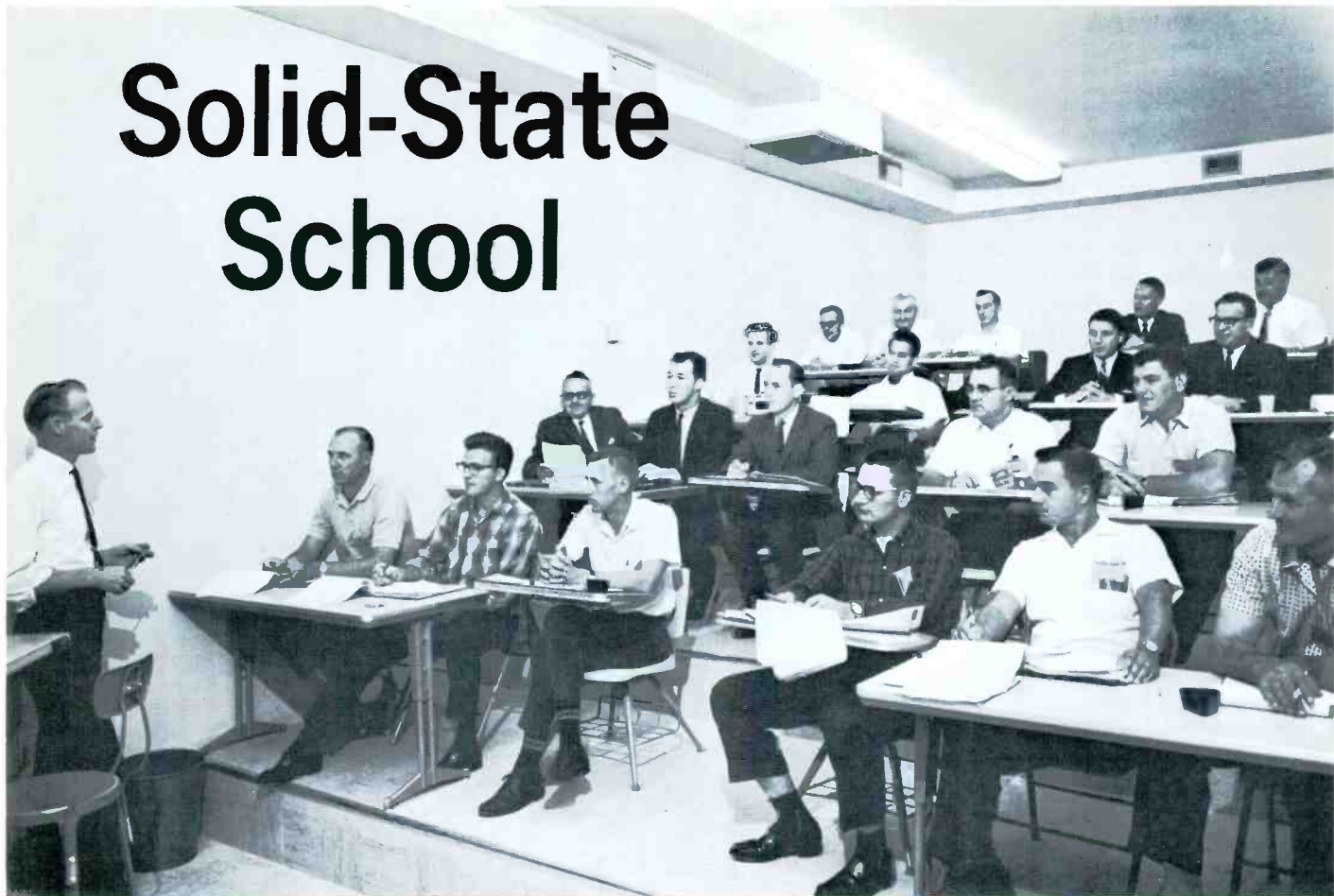
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Solid-State School



Realizing the shortage of and the increasingly acute need for trained cable technicians in the solid-state field, Ameco, Inc. of Phoenix recently opened a special solid-state school for the Fall-Winter semester of 1964-65.

There will be ten separate sessions held during this period with room for 20 technicians in each session. It is hoped that these 200 graduates of the Ameco Solid-State School will help provide the trained technicians

that are in demand by a growing CATV industry.

Due to wide spread interest in a monthly publication titled "Technically Speaking" that is mailed by Ameco to technicians throughout the nation, it was decided that the need for technical knowledge could best be met through an intensified training course of this type. The five day, 42-hour technical school is open to any cable television technician who makes proper application and receives confirma-

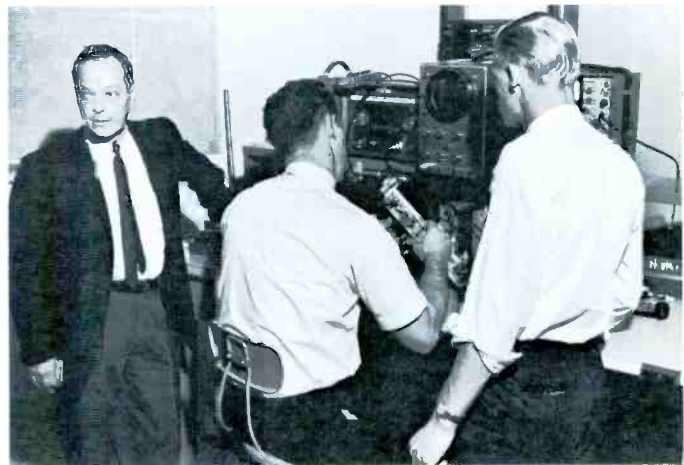
tion from Ameco as to the class he will attend.

The first session of the Ameco Solid-State School, held from October 19 through 24, was attended by 24 technicians. The men in attendance came from as far away as Pennsylvania.

The Ameco school was constructed along the amphitheater or stadium style to permit an unobstructed view of the instructor and equipment. The sessions are conducted by the top



A special classroom was built at Ameco's home office in Phoenix to accommodate the Solid State School.



Donna Nelson, Asst. Dir. of Tech. Oper., supervises as a systems technician is given work bench experience in alignment.

solid-state technicians in the country and the students attending the school have ample opportunity to try their hand in test and alignment, troubleshooting, maintenance, repair, and other solid-state techniques.

While "Technically Speaking" will not be discontinued as a result of the school, a technician who attends the Ameco sessions will find the technical knowledge a great aid in interpreting all articles and books of a technical nature.

However, the main purposes of the school is to provide the CATV industry with well trained and highly skilled technicians that can become an asset to any cable system.

Bruce Merrill, president of Ameco, states that there will be no tuition charge and no restrictions as to whom may attend the school. According to Merrill, this is simply another public service that Ameco is striving to provide the cable industry.

The combined experience of Ameco's engineers, technicians, and managers who are well versed in system design, construction, operation, and maintenance has been distilled carefully to create a training course that



Bob McCann of Harrisburg, Pa., (l), was presented the "Top Technician" award by Vice Pres. in Chg. of Mktg. & Sales John Buchanan at the Playboy Club at the farewell dinner on Friday night.

will provide the cable technician with a comprehensive picture of solid-state equipment.

Additional details of the Ameco Solid-State School can be secured through a coupon to be found on

page 30 of this issue of TV & Communications magazine.

While the first two classes have already been filled, Ameco advises that the following dates have some openings at this time:

- Session 3—Nov. 16 to Nov. 21
- Session 4—Nov. 30 to Dec. 5
- Session 5—Dec. 14 to Dec. 19
- Session 6—Jan. 11 to Jan. 16
- Session 7—Jan. 25 to Jan. 30
- Session 8—Feb. 8 to Feb. 13
- Session 9—Feb. 22 to Feb. 27
- Session 10—March 9 to March 14

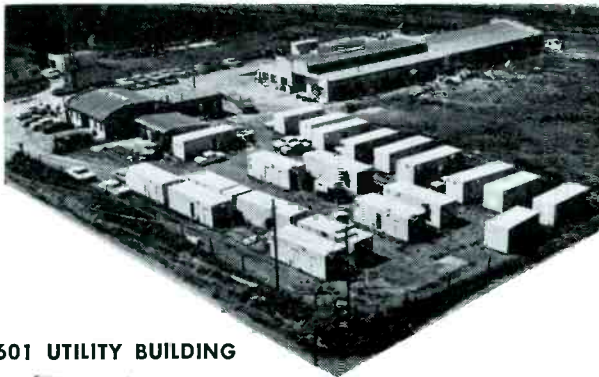
Highlight of the training school's first session was a farewell dinner at the Playboy Club where graduation certificates and the top technician award were presented. Bob McCann of Harrisburg, Pennsylvania was named top technician on the basis of final examinations given to all attending the school.

A continuing effort on the part of all manufacturers and system operators seems to be the only solution to the manpower shortage which now prevails in the CATV industry. Schools and seminars, such as the new Ameco Solid-State school, will undoubtedly help substantially to alleviate this present problem. Better trained technicians will accomplish more for employers—and they will earn higher wages. The personal success of well informed service and construction personnel will, in turn, attract additional men of high caliber into our growing community television industry. □



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Equipment for large microwave system being pretested at factory



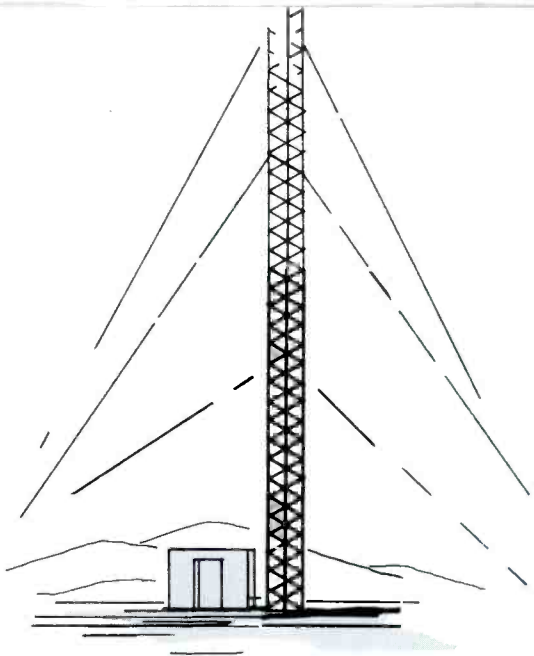
SERIES 601 UTILITY BUILDING



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Selecting A Head-End Site

By RICHARD OBARSKI
CATV Consultant

1. The Location.
2. The Equipment Building.
3. The Antenna Supporting Structure.
4. The Antennas.
5. The Electronic Processing Equipment.

A Cable System for a community can be broken down into three parts. The head-end, the skeleton system, and the house drop. The head-end is normally considered synonymous with antenna site although, with the advent of microwave, pay TV, local origination, switching and programming requirements, the point of origination in the system may be called by another name. For the purpose of this discussion the term "head-end" will be used when referring to the signal origination point in the system. The first question to be answered regarding the head-end would be the site or location. Whether microwave, local origination, or "off-the-air" reception is contemplated, the "ideal" site would be more or less in the center of the system. Unfortunately, with "off-the-air" reception this becomes impractical or impossible due to the requirement of elevation. Height is necessitated by the fact that in order to receive more or better TV reception the receiving antennas have to be installed at a point where they will intercept maximum signal with minimum interference. Even in a situation where local origination or microwave is used, the "ideal" location could present problems. For the present, let us assume that it is necessary or that a decision has been made to erect an antenna supporting structure for "off-the-air" reception, questions about the site arise and we hope to answer some of them.

Five distinct elements are pertinent to a discussion of a CATV antenna site:

This article will investigate element Number 1 — factors involved in the choice of an appropriate site.

Fort Stockton, Texas, Fig. 1, will be used as an example, and although the town is in the Southwest in relatively flat terrain, and at first glance looks easy, it proved to encompass most of the problems and compromises encountered in the course of site selection.

We first obtained topographical maps of the area and determined the general direction from which the desired signals are coming. (These maps are available from the Denver Distribution Section, Geological Survey, Federal Center, Denver 25, Colorado for areas west of the Mississippi River and from the Washington Distribution Section, Geological Survey, Washington 25, D. C. for areas east of the Mississippi River. In addition, some large cities have map stores or USGS offices which stock some of these maps.) In this case they all come from one direction and this happens to be north-north-east. Remembering that we want to be as far from noise sources (the town) as possible and that we do not want noise sources in front of the antennas, we examined the north east, north, and north west areas of the town. In Fort Stockton we also had to keep in mind the possibility of a microwave hop from Pecos. Tentatively we picked three sites as possibilities. These are shown on the map as 1, 2, and 3. Number 1 because it is favorable for microwave, has good elevation, and does not look across a noise source. Numbers 2 and 3 are

equally as good although they have about 200 feet less elevation making them less desirable from a microwave stand-point. Armed with maps and authority to lease or purchase land, we went to Fort Stockton and learned about airports, power lines, land owners, and local persons.

Site No. 1 was only 1000 feet across the highway from the Fort Stockton airport. Well, we still had sites 2 and 3. Or so we thought. Site 2 was surrounded by high voltage power lines and adjacent to a sub-station. Scratch 2. How could we lose on 3? Although the elevation for microwave was not too good and it was a little further from town, it looked

Factors to be Considered	SITE #1	SITE #2	SITE #3	SITE #4	SITE #5	SITE #6	SITE #7
AIRPORTS	N.G.	N.G.	Good	Good	Fair	N.G.	Fair
NOISE	Good	N.G.	Good	Good	Good	N.G.	Good
ELEVATION	Good	Fair	Fair	Good	Good	Good	Fair
DISTANCE	Good	Good	Good	N.G.	Poor	Fair	Good
AVAILABILITY— COST	Good	Good	N.G.	Good	Good	Good	Good
SPACE	Good	Good	Good	Good	Good	Good	Good
POWER	Good	Good	Good	Poor	Fair	Good	Fair
ACCESS	Good	Good	Good	Poor	Poor	Fair	Good
SUITABILITY	Good	Good	Good	Good	Good	Good	Good
ZONING	Good	Good	Good	Good	Good	Good	Good

noise free, and accessible. Unfortunately the owner of that choice piece of mesquite covered desert thought there was "gold in them thar acres". He would neither sell nor lease at any price. Eliminate site 3 and pick some more.

Sites 4, 5, and 6 were also eliminated by default. Site 4 on Seven Mile Mesa means just what it says. Seven miles from town. We couldn't justify the cost of a seven mile trunk line and four miles of power line. Besides Three Mile Mesa (site No. 5) was available. But, alas, without power. So off we go to site 6 and although it is accessible, available and has power lines right

there, the antennas will be looking across the noise source and, as we were to learn, it is too close to the airport.

This left site 7 by no means the only other possibility, but the one we finally chose as coming closest to our criteria. It is far enough from the airport, relatively noise free (we hope), it is available on an extremely reasonable long term lease basis, the elevation is adequate, it is not too far from town and although it was 2000 feet from power, the power company needed a line through the property and we got power. We had as much space as we wanted, in this case five acres. We had a paved access road about 600 feet away, and there were no zoning problems whatsoever. And finally, the land was suitable for erecting any type of antenna supporting structure we needed. Fig. 2 shows in chart form the ten criteria for choosing a site and how they apply to seven possibilities in Fort Stockton. We have them listed vertically in order of relative importance. I say relative because there is always something about one of the criteria that could make it less important than the next.

To those who have had the experience of choosing a site, it is now evident "after the fact" that the above is not necessarily in chronological order, and that delays and problems pop up. I would like to describe a hypothetical situation and our approach to it. After studying the maps (even a road map) to get an idea of the signal source, potential co-channel

problems, and topographic features both near and far we pick a few generalized areas to investigate further.

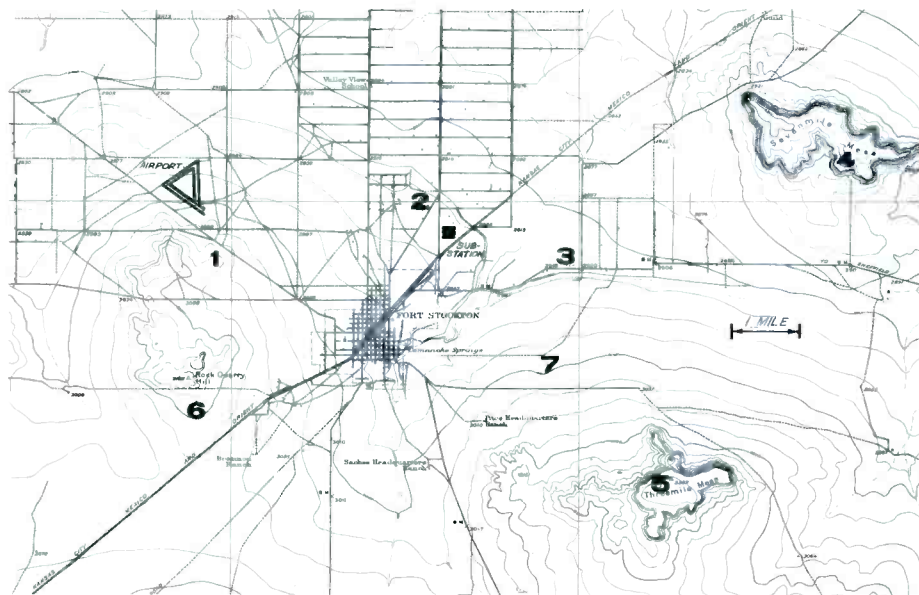
Next we should obtain the services of someone who lives in the community and knows the area well. This could be the system owner, the local legal representation, a realtor, etc. This simplifies the answers to some of the questions that come up. So as we go around looking over the general areas we choose, we can ask the first questions, "Where is the airport?"

Generally a site should not be within a minimum of three miles and preferably five miles from *any* airport. The size of the airport, whether it is controlled, has an instrument runway and orientation of the runways (traffic pattern) all have a bearing on the allowable proximity and height of a structure. So unless all other possible sites prove to be impractical we won't at this time bother with the airport area. It would be a shame to pick a site that looked far enough away from the airport, only to find after six or eight weeks of study by the FAA that it is on the approach path of an instrument runway. Don't laugh. The above mentioned Fort Stockton (population 8,000—no commercial air traffic) tower is right on the edge of their instrument approach zone and we were requested to move the proposed tower site six hundred feet to the north or lower the tower. We moved the site before the tower was erected.

How about power lines now. Any type, 120,000 volt or 12,000 volt. Where are they? Are there any sub-

stations nearby? We want to be a mile, preferably two, or more, from these. Even this precaution does not preclude the possibility of power line noise but at least we try to eliminate the obvious. Are we looking across parts of the town that could generate noise. Most power companies are extremely cooperative and usually go out of their way to help in eliminating power line noise. This doesn't mean that they can create miracles. They can find and replace a broken insulator ten or two miles away but they can't be expected to rebuild their entire plant.

We have to agree that all signals do not come from the same direction in some situations. Here we compromise. For example, three channels may come from the north and four from the south. We look for a site on the east or west side of town. If we do not have that choice, then at least let the high (7-13) channels come across the noise source. The high channels are less affected by noise. Or let the least desirable or strongest (closest in distance) channel go across the noise. The greatest enemy of signals is noise and there are two ways to minimize it. Pick a place where there is little or none or increase the signal to a point where the signal-to-noise ratio is improved. That is, with a stronger signal the noise will be less noticeable. The only way to increase signal is to get closer to the source or go higher in elevation. This does not mean necessarily that we could erect a 1000 foot structure over a noisy power line and improve the signal-to-noise ratio. In this case we would only be 1000 feet away from the noise and the amount of signal gained by the height would not offset the noise picked up. Nor does it mean that we could justify a site ten miles out. Although quiet, being ten miles closer to the source when you are 120 miles away doesn't mean much additional signal and the additional transportation cost of 20 to 30 thousand dollars might make it impractical. It takes more signal to overcome a set level of noise than it takes noise to spoil a viewable picture. In other words, it is possible to enjoy a weak noise free picture, but impossible to view a strong signal clobbered by noise. So along with our quiet site we would like to have the benefit of as



much elevation as possible.

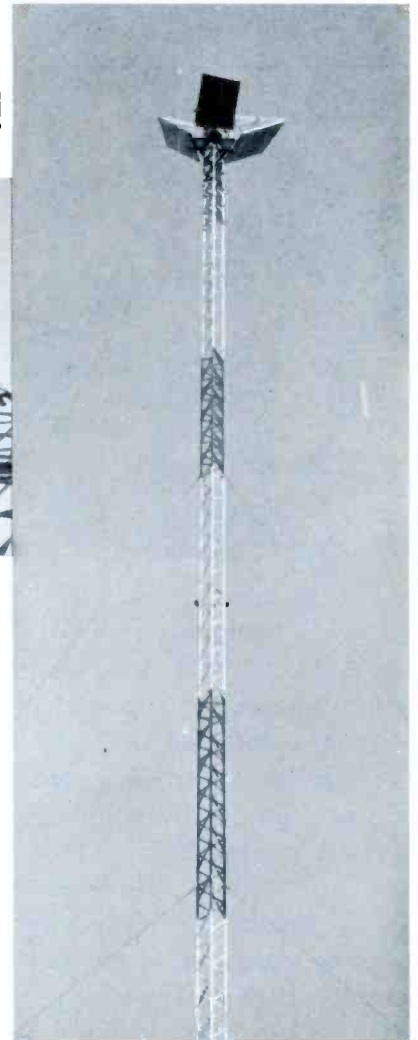
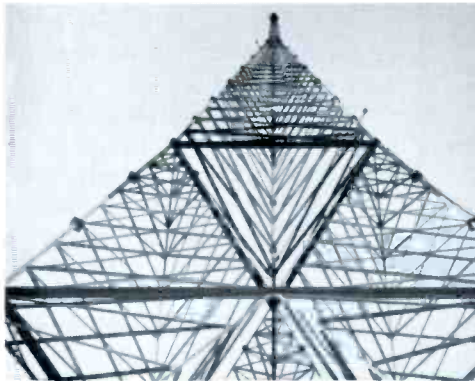
At this point if we have been lucky, we are able to ask whether the various pieces of land looked at are available, what they might cost, what power is available or the cost for a power line, if it is the required acreage, do we negotiate with more than one landowner? We can also get a good idea of the accessibility, suitability and zoning of our site. Regarding availability . . . by this time it should be apparent that the choice of a site is not based on the fact that the land is a free piece of swamp or that one of the stockholders owns a piece of property that is in a hole or will soon be surrounded by the town.

Cost . . . of a piece of land will depend on the locality. Good farm land will be more expensive than a rocky, mountainous, or desert type land. Whether to lease or buy normally doesn't matter and usually depends on the desires of the land owner. Keeping in mind that most of the land will still be useful for farming or grazing, a lease could be negotiated on the basis of a free TV connection or even money, but it should be for a long term, i.e. 20 years or more. Buying the land eliminates potential lessee-lessor conflicts and could produce unexpected dividends. Oil might be discovered on the property.

Space . . . will depend on the type of antenna supporting structure needed. Depending on the terrain it takes about six acres for a 400 foot triangular tower. For a rectangular tower we can figure that the square of the tower height in feet will equal the number of square feet required. For a triangular tower the length and width of the site are approximately 1.2 and 1.4 times the tower height respectively.

Power line . . . availability and how much line might have to be built is our next question. It could be as easy as running one span of secondary lines, or as is the case in some mountainous areas, several miles of tortuous primary pole line construction. There is no real rule of thumb which would apply to power line costs because each situation and each power company are different. If there is not much involved the power company may build the required line at no cost in anticipation of getting another customer.

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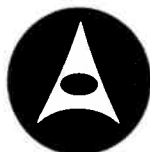
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THE AMECO
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With more and more of the CATV manufacturers following Ameco's lead and turning to transistorized equipment, the need for cable technician training in solid-state theory, design, construction, and maintenance is quite apparent.

In order to alleviate this need, Ameco is now operating a Solid-State School as a service to the industry. There is no tuition charge involved and the school is open to any cable system regardless of the make of equipment now in use.

For dates and details on this five day, 42-hour Solid-State School ... please mail coupon below.



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Let us now consider access to the site. Do we have to build fences, gates, and how many? Do we only have a few hundred feet of gravel to spread but have to haul it from 40 miles away? Will the tower or other construction people be able to get "on site"? Will we need snow plows, four wheel drive vehicles, mules, snowshoes, helicopters, an alpine guide, or as has happened, will we need a boat during the rainy season?

Finally we should check the type of soil which will have a bearing on the cost of installation of our structure and site building. If it's solid rock, blasting and/or drilling might be required. If it is sandy, extra depth and concrete might be needed for anchors.

Zoning ... is very seldom a problem but should be checked.

Assuming we have been able to lease or purchase this choice piece of real estate we must now pinpoint the latitude, longitude and elevation of our site. I suggest that the surveyor who does the plat required in the closing transaction be instructed to come up with those numbers. Although anyone can pull the latitude, longitude and elevation from a topographical map, having the exact spot attested to by the county engineer could save a lot of correspondence with the FAA, FCC, USCG, and others in the future. Surveyors are human so if his figures disagree with ours by more than 1/4

mile we will ask him to re-figure. A comparison of figures should be very close if not exactly the same.

We can now fill out form 117 as required by the FAA (Available from the FAA or tower contractor) in triplicate requesting approval for the proposed structure. If we are in luck the location will be approved in about two weeks. If it is determined that the proposed structure might constitute a hazard to the safety of air navigation then a study will have to be made. For example, if the structure is far from an airport, but on an airway and over 200 feet tall, a study has to be made. This means that a copy of the request for approval will be sent to all interested parties. If none of the "interested parties" is interested or objects the approval will arrive in about six weeks.

Now we can build the right size building, erect a suitable structure, install the antenna arrays, turn on the equipment and we're in business.

In this article we have tried to indicate the factors involved in the choice of an appropriate site. Most of the above applies to almost any site anywhere, be it for "off-the-air" reception, microwave, or local origination. The importance of the factors as stated previously are somewhat relative and anyone of them could outweigh any other one ... but they all demand consideration and thought. □

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LIGHTNING ARRESTORS

Yes or No?

By **WILLIAM F. KARNES**
Telesystems Corporation

William F. (Bill) Karnes of Tele-Systems Corporation is a well-known CATV engineer. He has engineered many systems throughout the country. His "arrival" has been welcomed by existing systems that sought better answers to their technical problems. This article is based on a question that is frequently asked of Bill.

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Question:

Our system does not use lightning arresters. Should we be using them? Why?

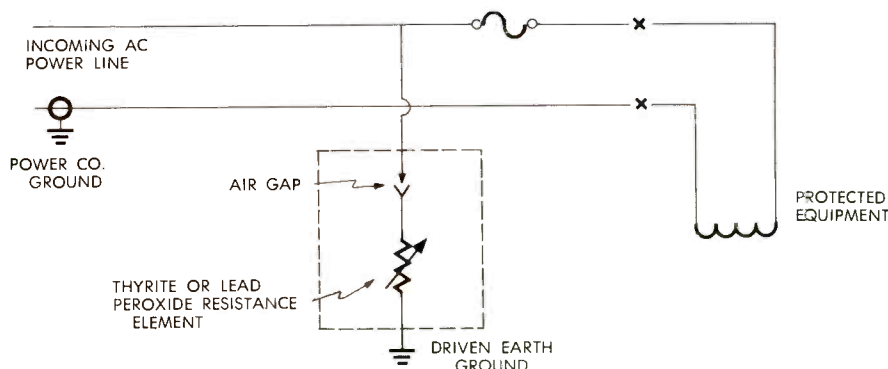


FIGURE 1

Answer:

You should. Lightning arresters give several kinds of protection. While it is true that they are of little help in the face of a direct lightning hit, they can protect you in many other ways. Experience shows that arresters are an effective safeguard in the great majority of conditions where surges build-up, and switching transients or

static charges would make the cable system inoperative.

The subscriber who suffers loss of picture can more easily understand and forgive when he knows that the massive degree of current discharge has been the cause. He is much less likely to comprehend your inability to safeguard his reception from the less spectacular varieties of damaging electrical build-ups.

I have found the valve type units to be most effective for CATV protection (see Figure 1). These, basically consist of an air gap in series with a substance whose resistance varies inversely with the current flowing through it. Materials used for this purpose might be thyrite or lead peroxide pellets.

This is how an arrester does its work (see Figure 2). Surge voltage produced by lightning increases until the arc-over voltage point of the air gap

is reached. Parenthetically you will note that an air gap is needed so that the arrester is not connected across the line during normal operation.

When the air gap is jumped an ionized path is created, and current begins to flow through the resistor material which is in series with the gap. Resistance decreases allowing more current to pass. This decrease in resist-

ance with an accompanying increase in current flow continues until the minimum resistance value of the element is reached.

At this point with the surge voltage still present, current will continue to increase, since resistance cannot drop to a lower point, voltage applied to the protected circuit rises.

This applied voltage can do damage when the voltage and the wave form join to bring about a high enough rise in value, but for most of the lightning surges, arresters have kept CATV equipment free from otherwise sure damage.

To be sure of correct arrester protection, careful installation is mandatory; and special attention must be paid to the grounding path. The ground wire should be heavy enough so that its resistance will be small when compared to the arrester minimum resistance. Number 6 solid copper is a good size for this use. Ground rods of sufficient diameter and length should be used.

You will find it helpful to consult with your local power company since their engineers have been working with the grounding requirements of your area.

These rules will help guide you. The ground wire run should be as straight as possible. Clips should be tight and clean. Corrosion will allow unwanted insulation to act as a bar against quick safety action. Arrester leads should be straight; they should never be pig-tailed or coiled. The reason; most lightning surges have a sharp rise time; representing a very high frequency pulse. Lead coiling, or indirect ground wire routing bring in an inductive element, and this reduces the efficiency of the grounding path. As a result, the efficiency of the lightning arrester is reduced. □

TV&C VISITS SKL



Our journey took us along the banks of the Charles River in Boston. There, overlooking the river near M.I.T. and Harvard University, we found Spencer-Kennedy Laboratories. Housed in two adjoining buildings in a quiet suburban setting, Spencer-Kennedy's 150 employees steadily turn out electronic and mechanical devices for closed circuit television.

Although our visit coincided with a particularly busy period for both production and sales personnel, we were accorded a very warm welcome. Spencer-Kennedy's President, Donald Spencer, and his staff organized a complete and informative tour. With camera and note-book we recorded our observations — to enable you to join us . . . on the TV&C "Visit to SKL".



Donald Spencer, President of Spencer-Kennedy Laboratories, Inc.

Founded in 1948, to design, manufacture and market electronic measurement instruments, Spencer-Kennedy Laboratories, Inc. has contributed important innovations and technology to the CATV industry.

Following pioneering work in the development of wide band distributed amplifiers in the early 1950's, founders George W. W. Brewster, Chairman of the Board; Fitzroy Kennedy and Donald Spencer determined to concentrate efforts on CATV equipment. Today, SKL's principal activity is the development and manufacture of devices for closed circuit television. Product systems include: wide band distributed or "chain" amplifiers, an original development of SKL on which the Company's early reputation in both the CATV and Instruments field was based, together with an ultra long line amplifier, automatic level controls, automatic slope controls, thermal gain and slope controls, complete head-end equipment, both solid state and tubed, including transistorized channel preamplifiers and all associated parts

and equipment such as cable fittings, cabinets and hardware, and particularly directional coupler tap-off devices.

Spencer-Kennedy also continues the manufacture of precision laboratory instruments for industrial, military, and space applications.

System operators have long been acquainted with the Model 212 dual stage amplifier which SKL introduced in 1949. Capable of reamplifying signals in the total VHF television band (Ch. 2-13), this unit was marketed with only minor modifications until 1962, apparently indicating an advanced engineering capability.

Obsoleting the 212 was the Model 222A which retained the same fundamental circuitry but produces higher gain and incorporates automatic thermal gain control and slope control. Recently added to the SKL line was the model 215 "Long Line" amplifier. Offering an eight channel capability, the 215 is designed for trunkline runs of up to fifty miles or more. Design of this new amplifier to keep pace with changing industry patterns reflects the Spencer-Kennedy philosophy of development and marketing.

Donald Spencer, President of SKL says "We believe our Company's competitive position and growth during the next few years will depend in large part on how well our



Part of the quality control and final testing area.



Assembly of SKL equipment is handled by skilled, well-trained workers.



Dick Schrader, Sales Engineer, demonstrates SKL head-end equipment for TV&C reporter.

Albert Clark displays new "Long Line" amplifier. Also on table is Model 507 Decay Rate Meter used in accoustical testing laboratories.

research, development, and marketing people analyze the requirements and desires of the ultimate TV viewers . . . the customers, as well as those of the many people in the CATV industry who service these customers. We had this in mind in the early days when we stressed the ultimate advantages of wide-band equipment and the ability to transmit color; we had it even more clearly in mind recently, when we stepped up our research and development affairs."

W. K. (Bill) Headley, Vice President, Sales, enthusiastically agrees, pointing out that the new Series 400 Multi-taps are carefully designed to please everybody — especially the man who has to climb the pole. "We wanted to make it as easy as possible for him to install directional couplers, using a minimum of tools, time and effort."

Albert Clark, Vice President, Production, and Carl Locke, Production superintendent; Dr. Jacob Shekel, Chief Engineer; R. B. Handley, Manager of Quality Control and George H. Ray, Director of Instrument Design, are all experienced, capable people, looking to, and thinking of the future. Fred Marz, Manager of Pre-Production, has completed 15 years of service with the Company, and is typical of the stability of SKL's employees. The average length of service of supervisory personnel is more than nine years,



Richard X. Cullinane, left, and Robert A. Brooks, CATV Systems Engineers confer on a layout problem.

TV & COMMUNICATIONS



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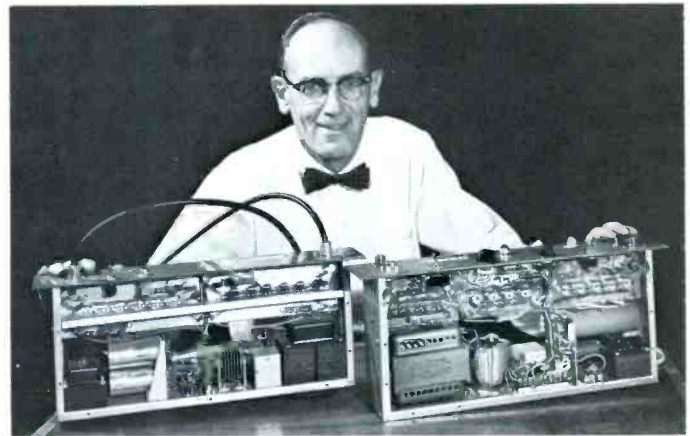
which is rare for an electronics firm. During our visit to SKL we were well impressed with these men, both as a team and as individuals with a deep concern for their industry and individual customers.

In reviewing Spencer-Kennedy's progress over the years, R. G. (Bob) MacLaughlin, Assistant Sales Manager, proudly listed many SKL firsts in the CATV industry, including:

- 1952 First use of a solid sheath cable in a CATV system, Barre, Vermont
- 1952 First automatic level control unit for wide-band systems
- 1953 First wide-band all-channel system, Brattleboro, Vermont
- 1954 First multivider line splitter for wide-band use
- 1956 First directional coupler (Chromatap) line tap
- 1957 First, and still the only, pilot-operated equalizer installed in the educational network, Hagerstown and Washington County, Maryland and subsequently in many CATV systems.
- 1959 First "Thermatic" gain control for CATV trunk lines



CATV systems engineering and layout section.



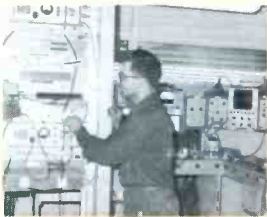
Fred Marz, senior employee, with SKL's 1950 Model 212C (left) and 1964 Model 222A (right) wide band television amplifiers.

- 1960 First "Thermatic" line equalizer
- 1960 First, and still the only, alarm relay system for locating any line amplifier malfunction; installed in Naples, Florida
- 1960 First of the present larger CATV suppliers to use transistor amplifiers

According to Bill Headley net sales of SKL in fiscal year to June 30, 1964 were up 31 percent. For four straight years, sales have increased, and are now just under three times the 1960 level.

Recently expanded capabilities in the field of system financing can be expected to further accelerate Spencer-Kennedy growth in the community antenna equipment market. And as our industry grows you may be confident, based on our first-hand observations, that SKL will stay right in step with the needs of CATV operators. □

NOTHING BUT THE BEST



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You can be confident of getting the most from your investment by consulting the established specialists in All Band CATV. 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 on the company that is truly "of CATV people—by CATV people—for CATV people!"

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LETTERS

Gentlemen:

According to the circulation policy of your magazine, TV&C is circulated on the tenth day of each month, so therefore we are wondering what has happened to our subscription. Would you please advise as soon as possible because being fairly new in this business I rely considerably on this magazine for up-to-date information and ideas that pertain to a cable system.

D. A. Shackelford, Manager
Cablevision Lethbridge Ltd.
Lethbridge, Alberta
Canada

• D. A., sorry your magazine arrived late. We have been several days "off the pace" in the mailing of TV & Communications. However, we are now on schedule and future issues should reach you on time. Thank you for your interest.

Gentlemen:

We have been intending to write to you following our careful reading of your TV & Communications publication for the past several months to tell you that we notice with pleasure a

continuing improvement in the periodical.

In our opinion this publication is of real and specific service to our industry, and we sincerely hope that you will continue to meet with success in the future of this undertaking, perhaps to the extent that the magazine may be published twice a month.

May we suggest that when your budget and time permit that you give consideration to making a field survey of specific CATV operations, on the basis of which you can bring to the attention of the industry, items of general interest concerning outstanding CATV operations. This information would be most helpful to CATV operators.

Again, best wishes for continued success.

Meadville Master Antenna, Inc.
George J. Barco
President

• George, your encouragement is sincerely appreciated. We have considered the possibility of publishing on a twice monthly basis as you suggest. At present we are consolidating our efforts and enlarging our news coverage in preparation for an expansion program. Whether "TV&C" becomes a bi-monthly will depend on

a number of factors which we are presently exploring.

The basic question is how many of our readers would favor a bi-monthly, and whether they would be willing to pay a higher subscription rate. Or would they settle for a slightly smaller magazine if it came twice as often?

We would appreciate hearing from as many readers as possible with regard to publishing "TV&C" twice monthly. How about it?

Gentlemen:

We would like to receive six additional copies of the October Issue of TV & Communications. The cover and other pictures were photographed in Parkersburg and are of great interest to us. We also would like to know the possibility of obtaining more copies at a later date.

Durfee's TV Cable Co.
C. O. Erickson
President

• C. O., thanks for identifying the cover photo for us. When NCTA headquarters provided the picture for use in "TV&C" we were unaware of its origin.

The copies of the October issue are on their way. However, we cannot assure you of being able to obtain copies at a later date.

GUY-GRIP

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Are you a cable TV operator looking for a man . . . or a man looking for a cable system job?

We can bring you together for both your mutual benefit. An employment service, exclusively devoted to the interests of the cable television interests, has been needed. TeleSystems Corporation is filling a genuine need in the CATV Industry by providing this service.

Many, many miles separate job seeker from the job opportunity. It would take great expense to pursue the opportunities that are now open. Similarly, much time and needless expense is lost in seeking the ideal person for the opening.

CATV has been growing fast. Ownership can benefit by the years of experience we have had in staffing our CATV systems. We have established significant criteria by which to judge whether a prospective employee is the right person for the job.

Often persons with good backgrounds in closely allied industries can make a successful transfer into CATV.

Or men with Manager or Chief Technician potential have pushed past the limits of their present opportunities and are seeking advancement in this exciting industry.

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

Write or Call:

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Personnel Placement Division
TeleSystems Corporation
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Glenside, Pennsylvania
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Continued from page 16

radio broadcasters against CATV. This is a new approach that reeks of self interest and has no basis in public interest. It seems that one of our crimes is, and again I quote, The CATV operators found that unused channels on the cable television set were ideal for the carrying of commercial-free radio programming—fine music or town and country or perhaps show tunes. Forgive us for giving the public what they want . . . fine music.

“Once more quoting from the Maine speech . . . Bruce Merrill, the chairman of the NCTA, predicts that ten years from now CATV systems will serve 20 of the nation's TV homes . . . and that means 12,000,000 homes receiving cable television, many with complimentary radio channels. One thing that seems to have been conveniently missing is the fact that the same Bruce Merrill has consistently predicted that these homes would not be equipped for Pay-TV. Yet the jam in the back continues. Mull this over for a moment if you will please . . . I say that it would be much easier and more economic and more efficient to convert all the broadcast stations in the United States to Pay-TV and link them into a network than it would be to link CATV systems into a Pay-TV network. Please understand that I do not say this will happen, but if we are to look into some kind of crystal ball and try to determine what could be done, the practicability of a marriage between network TV and Pay-TV is much more reasonable than the shotgun marriage we so strongly resist.

“Another thought along this line to consider . . . if a broadcaster denies his signal to a CATV operator, he is actually denying it to a segment of the public. If he charges the CATV operator for the signal, he himself is then in Pay-TV. And finally . . . I charge that there is no such thing as minimal legislation or regulation. If it must come, we ask only that the legislation take nothing away from the public. The future belongs to those who serve the public's needs. CATV does exactly that. I invite you to join the CATV industry, not with a ‘if you can't lick 'em, join 'em’ motive . . . but with the ebullient feeling of serving the public's wants and needs.” □

Continued from page 18

SHAHER RESIGNS FROM ENTRON

Robert J. McGeehan, President of Entron, Incorporated, has announced the resignation of Edward Shafer. Mr. Shafer has been with the community antenna television firm since early 1962 and served as vice president since April 1964.

Mr. Shafer's present plans are to remain in the CATV industry as a consultant to existing operators and to future applicants.

BRAND REX NAMES SALES DIRECTOR

The newly appointed Director of Sales and Marketing for the Brand Rex Division of American Enka is Bruce Van Wagner. He will maintain offices at the cable company's Concord, Massachusetts headquarters.

Associated with the coaxial cable industry for several years, Mr. Wagner was formerly Vice President of Anaconda Wire and Cable Company.

NEW REP COMPANY FORMED

Sales offices for Mez-Con & Associates have been established at 1070 Coldbrook Avenue in Chambersburg, Penna. The new firm is a manufacturer's representative agency for community television systems equipment.



Mezzalingua



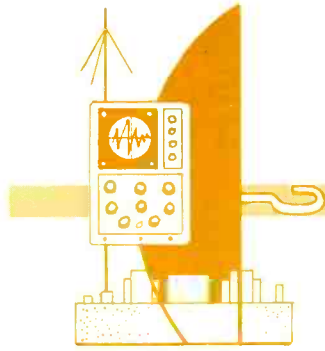
Conn

Directing the activities of the company is Daniel Mezzalingua and Girard Conn, both with long experience in the television equipment field.

The company will handle coaxial cable, lashing wire, messenger strand, television towers and electronics equipment. Headquarters for Mez-Con are in Manlius, New York.

VIKING ADDS McMAHON TO STAFF

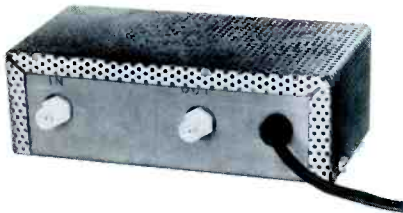
Kerwin McMahon has been added to the engineering staff of Viking Cable according to Arthur Baum, President of the Hoboken, New Jersey, company. Named as Technical Sales Engineer, Mr. McMahon will operate out of the Viking main office. He was formerly with Plastoid Corporation of New York. □



PRODUCT REVIEW

TRANSISTORIZED AMPLIFIER

A transistorized amplifier has been designed for low level system use as an individual subscriber amplifier by Viking, 830 Monroe Street, Hoboken, New Jersey. According to the manufacturer, the unit is ideal in amplifying signal levels normally too low to be divided among several TV sets.



Functioning as a booster unit, the Viking #953 can be installed as an after-tap amplifier to serve up to 4 TV sets.

The unit features an operating cost per year of only \$.25 on 117 vac or dc. Gain is 10.5 db minimum at 54-88, 177-216 mc and 6 db minimum at 108 mc. It has response of .1 db per band and .03 db per channel.

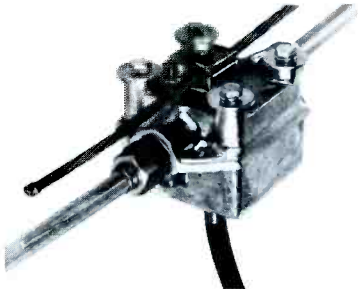
More complete details and price are available from the manufacturer.

AMECO INTRODUCES POWER PROTECTOR

A new lightning arrester is being introduced by Ameco Incorporated, 2949 West Osborn Road, Phoenix, Arizona.

Designated PP-3 "Power Protector", the unit is installed at each power location to provide filtered, protected AC outlets. It features internal "shunt to ground" arrester for lightning protection; automatic resetting circuit breaker to reactivate the system following a sudden surge or overload; four filtered AC outlets to eliminate RF interference, and an indicator-type fuse to enable operator to spot outage quickly.

Complete specifications on the "Power Protector" can be obtained from Ameco.



NEW DIRECTIONAL COUPLER OFFERED BY ENTRON

A new directional coupler designed to provide one tapoff outlet from trunk lines of CATV systems for feeding distribution amplifiers has been made available by ENTRON, INC., 2141 Industrial Parkway,

Silver Springs, Maryland, manufacturers of community, master and educational systems.

Entron reports that the unit, designated as Model DF-10, combines flat frequency response with excellent VSWR for VHF high and low band operation. It also permits advanced system installation techniques by its physical and electrical isolation of the distribution amplifiers from the trunkline.

The DF-10 is completely weather-proof and permits easy installation by means of a strand mounting clamp. Flare connectors are supplied for aluminum cables and UHF connectors are supplied for plastic jacketed cables. Complete details are available from Entron.

UHF RIGHT ANGLE PLUG

Kings Electronics Co., Inc. has designed and produced a new UHF right angle plug, part number KU 59-17 for use with RG 8, 9, 10, 11, 12, 13, 63 and 65/U cable.



This angle plug allows considerable saving in cable length by permitting the cable to be draped practically straight down from the panel. Moreover, KU 59-17 will accommodate any adapter to a smaller cable size that the regular PL 259 will take and will also accommodate K-Grip adapters to PL 259.

KU 59-17 features a brass contact and rexolite insulator. It is available from Kings Electronic Company, 40 Marbledale Road, Tuckahoe, New York (contact H. Watson).

CYLINDRICAL PARABOLA FOR ETV

The Technical Appliance Corporation has recently introduced a new cylindrical parabola antenna specifically designed for use in the Instructional Television



Fixed Service (ETV) band within the frequency range of 2500-2690 mc. This compact solid surface antenna measures only 10" by 16", and weighs less than 10 pounds. Rugged construction permits it to withstand thrust of up to thirty pounds per square foot (30 PSF).

The ECPA-1 Cylindrical Parabola antenna uses a broad-band dipole type driver to cover the entire ETV band without field adjustment. VSWR is 1.3:1 maximum over the entire band; gain is 12.5 db; impedance is 50 ohms. The antenna can be installed to provide reception of either horizontal or vertical polarized signals.

Complete data on the ECPA-1 are available on request from TACO, Sherburne, New York.

VIKING INTRODUCES NEW TAPS

Four new taps have been introduced by Viking, 830 Monroe Street, Hoboken, New Jersey, for CATV use. The new taps include a directional flattap, 4-way directional tap, a pedestal mount tap and an underground pressure tap.



Viking #522

A 4-way hybrid multi-tap that permits only the desired signal from amplifier. According to Viking, it is absolutely flat; reduces reflections by over 30 db to the "out line".



Viking #511

Another 4-way tap that is hybrid plus directional. This one is designed for critically low insertion loss (0.5 db). All terminals are matched and are isolated by over 30 db from each other (by 40 db from OUT line).



Viking #532

A high performance directional tap pedestal mount designed for easy installation in underground systems. It is designed to select only the amplified TV signal and reject all interference. It can also be used in cabinet mounting.



Viking #542

"The Football" is described by Viking as "a most unusual new Underground Pressure Tap." Its football shape is designed to enable quick, easy flow tapping. It features two stainless steel pins for positive grounding and is waterproof.



12 CHANNELS OF TELEVISION

Plus all the FM you want, plus
a weather channel, background
tape music and off-the-air FM stations!

Insure rapid system growth by providing a wide variety of entertainment for your subscriber. As the nation's established leader in CATV system design and supply, DAVCO is qualified to custom-engineer an All-Channel head-end to exactly meet your requirements.

The Davco Functional design Head-End delivers 16 channels of entertainment. 11 TV Channels, 2 tape channels, 1 weather channel and 2 off-air FM channels!

This is just part of hundreds of racks of custom Head-Ends that have been designed, assembled and delivered by Davco! Many of the most experienced CATV engineers across the country consistently choose Functional Design by Davco. There must be a reason! And that reason is the performance, reliability and economy of Davco's Functional Design systems.

CATV operators everywhere depend on Davco for fast delivery of all materials and equipment for their systems. You'll find the largest, most complete inventory of CATV equipment and supplies at DAVCO where you always receive prompt, courteous service. Reasonable prices, too!

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FIELD ENGINEERING OPPORTUNITY for right man. Leading CATV manufacturer requires high caliber technician well versed in antenna survey technique, CATV headend, trunkline and distribution. Must be free to travel. Minimum of 3 years extensive CATV experience. Excellent salary. Write Dept. 112, TV & Communications, P.O. Box 63992, Oklahoma City, Okla.

FOR SALE January 1st, 1965, all aluminum, all band, solid state system in one of the economically highest locations in the U.S. Town growing at over 100 families annually — present estimated population 6500. Excellent monthly rates plus excellent long term franchise. Owns all poles! Send inquiries to: Dept. 113, TV&C, P.O. Box 63992, Oklahoma City, Oklahoma.

BROADCASTER WITH CAPITAL TO INVEST WILL BUY INTEREST IN OPERATIONAL CATVs.

East Texas, Louisiana, Arkansas, Tennessee, Mississippi, Alabama, Georgia, North Florida. Write giving details, Dept. 114, TV & Communications, P. O. Box 63992, Oklahoma City 6, Oklahoma.

FRANCHISES WANTED. Will pay cash for secure CATV franchises in Washington, Oregon, Kansas and Oklahoma. Small systems will be considered. Send details, including population, subscriber potential, terms of franchise and pole agreement to: Dept. 115—TV & Communications Box 63992 — Oklahoma City, Okla.



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CATV consulting, management, engineering and construction. TV Cameras, closed circuit television installation. Twelve years in CATV.

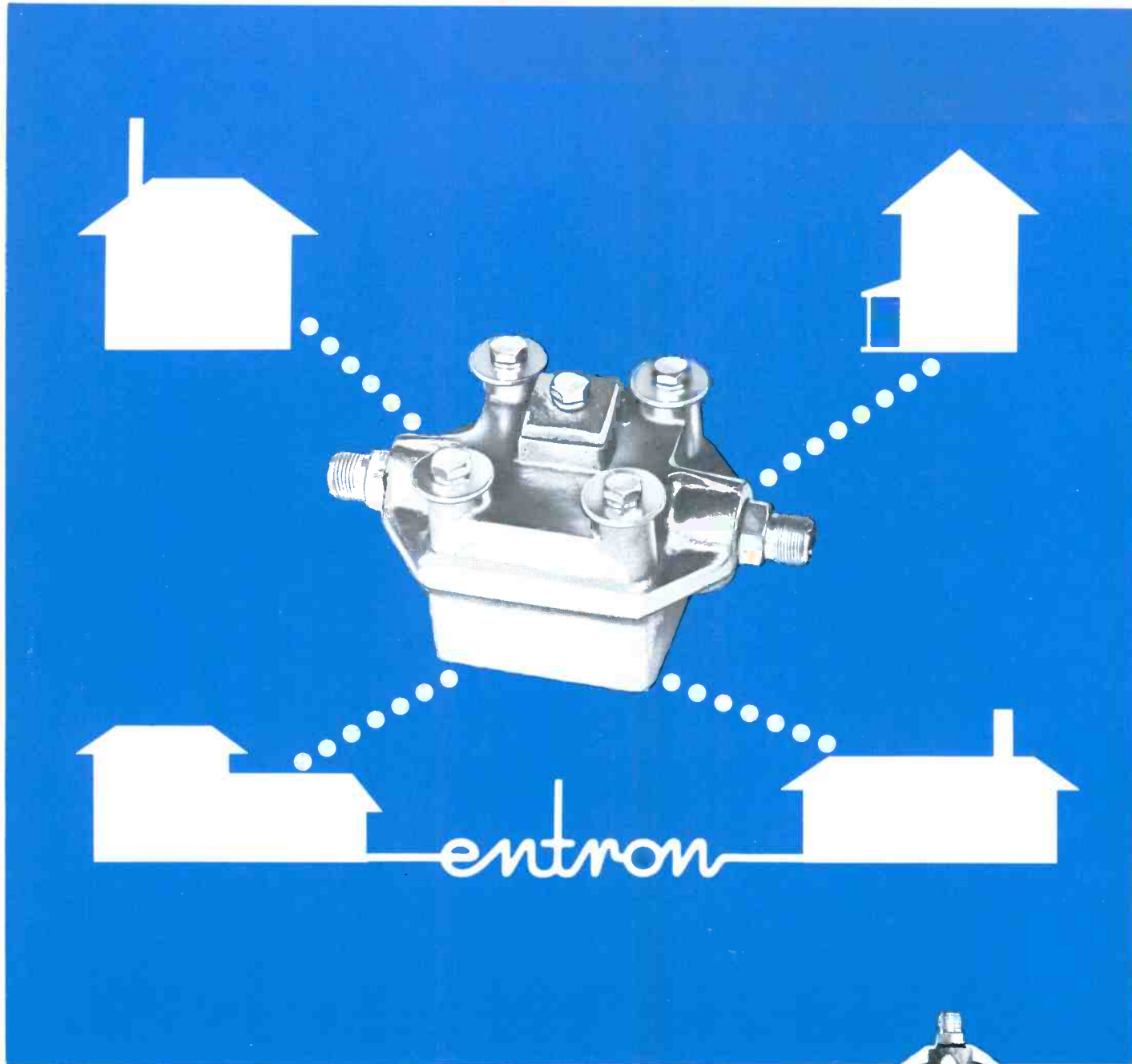
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Viking Cable Company
Hoboken, New Jersey
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UPGRADE YOUR SYSTEM WITH ENTRON'S **MATCHED** MULTIEE TAPS



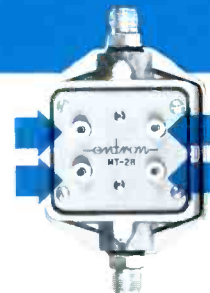
For new systems and system conversions Entron has designed the finest quality tapoffs . . . **MULTIEE**, the new 4-way tap.

Ultimate thru-line match and backmatch for all band color
Extremely low insertion loss (0.3 db average) • Seven attenuation values
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MT Series MULTIEE Tapoff.
Four threaded output fittings.

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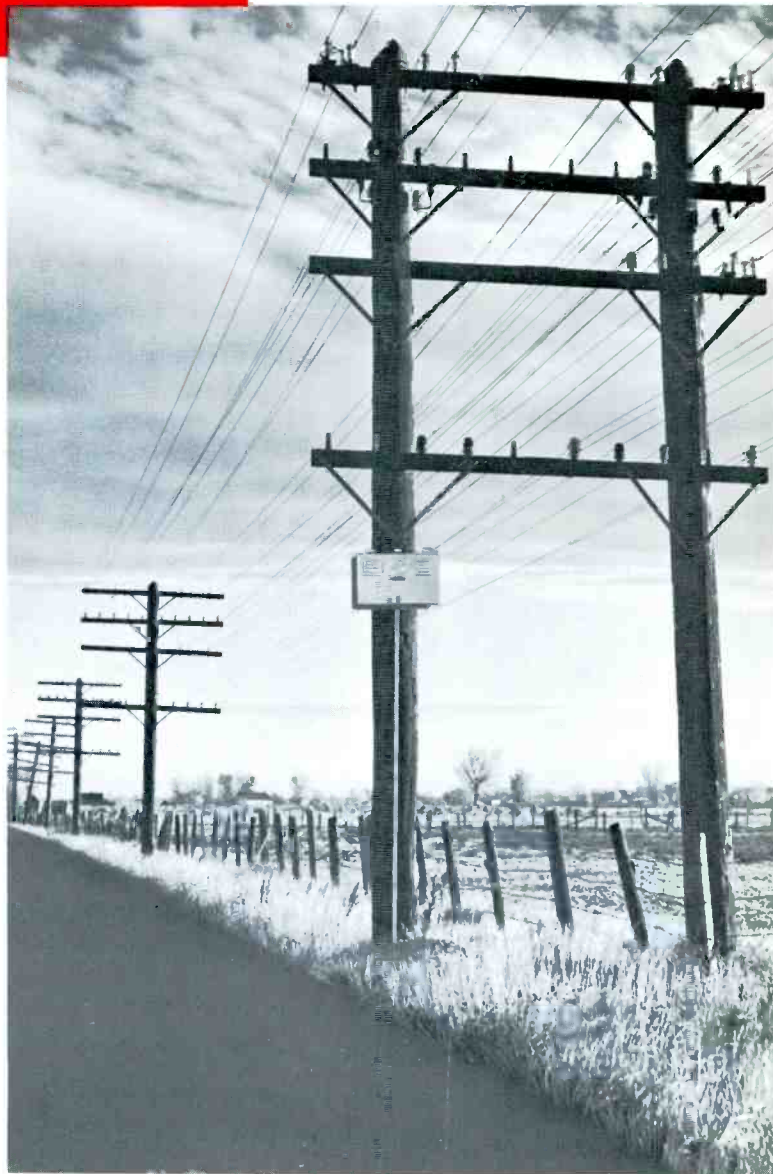


Now SKL's Model 215 Long Line Amplifier Opens New Markets Beyond the Horizon

When a signal pickup point 30 miles out makes the difference for a new project — when you want to feed your present signals to that town 20 miles farther away from your own distant signal source — when that small community a few miles from your system has been clamoring for your service . . . these are the times to look to SKL's Model 215 Long Line Amplifier.

With a capacity of up to 8 channels, and low noise and distortion characteristics that are a real engineering triumph, the Model 215 can deliver multi-signal service over great distances. After a point-to-point run of 40 miles, for instance, signal quality is of such a high order that a distribution network of 80 miles can be served throughout with pictures which meet very demanding criteria.

In those application problems where microwave for many channels is impractical, uneconomical or unobtainable, the Model 215 Long Line Amplifier system can be your ideal solution.



Are you looking at a new market presently lying "beyond the horizon"?

Let our Systems Engineering Department study your problem.

They may have the answer!

Call or write.

SKL

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