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AUGUST 1965

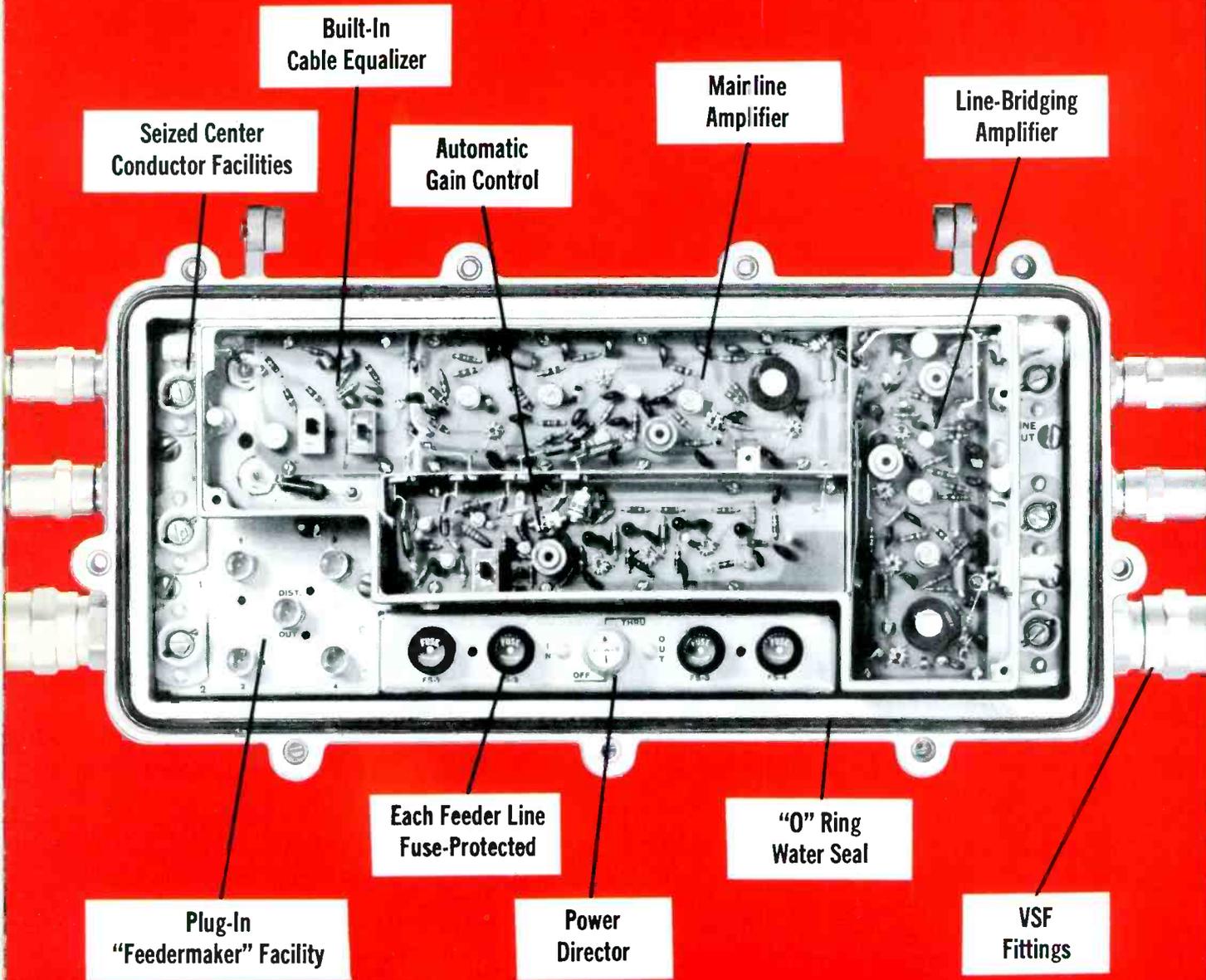
TV & Communications



NCTA CONVENTION REPORT - SPECIAL CATV TECHNICIAN'S SECTION

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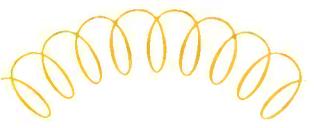


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AN OPEN LETTER TO BILL DANIELS



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NEW YORK: (212) WH 3-5793, HOBOKEN: (201) OL 6-2020



August 2, 1965

Dear Bill:

On behalf of my family and the entire staff of Viking, I would like to thank you for the tremendous job you did at the NCTA Convention in Denver Colorado.

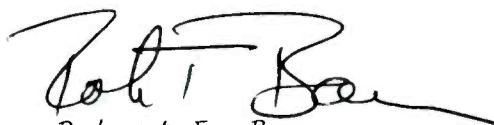
Whenever we were in need of assistance your staff was always available for advice and direct action.

The entire convention was the best coordinated and most imaginative in the history of the NCTA. This, we feel was directly attributable to your genius.

Congratulations on receiving the first annual Larry Boggs Memorial. We know it will be an inspiration for you to do even greater things in our wonderful CATV industry.

Say thanks to Monte Rifkin, Alan Harmon, Bill Ross, Ross MacGregor, Dick Zell, Tom Johnson and all your lovely secretaries that helped make the NCTA show the greatest ever.

Sincerely,
VIKING



Robert E. Baum
Vice President



Arthur Baum
President

AB/stz

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U/V sweep generator, model 4122

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The sweep oscillator is varacter tuned (no moving parts) for silent operation and long life. For VHF output the UHF sweep is mixed with a fixed oscillator signal at 900 mc and the resultant difference signal is amplified and level controlled to cover the complete VHF TV spectrum.

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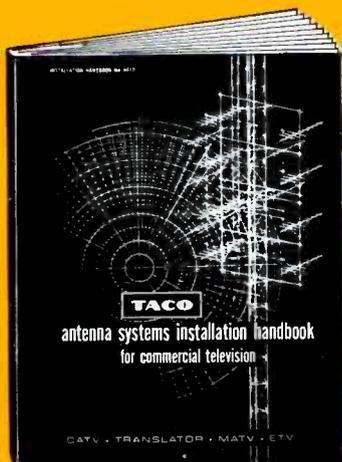
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TV & COMMUNICATIONS

THE PROFESSIONAL JOURNAL OF THE CABLE TELEVISION INDUSTRY



AUGUST, 1965

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ATM-65

The ATM-65 is Ameco's etched circuit, all-band trunk line amplifier with 30 db gain. It combines maximum output with low noise figure, as well as temperature compensation for constant performance at any ambient temperature.



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The ATB-65 is a low gain, high level bridging distribution amplifier, featuring an excellent match and extremely low insertion loss.



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The ATB-65-5 is a 25 db gain, high output bridging distribution amplifier. It can handle the most difficult distribution problem. Manual gain and tilt controls permit perfect level and slope control.



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The ATMB-65 is a combination of the Ameco ATM-65 trunk amplifier and ATB-65 bridging amplifier. It allows the cable operator to provide a high output signal to four feeder lines.



ATA-65

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Does the Bell (System) Toll for You?

With the slow, ominous advance of a crawling python, the Telephone Giant is maneuvering into position to engulf CATV in its lethal coils. Like that prodigious snake of the Orient, the telephone interests warily prod and probe, awaiting the perfect opportunity for the fatal contact.

What can CATV owners do to stay in business . . . to avoid assimilation into the Bell System's mighty complex? The first step is to gain the knowledge of what the phone company intends. Armed with facts and the principles of free enterprise on our side, escape lies within reach.

Current telephone company strategy for forcing entry into cable television involves the filing of CATV tariffs with state public utility commissions. Complete head-end and distribution plant is offered through lease agreements. System construction operation and maintenance services are proposed, at a rate somewhat higher than the cost of private ownership. Lacking the control, profits, freedom, and flexibility of outright ownership, the leased system is naturally not very attractive. However, it is made relatively more desirable by inexplicable delays in granting of pole attachment contract and, in some cases, the outright refusal of pole attachment permission. Even existing pole line agreements are being cancelled by some phone companies and others are drastically boosting pole rental rates.

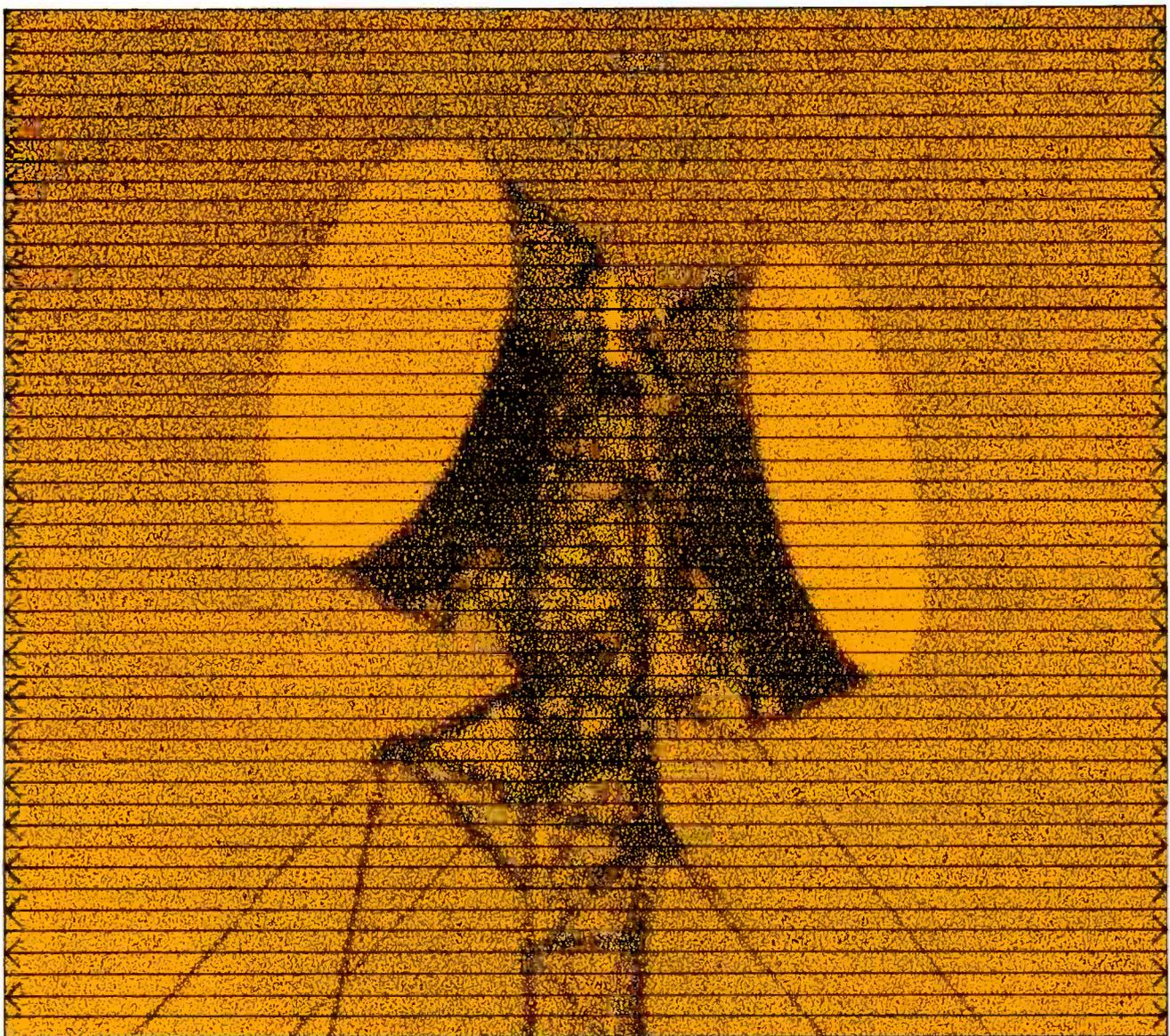
Counteraction through the courts, as well as Government agencies is advocated by E. Stratford Smith, an outstanding legal spokesman for community antenna interests. Smith adamantly declares that "the telephone companies are not entitled to dominate, control or monopolize CATV because they control communications' space on the utility poles and they are particularly vulnerable where their activities eliminate, restrain or otherwise preclude competition. . . . Clear cut evidence of refusal to grant attachment contracts while insisting upon acceptance of the tariffs may raise serious anti-trust issues," Smith notes. "Any combination of practices, or policies which denies reasonable access to the poles to an applicant with a franchise and which favors or forces acceptance of the tariffs may raise the same problems. Unduly high rates for attachment space, and other unfair rate practices, delays in granting contracts, delays in granting clearances, restrictive provisions as to services which can be furnished, and artificial conditions precedent to a contract which force acceptance of the tariffs, are all examples of practices and circumstances which may provide a basis for both private anti-trust action and for civil or criminal action by the Department of Justice.

"There is also in the opinion of a number of lawyers a substantial question of whether the Bell System companies may lawfully provide the service proposed in their tariffs. In 1956, a Federal District Court in New Jersey issued a consent decree pursuant to which Bell Telephone Companies are precluded from furnishing any communications service which is not a bona fide communications common carrier service. The tariffs as filed may reasonably be argued to constitute an effort to circumvent the restrictions of the consent decree . . . simply a means of entering into the CATV business under the guise of furnishing a common carrier service. The situation is readily distinguishable from the furnishing of telephone, teletypewriter, data transmission or other private line communications services to a business man to enable him to run his factory, chain of stores, line or railroad in an efficient manner."

We can't really blame the telephone folks for wanting a slice of the cable TV business. But when a company accepts the protection and benefits granted to public utilities it must also abide by the obligations incumbent upon it as a government fostered monopoly. And in the case of the phone company there is specific legal precedent to the effect that Bell cannot enter the wired entertainment business per se. The provision of cable facilities for the CATV operator in a community certainly does not constitute a common carrier service. And the pressure tactics of several Bell companies may well constitute an attempt to establish an illegal "corner" on community antenna television.

You can do **your part** to head off a phone company take over by writing to TV & COMMUNICATIONS when you observe telephone tactics which may be designed to force you out of business or to foster phone interest monopoly of CATV. We will channel such information, in confidence, to NCTA leaders for use in their campaign to preserve privately owned CATV. If all of us in cable television work together we stand a good chance of making sure that the Bell (System) will not ring out the death knell for the CATV industry as we know it today.

Stan Seale



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News SPECTRUM

NCTA MEET CONCLUDED; CONROY NEW CHAIRMAN

The 14th Annual National Community Television Association Convention held July 18-23 in Denver was described by cable TV operators, manufacturers and guests as the most successful ever held. NCTA officials estimate some 2,000 registrants.

Annual election of officers was held with Benjamin J. Conroy, Jr. taking over the post as National Chairman for the coming year. He succeeds Bruce Merrill. Conroy is president of Uvalde TV Cable Corp., Uvalde, Texas and former president of the Texas CATV Association. He has been a director of NCTA since 1961 and has served as NCTA secretary.

For a complete report on the issues, topics, activities and speakers of the Convention, turn to page 26. Photo coverage begins on page 35.

FILINGS ON CATV MICROWAVE PROPOSALS

NCTA, in filing on the FCC microwave proposals, told the Commission it doesn't have the legal authority to issue the proposed CATV rules. Comments from CATV opponents ranged from fence-straddling to severe regulation.

At deadline, the Commission received dozens of filings from opponents and proponents alike. Joining NCTA was Washington law firm, Smith & Pepper; Milwaukee Journal; TV Cable Service of Abilene, and Jerrold Electronics. NAB, Westinghouse, Storer and AMST all agreed that FCC should regulate CATV systems. The latter three complained, however, that the Commission didn't propose to go far enough in regulating the systems.

The three major networks also submitted comments with ABC asking for tough regulation; CBS warned against regulation but expressed mistrust of CATV, and NBC urging the Commission to wait for Congressional authority.

NCTA said the FCC hasn't had an adequate fact-finding inquiry, and hence the proposals amount to a pre-judgment of the issues. "If the commission has jurisdiction over CATV systems directly, as it concludes in this notice, it should compel the production of data from CATV system operators and broadcasters in order to determine the extent, if any, of adverse economic

impact upon television stations . . . this data should be accumulated before specific rules are proposed."

NCTA got into the copyright question with a statement to the effect that FCC obviously doesn't understand the situation. "The Commission ignores certain basic differences between broadcasters and CATV system operators. For instance, broadcasters get paid to carry programs on their stations. CATV systems do not. CATV systems improve the reception of the signals and allow more people to view them, which should benefit the broadcaster and the producer, if proper steps are taken by both to benefit from this larger viewing audience."

NAB spoke of "broad powers" and said "the Commission has the power to promulgate regulations . . . (if they) are necessary to promote and preserve an effective nationwide free broadcasting system." Not only does it have the power, but it has the duty to use it, the association said.

The Broadcast Association said "the act grants broad expansive powers and is designed to be flexible to the end that developments in the communication field, unforeseen by its framers, may be handled effectively." It added that "the effect of CATV broadcasting is direct and substantial. It is no casual, fringe relationship, but a dynamic force which has the potential of frustrating, if not entirely nullifying, a valid regulatory scheme carefully developed in the public interest."

Westinghouse warned that CATV might destroy UHF, so that it is imperative the FCC regulate and regulate quickly and sternly, without waiting for Congressional action.

CBS was opposed to FCC regulation, but said CATV "feeds parasitically on the very system which it may be threatening, and may destroy TV station service to rural viewers the CATV systems can't reach." It warned, however, "if the Federal government raises a protective wall in behalf of broadcasting, not only broadcasting's vitality, but its freedom will be eroded." CBS concluded it is "unwise . . . to protect one group of businessmen against the competition of another group."

Storer and ABC both asked for quick FCC regulation without waiting for Congress.

Jerrold Electronics said "the commission's evident haste in promulgating the instant rules is, in Jerrold's opinion, ill-considered."

TV FILM COMPANIES REVISE COPYRIGHT PROPOSALS

Fifteen Hollywood TV film production and distribution companies have had second thoughts about the FCC's proposal to regulate CATV's which don't use microwaves as well as those that do.

They asked the Commission to make it quite clear that the proposed order for CATV systems to carry local TV stations doesn't mean that the systems don't have to secure clearance from the holders of copyrights to the programs carried by the stations in question. The fear is that the FCC order that CATV's must carry the stations might be a defense in court for carrying the programs without permission. The lawyers said this could be met by a simple statement in a final FCC order to the effect that the Commission action "is not in derogation of any copyright or other proprietary interest."

FCC NOT TO BAN TV-CATV CROSS OWNERSHIP, BUT WILL WATCH FOR CASES OF ABUSE

By a First Report on its inquiry into acquisition of CATV systems by TV broadcast licensees (Docket 15415), the Commission reports that the inquiry "has not disclosed any substantial evidence of widespread abuses" and that "the danger of such abuses is not sufficiently great to warrant an overall or across-the-board prohibition against cross-ownership."

"Subject to the limitations set forth herein, and until the promulgation of another policy on this matter, the Commission will not withhold or defer action on applications for either television station license renewals, grants, or transfers or microwave license renewals, grants, or transfers merely because the applicant or licensee owns or proposes to own interest in both a television broadcasting station or stations and a CATV system or systems."

The action was taken on July 27 by Commissioners Henry (Chairman), Hyde, Bartley, Lee, Cox, Loevinger and Wadsworth, with Chairman Henry dissenting and issuing a statement in which Commissioner Cox joined.

NCTA, NJCATA CHARGE TELCO WITH MONOPOLY ATTEMPTS

The board of directors of the National Community Television Assn. charged that the Bell System and other telephone firms might seriously impair the future development of Community Antenna Television as an independently owned industry.

The board issued a statement expressing deep concern over the offering by the telephone companies to provide virtually the entire physical plant for CATV systems at public utility charges in more than 20 states.

NCTA directors said, "Many community antenna operators have expressed concern that the practices and policies of telephone companies may seriously impair, if not destroy, the future development of CATV as an independently owned industry.

"It is the intention of this Association to maintain close liaison with Bell System and other telephone companies in the interest of working out arrangements which will accommodate the legitimate interests of both groups and result in the best and most economical service to the public."

The head of the New Jersey Community Antenna Television Assn. also issued a blast at both American Telephone & Telegraph Corp. and its subsidiary, New Jersey Bell Telephone Co. The New Jersey group met in conjunction with the National Association's annual convention in Denver.

J. Phil Franklin, president of the New Jersey association, said Jersey Bell was "attempting to exercise monopoly control over the independent community antenna television industry."

He said the company's proposal to supply channels and associated facilities in connection with CATV service was thought to be in violation of a 1956 ruling by Federal District Court in New Jersey. The court forbade the company from engaging in any business other than the furnishing of common carrier communications services, Franklin said.

"The Public Utility Commission's granting of Bell's petition would be contrary to the public interest. It would set up an arrangement whereby Bell would then be in a position, through its control over the use of utility poles for the attachment of cable and amplifying equipment, to monopolize and control community television service as well as the manufacturing and installation of community antenna equipment," Franklin said.

"This maneuver to get into community television through the back door of a leaseback arrangement," he said, "plus the Bell System's present power to assign or deny pole rental to community antenna television companies would enable the telephone titan to throttle free competition and to turn the community television small businessmen into puppets of the mighty Bell System."

UNITED TELEPHONE STATES POLICY

United Telephone Systems, large independent telephone company, in an-

swer to questions concerning their policy on CATV issued the following statement of policy.

"United Telephone Companies have filed or will file distribution facilities lease-back tariffs before the utility commissions in each state in which they operate. These tariffs will be for distribution facilities only—taking the signal from a terminal outside the "head-end" building and terminating at the outside of the subscriber's house.

"The United Companies stand ready to provide these distribution facilities in each of their exchanges. The lease-back of these facilities will be offered to and will be available to any applicant applying for service. New pole attachment contracts will be considered only in exceptional cases and then treated on a case by case basis. Existing pole attachment contracts will be reviewed by the local telephone company. If modifications in rates or other clauses are required, these will be made on a case by case basis.

AMST ASKS FOR TOUGHER INTERIM REGULATION OF CATV

The Association of Maximum Service Telecasters has filed comments with the Federal Communications Commission urging that the Commission's proposed interim rules regarding community antenna television systems be strengthened. The Association declared that while the Commission is considering "appropriate regulations" to govern the long-range development of all CATV systems, it "should take steps to insure that CATV does not preclude the growth of UHF television stations, in accordance with previously established Commission and Congressional policy."

AMST said the Commission should roll back the effective dates of its interim procedures and apply them to any CATV system begun or expanded since April 23, 1965, the date the Commission announced its intention of ultimately regulating all CATV. AMST argued, "adoption and immediate implementation of effective interim rules—applicable to all CATV systems—is crucial in light of the surge of CATV activity." "Indeed," AMST said, "various CATV interests since April 23 have been urging local authorities to grant franchises as fast as possible before the Commission issues further rules." Therefore, the AMST petition added, the Association "strongly supports the immediate adoption of interim rules, applicable to all CATV systems, designed to ensure that CATV does not jeopardize the growth and development of free television broadcast service pending adoption of effective long-range regulations to govern CATV."

AMST proposed further that while the Commission's proceeding is evolving, no CATV system be permitted to extend the signal of any television station beyond its Grade B contour "except upon a clear and full showing" that there are special circumstances—such as (a) the community is remote and isolated; or (b) the community does not have and cannot be expected to receive in the future, direct off-the-air local or area television service, and (c) it can be shown that the operation of the CATV system, considered with all other CATV's operating or planned in the area "would not pose a substantial threat to the maintenance or the expansion of any existing UHF station or the development of new UHF service in the area."

ADOPT RULES FOR HIGH POWER TRANSLATORS ON UNUSED TV CHANNELS

The Commission has announced an amendment to its TV broadcast rules to permit translators up to 100 watts power to operate on unoccupied VHF and UHF channels assigned to communities in the TV table of assignments, effective August 16. The adopted rules are substantially the same as those proposed February 17 (Docket 15858).

L.A. INDEPENDENTS WILL GO TO ARIZONA, NEW MEXICO

The Federal Communications Commission has granted American Television Relay, Inc. of Phoenix, Arizona construction permits to bring the four independent television stations to Teleprompter's Farmington and Silver City cable systems in New Mexico, according to Helmut Dieter, president of the relay company.

"This marks a breakthrough for the CATV industry," Dieter said. The applications have been about one year in the processing. The present common carrier microwave service from Los Angeles to Yuma, Arizona will be extended into these new areas with the signal path to be split at Pinal Peak, near Globe-Miami, Arizona. The northern branch going to Farmington, the southern branch to Silver City.

OPTION ON CHICAGO SUBSCRIPTION TV SIGNED

Subscription television service may become a commercial reality in Chicago under an option agreement announced jointly by Field Communications Corporation and Zenith Radio Corporation.

The agreement grants Field Communications Corporation the right to acquire the Chicago franchise for Zenith's systems and to establish subscription TV facilities as promptly as possible after Federal Communications

Commission approval has been obtained.

"Subscription TV will provide a broad new service and will open a whole new spectrum in the world of entertainment," Marshall Field, Field Communications Corporation president said. "We believe this new service effectively supplements regular TV with quality box office fare and can be effective both as a business enterprise and as a public service in the community."

ENTRON SIGNS RECORD CABLE CONTRACT

A contract calling for the purchase of over 5 million feet of CATV cable has been signed by Amphenol Cable President, and Robert J. McGeehan, president of Entron, Inc.

The cable contract, which is reported to be the largest committed in the Community Antenna Television industry, calls for the purchase of over 5 million feet of coaxial cable for Entron's use in its CATV systems throughout the country.



Seated: Charles C. Camillo, Amphenol Cable President; Robert J. McGeehan, president of Entron, Inc. Standing: Wayne H. Schappele, Amphenol Cable marketing manager; and Edward P. Whitney, Entron's vice president.

"We are happy to have entered into this agreement," stated Mr. McGeehan, "because of our confidence in Amphenol cable and service. Entron has always stressed reliability in all our products and the use of Amphenol cable offers our customers dependable and consistent high quality in their systems."

GAB HOLDS 4th ANNUAL TV DAY; STATE-WIDE SESSION FEATURED TALKS ON BASEBALL NETWORKING, RATINGS, ETV & CATV

A baseball network in the Southeast for the Atlanta Braves, computers in TV time-buying, CATV and ratings were key topics discussed during the 4th Annual TV Day sponsored by the Georgia Association of Broad-

casters. The one-day television only meeting was held August 4 in Atlanta.

Headline speakers included William Bartholomay, Chairman of the Atlanta Braves; Warren Bahr, Senior Vice President, Young & Rubicam, Inc., New York, on the use of computers in TV time-buying; and William Wyatt, A. C. Nielsen Company. Wyatt talked on Ratings, Surveys and Statistics.

Georgia TVers heard a report on educational television in Georgia by Lee Franks, ETV Director; and a special summary of CATV by Marcus Bartlett, Cox Broadcasting Company.

AMERICAN CABLEVISION ORDERS 500 MILES OF CATV CABLE FROM AMPHENOL

More than 500 miles of coaxial cable has been ordered by Jack Kent Cooke, president of American Cablevision Co. from the Amphenol Corp.



Jack Kent Cooke, president of American Cablevision Co., Los Angeles, signs an order for more than 500 miles of coaxial cable from the Amphenol Corporation. Wayne Scheppele, marketing manager at the Amphenol Cable Division looks on.

Valued at approximately \$250,000, the order calls for a minimum of 2.5 million feet of coaxial cable to be delivered over a 12 month period, according to Mr. Cook. The cable will be used for the extensive expansion program now underway by American Cablevision.

AMECO AWARDS TECH-REP WITH TOUR OF MEXICO

Ameco technical representatives all over the country have been taking part in a contest which started January 1, 1965 and ended June 30. The prize goes to the tech-rep having the greatest percentage of increase in sales in a six months' period over the preceding six months' period.

The winner will go, with his wife, on a 10-day tour of Mexico. He will receive, also, \$50 for baby sitting fees and \$200 walking around money.

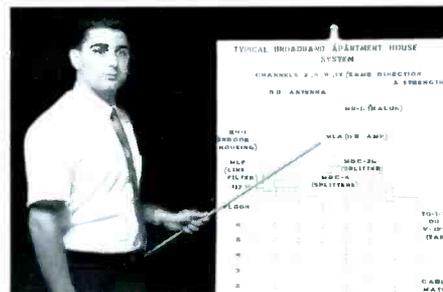
The man who made the greatest increase in sales over this period is Bruce Frazier. He operates Salesmo-

bile No. 7 out of Omaha, Nebraska, and travels Nebraska, Minnesota, northern Michigan, eastern Kansas, Iowa, North Dakota, South Dakota and Wisconsin.

L-C-A EXPANDS EDUCATIONAL PROGRAM

L-C-A, a New York sales firm, is supplementing the educational and training program in effect at Blonder-Tongue with a series of block diagrams showing typical MATV layouts for Apartment Houses, Motels, Hotels, Hospitals, Schools, etc.

The block diagram posters measure 17" x 22" and will be issued at least once a month to jobbers and distributors to hang in their stores in a conspicuous place for all their customers to view.



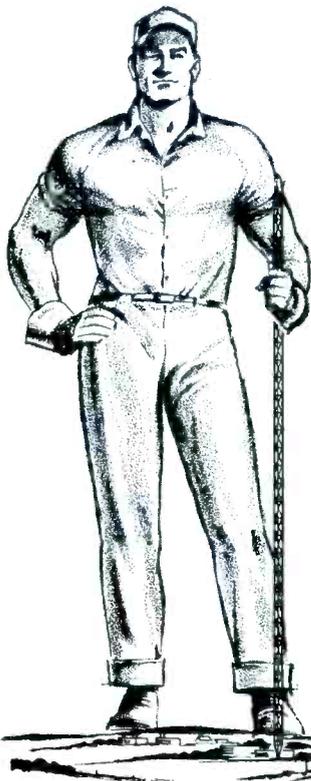
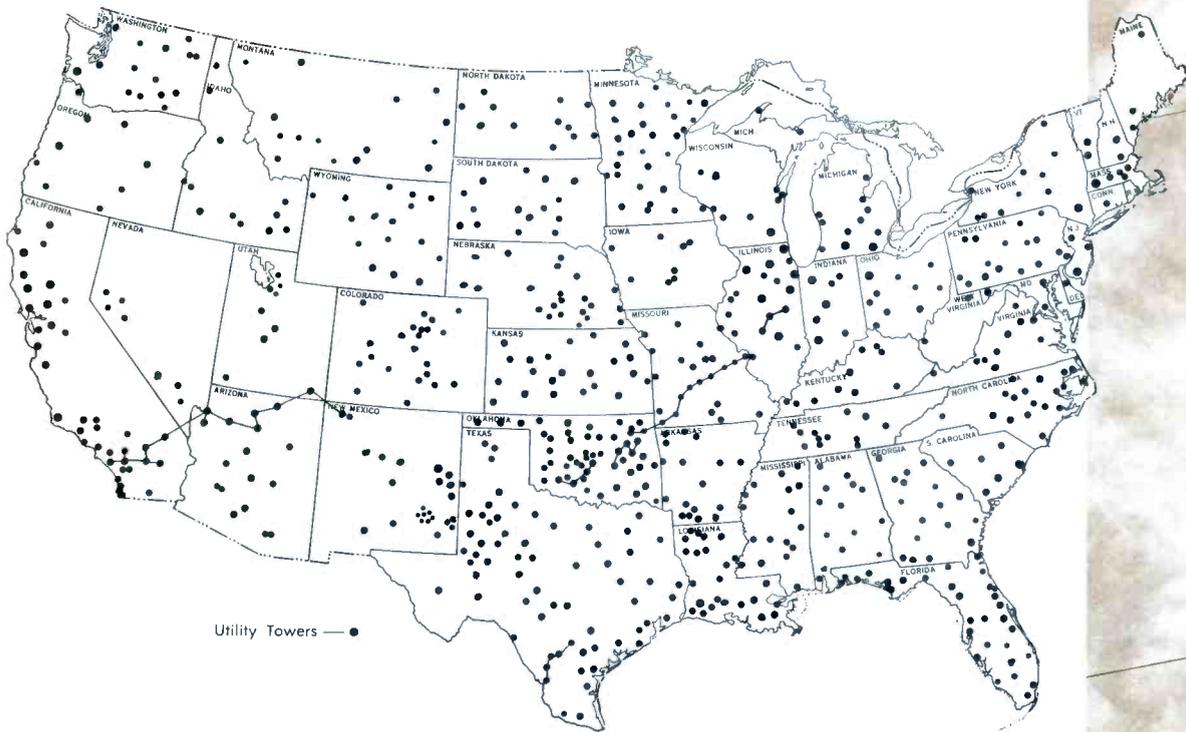
Paul Nichols and Robert E. Sargent principals of L-C-A stated that the future of MATV is knowledge of product and its adoption into a system. These poster block diagrams promote healthy questions to the jobber from their customers necessitating answers. It is at this point that L-C-A's jobber training program, put into effect over nine months ago, is placing the jobber in a knowledgeable position to serve its customers with answers.

ETV FOR 110 DELAWARE SCHOOLS

ETV systems are being installed in 110 schools throughout the State of Delaware under a contract awarded Jerrold by the Delaware Educational Television Board. Classroom in each of the schools will be equipped with television outlets connected to a closed-circuit cable system and master antenna. Educational television programs will be distributed through each school via the system.

The Diamond State Telephone Company will transmit instructional programs to the schools, via microwave and cable, from a central studio in Dover, Delaware. Jerrold CATV equipment is also used by the telephone company to amplify and distribute the programs on this state-wide network. Installation of the systems will be completed by Marco Electronics, an engineering contractor. All systems are expected to be in operation by the start of the fall school term.

Proven in hundreds of installations across the U.S. (and around the world.)



The many years of experience gained in hundreds of tower installations across the nation and in many foreign lands has made Utility the most respected supplier of towers for the CATV industry.

What does this mean to you? Complete peace of mind—because you can rest assured that your system will stay in operation even through extreme conditions. Add to this the fact that Utility Towers cost no more than ordinary towers . . . and you have the best tower buy available!

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

CHOOSE THE TOWER OF STRENGTH

Utility Tower COMPANY

3140 N.W. 38 • Oklahoma City, Oklahoma • (405) WI 6-5551

EASTERN DIVISION: P.O. Box 163 • Mayfield, Kentucky • (502) CH 7-3642

FOCUS

... On Progress

COMMUNITY ANTENNA TELEVISION SYSTEM FOR RIVERHEAD

Riverhead, N.Y. can now enjoy multi-channel television reception with the completion of *Long Island Cablevision Corporation's* newest community antenna television system. It is reported that this is the first CATV system to utilize a 300 foot, self-supporting TV mast instead of a conventional, guy-wired supported tower. The impressive mass of steel will support more than forty heavy-duty television antennas. It also was designed to support microwave television reception antennas for special, closed-circuit programs and Educational Television facilities.



Riverhead Town Supervisor, Robert B. Vojvoda, is pictured above in front of Long Island Cablevision Corporation's new office congratulating Philip J. Kenter, President of Cablevision, and Joseph T. Lopez, Treasurer.

Riverhead residents now receive twelve TV channels which includes seven standard stations from New York City, two from Connecticut, a closed-circuit weather channel with continuous background music, in addition to two UHF stations from New York City and Connecticut.

HOUMA TV CABLE NAMES BLISS AS MANAGER

Earnest E. Bliss, Jr. has been named manager of Houma TV Cable Co. in Houma, Louisiana. Mr. Bliss has been Chief Engineer of the system since it first began operation nine months ago.

Previous to that he was employed by Vestal Video, Inc., Vestal, New York as chief technician, and has been in CATV for a number of years.

ENTRON, FEC SIGN \$1 MILLION CONTRACT

A contract for \$1 million of business was signed by Entron Inc. and Federal Electric Corporation, *Robert J. McGeehan*, president of Entron announced.

According to Mr. McGeehan, who announced the contract at the annual convention of the National Community



Television Association in Denver, Entron will furnish equipment for a complex of community antenna television systems in New Jersey.

Entron Inc., located in Silver Spring, Maryland, manufactures CATV and communications equipment.

Mr. McGeehan declared: "Entron's new association with the Federal Electric Corporation is the second most significant step forward that Entron has taken this year. The other event was Entron's financing agreement in April with The Boston Herald-Traveler Corporation. It provided a credit line of at least \$6 million which might be increased to \$9 million."

Frank Scarpa, vice-president of Garden State Television Cable Corporation, for which Federal Electric holds the "turnkey" contract, pointed out that the new CATV complex would be the largest in New Jersey. It will provide multi-channel cable service for more than 20,000 homes initially, and will be greatly expanded in the near future, he said.

ATR PRESIDENT NAMED

Helmut Dieter, general manager of Decatur (Ala.) Cable TV, Inc., has been named president of American Tel-



evision Relay, Inc. national operators of a common carrier microwave system, according to *Bruce Merrill*, chairman of the board of American Television Relay and president of Decatur Cable.

Dieter has served as general manager of Decatur Cable TV since the company was organized in 1963. Decatur Cable TV now serves over 2700 subscribers and has been nationally recognized as one of the nation's fastest growing TV cable systems. Prior to his association in Decatur, Dieter was manager of the Fayetteville (Tenn.) TV Cable Company and prior to that, served as an engineer with *Jerrold Electronics Company*.

Randall Fraley, assistant manager and chief technician of Decatur Cable TV since 1963, has been promoted to general manager of the system.

PROMINENT CATV EXECUTIVE JOINS UNICOM

Unicom, Incorporated, specialists in Community Antenna Television, has recently announced the appointment of *Franklin R. Valentine, Jr.* as Executive Vice-President and Director. Prior to joining Unicom, Mr. Valentine was



associated with Charles A. Sammons and National Trans-Video of Dallas, Texas, for a period of 12 years. During that time he helped to pioneer CATV and pave the way for the development of systems in many areas.

MUIR OPENS CONSULTING FIRM

John S. Muir, California CATV executive has announced his entry into the cable TV consulting field. Muir has managed the Palm Springs system for H & B American and was a systems management supervisor for H & B. In addition, he directed construction, plant re-building and general management for an independent system company.

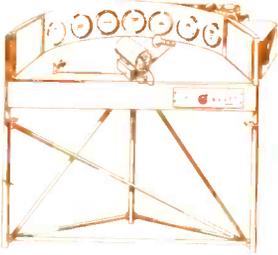
\$12.1 MILLION FINANCING FOR AMECO

Five major investment groups completed a \$12.1 million financing agree-
(Continued on Page 19)



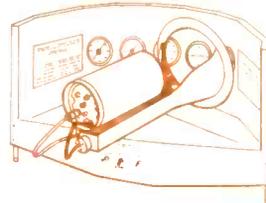
TELEMATION, INC. 2275 SOUTH WEST TEMPLE · SALT LAKE CITY, UTAH 84115 · (801) 487-7646

TeleMation takes pride in its pre-eminent position in the manufacture of supplementary service equipment for the CATV Industry. This position was reaffirmed at the NCTA Convention both by enthusiastic comments from delegates and by a volume of business over ten times that of any previous show. Every effort is being made to continue to merit the industry's endorsement by providing the finest supplementary service equipment available. Each of these products is expressly tailored for specific applications in the CATV Industry. Please fill out the business reply card below for further information on these or other products.



WEATHER CHANNEL

THE STANDARD OF THE INDUSTRY – In more CATV Systems than all other time/weather equipment combined. The Industry reconfirmed its dedication to quality products by placing orders for twenty-two TMW-2B systems during the NCTA Convention. Also reconfirmed is the overwhelming preference for the familiar Analog instruments with linear horizontal scanning. Other scanning methods have come and gone while the TeleMation approach has gained ever-increasing acceptance.



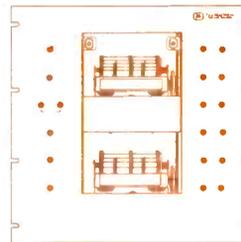
WEATHER CHANNEL 'J.G.'

ECONOMICAL AND COMPACT – The "WEATHER CHANNEL 'J.G.'" was specifically designed to fulfill the requirements of smaller CATV systems. It is built to the same exacting specifications that have made "WEATHER CHANNEL" equipment the accepted standard of the CATV Industry. The "J.G." gives accuracy and reliability comparable to the larger "WEATHER CHANNEL," but does not include the rain gauge, relative humidity gauge, slide projector, and 2:1 interlace sync generator.



NEWS CHANNEL

A NEW DIMENSION IN CATV PUBLIC SERVICE—"NEWS CHANNEL" highly acclaimed at its NCTA Convention debut, brings all of the news into the home twenty-four hours of every day. The viewer sees minute-by-minute reports as gathered by The Associated Press News Wire Service instantly as they are transmitted from news centers throughout the state and around the nation. All special bulletins are shown as they occur. News summaries are repeated for viewer's convenience – displays moving news copy twenty-four hours a day. Described by many as the "most significant equipment development in the history of CATV."



NON DUPLICATION SWITCHER

SOLVES NON-DUPLICATION SWITCHING PROBLEMS – TeleMation's TMP-204 Programmed Switcher is the ONLY available switcher designed to switch at one minute intervals throughout a seven-day week with adequate capacity and flexibility for CATV use. Handles up to 480 events per week. Controls 6 channels with integral video switcher selecting between main and alternate sources on each channel. Can switch any combination of the 6 channels simultaneously. Provides accurate switching at any selected minute throughout the week and automatically repeats each week. Presently used by many CATV operators in handling the most difficult non-duplication switching schedules.

See Other Side

TeleMation, Inc. Salt Lake City, Utah

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____ CITY _____

INTERESTED IN: STATE _____

WEATHER CHANNEL NEWS CHANNEL

WEATHER CHANNEL "J.G." NON-DUPLICATION SWITCHER

Other _____

Send Literature _____

Send Proposal on _____

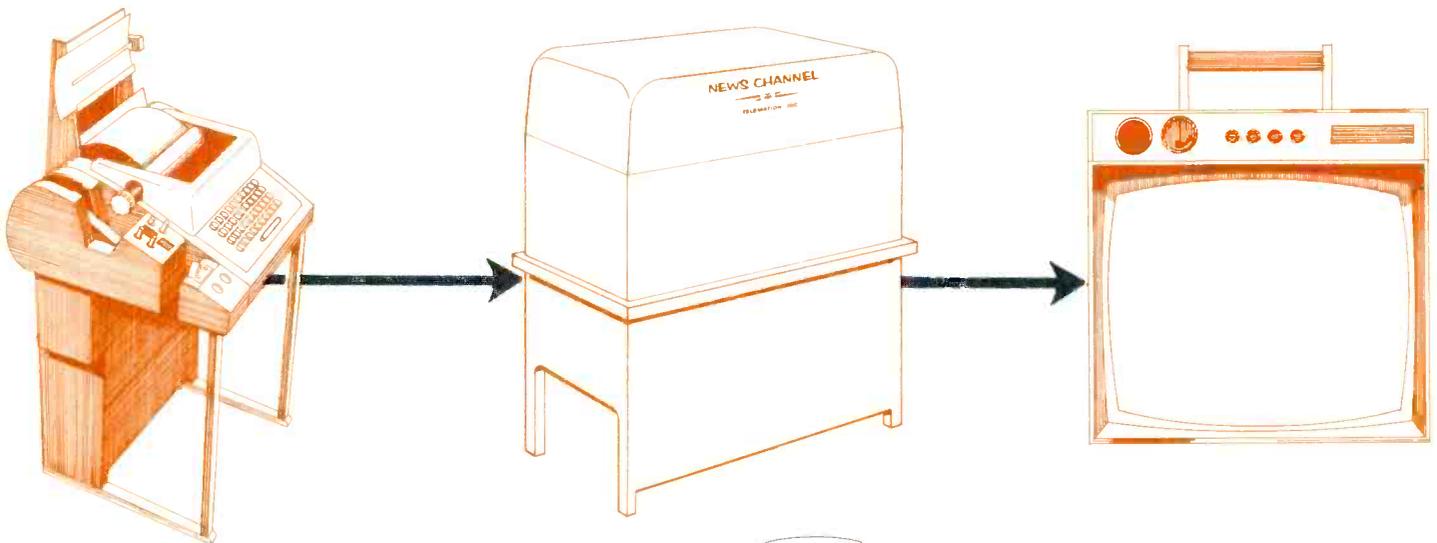
Follow-up and comments: _____



BUSINESS REPLY CARD
First Class Permit No. 2677

TeleMation, Inc.
P.O. Box 15068
Salt Lake City, Utah 84115





NEWS CHANNEL By TELEMATION, INC.

THE "NEWEST" CATV PLUS

"NEWS CHANNEL" offers a new dimension in CATV public service, at a time when more and more CATV operators recognize this need. "NEWS CHANNEL" brings all of the news into the home, 24 hours every day. At his convenience, the viewer can turn to "NEWS CHANNEL" and see the news instantly as it is transmitted on the AP wire from nation-wide news centers.

OVERWHELMING ACCEPTANCE

Industry leaders were quick to respond to this newest innovation in CATV supplementary service equipment. Some sample quotes from Convention observers:

"I feel this is a tremendous service — it enables the CATV operator to provide local and regional, as well as national news on a 24-hour basis. This seems to me to give us true stature as public servants, operating 100% in the public interest." Irving Kahn, President, TelePrompTer Corp., New York, N.Y.

"... this service is a dramatic step forward in providing communications directly to the homes of the over two million subscribers to CATV service..." Bill Daniels, President, Daniels & Associates, Denver, Colorado.

"I was greatly impressed with the "NEWS CHANNEL" I viewed at the NCTA Show in Denver. I feel this is going to become one of the most important services a CATV operator has to offer his subscribers. My future plans call for a "NEWS CHANNEL" in all systems where

we have the channel capacity." R. J. McGeehan, President, Entron, Inc., Silver Springs, Maryland.

"I think "NEWS CHANNEL" has a marvelous future. I watched a lot of it in Denver and thoroughly enjoyed it." Jack Kent Cooke, President, American Cablevision, Inc., Beverly Hills, California.

"NEWS CHANNEL" is exciting and has tremendous public service and other applications. We are getting it for a number of our systems starting with Lake Tahoe, California, where we predict it will be a particularly big hit." George C. Hatch, Vice President, Community TV, Inc., Bozeman, Montana.

Leading trade journals also recognized the importance of this new development—

VARIETY, "... A forward looking note ... answering the American people's insatiable appetite for information."

BROADCASTING, "... An uncommonly interesting exhibit of equipment that excited cable operators and prospective operators ... including an around-the-clock "NEWS CHANNEL" using AP radio wire service..."

RADIO TELEVISION DAILY, "An innovation in providing CATV subscribers with around-the-clock news..."

Perhaps the best indication of acceptance in the final analysis, is sales. Within minutes after the completion of the initial Denver presentation, the first firm order was signed for "NEWS CHANNEL." Throughout the remainder of the Convention TeleMation and The Associated Press were flooded with rate requests, with many additional orders written.

See Other Side

TeleMation, Inc. Salt Lake City, Utah

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____ CITY _____

INTERESTED IN: STATE _____

WEATHER CHANNEL NEWS CHANNEL

WEATHER CHANNEL "J.G." NON-DUPLICATION SWITCHER

Other _____

Send Literature _____

Send Proposal on _____

Follow-up and comments: _____



BUSINESS REPLY CARD
First Class Permit No. 2677

TeleMation, Inc.
P.O. Box 15068
Salt Lake City, Utah 84115

ment to provide funds for the expansion plans of Ameco, Inc., and affiliated companies of Phoenix, Arizona, *Bruce Merrill*, President, announced. Ameco designs, manufactures and builds cable television systems and has other companies affiliated by common ownership by Mr. Merrill.

The First National Bank of Arizona, in cooperation with The Girard Trust Bank of Philadelphia is providing \$6.5 million on a long-term financing plan to Ameco and affiliated companies: American Television Relay, Inc., a microwave common carrier under Federal licensing, and television station KIVA-TV in Yuma, Arizona. Of the \$6.5 million, \$3 million will be borrowed by Ameco.

Morgan Guaranty Trust Company of New York City, in cooperation with General Equities Corporation of New York, made an additional \$5.6 million long-term loan available to another affiliate, American Cable Television, Inc., presently owner and operator of 30 cable television systems throughout the United States.

DEROCHER JOINS KAISER CATV

Joseph L. Derocher has joined Kaiser Aerospace & Electronics, Phoenix, and will coordinate CATV System design and estimating in the Marketing Department, of the Phoenix Elec-



tronic Plant. Derocher brings to Kaiser his years of CATV field experience in all phases of system layout and design.

Derocher has attended Arizona State University in Tempe, Arizona, and is an honor graduate of the Dale Carnegie School.

TELESIS IS NEW CATV FIRM

Telesis Corp. of Chicago is the recent product of two former Polaris stations executives. *Richard Shively*, president, and *Charles Bevis*, vice-president, head the new CATV firm which now has eight CATV systems under construction, holds franchises for systems in 13 other areas and has still more applications pending. The head of the technical development subsidiary is Jack Hopkins, formerly of WSM-TV in Nashville.



KNIGHT NAMES MANAGER

Norman Knight of Boston announced the appointment of *Walter Welch* as general manager of CATV operations. Mr. Welch will develop various CATV properties including Virgin Isles T.V. Inc., St. Thomas, Virgin Islands, U.S.A. and other Knight Caribbean interests for the Knight Enterprises.

Welch has been vice president and general manager for Community Television Cable Corporation of Lehigh Acres, Florida. After 15 years of broadcast engineering, he entered the CATV field in 1958 and has served as chief engineer with Alpine Cable Television of Alexandria, Louisiana and General Television Systems of Naples, Florida.

JERROLD REPORTS \$5 MILLION SALES AT CONVENTION

Over \$5 million in CATV equipment and cable was sold during the five-day period of the National Community Television Association show in Denver by the CATV Systems Division of The Jerrold Corporation, Philadelphia, it was disclosed by *Lee Zernick*, Vice President of the company.

The million-dollar-a-day figure does not include contracts for "turnkey" construction services, Mr. Zernick reported. "This latter figure," he said, "will be disclosed when the necessary plant layouts have been fully engineered."

Robert Beisswenger, Executive Vice President of Jerrold, noted that this figure "substantially exceeded any past record" of the company for CATV systems sold at the show.

The success was attributed by *Jerry Hastings*, Manager of Jerrold's CATV Systems Division, to several factors: record breaking show attendance; the large number of new systems being built; rapid changeover by older 3- and 5-channel CATV systems to 12-channel operation; and broad acceptance of solid state CATV equipment.

Milton J. Shapp, President and Chairman of the Board of The Jerrold Corporation, a noted authority in CATV industry affairs, was elected to a three-year term as a Director of the

National Community Television Association.

AMERICAN CABLEVISION PROMOTES BRESNAN

William Bresnan has been named Vice President in charge of Engineering at American Cablevision Co., Beverly Hills, California.

Mr. Bresnan is a member of the Institute of Electrical and Electronics Engineers, National Exchange Club, North Central Community Antenna Television Association (Engineering Division) and served as its first chairman in 1962-1963.

Among other numerous accomplishments, Bresnan designed and built the Rochester Video CATV System in Rochester, Minnesota and stayed on as Chief Engineer. He also designed and built a 35 mile G-Line between Morongo Valley and Twentynine Palms, California.

MILLION DOLLARS WORTH OF SYSTEMS UNDER CONSTRUCTION

Edward P. Whitney, vice president of Entron, Inc., has announced that the company has over a million dollars worth of contracts for systems now under construction. This includes CATV systems in Bridgeton, N.J.; Dover, Del.; Jacksonville, N.C.; phase three in Utica, N.Y.; Laurinburg, N.C.; and Vincennes University; franchises in Washington and Bridgeport, Ill.

INTERNATIONAL EQUITY TO PURCHASE ADDITIONAL CATVS

International Equity Corporation plans to extend its CATV interests through purchase of CATV systems, franchises and micro-wave systems, according to *Ralph J. Roberts*, President.

International Equity Corporation (IEC) is a diversified company with

OUR COVER

The 14th Annual NCTA "Community Public Servants" Convention in Denver set the stage for our cover photograph this month. Shown (left to right) are TV & COMMUNICATIONS Editor, Stanley M. Searle; NCTA President, Frederick Ford; TV personality Debbie Drake; Ben J. Conroy, Jr., newly elected NCTA Chairman; Immediate Past Chairman, Bruce Merrill, and Sherrill D. Dunn, Managing Editor of this publication.

The host of red-coated young gentlemen in the foreground are Convention pages supplied through the courtesy of TV & COMMUNICATIONS and CABLE TELEVISION REVIEW.

substantial investments in CATV, Storecasting and Retail Merchandising.

According to Daniel Aaron, Vice President for CATV operations, existing properties and systems now being engineered for communities in which franchises have been obtained give IEC a potential of 45,000 subscribers.

The company has applied for a franchise in Philadelphia, and recently was granted franchises in Cheltenham and Upper Darby, both suburbs of Philadelphia.

MERRILL SELECTS ASSISTANT

A. B. (Burt) Covey joins Ameco, Inc. as assistant to Bruce Merrill, president of Ameco. Mr. Covey, who



will work out of Ameco's New York office, is a graduate of the University of Kansas, Lawrence, Kansas with a B.S.E.E. degree.

He was with the Bell System for 42 years, starting in 1923 with Southwestern Bell Telephone Company, St. Louis, as Transmission Engineer.

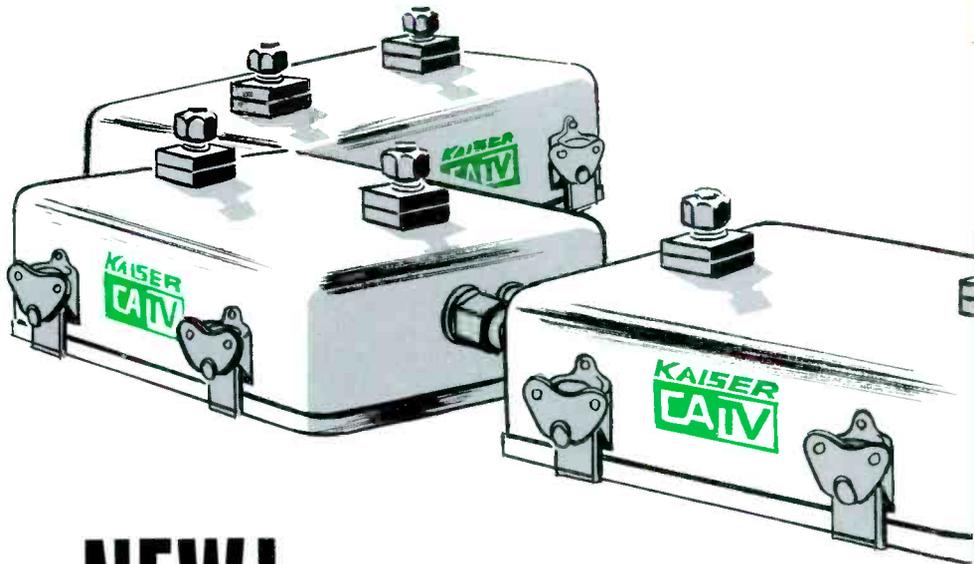
WILLIAM F. KARNES NAMED SALES MANAGER OF TELESYSTEMS

The appointment of William F. Karnes as Sales Manager for TeleSystems Corporation has been announced by Fred Lieberman, President of the Glenside, Pa. CATV firm.

Karnes, who has been a field engineer, sales engineer and system operator, has had 10 years experience in every phase of the CATV industry. A native Texan, he joined TeleSystems in 1962 as Manager of the corporation's Southwest Regional Office in Dallas. He was transferred to the home office in 1964 to become Assistant to TSC's Engineering Vice President.

In his new post Karnes will direct sales efforts. TeleSystems offers complete turnkey contracting and consultation services to the CATV industry, as well as operating its own systems serving 50,000 subscribers in 34 communities spread throughout the United States.

KAISER CATV



NEW! from Kaiser CATV

More high quality CATV Components from Kaiser! The transistorized, all-silicon Kaiser amplifiers, Models KAA-25 (AGC) and KMA-25 (with manual gain control) are designed especially for service in CATV systems with up to 12 channel TV and full FM band capability. The Kaiser amplifiers feature high gain, with high output, low cross modulation and nominal 15 db noise figure. The 25 db spacing, convenient a.c. cable powering and weatherproof messenger-mounted housing permit flexible application in a variety of trunk line situations.

Write, phone or visit . . .



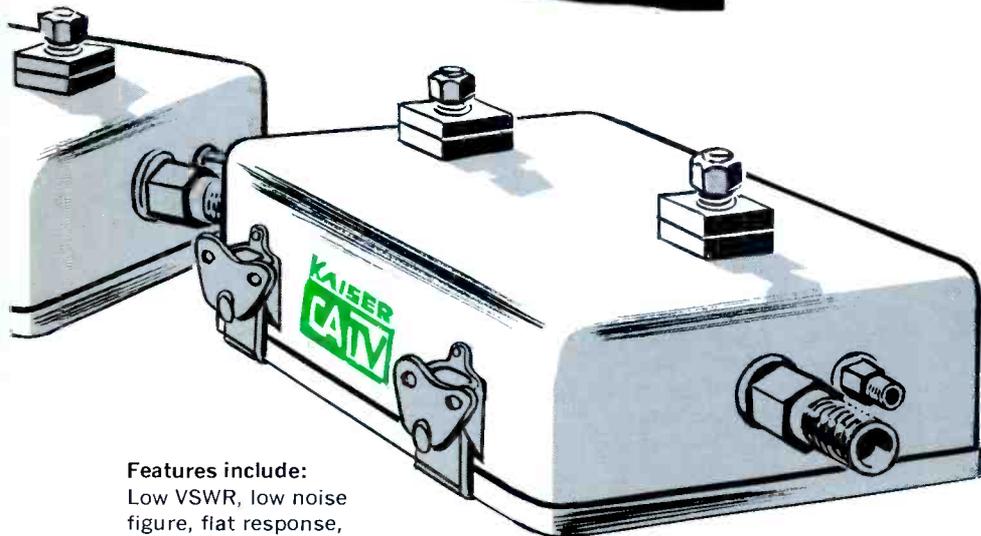
PHOENIX ELECTRONICS PLANT

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KAISER QUALITY WORKS FOR YOU TODAY AND TOMORROW

NOW IN FULL PRODUCTION

First introduced at KAISER CATV's dramatic Cascadeability Exhibit at the NCTA Convention in Denver, the KAA-25 and KMA-25 (with manual gain control) are now in full production at Kaiser Phoenix electronic plant, where Quality Works for You, Today and Tomorrow.



Features include:

Low VSWR, low noise figure, flat response, lightning protection and regulated power supply.

The new KAA-25 and KMA-25 amplifiers are furnished complete in weatherproof housing and ready for installation.

KAISER
AEROSPACE &
ELECTRONICS

Phoenix Electronics Plant
P. O. Box 9098, Phoenix, Arizona
Phone (602) 943-3431

KAISER CATV

LETTERS

Dear Sir:

I read your magazine quite often, and I am looking to you for some help. A year or so ago an engineer in Canada designed a long range antenna for TV Cable systems, by using the principle of tropo-scatter TV sky waves.

I understand that in Canada there are quite a few in use. One in particular in Estevan, Sas., Canada.

I would like to have the address of the company that designs and installs this antenna.

Daniel L. Gillespie
CATV Field Engineer
Sunbury, Penna.

Dear Sirs:

Please advise where we may obtain more information on parabolic antennas for tropo-scatter reception as described in your June, 1965 issue, page 32 of TV & COMMUNICATIONS.

Henry L. Falconio, Jr.
Sec-More Cable Television
Westville, Illinois

• *Benco Television Associates, Ltd., 27 Taber Rd., Rexdale, Ontario, Canada is the company to which you refer. Contact Mr. Harry Gray at that address. We reported on the tropo-scatter reception system in our June TV & COMMUNICATIONS.*

Gentlemen:

You published reprints of an article appearing in the June, July, August and September 1963 issues of the Video Communications Journal. The author was Jeremiah Courtney and the article was concerned with the enforcement of Section 605 of U.S. Code 18.

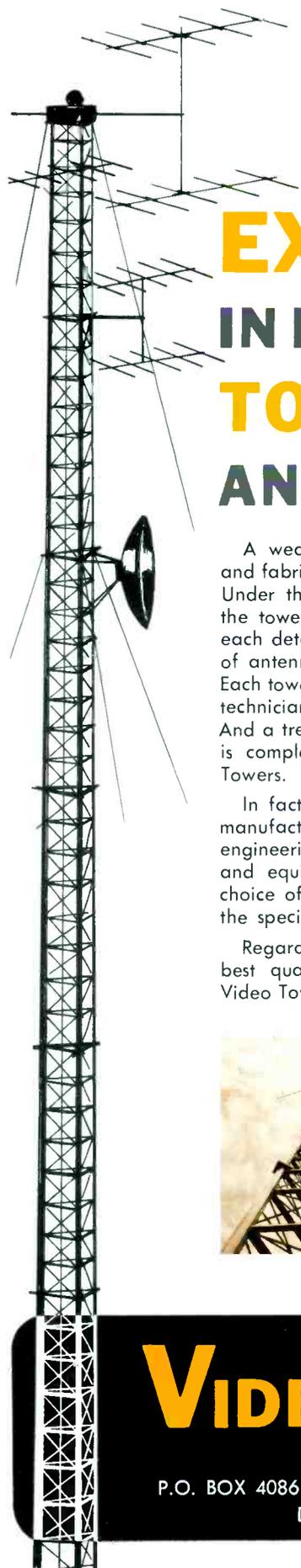
If this pamphlet is still available, please send us a copy.

Wayne Moore, Jr.
Code Planner
Metropolitan Planning
Commission
Atlanta, Georgia

• *VIDEO COMMUNICATIONS JOURNAL is no longer being published. The reprints to which you refer are no longer available. We suggest you contact the Federal Communications Commission with regard to any specific questions you want answered.*

Dear Stan:

First, let me both thank you and commend you for the two excellent periodicals you are now putting out.



EXCELLENCE IN EVERY DETAIL OF TOWER DESIGN AND FABRICATION

A wealth of practical experience in design, manufacture and fabrication goes into each tower erected by Video Towers. Under the supervision of Ed Moyer, a thirty year veteran in the tower business, every order receives careful attention to each detail. . . . From the drawing board to final installation of antennas, hardware and lighting on the finished structure! Each tower is built on precision jigs manufactured by the skilled technicians of Aeroaffiliates, the parent firm of Video Towers. And a tremendous depth of engineering and construction talent is completely at your disposal when you call upon Video Towers.

In fact, our firm has the largest and best equipped tower manufacturing facility in the industry! A completely staffed engineering department is backed by the best erection crews and equipment available. Video Towers also offers you a choice of system financing and leasing programs, tailored to the special requirements of CATV operation.

Regardless of your needs or problems, call on the industry's best qualified, fully experienced tower manufacturer. Call Video Towers collect for complete specifications and quotation.



VIDEO TOWERS INC.

P.O. BOX 4086 — FORT WORTH, TEXAS — (817) CE 2-1220
Dallas Office (214) AN 4-1112

Neither the NCTA Bulletin nor the TV Guide Publication have ever really filled the bill, insofar as being a comprehensive disseminator of industry information. Both of yours do, and I wish you the best for a profitable future.

Byron D. Jarvis
National Trans-Video, Inc.
Dallas, Texas

Dear Stan:

Enclosed is a print showing myself, J. E. Davidson and my wife, Noreen, just before departing Stapleton Field at Denver. There were many CATV'ers who flew to Denver for the convention in their own private plane . . . note that we carried 26 pieces of luggage and gear!



Congratulations and thanks to you and your staff for everything you did that contributed to the success of our convention.

Jim Davidson
President
Davco Electronics
Batesville, Ark.

Dear Stan:

You did it again!

Knowing some of the problems involved, I think your July 26 issue of Cable TV Review, out with all the real NCTA Convention News just two days after the sessions ended in Denver, merits a Triple "E" for editorial effort, energy and excellence.

How did you do it? I'm still organizing my notes.

Samuel J. Henry
SAMUEL HENRY & ASSO.
Phoenix, Arizona

Gentlemen:

. . . we are not interested (in receiving TV & COMMUNICATIONS), but thank you.

We have been receiving copies of your COMMUNICATIONS, in which we are interested, and do want to continue to receive.

Everett Davies
Davies Radio Shop
Sacramento, California

• *Everett, our two-way radio publication will continue to be sent to you. Your name is being removed from TV & COMMUNICATIONS lists.*



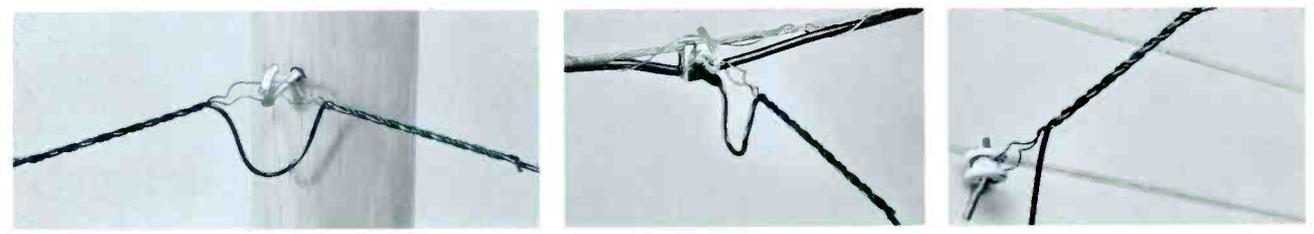
New!
TELEGRIP
 for
CATV

**Unique dead-end design
 assures your customers uninterrupted
 television reception; fast hook-up**

Check these benefits:

- ✓ Economical to buy and apply.
- ✓ Wraps on in seconds without tools.
- ✓ One piece — easy to handle; easy to stock.
- ✓ Made of stainless steel to resist abrasion and corrosion.
- ✓ Only flexible CATV dead-end commercially available.
- ✓ Holds full rated strength of RG-59/U coaxial cable.
- ✓ Won't crush cable or affect its dielectric properties.
- ✓ Holds cable in straight-line suspension; prevents kinking.
- ✓ Twist at end of leg prevents spin-out of cable.
- ✓ Performance proven by extensive laboratory and field testing.

Use TELEGRIP on all three connections — pole, tap, and house



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 COMPANY**

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CATV Department 5349 St. Clair Avenue, Cleveland, Ohio 44103

- Please send 4 FREE samples of TELEGRIP.
- Please send Price List and Product Information Bulletin No. H-39.
- Please send TELEGRIP Laboratory Test Data.

NAME _____ TITLE _____
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP NO. _____

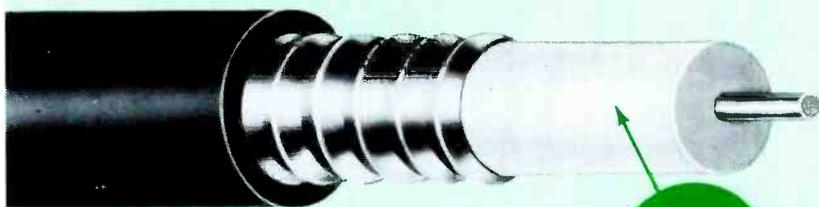
Unexcelled for Unmatched

SUPERIOR COAXIAL CABLES
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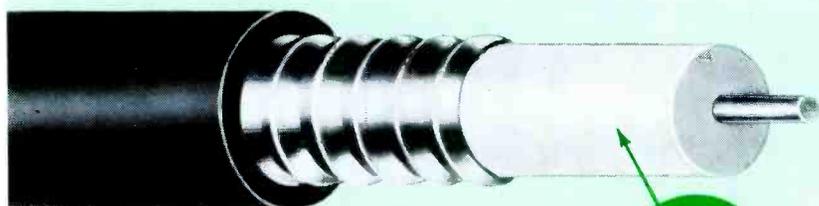


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	Ch. 2	Ch. 6	108 mc.	Ch. 7	Ch. 13
4920	0.75	0.93	1.08	1.41	1.57
4930	0.58	0.68	0.80	1.07	1.20

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6030	0.56	0.67	0.79	1.05	1.19

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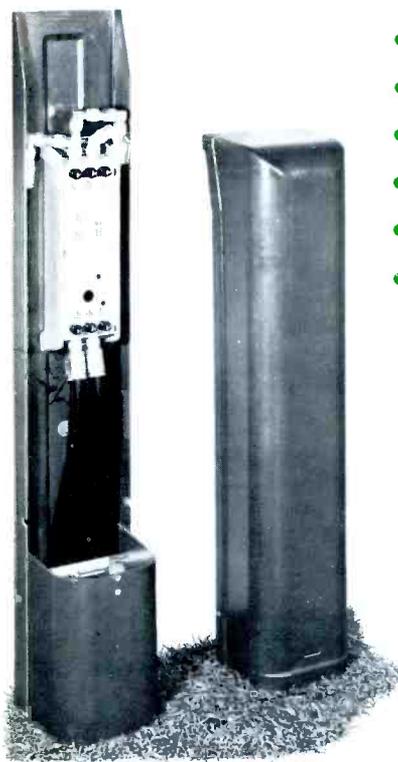
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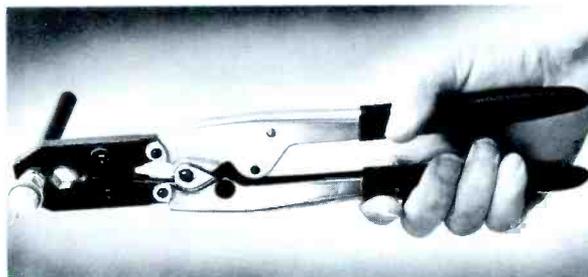
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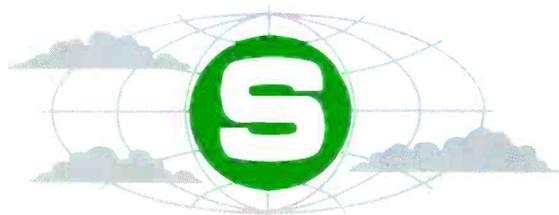
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14th ANNUAL NCTA CONVENTION

A pleasant lull between the recent Colorado floods greeted the nearly 2,000 attendees who trekked to the Denver Hilton hotel for the 1965 National Community Television Association convention. The mile-high city proved to be an excellent site for the biggest, best organized, and most enjoyable convention in Association history.

The exhibits opened Sunday afternoon to the tunes of an NCTA sponsored western band and the atmosphere was perfect for the most impressive array of displays ever to greet a congregation of community public servants. One could have spent the entire week strolling from booth to booth but the cable operators obviously came for business this year and they filled every luncheon, speech and panel discussion to overflow capacity. Note-pads and pencils were in evidence in all hands and the attitude of all present was one of serious attentiveness.

Monday was the day for official welcomes from Thomas G. Currihan, Mayor of Denver, and John A. Love, Governor of Colorado. Beginning with a Chuck Wagon Breakfast honoring those attending their first NCTA Convention, the day included the Annual Report of Bruce Merrill, outgoing National Chairman of NCTA. Merrill foresaw a continuing battle against the efforts of the FCC, NAB, copyright syndicators, and telephone companies. He called for "the membership, state and regional organizations and the NCTA staff to act as one voice and one body against our detractors." The NCTA this year, the Chairman said, "joined the state and regional associations in furnishing legal arguments for the defeat of (harmful) legislation or assumption of jurisdiction."

At a luncheon honoring the broadcasters active in the CATV industry, the Honorable Oren Harris, (D. Ark.), U.S. House of Representatives gave a special address in which he stated that both broadcasters and the Commission "are becoming aware that the economic philosophy of continuing scarcity should not be imposed on the

American scene." The biggest competitive battle he foresees, however, is between telephone companies and CATV. This competition may result, he said, "in changes in state and local laws relating to common carrier activities and local franchising of community antenna activity."

The afternoon featured a hard-hitting session on successful sales methods and promotions, composed of talks by the CATV industry's most sales-minded and successful "connection-getters." Entitled *SALES, SALES, SALES!!* the session was presided over by Frank Thompson, NCTA Vice President.

Tuesday began with the Annual Old-Timers Breakfast and moved quickly to a *Finance, Taxes and CATV* session featuring talks on the recent tax rulings affecting CATV, the finance company and CATV, and the position of small business investment companies and banks toward CATV.

At the luncheon honoring NCTA President, Frederick Ford, Mr. Ford reviewed the NCTA's efforts over the past year and called for both the broadcasting industry and the cable industry to "grow and expand together" and predicted the results will be a "stronger nationwide television system, with better programs and clearer pictures, and the increased confidence of the American people." The Association's president stated that the FCC's efforts to date have been "grossly deficient" in establishing a national policy to assure the people of the United States "the greatest practicable diversity of television programming." Ford called for a "careful re-examination of legislative policy" for regulatory concepts of television reception. He noted that only Congress is capable of formulating such a policy.

Immediately following Ford's speech was another high point of the convention — the short and humorous talk given by FCC Commissioner Robert E. Lee. Revealing himself as a personable and entirely likeable man, he completely exhaled the luncheon crowd — and completely avoided making any comment about CATV.

A two hour question and answer period entitled *CATV—Its Problems—The Solutions* was next on the agenda. It yielded a rather interesting round of questions and answers.

Attorney E. Stratford Smith of Smith & Pepper, Washington D.C. charged that the FCC is not attempting to find out what the public interest is in connection with CATV. "They don't know the facts," he said.

"What about copyrights?" asked Sol Taishoff, Publisher of Broadcasting Magazine. All panelists agreed that CATV could not get copyright from broadcasters until "The Hill" makes a decision.

The business of the day ended with a reception held for Frederick W. Ford and Bruce Merrill.

Wednesday was not quite so filled with activities but a very important *Legal and Legislation Session* filled the morning hours with George Barco, NCTA officer, moderating. Featuring discussions of the FCC's proposed rulemaking and Federal and State Legislation, it proved to be one of the most interesting sessions of the week.

During this discussion, attorney Jack Cole of Smith and Pepper, Washington, D.C. blasted the FCC for proposing legislation in contradiction to its own findings in the three hearing cases involving the question of economic impact by CATV systems on local broadcasting stations.

He cited *Carter Mountain, Mississippi Valley Microwave*, and *Tele-Prompter Transmission of Kansas* cases in which the presiding trial officers in each case have "failed to find injury to a television station as a result of CATV competition." Cole further pointed out that the Commission hired Dr. Martin H. Seiden to perform "an unusually comprehensive and general objective analysis of the problem," in which he stated that "CATV, therefore, has not had a direct economic impact on broadcasters." With regard to CATV, Cole said, "The commission does not want to be bothered with facts. Facts are troublesome; and any involvement in an objective evaluation of this problem would sure-

ly produce a result decidedly different from that previously desired by the Commission."

On the copyright issue, E. Stratford Smith predicted a decision in the United Artists case by sometime next spring. He also stated that he foresaw "a good solid two year fight ahead of us" on the copyright questions now before Congress.

Following this was the Wednesday luncheon which featured a special address by David M. Snow, President of the National Education Sciences Corporation, Los Angeles, California. In his speech he asserted that he, as a taxpayer resents "having to pay common carriers for a service that CATV could and should carry just as well and at much less cost!"

Thursday proved to be a day full of activities beginning with a Technicians' Breakfast followed by a closed session on confidential information on legal and legislative aspects of the CATV industry. Frederick Ford, Robert L'Heureux and E. Stratford Smith composed the panel. A series of technical talks filled the hours between 9:30 and 12:00 a.m. and Technicians awards were presented at the noon luncheon.

After the reception for Ben Conroy, Jr., the new Association Chairman, came the highpoint of the entire convention, the NCTA 14th Annual Banquet. Albert J. Ricci, Master of Ceremonies made a rather novel introduction of the new chairman. Seemingly at a loss as to whether Ben Conroy, Sr. or Jr. was the new Chairman (the ballot merely read Ben Conroy) Ricci called Milt Shapp, E. Stratford Smith, and Robert D. L'Heureux to the stage to help solve the problem. Their decision was that Ben Conroy, Sr. should resign and leave the post to Ben Conroy, Jr. After a moving acceptance speech in which Conroy pledged the full support of the NCTA to the industry, he introduced the new officers.

Following are the new officers: Robert J. Tarlton, President Panther Valley Television Co., Lansford, Pa. is the new National vice-chairman. Secretary is Alfred R. Stern, President, TeleVision Communications Corp., New York, N.Y. Franklin R. Valentine, Jr., General Counsel and Director, UNICOM, Inc., New York, N.Y. is the new treasurer. All will serve a one-year term.

Elected to the NCTA Board of Directors for three-year terms were: Robert Clark, President, Vumore Co., Oklahoma City, Okla.; Irving B. Kahn, President and Chairman of the Board of TelePrompter Corp., New York, N.Y.; Albin J. Malin, President and General Manager, Community TV Corp., Laconia, N.H.; James R. Pal-

mer, President, Centre Video, State College, Pa.; Buford L. Saville, Vice President and General Manager, Potomac Valley Television Co., Inc., Cumberland, Md.; Milton J. Shapp, President and Chairman of the Board, The Jerrold Corp., Philadelphia, Pa.; Frank P. Thompson, Regional Manager, Rochester Video, division of American Cablevision Co., Rochester, Minn. Elected to a 2-year term to the Board was: Mrs. Pat Hughes, President, Moses Lake TV, Inc., Moses Lake, Wash. Elected to 1-year terms were: Robert F. Jernigan, Vice President and General Manager, Mississippi CATV Systems, Inc., Hattiesburg, Miss.; John J. Morrissey, Jr., President and General Manager, Durango Television Network, Inc., Durango, Colo.; outgoing NCTA National Chairman Bruce Merrill, President, AMECO, Inc., Phoenix, Ariz., remains on the Board as Immediate Past National Chairman.

One of Ben Conroy's first actions as new Chairman was to appoint Irving Kahn and Frank Thompson to serve with the 5 officers on the NCTA seven-man executive committee. The executive committee acts for the board between the three regular board meetings each year.

Following this introduction, Stan Searle, Publisher of TV & COMMUNICATIONS, recognized and gave cash awards to the 12 TV & COMMUNICATIONS Page boys who served so well at the convention. The boys were selected from the sons and grandsons of system operators on the basis of an essay each submitted about CATV.

The final official act of the evening was the presentation of the First annual Larry Boggs Memorial Award to Bill Daniels of Daniels and Associates. The presentation was made by Fred Stevenson and G. H. (Tubby) Flinn, award committee chairman. Mrs. Boggs was honored with a bouquet and a replica of the award plaque.

TOPICS AND SPEAKERS

Perhaps the reason for the capacity attendance of all functions was the extreme concern of operators on such key issues as telephone company entry into CATV, proposed and existing FCC regulation, and the unresolved CATV/copyright question. Association leaders indicated that they will vigorously oppose, through the courts if necessary, telephone company efforts to control the cable television industry. Voicing this general feeling, Ben Conroy, Jr., told the membership, "We're ready to go . . . ready to fight" in regard to the phone company challenge. He expressed the belief that "the entry of the telephone company into CATV is the most clear

and present danger our industry faces."

"The biggest battle may be between telephone companies and CATV operators."

Oren Harris began his speech by criticizing the National Association of Broadcasters for attempting to maintain a status quo through influence of government. "When rapid and abrupt changes occur," he said, "the temptation is great to hold on defiantly to the status quo and to attempt to fence out any newcomers who might seek to enter the market place. The temptation is great to enlist in this fencing-out effort the aid of the Congress and state legislatures as well as regulatory commissions on all levels of government — federal, state and local."

Applying this statement to the CATV problem, he surmised that the CATV operators, "are quite indignant about this approach (of the radio and television broadcasters) and hope that other governmental bodies, namely, the Congress and the courts will assist you in your struggles in the market place."

Alluding to the activities of the FCC, Harris said, "the battle over CATV regulations before the FCC and before our committee is likely to result in important changes in attitude on the part of the broadcasters as well as the FCC. I firmly believe that both broadcasters and the Commission are becoming aware that the economic philosophy of continuing scarcity should not be imposed on the American scene. I believe broadcasters and the Commission will move forward aggressively to find new technical ways by means of boosters, translators, and other methods to give to almost all Americans an adequate free choice among available television. CATV should and will play an important role in achieving this objective."

But in his opinion, the biggest competitive battle "may well be between the telephone companies and CATV. As the economic prospects for CATV expand and become brighter, the relationship between telephone companies and CATV operators is likely to change. This change in relationship may entail a reexamination of the services which should be rendered to the public by CATV and by common carriers. Such reexamination may result in changes in state and local laws relating to common carrier activities and local franchising of community antenna activity."

On the other hand, he said that he "would not be at all surprised if the FCC should decide that the Congress has already granted to it the authority to regulate CATV operations even

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TRA-220D

The **TRA-220D** is a silicon transistor all band (30-220 MC) amplifier specifically engineered to meet the most rigid environmental requirements of CATV systems. It is a deluxe 28 DB high level **CAS**cader and distribution amplifier combined in a weatherproof, cast aluminum housing. Built-in "Temperature Compensation" holds amplifier gain to approximate cable losses due to temperature changes. The high level distribution output feeds a two or four way splitter. Operating specifications such as gain, match, bandwidth, and output capability are unparalleled in the industry. Operates on 22 to 35 VAC (*Positive half cycle of AC is utilized).

TRA-220S is identical to the TRA-220D above except that it is a **CAS**cader only, with single input and output.

* NEGATIVE "FEEDER SYSTEM"



The **TRA-217** is a silicon transistor 24 DB line (all band) amplifier for applications not requiring the high performance specifications of the TRA-220 series, although many of the features are the same.

The **TR-108** is a low band (30-110 MC) version of the TRA-217 above, with a nominal gain of 28 DB on channel 6. (*Negative half cycle of AC utilized on the above units).



TRA-215A — A 20 DB silicon transistor line extender (high band 30-220 MC).

TRA-215T A 20 DB silicon transistor amplified line tap (all band 30-220 MC).

TR-105 — A 25 DB silicon transistor line extender (low band 30-120 MC). (*Negative half cycle of AC utilized on above units).



TR-215-2 is a 16 DB silicon transistor line extender with dual outputs (all band 30-220 MC). (*Negative half cycle of AC is utilized).

Splitters — Both 2 and 4 way matched splitters are available in this housing. Specify fitting requirements.

* In an effort to fully utilize the AC voltage supplied to the line powered transistor amplifiers, CAS is using a technique of isolating the loading effects of the feeder systems on that of the trunk supply voltages. Thus, this positive and negative approach which is fully explained in CAS bulletin #1001.

COMPLETE SYSTEM REQUIREMENTS



The **TRA-224** is a high level silicon transistor all band Bridging Distribution Amplifier for mounting in a separate weatherproof housing. It is designed to be used in conjunction with existing tube equipment where it is desirable to line power transistor amplifiers. Two separate inputs make it possible to use the TR-224 to bridge the line with less than 1 DB insertion loss, and have 15 DB available gain at each of four outputs, or it can also be used at the end of a line application with a gain of 24 DB to the four outputs. Dual output transistors make output levels up to 50 DB all band possible — operates 117 VAC, and supplies 24 VAC (2 amps) to four outputs.

The **TRA-124** is identical to the TRA-224 above except it is a low band version (30 to 110 MC) with 6 DB more gain at Channel 6.



In-Line Tap — The directional in-line tap comes in a variable tap from 8 to 34 DB, a fixed tap of 3 and 0 DB attenuation. A minimum of 20 DB isolation between drops is maintained. They can be used as a single house drop or with a 2 or 4 way splitter for multiple taps, which are mounted on an interchangeable cover.

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with regard to those aspect where jurisdiction is now claimed by state and local governments." Cautioning that he did not favor such an interpretation by the Commission of the provision of the Communications Act he said, "I simply do not believe that the Commission now has the authority to promulgate the regulations which it already has promulgated and proposed with regard to CATV. Neither do I believe that the Commission has the authority to preempt in any way state and local laws providing for the regulation of your operations."

"When it comes to regulating community antenna television operations," he said, "the FCC has failed to do what it should have done — namely propose a specific course of action to the Congress for its consideration."

When it comes to non-simultaneous duplication, he said he could see "little, if any, reason at all in imposing on community antenna television limitations with regard to duplication following broadcasts by local stations."

Noting that it is typical of Federal regulatory boards and commissions to think that Congress has divested itself of all authority over the industries under the agencies' jurisdiction, he indicated that this will not remain true for the FCC. "The philosophy underlying previous television legislation by congress constitutes Congressional reaffirmation of (Congress's) faith in an ever expanding television industry."

"Educational Television" — "What have you done about it?"

David M. Snow, President of the National Education Sciences Corporation, insisted that CATV is passing up a golden opportunity in the field of education. "Education," he said, "is the biggest single public expense in the United States. This trend of expense growth seems unending."

Some of the reasons he mentioned for this rising cost were: the rising pupil-to-teacher ratio, cost rise in building school plants, higher requirements on teachers abilities, and demands by the state and Federal governments for greatly expanded scope in elementary education.

To help solve some of the problems, he suggested that multi-channel instructional television facilities can be provided by CATV owners and operators. Santa Ana and Anaheim, California, he said, are now paying Pacific Telephone and Telegraph fifty-five to sixty thousand dollars per year, on a ten year contract, for a 150 mile plant carrying 100 programs per week on four channels.

Up to 97 thousand dollars would be saved, he maintained, by using CATV services.

Because of this, "CATV operators have both the opportunity and obligation to get involved in the total communications spectrum for their communities. If you take time to discuss things with people in the education business, you can see how CATV can provide their requirements on a nation-wide basis."

"Only Congress can establish orderly procedure"

NCTA President, Frederick Ford, in his address, asserted that the proposed rule-making of the Federal Communications Commission is grossly deficient in meeting adequately the basic problem — "which is the establishment of a national policy to assure that the people of the United States would have access to the greatest practicable diversity of television programming, whether by wire or radio!" Looking to the future, however, he felt that the activity on the Commission, Congressional and Judicial levels will be conducive to the efforts of the CATV industry to render the best possible service to the public.

After this opinion concerning the FCC, Ford gave a report on his stewardship of the office of President. He recalled that when he assumed office, "the community antenna television industry was beset on every side by powerful economic forces, and seemingly by the government itself, which at times appeared to threaten its very existence. "It was not too many years ago," he said, "that little was known or heard of the existence of CATV." "And of those who did know of it, there were many who freely predicted its early demise with the anticipated construction of television broadcast stations."

But, like the Bumble Bee who doesn't know he is technically unable to fly, the CATV industry, Ford says, "just goes on rendering service to the public and grows month by month."

Recalling that in January, the Association was engaged in serious negotiations with representatives of the National Association of Broadcasters, Ford said that the proposed settlement, which was defeated by a one-vote majority of the Board of Directors of the NAB, "was just and reasonable" from the broadcasters' point of view. "Although restrictive and burdensome with respect to CATV, it was agreed that those restrictions were not intolerable. They were calculated to achieve a regulatory status with the Federal Government, and thus avoid the numerous legislative attempts in State legislatures to restrict and contain unduly the activities of CATV.

"We have testified," he continued, "at great length before the House

Interstate and Foreign Commerce Committee on legislation to give the FCC appropriate jurisdiction over CATV." On this matter, he recalled the strong position the NCTA has taken against the Commission's proposed action, and in favor of the principle of legislation.

On the matter of copyright legislation, Ford pointed out that the NCTA has "presented extensive testimony" to the Subcommittee of the House Committee on the Judiciary. In this instance, he said, several powerful owners of copyrights have banded together and convinced the Register of Copyrights that it was permissible for them to compel CATV subscribers to pay for their TV entertainment twice — "first, through the cost of copyrights included in the purchase price of the product; and, second, through the imposition of the iniquitous double burden of requiring them to pay additional copyright fees for the same performance in their monthly service charges."

"In both of these instances," he summarized, "I am satisfied that the presentation by representatives of our industry was far more meritorious, and presented our position far more effectively than that of the television industry and the copyright owners. In neither case, did we seek any special advantage. We merely sought an opportunity to serve the public in the manner which they desire."

Ford categorized the major policy problems facing the CATV industry into three groups: federal jurisdiction, pole attachment contracts and CATV activity of telephone companies; and copyright legislation. What is urgently needed in the problem of Federal legislation and regulation, he said "is a basic and careful reexamination of legislative policy looking toward the formulation of regulatory concepts which will be adequate to deal fairly and efficiently with the new and dynamic problems presented by these new technological developments in the manner of receiving television signals by the public." In his opinion "only Congress, through its authority, wisdom and experience" can maintain an equitable balance between the Television and CATV industries, while its statutory directives for solving this very complex problem are carried out by the Commission. "Only in this manner, will the Commission be enabled to conduct a thorough examination of the subject . . . and be in a position to promulgate rules which are reasonable."

Concerning activities of major telephone companies in the field, Ford said that the plan of the telephone companies in the past appeared to be

the eliminating of small systems by filing tariffs with state regulatory commissions, whereby all distribution facilities would be owned by the telephone companies and the CATV operator would merely furnish the antenna, lease the phone companies' facilities and make the actual connection to the set. "In some cases it appeared that the telephone companies would cancel pole line contracts and use other pressure tactics to force acceptance of their terms and in some cases operate the business themselves," he said.

In an effort to crystalize this problem, Ford revealed that he and the NCTA General Counsel had talked with representatives of the American Telephone and Telegraph Company and the General Telephone and Electronics Corporation. As a result, he said, "a new liaison has been established by both organizations with your national headquarters which may go far toward lessening the friction and solving the difficult pole line problems which arise in the industry."

Ford summarized the copyright problem by saying, "you may rest assured that we will continue our efforts to protect your subscribers' interests in the fullest dissemination of television programming without discrimination or double payment to copyright owners of television programs." In reference to handling all these problems in the future, Ford stated, "We will seek to further educate our government officials, legislators, broadcasters and copyright owners to a greater understanding of the benefits of the service we render, to the end that fair and equitable rules will be adopted for our service."

In support of his suggestion that cable operators establish low-power UHF stations, he said the purpose was "to give urban areas a further choice of service with an additional or perhaps a first service to rural areas." "Today, I am more convinced than ever that, if UHF is to survive as a national service, it will be through the efforts and initiative of CATV operators." Noting that the FCC is also coming to this view, he urged operators to establish these stations, when economically feasible, to further serve the public.

Television stations promoting protection by the government of their economic interests are wrong, he maintained — "wrong in concept, wrong in principle and wrong in their efforts to seek the government's protection by law and regulation of the status quo.

"We do not seek government protection. We seek an opportunity to serve the people of the United States. We oppose artificial limitations on our

right to deliver a diversity of competing signals. We provide a service which the government should recognize furthers its objective of diversity in program sources."

The NCTA President also defended the position of CATV against the opinion that CATV is the first step to pay television. "We all know this is not true. Pay TV by wire is uneconomical as demonstrated in Los Angeles, and is, in fact, of very little interest to our industry."

In summary, he said that the forces which would "legislate us by rule or law into impotence, must be opposed. We must make ourselves heard, so that the legislative authorities in this country can rectify the injuries which would be imposed upon the public through punitive restrictions on our industry."

"I feel as if we are being offered up as a peace offering by the FCC to the broadcasters."

Out-going NCTA chairman, Bruce Merrill commented on the progress made during his year in office in his Annual Report. "We had some problems . . . we still do. Some we have solved, and I think all we have moved closer to solution."

Commenting first upon additions to the staff, he had this to say about the

acquisition of the Association's new president: "It came to our attention that perhaps Fred Ford was not too interested in completing the seven-year term on the FCC to which he was appointed last June. We immediately made contact with him — the 'we' in this case being Marty Malarkey and his Selection Committee. After a brief period of negotiation, Fred and your Board agreed to a contract and on January 1st Fred became our new President.

"This man is a tremendous addition to our industry. He's a great guy," Merrill said.

Merrill then took a look at the posture of the industry today. "Our industry reminds me of a surfer coming in on his board with a real boomer behind him. If nothing upsets us, we'll come racing in on one of the most outstanding success stories of the century. But, whether or not we can stay on top of the situation depends on our strength and skill and ultimate faith in the rightness of our position."

Listing the three major adversaries of CATV as being the FCC, the NAB, and the copyright syndicates, Merrill said, "None of these want to kill us off. They do want to control us, contain us and shape our size and growth to suit their own self-interest. In ad-



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dition to this," he stated, "we have on the sidelines, just beginning to move in, the telephone companies. Now do you know how Custer felt? Only we're going to whip those Indians."

Having set the stage by mentioning the preceding trouble spots, Merrill reviewed the actions of the NCTA for the past year. "During the year we have strengthened our liaison with state and regional CATV organization. Your Chairman, your President, your general counsel and others from the Washington Staff have represented NCTA at every state or regional meeting possible, and this has been almost all of them. They have made appearances before legislative committees in several states where public utility type legislation has threatened us. We have drawn the state and regional groups into all matters pertaining to regulation, legislation and telephone company problems. This past year has demonstrated that this is all-important . . . that we must have more of it . . . that the problem facing us calls for the ability of the membership, state and regional organizations and the NCTA staff to act in unison as one voice and one body against our detractors."

Recapping the activities of State legislatures and Public Utility Commissions for the past year, the chairman continued, "A number of State legislatures and Public Utility Commissions have considered the possibility of transforming CATV systems into public utilities and placing them under the jurisdiction of State PUC's.

Only in Connecticut did the law pass. The State passed a law whereby CATV systems in Connecticut must pay to the State 6% of their gross profits. It is expected that at some appropriate time a legal attack will be made upon both of those laws.

"In all of these cases," Merrill pointed out, "NCTA joined the State and Regional Associations in furnishing legal arguments for the defeat of this type of legislation or assumptions of jurisdiction. In most of these cases the briefs were furnished to State and Regional CATV associations or to local CATV operators and their counsel. Until Federal Legislation is clearly dispositive of this issue, we can expect a continuous battle in many states to escape state PUC jurisdiction."

Looking on the brighter side, Merrill noted that "CATV has really caught the National spotlight this past year. Hardly a newspaper did not carry some CATV coverage or editorial comment.

"Significant editorial comment and columnist mention occurred in newspapers of most major cities, including *New York Times*, *The Wall Street Journal*, and *Washington Evening Star*. National magazines gave CATV feature attention: *Time*, *Newsweek*, *Dun's Review*, *Good Housekeeping*, *Television Magazine*, to name a few.

Mr. Merrill's comments on the National Association of Broadcasters were not so optimistic. "This was a year of extensive and, to date, futile negotiations with representatives of National Association of Broadcasters.

"We have made it clear to all that this industry will never voluntarily submit to anything more than simultaneous non-duplication on our cable systems. We have attempted to show the broadcasters that in seeking to protect themselves competitively with artificial restraints on the services our industry can provide the public, they do the public a disservice. In addition, they set a pattern which will surely lead to curtailment of profits in their own industry."

In regard to the Federal Communications Commission, "This was the year when the FCC finally moved against our industry. In the Commission's First Report and Order in the microwave dockets, the arbitrary, cumbersome, inequitable, unjustified, ill-advised interim operating condition previously imposed on systems using microwave, were made even more so and made official. We have challenged this before the Courts and before the Congress. We must prevail in this struggle to free ourselves and our customers from this atrocious scheme. I feel as if we are being offered up as a peace offering by the FCC to the broadcasters. They seem to say between the lines of their documents, 'We know we have been mean to you poor broadcasters in the past but, see, we herewith relegate CATV to inferior status, subject to your whims and caprices to prove that we really love you after all.'

"It is really one of the biggest power grabs of the century. If the Commission succeeds in doing to us what they are attempting to do, they can by the same line of reasoning reach into and control major portions of every American activity. We must not let this happen."

Finally, discussing the problem of the telephone companies, Merrill concluded, "This was the year when the nation's giant telephone systems awoke like one of the three bears and said 'Somebody's been building CATV systems on my poles.' We're here to tell them that somebody's going to go right on building CATV systems. We started this industry. We proved the need for our service and we have shown the public what we can do. And we're not going to allow any ten billion dollar a year giant to stop us or slow us down."

EXHIBITORS, ENTERTAINMENT

Business at the manufacturers' spectacular and interesting displays was always booming. Aberdeen Co. displayed an assortment of stainless steel lashing wire and clamps, and co-sponsored the Ray Bloch Orchestra and the Taylors, a Denver-based night club group at the annual banquet. Alpha



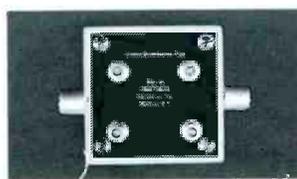
4WAY INLINE MULTI-TAP

MODEL #609-612

Model #609-612, 4-Way Inline Multi-Tap is composed of a flat directional tap, combined with a 4-Way Hybrid Splitter. Only the desired signal coming from the amplifiers is selected by the taps, and reflections from the tap lines are blocked by over 40db to the "out line".

This Inline Multi-Tap is designed with low insertion loss and low VSWR at all terminals, enabling high quality trunk cables to be used.

Will permit up to 5 amperes AC or DC power feed-thru with taps isolated.



BOTTOM VIEW



SPECIFICATIONS						
Frequency Response:						5-216 mc
V. S. W. R.						All Terminals 1.22:1 max.
Tap Attenuation:	± 5 db	15 db	18 db	22 db	26 db	30 db
ISOLATION: (a) between Tap Terminals	30 db					
(b) between Tap Terminals & Output Connectors	45 db	48 db	52 db	56 db	60 db	
Insertion Loss:-	1.5 db	1.3 db	1.2 db	1.0 db	1.0 db	1.0 db
Dimensions:-						3-1/8" x 2-1/4" x 2-1/8"
Line Fittings can be furnished as follows:-						
ORDER #						
609 - 'F' Fittings in and out						\$7.95
610 - UHF Fittings in and out						\$8.25
611 - .412 Fittings in and out						\$9.50
612 - .500 Fittings in and out						\$10.50

All Taps are 'F' Fittings that will accept any size 59/U wire. Units come complete with messenger and pole mounting hardware.

CRAFTSMAN
ELECTRONIC PRODUCTS, INC.

133 WEST SENECA ST.
Area Code 315

MANLIUS, N. Y. 13104
Phone OVerbrook 2-9105

Only Plastoid makes a great aluminum sheath co-ax today—

and there are 3 big reasons:

1. **Plastoid welds for strength.**

Our process is exclusive in cable-making. We share it with the makers of today's strongest hydraulic tubes and helicopter rotors. By going to UHF-welding, we can start with the strongest aluminum available: precision-rolled (wrought) strips. Then we add strength as we weld. Our seam is actually stronger than the parent metal. And by UHF-welding, we avoid the gaps and overlaps that make seamless cable vulnerable to fissures that can let in dampness and deteriorate your CATV signal. Further: we eliminate the metal fatigue that leaves seamless open to unpredictable breakage. Since we can also maintain better manufacturing control, we provide greater concentricity. This means more ease in matching splices—plus superior performance right down the line with Plastoid.

2. **Plastoid welds for length.**

Just tell us the cable lengths you need. Chances are that we can match your requirements to the inch. If you are ready to string a spliceless mile of aluminum sheath co-ax, Plastoid, and only Plastoid, provides a choice of two cables: TA-5 for .500-inch trunks, TA-4 for .412-inch feeders. These come in lengths up to 5,000 feet. Then, for head ends, there's TA-8 (.750-inch co-ax) in lengths up to 2,000 feet. All sizes come both jacketed and unjacketed. All footage is certified. You save on reels, transportation and installation. One truckload, one big reel goes farther. Because you need less splices, you save on connectors. Probably on boosters, too. Less splices mean less chance for vapor to get in and to break down your dielectric. So you save initially. You keep saving as Plastoid protects your signal quality.

3. **Plastoid pre-tests six ways.**

Of course Plastoid pre-sweeps. We test everything. Take return loss. No cable leaves our plant with less than 26.5 db return loss at any frequency between 40 and 230 mc. Even the aluminum that goes into your sheath is pre-tested for the uniformity that means strength and flexibility. Eddy-current tests verify sheath integrity. The smallest pinhole would be detected. And we make ATSM cone tests, flare tests—plus special hydrostatic tests. All prove Plastoid UHF-welded co-ax to be stronger than seamless. For more details and special pricing information about today's only great CATV cable, please call, wire or write:

PLASTOID

 CORPORATION

42-61 24TH STREET / LONG ISLAND CITY 1, N. Y. / ST 6-6200

Wire Corp. offered triaxial and coaxial feeder cables.

Ameco, Inc. employed 7 booths and 35 salesmen to present their products and also proved to be one of the outstanding hosts of the convention. Ameco's "Festival of the Sea," a Hawaiian Luau held in The Petroleum Club was thoroughly enjoyed by the almost 1,300 people attending.

Both Amphenol Cable Div. and Anaconda Wire & Cable Co. displayed their brands of coaxial cable and Anaconda's hospitality suite proved to be the locale for interesting conversation. Andrews Tower, Inc. offered CATV towers and tower construction, while Armadillo Mfg. Co. displayed its fiberglass equipment buildings and sponsored tours through its Denver plant.

Benco Television Associates from Canada featured its tropo-scatter reception antennas and broadband amplifiers. Blonder Tongue Systems, Inc., introduced several of its CATV products and also provided a hospitality suite. Burnup & Sims, Inc. offered its services as conduit contractors and Canada Wire & Cable Co., Ltd., displayed its line of coaxial cables.

CAS Mfg. Co. unveiled its new all band line extender and furnished flower decorations and corsages for the ladies at the Annual Banquet. Channell Splicing Machine Co., Inc. displayed cable specialties for aerial, underwater and buried systems.

Delta Electronics, Ltd. and Dynair Electronics, Inc. displayed, respectively CATV test instruments and a new solid-state VHF-UHF tuner. Electronic TV Equipment, Inc. presented wide-band TV tube and transistor type amplifiers. Collins Radio Co. showed its microwave equipment and Craftsman Electronic Products, Inc., its CATV accessory equipment.

Entron, Inc., besides featuring its latest equipment, was the sponsor of the delightful comedy team of Phil Ford and Mimi Hines. Appearing at the Entron honorary luncheon, Thursday, they "tore down the house" just as they have done repeatedly in the past at famous night clubs and on such TV shows as the Jack Paar show. Another hit of the convention sponsored by Entron was a nightly Entron au-go-go which featured lively go-go music, and stuffed animal prizes for proficient "frug," "twist" and "jerk" dancers.

Fort Worth Tower company moved part of their display outside to demonstrate their line of CATV and microwave towers. Garnett Co. also displayed truck-mounted equipment in the outdoor exhibit area along with Hunt-Pierce Corporation's truck mounted aerial lift equipment.

Jerrold Electronics Corp. featured

one of the largest displays at the show and also produced one of the most entertaining parties. The Jerrold Ranch Party was a strictly no-coat affair and they meant it. After making everyone remove their coats, company President, Milt Shapp tried to take it one step further. He introduced the Jerrold people present at the convention and then said "We at Jerrold will take off our shirts for the industry anytime"—and then he did! Entertaining at the Jerrold Party were the world-famous Koshare Indian Dancers, Willie Sessums, the fastest female gun in the West; the Parrish Square Dancers; Chan Canasta, magician, psychologist and mind-reader, and Rocky Starr's Western Band.

Kaiser Aerospace & Electronics Corp. displayed a simulated 750db trunk line and Lenkurt Electric Co., Inc. presented its microwave system for color or monochrome TV relay. Microwave Associates, Inc. featured its new TV relay equipment, designed for use in rack-mounted and portable operation.

The National Consumer Services division of Reuben H. Donnelley Corp. presented its new marketing promotion services to the operators. The company also maintained a lively hospitality suite.

National Crane Co. employed the outside area to show its truck mounted equipment. Displaying CATV antennas and related equipment, National Theatre Supply Co. also offered turnkey service and system planning. Pete Collins Co. offered their systems design and construction and Phelps Dodge Electronic Products Corp. featured its new aluminum-sheath cable.

Besides maintaining a popular hospitality suite, Plastoid Corporation exhibited their entire line of CATV cable. Jack Pruzan Co. unveiled its specialties of line construction materials and Rohn Systems, Inc. demonstrated its CATV and microwave towers along with its line of reflectors and lighting equipment.

A detailed story of Rome Uniform CATV cable was presented by the Rome Cable Div. of Alcoa as well as their interesting hospitality suite. Sony Corp. of America exhibited its video tape recorders and TV monitors.

Spencer-Kennedy Labs., Inc. was the host for the Thursday Technicians' Breakfast and also featured their transistor line extension and trunkline amplifiers. State Labs, Inc. revealed its line of electron tubes and Superior Cable Corp. showed its complete line of TV system products, as well as furnishing a "superior" hospitality suite.

Tape-Athon, Inc. featured its automatic tape playback system for CATV use. T.C.A. Tower Co., Inc., demon-

strated its modified tower sections, obstruction lights, beacons and modified antenna booms.

Telemation, Inc. had its Weather Channel and News Channel equipment in operation and also furnished leatherette cover memo pads with the Convention agenda for the convention attendees. TeleSystems Corp. represented its consultant services for the CATV industry. Times Wire & Cable Co., along with the New Mexico Association sponsored a well-attended cocktail party in the Grand Ballroom. The company featured its seamless aluminum sheath coaxial cable.

The TV & COMMUNICATIONS booth attracted an extra amount of attention when TV personality, Debbie Drake, arrived to have her picture taken with Frederick Ford, Ben Conroy Jr., Bruce Merrill and Stan Searle and Sherrill Dunn of TV & COMMUNICATIONS.

Utility Tower Co. displayed sections of several types of their towers for CATV use and also their micro-flectors. Video Towers, Inc. offered their tower installation services.

The high-point of the convention (entertainment-wise) was reached when the King Family made its appearance at the Annual Banquet. Sponsored by Viking Cable Co., and the American Broadcasting Company, the popular television entertainment family put on a show that the system operators, their families, and the attending manufacturers will not soon forget. Viking also sponsored a "Honky Tonk" hospitality suite featuring a rinky-tink piano.

Weather-Scan company displayed its complete time-weather service channel in one package, and Westbury CATV Corp. exhibited its transistorized trunk and distribution amplifiers.

Reports have it that the Ladies Program was extremely enjoyable this year. Featuring trips to the United States Air Force Academy, the mountain mining town of Central City and its Opera House and a one-half hour live show by TV personality Debbie Drake, the ladies endorsed this agenda as a success.

In summary the 14th Annual NCTA Convention was a complete success. All functions were carried out efficiently, professionally and with dignity. The entertainment and meals were superb. We at TV & COMMUNICATIONS join with the operators, guests, and attendees of this 14th convention in commending Don Anderson, Wally Briscoe, Arlene Worischek, and the entire NCTA staff along with Bill Daniels, Tom Johnson, Alan Harmon and the rest of the convention Committee for a truly great 14th NCTA Convention.

MEETINGS, ADDRESSES



Governor John A. Love welcomed NCTA members to Colorado.



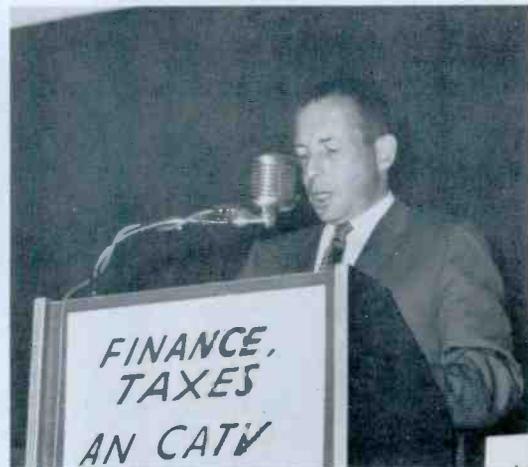
Fred Ford at luncheon in his honor.



Frank Thompson at Sales Session.



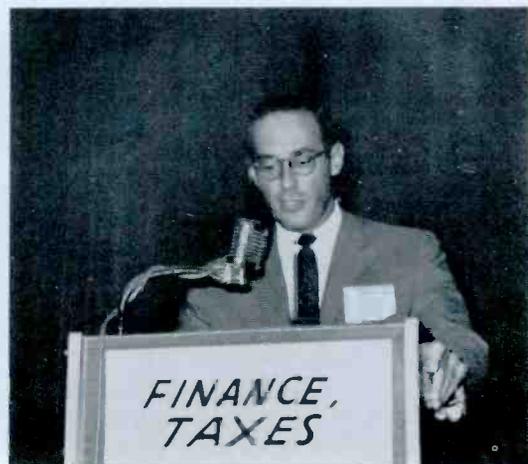
E. Stratford Smith on CATV's problems.



James F. Ackerman, Economy Finance: "The Finance Company and CATV."



Rep. Oren Harris Key speaker at Convention.



Alfred Stern: "The Bank and CATV."



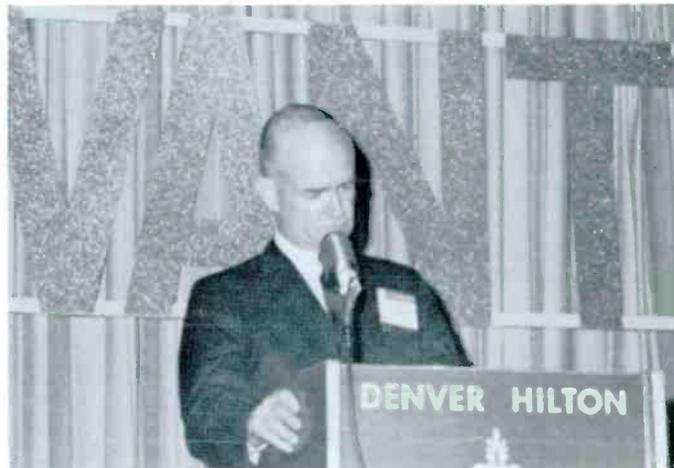
Robert H. Berger at Sales Session.



Robert E. Lee, FCC Commissioner, was featured speaker at luncheon.



David M. Snow: "CATV can serve ETV."



John N. Spottwood presided over Broadcaster's Luncheon.



Martin F. Malarkey, Jr. presented Guests of Honor at Frederick Ford luncheon.



Arlo Woolery, Arizona CATV operator, presided over "Arizona Day" breakfast.



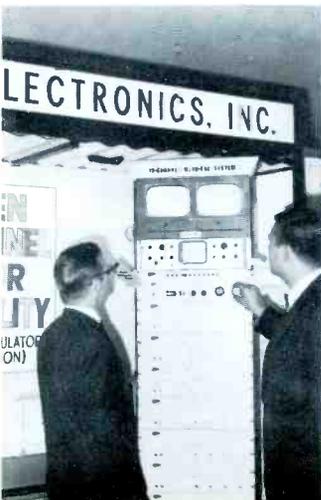
BLONDER-TONGUE: R. B. Helhoski and Dale Matheny.



HUNT PIERCE: John Nevin, Phelps Dodge; R. W. Reardon, Sigma Industries; and Carson C. Bitner, C. Bitner Co.



WEATHER-SCAN: Jim Hudson and Mrs. R. H. Tyler.



DYNAIR: Dwain Keller and Bob Jacobs of Dynair.



One in foreground is from Community Antenna Cable Systems; other is from Baker Mfg.



AND STILL THE LEADER IN CATV TOWERS



Ft. Tower Co. offers you excellent towers plus complete construction services!

Cable television operators are coming to us in increasing numbers. They know our reputation for delivery, price and reliable towers.

Check prices, compare quotes, evaluate specifications . . . and you, too, will reach the conclusion that Ft. Worth is your best bet for CATV and microwave towers and buildings. The basic reason for Ft. Worth Tower's steady growth is the wealth of experience which we have gained as a pioneer supplier of CATV towers. Our men are thoroughly trained in every step — from drawing board to fabrication, to installing antennas and head-end structure. You will be pleased with our prices, too.

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Tommy Moore, Inc. — Big State Engineering, Inc.
Tower Construction Finance, Inc.



SPENCER KENNEDY LABS: Donald Spencer; Sabin Florescu, Carlsbad Cablevision; Joseph J. Sedik, Andrew Corp., and Jacob Shekel, SKL Chief Engineer.



SUPERIOR CABLE: Carl T. Witherell, Twin State Tele; Ron Westwood, Don W. Hoffman of Superior.



COLLINS RADIO: W. Dale Leonard, Collins with W. E. Townsend, Seven Hills Antenna.



NATIONAL THEATRE SUPPLY



STATE LABS: Jack Waneland, State Labs; Randy Wright, Repronics, and Steven H. Pullman of State Labs.



AMECO: Cliff Beyersdoerfer of Ameco, Richard Lindell, TeleCable.



SONY CORP.: Chuck Langee, Sony with Mrs. J. E. Hudson, Jr., Weather-Scan.



ABERDEEN CO.: Fred Rutledge, Meredith Avco and George Acker.



SIGMA INDUSTRIES: Hollis Rogers, Repronics; M. G. Irvin, and Fred Garza, Repronics.

To what lengths must a cable manufacturer go to prove his product is better?

As long as the distance between your amplifiers—even up to one-half mile continuous lengths.

When Times Wire and Cable decided to build a CATV cable to outdistance any other in length and performance, we really went all the way: We built a cable that can span the entire distance between your amplifiers.

However, it's not just that Times JT-1000 CATV cable is longer that makes it better. It's also continuous. It's seamless for the entire length. And it's aluminum. Put them all together and you have *continuous seamless aluminum tube sheath CATV cable* in lengths up to 1/2 mile long—a feat nobody else has yet been able to match!

Here's what these new longer lengths mean to your CATV operations:

- Easily saves you 10% installation and shipping costs. Longer lengths mean fewer splices—8% saved. Another example: Only 1 reel needed for 2,500 feet of cable instead of 1 reel for each 1,000 feet—another 2% saved.

- Times seamless cable is waterproof. Puncture it, splice it, apply as many pressure taps as you like. Water vapor and/or water can't travel in Times self-sealing solid sheath cable. Complete dielectric adhesion to center conductor and complete compression seal to outer conductor eliminate longitudinal vapor or water paths.

- Times cable gives you minimum return loss guarantee. Your choice of guaranteed 26 db or 30 db minimum return loss—a must for minimum ghosting, true color reproduction.

- Increases profit by decreasing splices and scrap. Fewer splices mean less material wasted (fewer failings), less maintenance needed, too. Less maintenance means less labor cost and more profit.

And don't forget: long after so-called economy cable has been replaced (it starts deteriorating the day you install it), Times continuous seamless aluminum tube sheath CATV cable will still be a top performer, keeping pace with your system's planned potential.

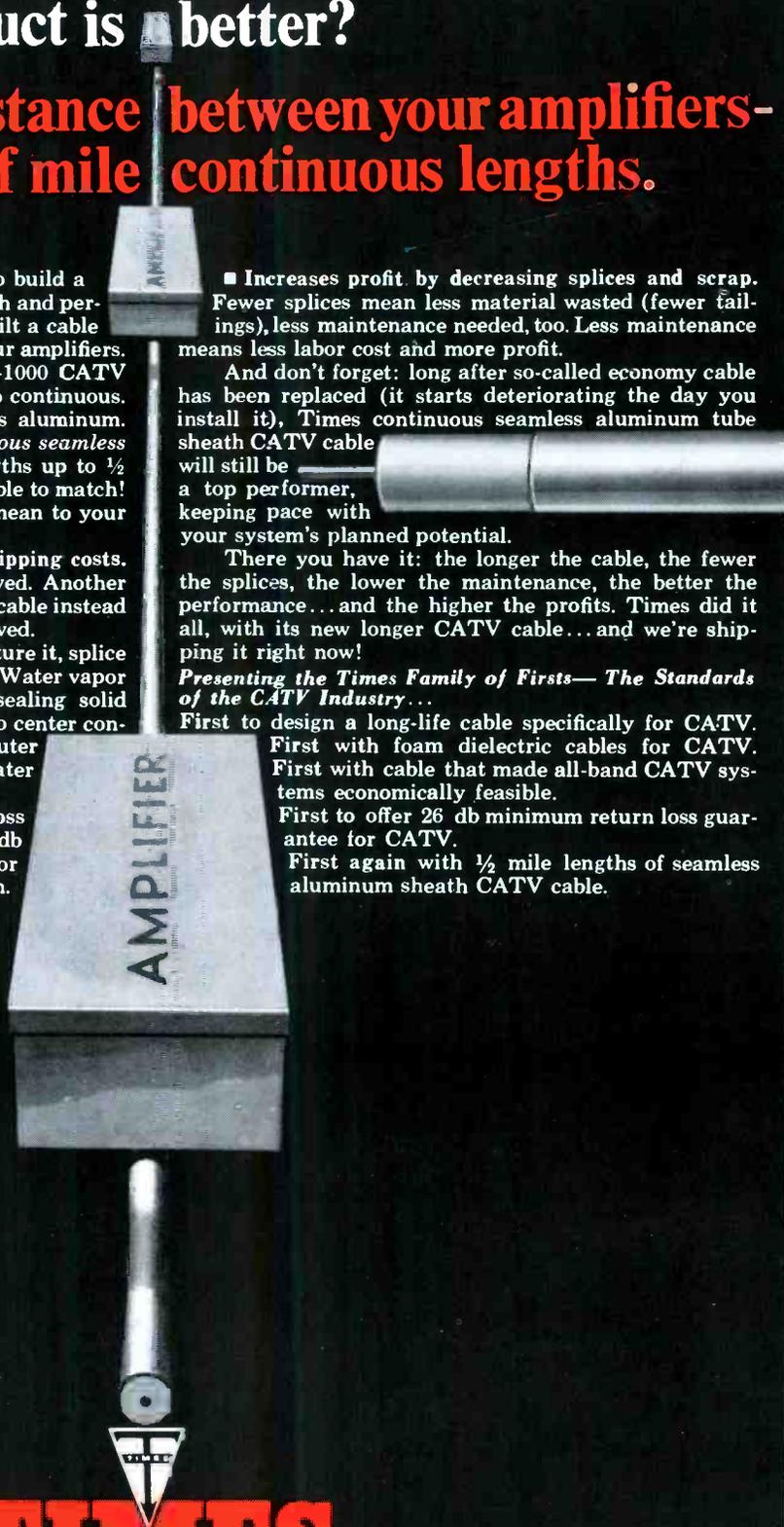
There you have it: the longer the cable, the fewer the splices, the lower the maintenance, the better the performance...and the higher the profits. Times did it all, with its new longer CATV cable...and we're shipping it right now!

Presenting the Times Family of Firsts—The Standards of the CATV Industry...

- First to design a long-life cable specifically for CATV.
- First with foam dielectric cables for CATV.
- First with cable that made all-band CATV systems economically feasible.

- First to offer 26 db minimum return loss guarantee for CATV.

- First again with 1/2 mile lengths of seamless aluminum sheath CATV cable.



TIMES WIRE & CABLE

DIVISION OF THE INTERNATIONAL SILVER CO.

Wallingford, Conn.

Transmission System Design and Engineering/Standard & Special Coaxial Cable/Multiconductor Cable/Complete Cable Assemblies/Teflon® Hook-Up Wire *A Du Pont Trademark



VIKING CABLE: Ted and Arthur Baum.

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Our record of job performance and completion on time - on budget - is unequalled. Among our clients are:

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CATV Sys
CONSTRUCTION

EQUIPPED

Our crews have all and modern equipment.

BURNUP AND SIMS



PRUZAN: Jack Pruzan with Lloyd Hannah, TeleCable of Seattle.



VIDEO TOWERS: Woody J. Woodward and Ed Moyer of V-T with H. L. Walters, Kentucky Cable TV and Leonard Gregory, KCTV.



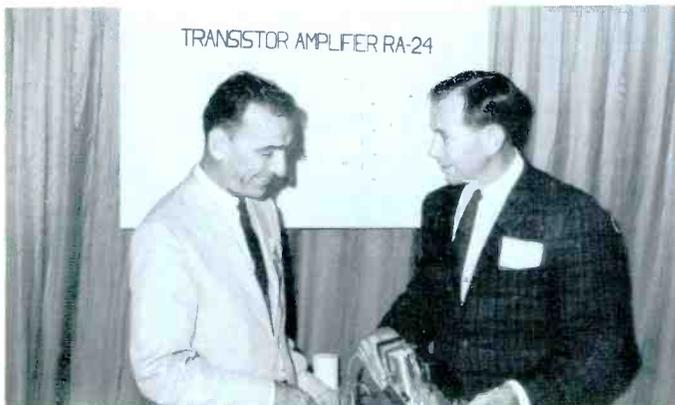
ALPHA WIRE: William Dean, Alpha; Allen Harmes, Palare TransVideo; J. Kirschenbaum, Alpha, and J. William Gibson, Ameco.



MICROWAVE ASSOC.: Erik Stromsted and E. A. Malone.



ROME CABLE: John Pranke, Rome; Allen J. Williams, Williams, Assoc.; E. Mark Wolf and Bud Jones, Rome.



ELECTROLINE: Maurice Ulfman and J. R. Evans of Teleng Ltd., England.



PLASTOID: J. Leon Brodsky with Milton Weinschel.

bury catv corp.



WESTBURY CATV: Henry Shapiro, Westbury; Joseph J. Sedik, Andrew Corp., and Joe Rodgers, Westbury.



T.C.A. TOWER: Mr. and Mrs. Byromp Moore with Nina F. Tarr.



LENKURT: Bill Green, Bob Verlander and Paul Habenight.



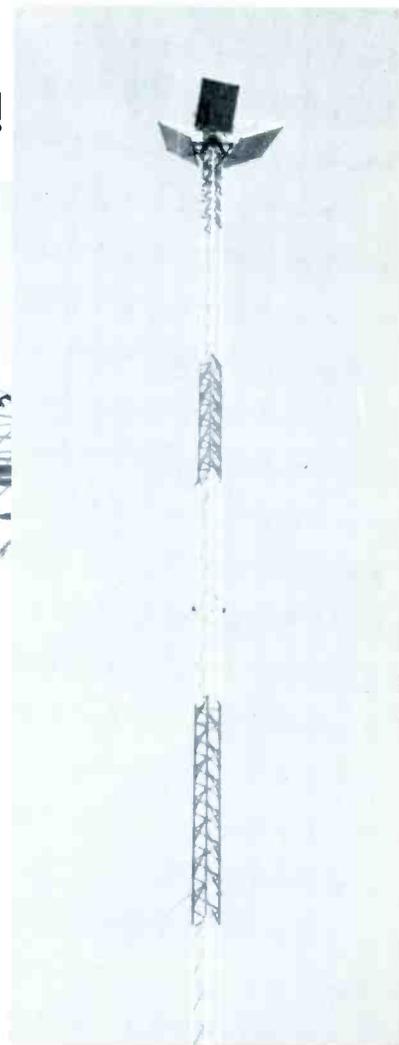
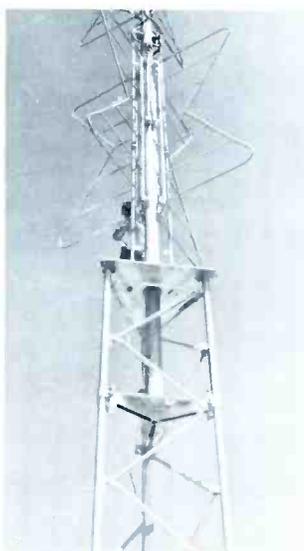
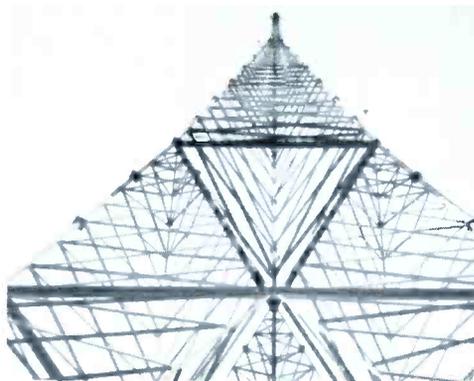
WEATHER-SCAN: Mrs. J. Hudson with Mrs. R. H. Tyler.



CHANNEL SPLICING MACHINE CO

TV & COMMUNICATIONS

CHECK **ROHN** FOR YOUR TOWER NEEDS FIRST!



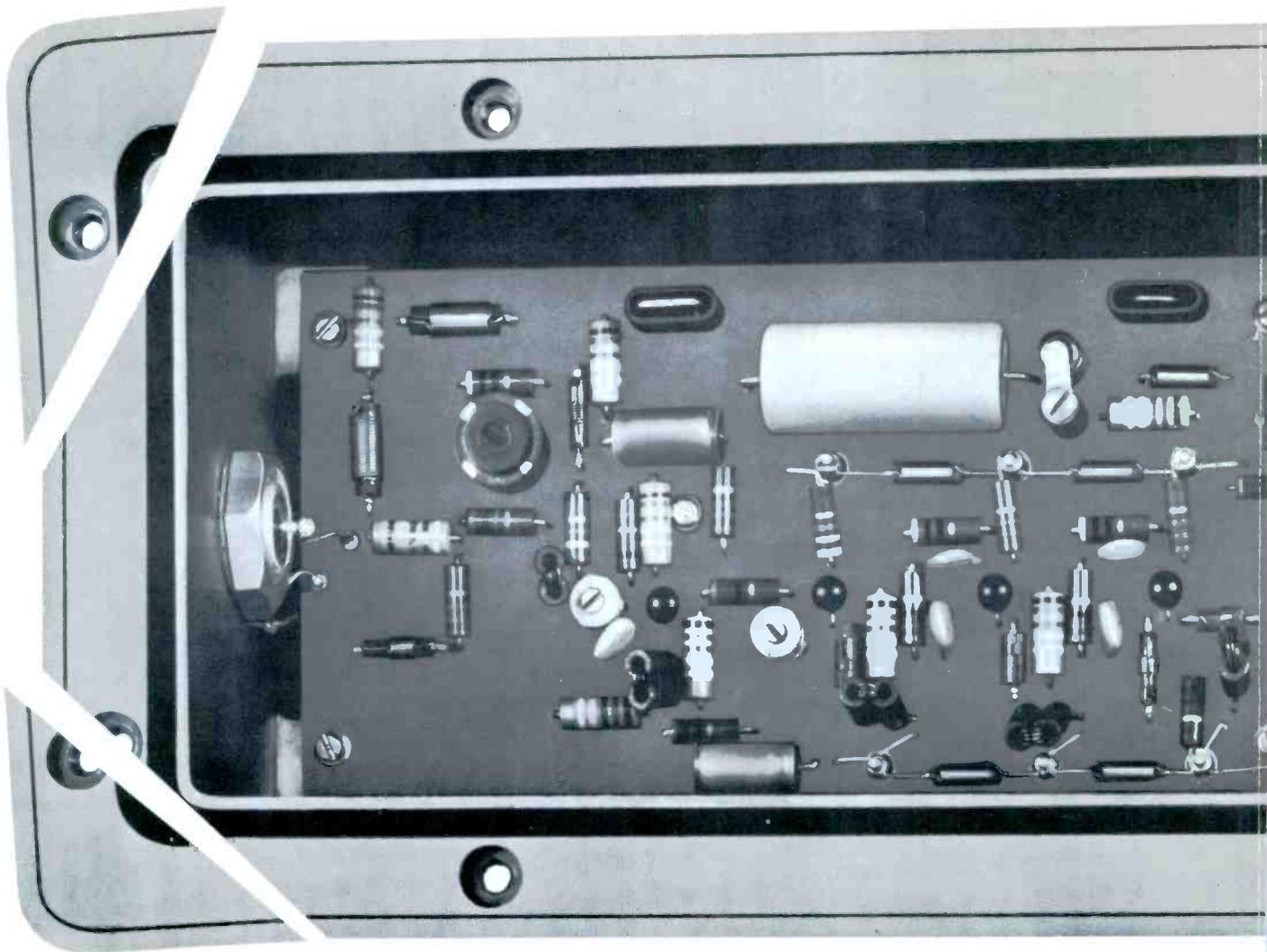
- ✓ Full line of proved communication towers to fit every need . . . includes heavy duty broadcast, CATV, and microwave.
- ✓ Tower design and engineering is tested by thousands of ROHN tower installations.
- ✓ Complete installation service available to take care of the entire job—professionally and to save you money.
- ✓ Complete line of microwave reflectors and tower lighting equipment available.
- ✓ Deal with one of the oldest and largest tower manufacturers in the U. S.—representatives world-wide.

Write — Call — Wire for Immediate Service

ROHN Manufacturing Co.

P. O. Box 2000, Peoria, Illinois

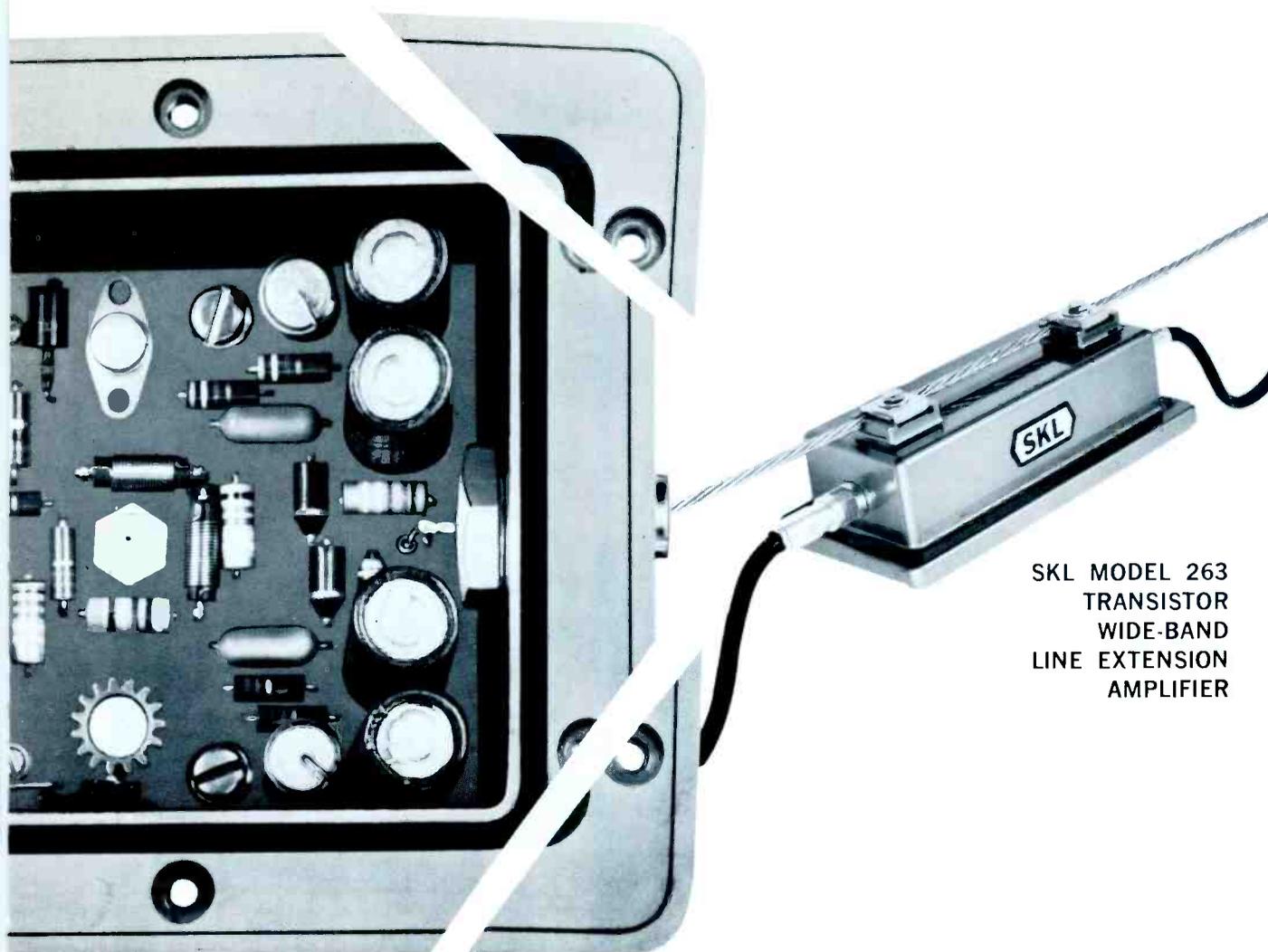
Phone AC 309-637-8416



WE COULD CUT COSTS

But...if We Did...You Wouldn't Have SKL Q

The SKL Model 263 Line Extension Amplifier is a new high output, transistorized amplifier with full 12-channel bandwidth. It is designed for use as a line extension amplifier in any wide-band distribution system. The nominal gain is 22 db at 216 mc, with a 7 db slope across the 54 to 216 mc band. Manual gain and tilt controls complete the compensation for the average cable losses encountered in feeder lines. Low noise and cross-modulation allow the Model 263 to be used even at the most remote ends of a distribution system. AC cable powering provides flexibility in designing new and in extending or updating existing distribution systems. The unit is housed in a rugged, waterproof, cast aluminum box with a captive cover, and may be mounted on the messenger or on a pole.



SKL MODEL 263
TRANSISTOR
WIDE-BAND
LINE EXTENSION
AMPLIFIER

TURNERS...

Quality and Reliability

SKL 263 TRANSISTOR WIDE-BAND LINE EXTENSION AMPLIFIER

FEATURES:

- 12-Channel Bandwidth
- Built-In Cable Compensation
- Gain and Tilt Controls
- High Output Capability
- High Return Loss
- AC Cable Powering

Call or write for SKL Model 263 Product Data Sheet containing complete specifications and the SKL Short Form Catalog describing all SKL Cable Television System Equipment and Services.

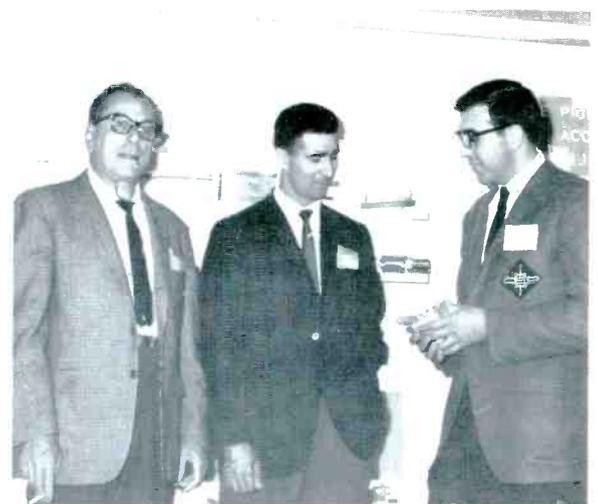


SPENCER-KENNEDY LABORATORIES, INC.

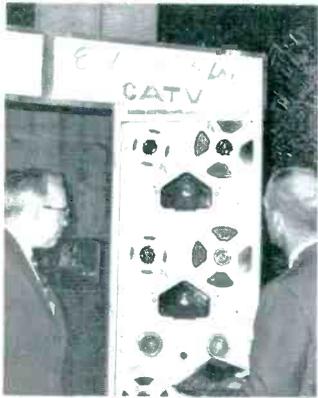
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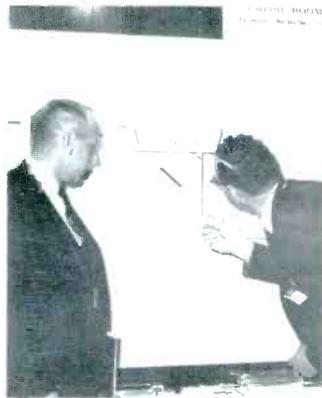
FORT WORTH TOWER: Ronnie Stephenson and T. W. Moore, Fort Worth Tower; Stanford G. Socia, Stan Socia Corp.



CRAFTSMAN: W. J. Calson and A. V. Bagnardi, Onedita Video with Vincent Borelli, Craftsman.



TAPE-ATHON: Tom Aye, Nick Huysman, Comm. Video Ltd., Vancouver.



BLONDER-TONGUE: R. B. Helhoski and Dale Matheny.



UTILITY TOWER: David P. Callahan, Rowley United Theatres; D. E. Neilson and Bud Duvall of Utility.



TIMES WIRE: L. J. DeGeorge, Times; Charles Hale, Harlan (Kentucky) Community TV, and Newell Mc-Donald, Times.



TELESYSTEMS: Glenn Scallorn, Mrs. Bob Magness and George Barco.

CANADA WIRE AND CABLE COMPANY LIMITED



CANADIAN WIRE: P. P. Levens.



CAS MFG.: Allen Harmes, Palace TransVideo; Bob Taylor, CAS; Lloyd Adams, Community TV; Preston Spradlin; Thomas W. Mitchell, Westen TV, and Bill Medlin, CAS.



TV & COMMUNICATIONS: E. J. Vehnekamp of Nanatel Cable with Patrick T. Pogue, TV & COMMUNICATIONS and Leo O. Levisay, TelePrompTer.



DELTA: R. D. "Chuck" Jenson, Delta; T. Schapira, Ketchikan Alaska Television.



PHILIPS DODGE: C. William Stanley, United Transmission Inc., Kansas City and Frederick W. De-Tuck, P.D.



ARMADILLO: Norman E. Cellers, Lenkurt Electric, and Jerry Davis



KAISER: Clay Marohnic of Amphenol with Gay C. Kleykamp, Kaiser.



JERROLD ELECTRONICS: David Hauman, Hauman TV; Cliff Thompson, Mid State Communications, and Bob Pesick of Jerrold.

TV & COMMUNICATIONS

SOLID STATE IS WONDERFUL BUT PROFITS ARE PROVEN USING THE SUPER 60

OVER 4000 IN USE
NOW A SWITCHABLE BRIDGED INPUT
HIGH LEVEL DISTRIBUTION AMPLIFIER

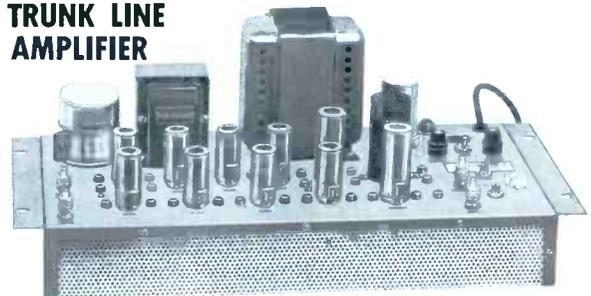


SUPER 60B

SPLIT BAND DELIVERS ONE VOLT
PER CHANNEL ON NINE CHANNELS

GAIN SINGLE INPUT	50 db
BRIDGED INPUT	40 db
BRIDGING LOSS	1 db
V.S.W.R.	1.2-1
OUTPUT 9 CHANNELS	60 db
Output tubes. 2 Amperex S. Q. 8233	
List	\$195.00

ABHL 60 TRUNK LINE AMPLIFIER



SPLIT BAND HIGH LEVEL CASCADED

Flat response through 40 db of cable. Output 46 db per channel for 12 channels. Separate gain and tilt. Hi and Lo band.
List

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DIRECT SHIPMENT FROM OUR
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KENMORE ELECTRONICS INC.
9 EUCLID AVENUE, KENMORE, N.Y.

DELTA ELECTRONICS LTD.
70 RONSON DRIVE • REXDALE • ONTARIO



AMPHENOL: John W. Holland and Robert Kramer of Amphenol.



PETE COLLINS CO.: Karen Wagnon.



ROHN SYSTEMS: H. E. "Bud" Blaksley, Rohn; Richard N. Lawrence, Lenkurt Electric, and C. A. Wright of Rohn.



TELEMATION: Ben Preece; Fred Johnston of Genes TeleCable, and Bruce Freel.



ANACONDA: Gordon McAleer and Peter Lazanich; L. Kenneth Wenger, Allied Video Transmission, and two members of the press.



BENCO: Terry Blanks, Benco; Richard Linebarger of Construction Electronics, and Harold Sharkey, Benco.



ANDREWS TOWERS: Paul R. Bradley and John Andrews.

CANDID PHOTOS



Phil Ford and Mimi Hines provided delightful entertainment at Thursday's luncheon. Entron sponsored the comedy team.



Viking's hospitality suite offered lively "rinky tink" piano music.



NAB meets NCTA: John Dille and William Carlisle chat with Fred Ford after luncheon.



THANK YOU

For the tremendous response at the N.C.T.A. Convention. You almost overwhelmed us. If you had to wait or did not get all the attention you deserve, please forgive us.

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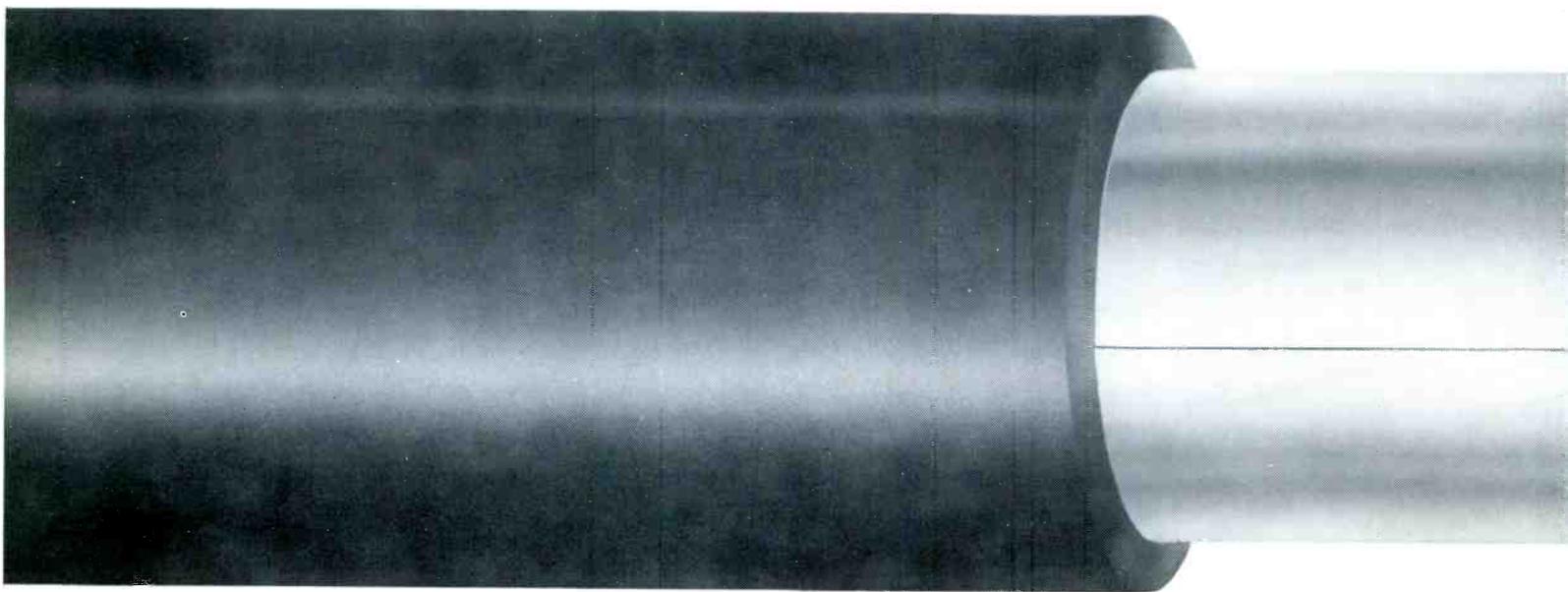
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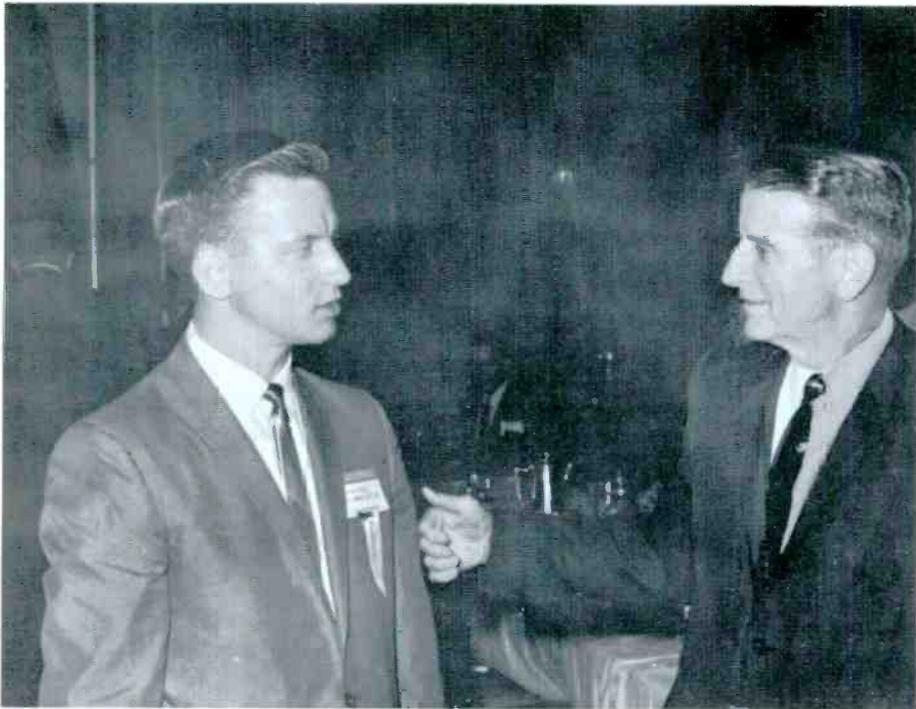
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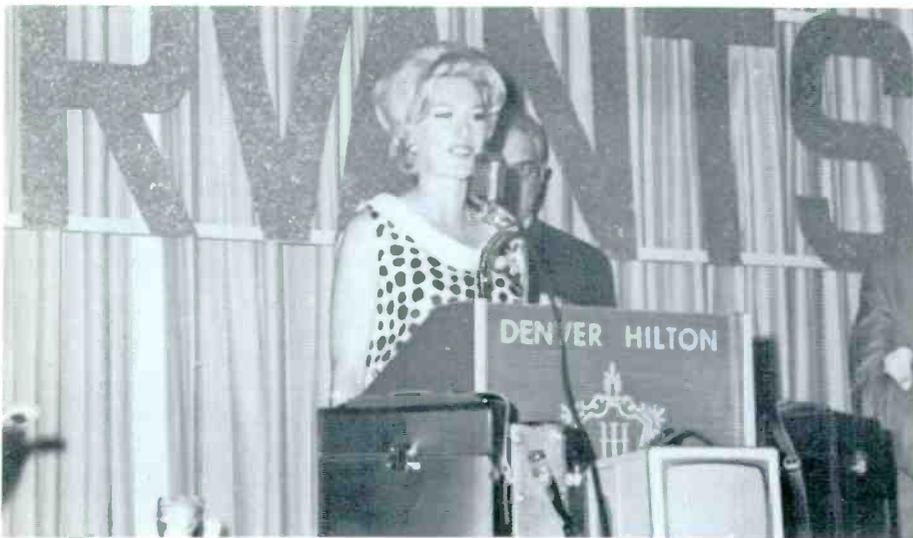


Editor Stan Searle interviews Guest Speaker Harris.

Page draws winning ticket for Reuben H. Donnelly give-away.

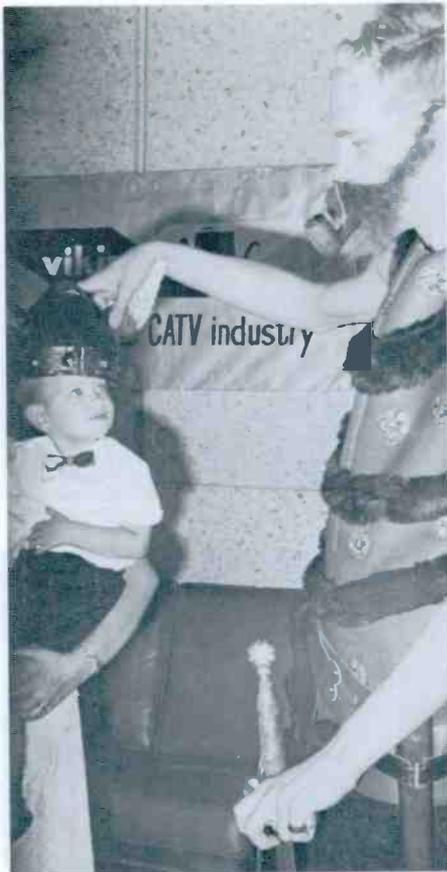


Al Warren, TV Digest, receives honor from Fred Stevenson.



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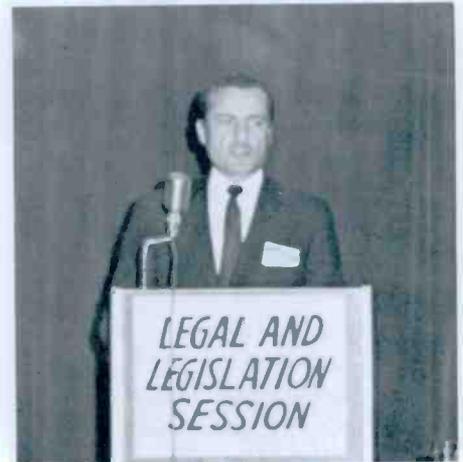
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Milt Shapp introduces Jerrold Ranch Party hosts.



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E. Stratford Smith addresses legal session.



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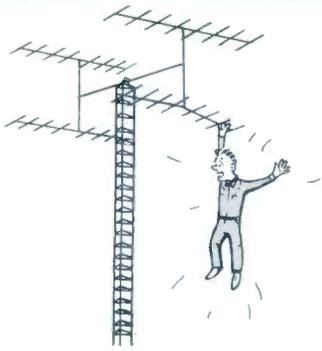
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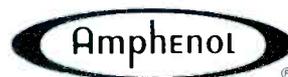
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Al Ricci, Milt Shapp, and Ben Conroy Sr.



Stan Searle recognizes TV & COMMUNICATIONS pages.

THE CATV INDUSTRY

Its History, Nature and Scope

By Robert D. L'Heureux
NCTA Legal Counsel



PART IV

The Federal Communications Commission and CATV

Much has already been made of the fact that the CATV industry got off to a modest start in 1949. In many cases these pioneers were television set salesmen or repairmen who had some knowledge of how television reception could be achieved. Many of these pioneers were returning GI's who had accumulated modest savings during the War and who made use of these to build the early CATV systems. One of these was Mr. Alfred Ricci of Keene, New Hampshire who had, while overseas, put to good use whatever spare moments he had by doing laundry for fellow servicemen and officers. He was paid largely in IOU's. Later he was made a prisoner-of-war by the enemy. At the end of the War he went to his local bank and asked it to collect on the IOU's which he held from servicemen all over the country. Almost all the debtors were located and paid up. This served as the fund from which an excellent CATV system was built. Scores of similar stories can be told.

The early beginnings of the CATV industry were well depicted by the Hon. Oren Harris, Chairman of the Committee on Interstate and Foreign Commerce of the House of Representatives of the United States in an address printed in the *Congressional Record* of June 20, 1962. Chairman Harris stated:

"The history of the community antenna industry reveals the development of an entirely new industry in the best American tradition. In the very early days of television only very limited service was available in metropolitan areas and virtually no service in rural areas and small cities and towns more than 50 miles from the few major metropolitan areas. The Federal Communications Commission had imposed a so-called 'freeze' on the licensing of television stations because of technical problems. This freeze lasted for several years and would have restricted the benefits of this dramatic new medium of mass communications to a few privileged urban areas were it not for the ingenuity of the small American businessman and the insistent demand by the public for the pleasure and educational benefits of television throughout the hinterland.

"There were no precedents for this industry. However, since a single antenna could serve a hotel or an apartment house, then why could it not be made to serve an entire community?"

"The idea did not generate with the large and powerful electronics corporations such as the RCA's, the General Electric, and the Philcos. It developed with local radio and television dealers in small towns who sought some way of providing television signals to the public clamoring to purchase receivers. The first systems were indeed amateurish. They consisted of an antenna mounted on a pipe on the top of a hill; twin lead wire, such as connects any antenna to the television receiving set, extended from the antenna down the hillside and throughout the area serviced. It was supported by trees, fenceposts, corners of buildings, and passed over alleys, backyards, etc. Inexpensive amplifiers, such as used in office intercommunications systems and available at most radio supply houses, were spaced at required intervals along the line. At times they worked surprisingly well and, at other times, because of inexperienced operators and the fact that the equipment was not designed to meet the demands of an extensive antenna system, they were very poor.

"The industry was born almost simultaneously on both coasts in 1949 and 1950. Recognizing the public need and demand in rural and fringe reception areas for television reception and for equipment designed to meet the rigors of outdoor operation, suppliers of electronic equipment began to experiment with a designed CATV amplifier and specialized equipment. The American public brought their demands to these people and insisted that they be met in the small cities and towns across the country. Many men and women with little or no training and with the limited advice available began to build and rebuild, making known their wants and frustrations to the equipment suppliers. The demands of this new industry resulted in the formation of new companies whose primary objective was to solve the problems of multichannel master antenna reception for these small cities and towns. Established manufacturers were too busy with other problems to devote the time and resources necessary to start from scratch. As a result, the dominating equipment suppliers in the CATV field today, 12 years from when the industry was first established, are still the companies which were organized to meet this demand. The industry has never been able to stand still. Development has been constant until today more than \$450 million has been invested in community antenna reception and the industry has caught the imagination of, and challenged, some of the country's largest entertainment and financial organizations.

"Essentially, however, the industry was born in small town America. It can take credit for its development and it still retains much of this original flavor. It is a real example of grassroots demand and development."

These new businessmen believed at that time that the CATV industry might have a very limited existence. Most of them felt that when the Federal Communications Commission did lift the television freeze, which has been referred to earlier, there would perhaps be no future for the CATV industry. Little did they know that this new industry would have to cope with all the problems of local, State and Federal attempts to regulation which are common to the giant steel industry and other large enterprises.

Some of these simply obtained a business license from the city or town where they operated a CATV system. Others made a formal application to

the city council for a permit to conduct this type of a business. This presented a problem to the City Fathers who did not know what a CATV system was but who were greatly interested in permitting one to be built if this meant that the people of the city could obtain television reception otherwise unavailable or available in an inferior quality. Because CATV operators intended in most cases to attach the cable to telephone or power company lines, the City Fathers generally issued the permit to make use of city streets in the form of a so-called "franchise". Actually the word "franchise" is a misnomer, because a CATV system was not considered to be of a public utility nature and was never regulated as a public utility.

Although the industry originated in 1949, it was several years before its existence was made a point of controversy before the Congress of the United States, the Federal Communications Commission or State agencies. This was perhaps due to the fact that television broadcasters shared with the CATV pioneers the belief that CATV was a temporary expedient. Also, most television broadcasters wanted their signals to be received on the cable in order to have a larger audience.

When the author of this article was Chief Counsel to the Senate Committee on Interstate and Foreign Commerce in 1953, there were early rumblings of efforts by a small group of local television broadcasters to retard the development of CATV by requiring a CATV system to obtain consent of the originating television system before the CATV system could carry a signal. When the Chairman of that Committee, the late Charles W. Tobey of New Hampshire, mentioned to me that a small number of broadcasters thought that legislation should be enacted to require consent of the emitting station, I asked him whether it would not be wise to obtain evidence that CATV systems were in fact causing injury to the public, before the broad-

caster was given a weapon to stem the growth of the CATV industry. His successor in the Chairmanship, John W. Bricker of Ohio, was of the opinion that the television networks were the key to making available to the public as many television signals as possible. Accordingly he introduced a bill³⁸ to allow the Federal Communications Commission to regulate networks.

It was not until 1958 that the outcries of a small number of local television broadcasters had reached such a crescendo that the Communications Sub-Committee of the Committee on Interstate and Foreign Commerce of the United States Senate held hearings on the subject.³⁹ Operators of a television broadcast station in a one or two-station television market, paraded before the Sub-Committee to claim the existence of a serious economic impact by CATV systems upon their stations. The only trouble with their claims was that they were all in the field of prognostications. None could show that the CATV system had caused a serious adverse economic impact.

The Sub-Committee did prod the Commission into looking thoroughly into the matter. The Commission instituted an inquiry⁴⁰ into CATV systems, satellites, boosters, etc. It was not surprising that the Commission took the easy way out and echoed the demands of the local television broadcasters. The Chairman of the Commission on April 22, 1959, informed the Sub-Committee: "After carefully weighing all the conflicting proposals urged on the Commission, it has been decided to recommend the adoption of legislation which would require CATV systems to obtain the consent of the originating station for the redistribution to CATV subscribers of programs broadcast by such originating stations; and in addition requiring CATV stations to carry the programs of television stations assigned to communities in which the CATV serves subscribers."⁴¹

The Commission in Docket No. 12443, mentioned above, did listen to the pleas of local television broadcasters and other parties and did conduct a thorough study of CATV systems and other so-called auxiliary services. The Report and Order of the Commission in Docket No. 12443 was the product of a full year's investigations into the charges made at the Senate hearings and of similar complaints. In this document, the Commission found in effect, that it is impossible to conclude that any CATV system has had serious adverse economic impact upon any television station. The Commission did not

state that there was no adverse economic impact on such station. In fact, it presumed that there would be, but the Commission did point out the sheer impossibility of making a factual determination upon the seriousness of this impact with respect to the continued existence or serious degradation of the quality of a television station or even the probability of either of these eventualities taking place in the future in any given case.

In its report in Docket No. 12443, the Commission said:

"In short, we conclude that there is a likelihood, or even probability, of adverse economic impact from auxiliary service upon regular television stations. But in what situations this impact becomes serious enough to threaten a station's continued existence or serious degradation of quality of its service—or whether these things will probably happen in any particular situation—we cannot tell from the data before us. Moreover, as we have stated many times in considering economic injury, broadcasting is a dynamic business. If one station goes under, another station, or here another form of service fulfilling many or all of the same functions, may well soon replace it. . . ."⁴²

In 1959, several bills⁴² were introduced. Hearings were held and the Senate Committee on Interstate and Foreign Commerce reported to the Senate an original bill (S. 2653, 86th Cong., 1st Sess.—1959), designed to amend the Communications Act of 1934 to establish jurisdiction in the Federal Communications Commission over CATV systems. The main feature of the bill is that it excluded CATV systems from the definitions of broadcasting and common carrier and it limited the jurisdiction of the Commission to CATV systems located within the contours of a single television station. If the CATV systems were within the contours of more than one television station, the Commission did not have authority over it.⁴³ The Senate Committee was impressed by the argument that it would be a calamity if a CATV system were able to put out of business a lone television station in a community, because the rural population would be deprived of television reception by a local television station.

Accordingly the Senate Committee restricted the Commission's authority to just that situation. However, this was true with respect to all existing CATV systems which were "grandfathered" in. For the future the Senate Bill would have given the Commission a license to guess upon the probable impact of a CATV system in an area. If the Commission guessed that it would have a

serious adverse economic impact, it could refuse a license. After debate on the floor of the Senate, the Senate Committee's bill was defeated and it was sent back to the Committee and eventually died.

In 1961 the Federal Communications Commission had its own proposed legislation introduced in the Congress.⁴⁴ This bill did not incorporate the licensing feature of S. 2653, although it did exclude CATV systems from the definition of "common carrier" and defined CATV somewhat as did S. 2653. CATV was excluded from the definition of broadcasting. The bill provided for an amendment to the Communications Act which would have clothed the Commission with discretionary jurisdiction in the public interest, to issue rules and regulations with respect to CATV systems in an area served by both a CATV system and a local television broadcast station. No action was taken on the FCC proposal and no further bills on the subject were introduced. The reason why no action was taken on the bill could well be that given in a Note in the Georgetown Law Journal in the fall of 1963, as follows:

"By the language of the bills, the imposition of restrictions and conditions upon CATV systems could have been discretionary with the FCC when considered 'desirable,' without any showing of necessity or urgency by the local broadcaster. Hearings on the issues in cases of controversy would also have been discretionary with the FCC. The bills were aimed primarily toward protecting the TV broadcast industry, and secondarily toward promoting multiple TV services; thus, they were apparently in accord with the FCC's second and third 'priorities'"

"It would seem that because no frequency allocations are involved in CATV operations and because the number of actual controversies between broadcasters and CATV systems are so relatively few in number, there is little need for a mandatory licensing requirement as was proposed by the committee. On the other hand, the FCC's proposal would appear to have been too broad in scope, too discretionary and without necessary standards or a requirement for an evidentiary showing of injury in cases of controversy. It seems, then, if CATV's and TV broadcasters are to function harmoniously within the same communities wherever that situation exists, and with a minimum of regulatory burden on the FCC, a fresh legislative approach is necessary."⁴⁵

Until 1959, the Commission had adopted the traditional free enterprise attitude that a new industry would not be curtailed unless there were proffered proof that it was having a substantial adverse economic impact upon another business to the detriment of the public. This philosophy was contained in indelible terms in Docket 12443. However, under the prodding of a handful of small local television broadcasters and under the sting of a staff report of

39 Hearings on S. 2653 Before the Communications Sub-Committee of the Senate Committee on Interstate and Foreign Commerce, 86th Cong., 1st Sess. 837 (1959).

40 See In the Matter of Inquiry Into the Impact of Community Antenna Systems, TV Translators, TV "Satellite" Stations, and TV "Repeaters" on the Orderly Development of Television Broadcasting, Docket No. 12443, Report and Order No. FCC 59-292, 24 Fed. Reg. 3004, 18 P. & F. Radio Reg. 1573, Para. 10 (1959).

41 S. Rept. No. 923 86th Cong. 1st Sess. 5 (1959).

42 S. 1801 (Chairman Warren G. Magnusen—incorporating FCC proposals), S. 1886 (Senators Frank Moss and James Murray), and S. 2303 (Senator A. S. Mike Monroney).

43 Congressional Record Daily, Senate, May 17, 1960, pp. 9651, 9676, 9682, and 9683.

44 S. 1044, 87th Cong., 1st Sess. (1961); H.R. 6840, 87th Cong. 1st Sess. (1961).

45 Note—Community Antenna Television: Survey of a Regulatory Problem by John C. Palmer, Jr., James R. Smith and Edwin L. Wade, the Georgetown Law Journal, Vol. 52, No. 1, Fall, 1963, pp. 173-174.

the Senate Committee on Interstate and Foreign Commerce (popularly known as the Cox Report), which raised the question whether the Commission had properly exhausted its existing authority to control CATV systems, the Commission a few months after the issuance of Docket 12443 in 1959, started to change its official attitude toward CATV systems. It began amending Section 21 of its Rules and Regulations as applied to common carrier microwave services.⁴⁶ This was one way the Commission could attempt to retard the growth of CATV systems. The new Section (21.709) required that upon renewal of a license application, the applicant would have to indicate the percentage of use of the microwave facilities by customers other than a related CATV system. This was done without rule-making proceedings, under the guise that the amendment was procedural in nature, and, therefore, that rule making is not required pursuant to the provisions of Section 4(a) of the Administrative Procedure Act. The amendment provided that unless a licensee could show a 50 percent usage of his facilities by customers other than the related CATV system, hearings would be necessary to consider the application for renewal in light of whom he was serving and why. This was a very effective tool because CATV systems were largely in remote locations where there is little public demand for microwave service. Licensees found difficulty naturally in being able to show enough unrelated customers to meet the requirement.⁴⁷

Carried to its logical conclusion, this insistence by the Commission that a common carrier proposing to serve CATV systems must show that it is not subject to substantial ownership by one holding an interest in a CATV system could well result in increasing the large hold on common carrier microwave licenses now possessed by Bell Telephone

Company and a few other giant corporations. This fear has not deterred the Commission from proceeding to affect CATV systems to the extent it can.

The next move by the Commission to control in some way the fast growing CATV industry was based upon alleged economic impact. Traditionally the Commission has refused to deny broadcast licenses upon the mere claim by an existing station that there is not enough business in the area to support two broadcast stations.⁴⁸ The United States Court of Appeals for the District of Columbia Circuit in 1958 urged the Commission to take into consideration whether the public interest will be affected by the economic impact on an existing broadcast station.⁴⁹ Still, the Commission has exercised a wise restraint in considering protests based upon an alleged probable economic impact on an existing broadcast station and then finding that such probable adverse economic impact has not been proven.⁵⁰

Despite its traditional attitude towards claims of adverse economic impact, the Commission under the helm of Chairman Newton Minow decided to make an exception to its policy with respect to CATV systems. The Commission in July of 1962 denied requests for rule making with respect to CATV, but it expressed its concern with "the very real danger that operations of CATV systems may force the local television stations . . . off the air."⁵¹ Thus the Commission re-echoed the old cry of a handful of small local television stations before the Senate Commerce Sub-Committee on Communications, as explained above. The Commission did not have one iota of evidence that one CATV system had ever forced a local television station off the air, but the Commission repeated an unfounded charge made against CATV systems by a handful of self-interested local tele-

vision broadcasters who were seeking to perpetuate their local monopoly or quasi-monopoly.

The Commission tested its authority to guess the development of the industry in the future in the famous Carter Mountain case.⁵² The Hearing Examiner in that case had proposed to grant a license for improved microwave facilities to a bona fide common carrier serving several CATV systems in Wyoming. The local station claimed it would be forced off the air if the amended license went into effect. The Commission ordered hearings to be held on the claim of economic injury before the amended license could become effective.⁵³ The Hearing Examiner concluded that the grant should be made. On appeal, the Commission reversed this decision, finding that the CATV system was responsible for loss of revenue to the station, that the station would probably go off the air if the CATV service were improved, that the public interest could be injured through loss of local service, and therefore that the application should be denied.⁵⁴ The Commission offered the common carrier an alternative, stating that this denial was without prejudice to a later grant of the amended license if the applicant could obtain an agreement from its CATV Customer that it would not duplicate the local station's programs, and would carry those programs as broadcast if so requested by the local station.⁵⁵ The United States Court of Appeals for the District of Columbia Circuit upheld the decision,⁵⁶ relying largely on the so-called "expertise" of the Commission in overturning its prior holding. I invite the attention of members of the bar to the paucity of evidence on the matter of the existence of a substantial adverse economic impact upon the local station in that case. The Carter Mountain case is authority only for the fact that the Commission may, after a full hearing,

46 In the Matter of Amendment of Part 21 of the Commission's Rules to Add a New Section 21.709—Domestic Public Radio Services (Other Than Maritime Mobile), Order FCC 59-762, July 24, 1959, 47 C.F.R. § 21.709 (Supp. 1963).

47 For an illustration of how this "procedural" rule had a very "substantive" effect, see the following cases: In re Applications of Columbia Basin Microwave Co., FCC Docket Nos. 14318-19, Memorandum Opinion and Order FCC 63-367, 28 Fed. Reg. 4372, 25 P. & F. Radio Reg. 367 Para. 5 (1963); In re Applications of Peninsula Television Relay Corp. (Docket No. 14473) and Eastern Shore Microwave Relay Corp. (Docket No. 14474), Memorandum Opinion and Order FCC 62-283, 27 Fed. Reg. 277, 23 P. & F. Radio Reg. 183 (1962). The Eastern Shore Application was later dismissed with prejudice, at the request of the applicant, Memorandum Opinion and Order FCC 63-547, June 14, 1963; In re Applications of Black Hills Video Corp., FCC Docket Nos. 14321-28, Memorandum Opinion and Order FCC 63-18, 28 Fed. Reg. 331 (1963); In re Application of Arizona Micro-Wave Sys. Corp., FCC Docket No. 14316; In re Application of Dakota Microwave Co., FCC Docket No. 14315; In re Applications of Superior Communications Co., FCC Docket Nos. 14331-33; In re Application of Ceracche and Co., FCC Docket No. 14320, Memorandum Opinion and Order of Hearing Examiner FCC 62M-772, 27 Fed. Reg. 5351, 23 P. & F. Radio Reg. 811 (1962); In re Applications of Antennavision Serv. Co., FCC Docket Nos. 14336-40; In re Application of Western TV Relay, Inc., FCC Docket No. 14317; In re Application of Mesa Microwave, Inc., FCC Docket No. 14334.

48 FCC v. Sanders Bros. Radio Station, 309 U. S. 470 (1940).

49 Carroll Broadcasting Co. v. FCC, 103 U.S. App. D.C. 346, 258 F. 2d 440.

50 For a complete discussion of this subject see FURTHER COMMENTS IN OPPOSITION TO PROPOSED RULE MAKING by National Community Television Association in Dockets Nos. 14895 and 15233, Exhibit 11 Complete Analysis of Economic Impact Decisions in the Field of Broadcasting.

51 In the Matter of Distribution of Television Programs by Community Antenna Television Systems, Memorandum Opinion and Order RM-300, FCC 62-871, 23 P. & F. Radio Reg. 1624 (1962).

52 In re Application of Carter Mountain Transmission Company, FCC Docket No. 12931.

53 Docket No. 12931, Memorandum Opinion and Order FCC 60-564, May 20, 1960.

54 Docket No. 12931, Decision FCC 62-177, 32 F. C. C. 459, 22 P. & F. Radio Reg. 193 (1962).

55 Docket No. 12931, Decision FCC 62-177 Supra Footnote 54 Para. 16; Petition for Reconsideration Denied, Memorandum Opinion and Order FCC 62-549, 22 P. & F. Radio Reg. 194h (1962).

56 Carter Mountain Transmission Corp. v. FCC, 321 F.2d 359 (D. C. Cir. 1963).

impose conditions upon an applicant for a common carrier microwave license, if the applicant proposes to serve CATV systems. Undoubtedly, the same principle applies to private microwave licenses. The CATV industry cannot rely upon that Court to protect it from a claim by the Commission that it has authority to resort to its magic crystal ball to determine that a CATV system will injure a local television station by its future operations. This protection will have to come from the Congress of the United States. The CATV industry has nothing to fear from a bona fide hearing based upon alleged economic impact.⁵⁷

The Commission's highly discriminatory decision in granting Claremont, N. H., VHF translator applications (BPTTV-1269-1272, 30056-Public Notice B, January 11, 1963, Report No. 4491) is ample proof that the Commission will go to great lengths in order to protect the interests for which it is primarily responsible from only minor injuries or from imagined adverse economic impact upon television stations. Although Section 4.703 of the Commission's rules requires VHF translators to provide complete protection against interference to direct reception of any regular TV Broadcast station and requires UHF and VHF translators to provide complete protection to all stations and services from interference which results from out-of-band emissions, the Commission in the Claremont translator applications discussed, supra, without holding a rulemaking proceeding to determine the facts, completely changed the effect of its rules and decided that "CATV systems are not entitled to such interference protection, that a CATV operator is not a viewer since his facility, while receiving signals in many cases off the air, does so for the purpose of distributing them to subscribers for a fee rather than for free viewing."

This decision was characterized as discrimination against the CATV industry by Commissioner Ford in his dissent. (Compare Public Notice - B, Jan. 11, 1963, Report No. 4491, referred to supra, with FCC Rule 4.703 and the Commission's General Guide For Television Translator Applicants,⁵⁸ No. 92495 for evidence of the Commission's complete disregard of its rules and policies because a CATV system is involved). Just because translators are generally operated by a cooperative or on a "share the expense" basis by a group of people rather than by a profit-

making CATV company, the Commission feels that it may disregard its rules and allow them to create interference at the head-end of a profit-making CATV system. This is simply another link in the chain which the Commission is unwittingly tightening around the neck of the CATV industry, along with the Carter Mountain Case.⁵⁸

Another instance of the Commission's ignoring its own rules is the San Juan Non-Profit TV Association Application for translators (Docket No. 14188, File No. BPTT - 528, Docket No. 14189, File No. BPTT - 530, Docket No. 14190, File No. BPTT - 531). Although the Commission's rules provided that "Although one TV translator station may broadcast the signals of another TV translator station, such stations may not be established solely or primarily for the purpose of providing a relay system for television signals," the Commission in that case allowed the translator in effect to be used as a relay system.

Another effort of the Commission to make the CATV industry bow to its desires or rules with respect to how the CATV operator shall conduct his business is the devising of a set of proposed rules for denying private microwave service in the business radio service (12,000 mc) to no business except CATV companies. This was later addressed likewise to common carrier licenses (Docket Nos. 14895 and 15233). In these proceedings the Commission proposed originally to saddle a CATV operator who operated within the Grade A or B contours of a television station with the burden of not duplicating the programs of such stations simultaneously and 30 days before and after the time of the broadcast. Later the proposal was cut down to 15 days of delayed non-duplication. In the interim any applicant for a license, whether private or common carrier, can obtain a license only if the CATV system which it serves will agree not to duplicate simultaneously and 15 days before and after the time of the broadcast of signal of a television station within the Grade A contours of which the CATV system is located. While a small number of licenses have been granted on this interim basis, this virtual freeze has stymied the development of the CATV industry tremendously. Obviously, some applicants for common carrier or private microwave service will agree to these onerous terms, because if they propose to re-

ceive the signals of an independent television station, they will not be embarrassed by the non-duplication prohibitions.⁵⁹ Finally, the Commission's proposal to revise its rules with respect to common ownership of microwave and CATV and to force the CATV industry into higher frequencies (Docket 15586), thus incurring huge added expenses for development of equipment, can only serve as another brake on the ability of the CATV industry to provide the subscribing members of the public with clear television reception.

The Nub of the Controversy

At this point the reader must be asking himself: What are the true facts which have led to this controversy between some television broadcasters, the FCC, and the CATV industry? The Commission does appreciate the service rendered to the public by CATV systems. However, it is harassed by a small number of broadcasters who keep harping upon the potential dangers presented by CATV systems.

There can be no clearer or more precise statement of the proper role of CATV service than that made by the Chairman of the Commission, Mr. E. William Henry, before the National Association of Broadcasters at the Conrad-Hilton Hotel in Chicago, Illinois, on April 7, 1964. On page 10 of this address, the Chairman stated:

"Second, community antenna television provides a useful though limited service which is not provided by free television. We should seek ways to integrate it fully into our national television system. We should not shrink from hard choices when community antenna television threatens to thwart basic purposes of the Communications Act. It must not be permitted, for example, to hamper the development of UHF, but we must make a strenuous effort to find measures which will allow both kinds of television to survive—to keep open for the public all of the choices which a free economy makes available."

The true facts with respect to the relationship between broadcasting and community antenna television were contained in the FURTHER COMMENTS IN OPPOSITION TO PROPOSED RULE MAKING, filed by the National Community Television Association on April 20, 1964 in Dockets Nos. 14895 and 15233. The highlights of this pleading are summarized at this point.

Highlights of Comments Filed by the National Community Television Association Before the FCC in Response to Proposed Rulemaking to Regulate Microwave-Served CATV Systems

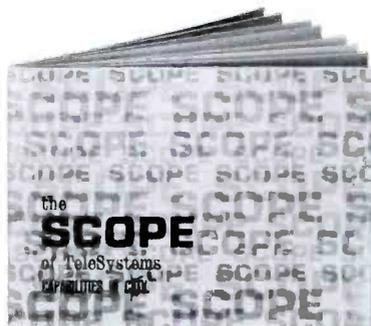
Basic Information:

No. of CATV Systems in the United States	1,295
No. of CATV Systems Receiving Microwave	250
CATV Systems with Microwave:	

⁵⁷ See for example *In re Applications of Mississippi Valley Microwave Co., Inc.* FCC Docket No. 14852 (1962). Note particularly the FCC Broadcast Bureau's Proposed Findings and Conclusions, p. 42. —See also *In re Applications of Teleprompter Transmission of Kansas, Inc.*, Dockets Nos. 15069, 15070, 15071, and 15072.

⁵⁸ *Carter Mountain Transmission Corporation v. Federal Communications Commission & Joseph P. Ernst and Mildred-V. Ernst, d/b as Chief Washakie TV*, United States Court of Appeals for the District of Columbia Circuit, Case No. 17089, 1962.

⁵⁹ For a complete study of the harmful provisions of these proposed rules see the National Community Television Association's COMMENTS IN OPPOSITION TO PROPOSED RULE MAKING (Docket No. 14895), FURTHER COMMENTS IN OPPOSITION TO PROPOSED RULE MAKING (Dockets Nos. 14895 and 15233), REPLY COMMENTS IN OPPOSITION TO PROPOSED RULE MAKING (Dockets Nos. 14895 and 15233), and ADDITIONAL COMMENTS IN OPPOSITION TO PROPOSED RULE MAKING (Dockets Nos. 14895 and 15233).



It will take you 117 seconds to read this booklet. It took us 8 years to write it.

We started writing this booklet when we started operating our first cable system . . . back in 1957.

Even then, we knew a sound CATV system depended on more than just the equipment.

So, instead of basing our outlook on just nuts, bolts and wires, we took the broader approach. We delved into franchise procurement . . . feasibility research . . . engineering . . . construction . . . financing . . .

sales promotion . . . as well as personnel training and management. These are areas in which TeleSystems serves CATV operators. And you'll find all of our services outlined in this brief little booklet, called "Scope."

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Please send your free copy of "Scope."	
Name	_____
Title	_____
Firm Name	_____
Address	_____
City	_____ State _____

(1) Not within coverage area of any television stations	79
(2) Within Grade B coverage area(s) only	71
(3) Within Grade A coverage area(s)	28
(4) Within City Grade coverage area(s)	26
(5) Within City of Assignment of a Television Station	46

Reception of "Local" TV Stations:

NOTE: The FCC's Proposed Rules would require a microwave-served CATV system to receive the signals of TV stations within whose Grade A coverage area the system is located, if the station so requests; stations with CATV systems in Grade B coverage areas could seek CATV reception on a case-by-case basis.

I. The extent of CATV reception of television stations located in CATV-served communities.

A. There are 96 cities in the United States that have both a CATV system and a television station.

B. 122 television stations (100 VHF, 22 UHF) are in operation in these 96 cities:

C. 105 CATV systems are located in these 96 cities:

(a) 85 of these 105 CATV systems receive the local station.

(b) 15 of these 105 CATV systems do not receive local station(s).

(c) 2 CATV systems receive 1 of 2 local stations.

(d) 3 CATV systems in one community (Los Angeles) receive 7 of 9 local stations.

(e) 11 of the 15 CATV systems that do not receive the local station(s) make the local station(s) available to subscribers through a switching device.

II. Of the 250 microwave-served CATV systems, only 20 are within the predicted Grade A coverage area of at least one television station and do not receive that station. (An additional 35 systems are within the predicted Grade B coverage area of at least one television station and do not receive that station.)

Alleged Economic Impact:

NOTE: The FCC, while recognizing "the valuable service CATV systems can render," is concerned that CATV should be "as a complement to, and not at the cost of eliminating or crippling local television service."

I. The facts developed from NCTA's research support the contention that general rulemaking is not the answer to CATV/TV station "problems," that evidentiary hearings are necessary to determine the extent of alleged adverse economic impact of CATV on a television station.

II. The extent of economic impact:

A. CATV as a factor in "eliminating" television stations.

1. 651 television stations have been on the air:

(a) 522 stations were on the air as of January, 1964.

(b) 129 stations have quit the air.

(2) Of the 129 stations that have quit the air, 24 were located in communities in which CATV service operated when the station quit.

(a) Only 3 of these television stations are now off the air and cited CATV as one of the factors in their demise. Even in these 3 cases there is no proof that CATV would have the effect of "eliminating" stations.

(b) In the past 5 years, NO television station has quit the air and claimed CATV as a factor.

B. CATV as a factor in "crippling" television stations.

1. In FCC Docket No. 12443 in 1959, 19 local television stations made serious allegations to the general effect that the impact of CATV had placed them more or less on the brink of disaster.

2. 18 of these 19 stations are still on the air today in 1964.

3. A Comparison, for the years 1959-1963, of network base hourly (advertising) rate, or the highest local hourly rate—whichever data was available to NCTA for 12* of the 19 television stations and one other station mentioned as alleging CATV impact in Docket 12443, reveals (* data available for 12 stations):

(a) 3 have had no change in their hourly rate.

(b) 9 have had increases ranging from 11 - 1/9% to 66 - 2/3%.

(1) The majority (5) have had increases of 25% to 32%.

C. There has not been any persuasive evidence that a CATV system has "eliminated or crippled" or even had a substantial adverse impact upon local television service or that such a thing is likely to happen.

Program Duplication:

NOTE: A major element of the FCC rules proposes that CATV service not duplicate a local TV station's programs simultaneously (at the date and hour of its local broadcast) or within a time period of 15 days before and after its local broadcast (non-simultaneous duplication).

I. There are 250 CATV systems served by microwave. Duplication by contour overlap from signals of TV stations with the same network, or network duplication between stations and translators already exists off-the-air at 60 of these system locations. Most of the contour overlap duplication involves at least one Grade A signal—41 of the 60 locations. 28 of the 41 systems were within two or more overlapping Grade A contours from TV stations with the same network.

II. The FCC itself in recent years has been the greatest contributor to the overlap duplication of TV signals:

A. Through the approval of applications seeking greater tower heights and transmitter site changes, the FCC has created much the same type of overlap of contours of television stations which it is attempting to neutralize through its non-duplication requirements in the proposed rules with such signals are received by a CATV system.

B. In one case of overlap studied by A. D. Ring and Associates, consulting engineers, at the request of NCTA, the Grade B contour of one station was increased from 12,700 square miles to 18,900 square miles and the area of overlap was doubled, increasing from 3,560 square miles for the original facilities to 7,000 square miles for the new facilities.

III. Of the 20 microwave-served CATV systems located within the predicted contour of at least one Grade A signal, and do not receive that signal, 13 are located in communities where network service duplication exists by contour overlap off-the-air.

IV. After extensive studies on the matter of duplication and lengthy examination of all data, NCTA was unable to find any set patterns in simultaneous and non-simultaneous duplication from one CATV system location to another.

V. NCTA's duplication studies reveal that there is almost 5 times as much simultaneous duplication as there is non-simultaneous duplication.

VI. By studying the "worst" areas where most duplication was expected, NCTA research results showed an average of 4.8 hours of non-simultaneous duplication per week during evening hours.

Comments on PAY-TV:

Community antenna television systems by their very nature, serve the entire community, or at least every television set in the community that is connected into the system. Each set receives the same signals, on the same channels, in the same quality as every other set. It is rather like a party line telephone system, and as the present day CATV systems are constructed, it is not possible to deliver signals to any selected groups of sets without the same signals being receivable on every other set connected into the cable system. Thus, community antenna systems as they exist today, cannot serve as pay television systems, which by their definition must be able to provide programming on a selective basis, i.e., the set owner who pays for the program receives it, the set owner who does not pay does not receive. If CATV systems were to become pay television systems, they would have to

be re-constructed in such a manner that it would be possible to deliver signals to connected sets on a selective basis.

Comments on
Hidden Dangers of Regulation:

I. Although the FCC proposed a 15-day before-and-after non-duplication rule, most attorneys serving both broadcast and CATV interests, report that most recent station/system contracts are for simultaneous non-duplication only. This is significant evidence that broadcasters themselves know the dangers involved in non-simultaneous duplication that will arise from advertisers and problems coming out of arbitrary black-outs of programs otherwise available to the CATV-served public.

II. NCTA's research shows that only a small number of microwave-served CATV systems would have to refrain from duplicating programs on a non-simultaneous basis, for more than a few hours a week. Simultaneous non-duplication would be required for only 30 to 50 percent of the time.

NCTA studies failed to reveal any evidence that advertisers are deterred from using the facilities of a local television station because of the presence of a CATV system. In fact, merchants in the town often profit from advertising of name brand products which are advertised on distant stations.

III. The proposed rules will allow unreasonable broadcasters to obtain automatic protection by merely requesting it in writing. This will force the CATV operator to deprive the subscribing public of the free choice of programs they wish to see, until such time as the CATV operator can obtain a waiver of the rules based upon the fact that this will injure the public, adversely affect the financial position of the CATV system, and in no way benefit the local television station requesting relief. When this is balanced against the record of 12 years' operation during which there was no attempt by the Commission to regulate CATV systems and the small number of controversies which developed during that time, one wonders what the Commission hopes to accomplish through these far-reaching rules.

Comments on
The Ability of CATV To Serve The Public Interest

NOTE: The FCC has stated time and again over the years that it wished to make available to the public as broad a choice of programs or program sources as possible.

I. The facts provided in its research permitted NCTA to assess the TV stations—and consequently their network affiliations—that were being received

by microwave-served CATV systems. The facts show no disparity between networks received; on the contrary examination reveals the pointed fact that CATV reception is performing a useful service in *rectifying* any disparity that may exist in the ability of television networks to reach all parts of the nation. The facts are these:

A. 310 television stations (20 ETV) are being received by the 250 microwave served CATV systems.

B. Signals for these 310 stations are received as follows:

1. Signals from prime network stations:
 - ... ABC network: 290 signals received
 - ... CBS network: 286 signals received
 - ... NBC network: 329 signals received

2. Signals from patchwork network stations:

- ... ABC Prime Affiliation, shared with:
 - NBC Secondary CBS Secondary*
 - 19 signals received 12 signals received
- ... NBC Prime Affiliation, shared with:
 - ABC Secondary CBS Secondary*
 - 65 signals received 37 signals received
- ... CBS Prime Affiliation, shared with:
 - ABC Secondary NBC Secondary*
 - 152 signals received 96 signals received

UHF Television and CATV:

NOTE: The FCC has expressed considerable concern with respect to whether the development of UHF television stations would be hindered by microwave service to CATV systems.

I. 15.2% of all existing UHF stations (roughly one out of every six) were constructed in communities in which CATV service existed when the UHF went on the air.

A. There are now 92 commercial UHF stations on the air.

1. 22 of these have CATV service in the same community.

2. In 14 of the communities the CATV service existed before the station went on the air.

II. 107 UHF stations have quit the air.

A. 10 of these stations had CATV service in the same community at the time the station quit.

B. Of the 3 television stations that have quit the air and cited CATV as one of the factors in their demise, one was a UHF station.

C. In 2 of the 10 instances (in "A" above) the UHF operators wrote letters commending the CATV service for its assistance.

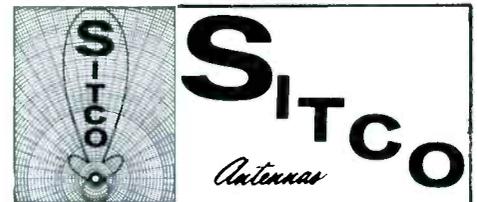
III. Summary

A. UHF television stations *do* go on the air in CATV communities.

B. Very few UHF stations have gone off the air in CATV communities.

C. The evidence does not seem to warrant the Commission concluding that CATV systems are apt to impede the growth of UHF television stations.

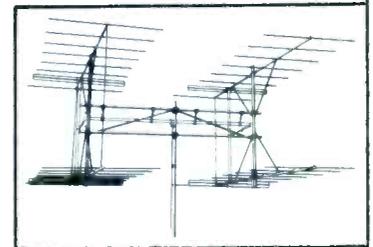
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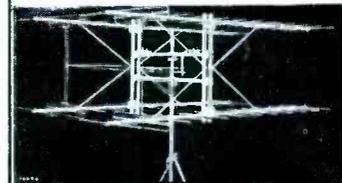
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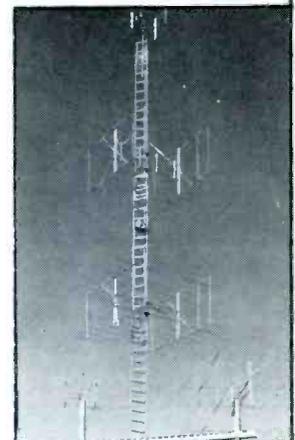


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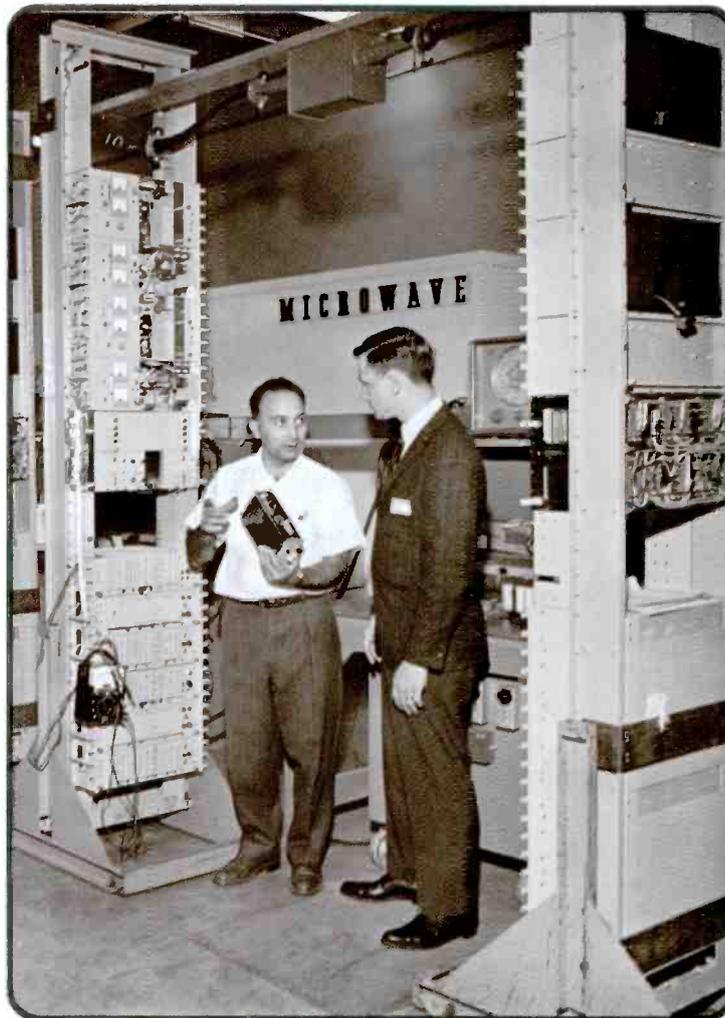


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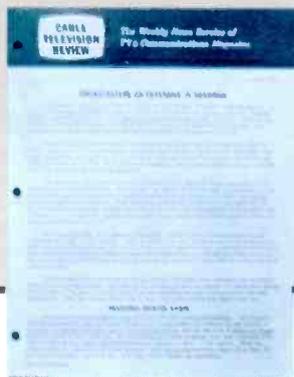
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Nothing mysterious about it! The editors of CABLE TELEVISION REVIEW make it their business to know CATV and CATV operators. Not just the big political and economic questions confronting the entire industry—but the everyday, practical matters that affect individual system owners and their employees. Sure, it's harder than sitting behind a desk all the time and sometimes we even get some mud on our boots. But meeting the people who really are the CATV industry is mighty enjoyable—as well as informative. And we happen to think that the perspective on community antenna television is probably a lot better from a dusty mountain at Tucumcari than it is from our nice comfortable desks!



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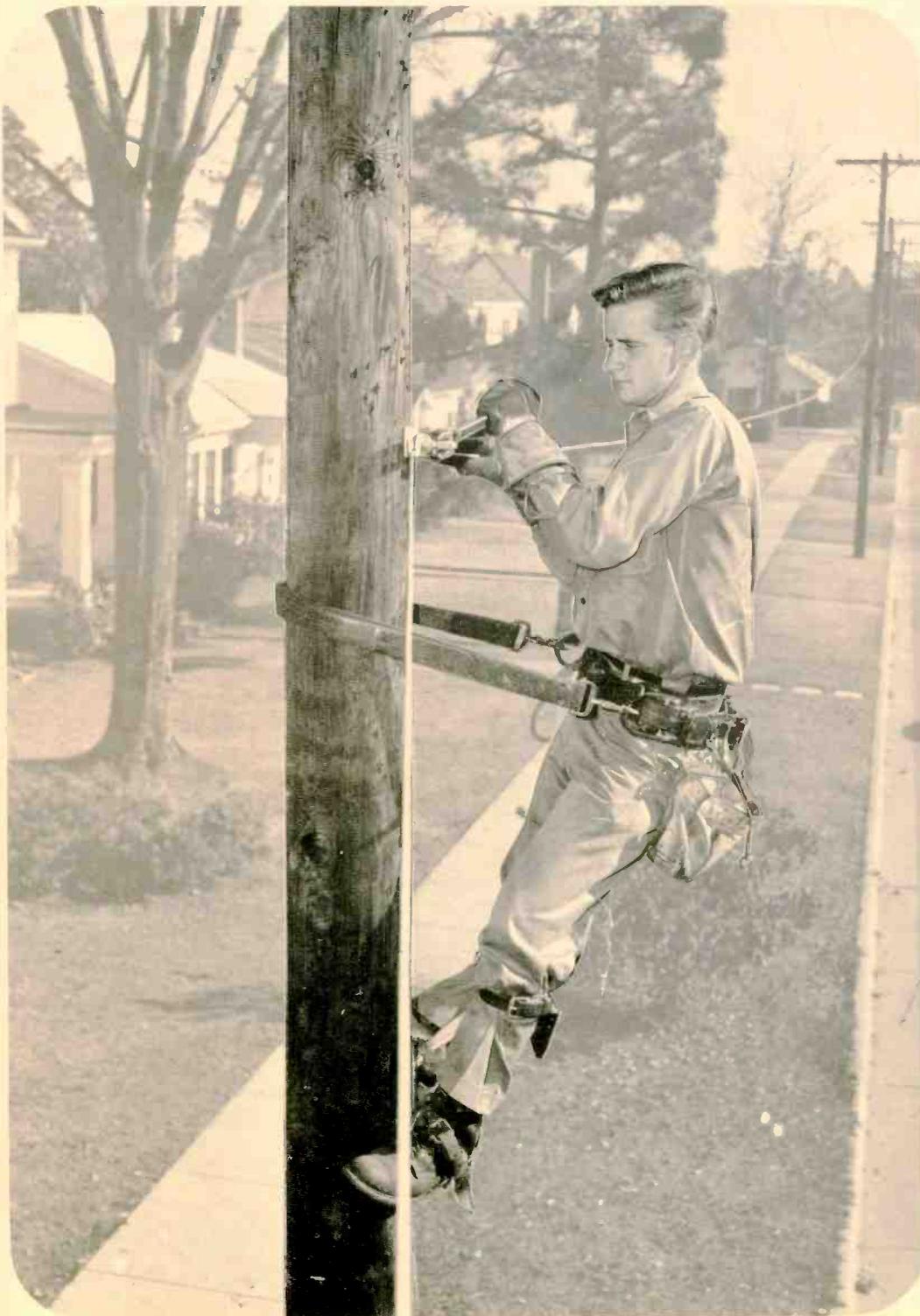
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Today's Technician

Man of the past... or man of the hour?

By R. L. Cowart

In the early days of CATV the technician *was* the CATV industry. He was the man who was primarily responsible for the innovations and adaptations required to make possible CATV as we know it today. Community antenna television probably started in the hills of Oregon near Astoria where a technically inclined broadcaster had the foresight to adapt distribution equipment designed for hotels and motels to the project of supplying a television service to an entire community. The beginnings were as crude as the equipment used.

There were no cables. There were no techniques. The chances of success were very slim indeed. Yet from these feeble beginnings has come a multi-million dollar industry filling an important role in the entertainment field.

The early idea of CATV was fostered by and generated from technically oriented people in the radio and television servicing field. Their ingenuity overcame the extreme limitations and lack of equipment and techniques. These were the people who forged ahead and created their own solutions to the problems of "wired television." It is perhaps unfortunate that during its formative period this young industry was unable to attract to itself more qualified engineers and men experienced in management and administration. Had this been so our great industry would have grown far more rapidly. As it stands now, it seems remarkable that we have come as far as we have.

Life in "the old days" was indeed hectic. There was scarcely any equipment available that could be utilized as supplied by the manufacturer. Consequently the system technician, usually the owner of the enterprise, was forced to modify or redesign equipment to best fulfill his needs. There were as many different ways to build systems as there were technicians.

No rules had been formulized; no thorough analysis had been given to systems. No planning, and very little system. It was simply a case of doing the best you could to insure that the signals continued to travel down those short, short, lines of yesterday. As we look back now, most of us laugh at our early adventures in CATV: The 600' feeder lines; our horror at the thought of running highband channels in a system; the lack of regard given to system AGC and stability. But we were learning, and we seldom made the same mistake twice.

Manufacturers were quick to respond to the changes from the field and it wasn't long before a definite plan began to emerge. A plan which eventually led to our present concept of system construction. Technicians began to ask questions of the manufacturer such as "Why does my signal deteriorate down the line?" "What can I do to reduce the snow in my system?" "How can I arrange my antenna structure to more efficiently utilize those feeble signals?" The answers soon came back and were put into practice. Advance piled on top of advance as new knowledge and new methods became known. One of the major reasons for the formation of our national association was the desire and urgent need to exchange technical information.

The Technician's Changing Role

The cable industry soon grew out of its early formative period and business and investment people began to enter the field. At this crucial point the technician was relegated to a minor role. That this should happen, on one hand, seems incomprehensible but none-the-less it happened. Technicians

lost their primary niche in the industry. Those who survived this early period broke away from system operation itself and many became consultants. Those who remained, however, were still extremely important to the system. In most systems today, in fact, the technician shoulders a responsibility almost equal to that of the system manager. He is responsible for the entire technical operation of the plant and for purchase and modifications to the system. Of course, the problem of maintaining system operation is his. Many technicians are satisfied with this more minor role and do not avail themselves of the industry's schools, publications and technical seminars. It is unfortunate that the number of these satisfied and complacent technicians continues to grow.

Technician Complacency

Many CATV technicians feel that because their system is complete, with little or no future expansion in sight, they need not concern themselves with spec sheets and catalogs from manufacturers other than those whose equipment they are using. On the contrary, every technician should read and absorb the specification sheets for *all equipment* from all sources that he can obtain because Company "A" may have one or two ideas that he can adapt to his present system. They may have an idea by which his present plant can be modified to yield an operating economy or higher quality transmission. This is an important point which is well illustrated by the following facts. Some years ago the subject of thermal compensation became fairly widely discussed but many system technicians felt that because they were not using the products of the company which had introduced the method of thermal compensation they should not consider adoption of the technique because it might be incompatible with existing equipment. But those technicians who were alert instantly realized that here was a technique which could be successfully employed, regardless of the equipment in the major portion of the system. So they gained considerable benefit by keeping abreast of technical progress.

Technician Opportunities

Because of the fairly rapid growth rate in systems today, it has been impossible to fill all of the system technical openings from within our industry. Because of this we have had to go to the TV technicians, to the two-way radio people, and others in similar forms of communications to recruit technical talent. Many of these people have joined a system as an installer or technical helper. If they demonstrate ability they usually advance to the position of system technician. Those who demonstrate administrative ability in this position often become managers themselves. This is a worthwhile manpower utilization in system operation because ours is still an extremely technical business. And a manager with technical training or one who has been a system technician is far better qualified to assess absolute system requirements than one who may have business ability but whose experience in system operation and construction is limited. It is the responsibility of every system technician to make sure that he has taken every possible advantage of every bit of technical information available.

Systems Understaffed

In any other business the investor always surrounds himself with the most proficient professional help that he is able to obtain. But this is not usually the case in CATV. With few

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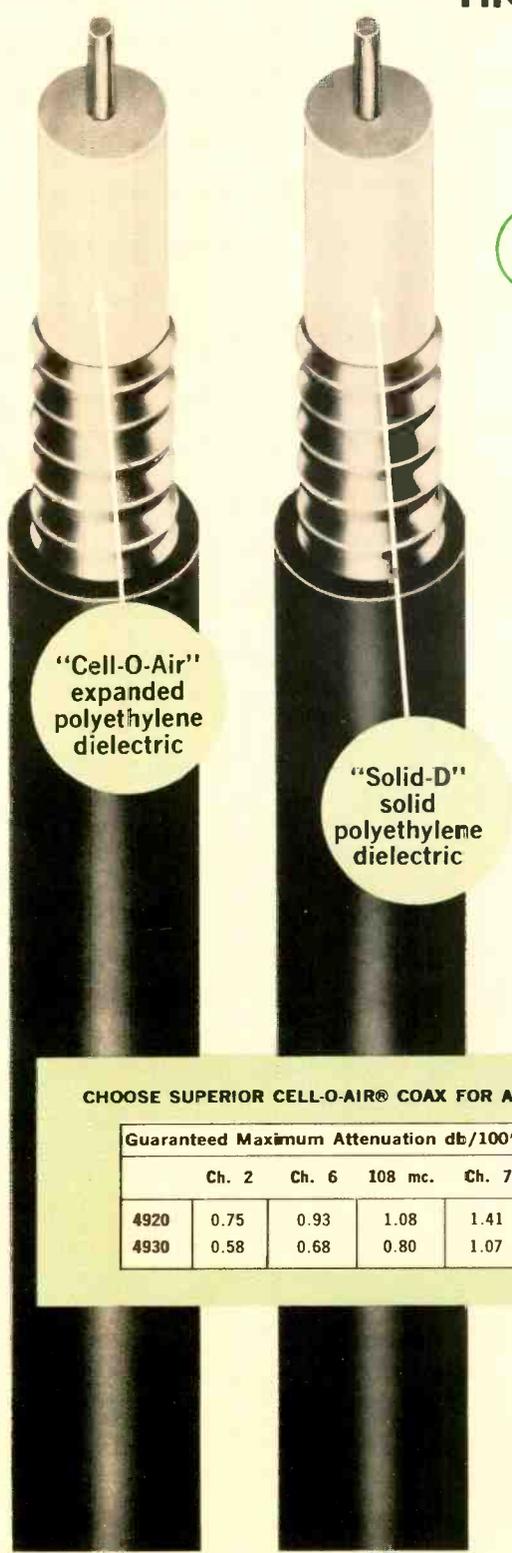
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exceptions, the major operators throughout the country operate primarily as financial institutions with thoughts mostly of cash flow or methods by which to increase it. Few major groups maintain on their staff a registered professional engineer capable of making technical decisions. Yet this remains an extremely technical industry. If a person wishes to build a \$500,000 building he would never consider starting construction unless he had detailed drawings, cost estimates, time estimates for each phase of construction, and a thorough analysis of the structural capabilities of the building. Yet in CATV we find this same investment being made without consultation with the technically qualified advisor. The trend these days seems to be to depend wholly upon the manufacturer to supply technical information. The reason so often given is that the manufacturer has a much larger engineering staff than the system operator could ever hope to achieve. But what has happened to our initiative and drive, or rather what has happened to the technician's initiative and drive?

The initiative that caused him to launch this industry? Is the imaginative, fact-hungry, pioneer-spirited technical type just a legend from the CATV past?

The Challenge

Technicians, there is a tremendous opportunity for you in CATV. Rally to the challenge—by developing your own potential and your system's potential—and you will do a great service to yourself and to your industry. The relatively few truly professional technicians in cable television today command high respect and even higher salaries.

The crying need of the hour is for more ambitious technicians to recognize that we face frontiers today which are as promising as those of CATV's early days. The big city and very small town, multi-channel CATV services, supplemented by an assortment of auxiliary services present a direct challenge to *your* imagination and ingenuity. The technician who will rise to meet *today's* opportunities will be cable television's "man of the hour."

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Over the years, we have determined that this principle can be applied to the construction of our headend build-

ings. We have found that if we slam together a "mike shack" or "dog house" we are prone to treat everything in this "shack" in the manner to which it seems to be accustomed. On the other hand, a well-planned and neatly constructed "Control Center" seems to encourage us to do neat and permanent maintenance and repairs.

I do not know why this is true. It

does not seem that it should be necessarily true that junky-looking equipment should operate the way it looks, but experience has taught the military services, broadcast stations, Western Electric, etc., that neatly installed electronic equipment in well-planned, properly lighted, roomy quarters is apt to be cared for in such a manner as to produce good results.

Each microwave transmitter is required, by law, to have an inspection by a FCC licensed technician at least every six months. This inspection must be recorded in the station log, which is kept in the *transmitter house*.

Each transmitter station is also required to have, on hand, at all times, a complete set of instruction manuals, replacement tubes and klystrons and spare tower lights.

Although receiving towers and control houses do not, at the present time, come under these rules, it is certainly good business to maintain them in the same manner.

Short of wasting money, I do not believe we can carry this thought too far. Each Control Center should have such things as an ash tray, waste paper basket, broom, step ladder and a chair or stool or two (instead of cable spools) in order to encourage the type of maintenance that will result in permanent repairs. Since we do not have windows in our control buildings, we are not allowed the privilege of little, green window boxes. But, I am not convinced that pretty, little green window boxes would be a detriment to this building that is so important to the maintenance and proper operation of our systems.

Let's be ready for an inspection by either Chick Sale or the FCC inspector.

CHECK LIST FOR MICROWAVE BUILDINGS

1. A legible copy of the current authority for operation posted in a plastic cover in a conspicuous place.
2. Make, type acceptance number, power, frequency, etc., of transmitting equipment must agree with authority for operation.
3. FAA lighting and marking instructions sheet in a plastic cover.
4. Tower lighting and painting should at all times meet the obstruction marking specifications as stated in the authority for operation.
5. Logs are kept in a permanent, orderly manner. All maintenance performed must be logged and signed by the licensed technician or field engineer performing the maintenance or repair. License number of technician must be shown along with log entry.
6. Frequency, power and deviation checks have been made by licensed engineer and properly entered in the log within six (6) months at all times.
7. All licensed personnel must carry with them a verification card, FCC Form 758-F, when performing maintenance on any microwave transmitter.
8. Spare parts, tubes, klystrons, fuses, etc., (including spare tower light bulbs) are located in the microwave buildings, preferably in parts cabinet with proper list.
9. The manufacturer's supplied technical manuals permanently located in all microwave buildings. These should be kept up to date with all supplements showing modifications.
10. All microwave test meters are in working order.
11. All cabling, labeling, waveguide runs and general construction should be done in a permanent manner.
12. Name and phone number of engineer or technician responsible for upkeep of equipment. Also, proper steps to take in case of trouble. This includes names of personnel connected to other stations in the link.

Basic Antenna Array Theory

MINIMIZING CO-CHANNEL INTERFERENCE

by
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Scientific-Atlanta, Inc.

Co-Channel interference has become an increasingly important problem for CATV systems, due to the rapid growth of all-channel distribution. Many systems now operate in the primary coverage area of one or more TV signals and distribute twelve channels of television; thus they are usually required to distribute fringe-station signals in order to fill their channel capacity.

In March 1959, the Television Allocations Study Organization graded viewers' opinions of television picture quality in the presence of co-channel interference as follows:*

Picture Quality	Signal-to-Interference Ratio, db
Excellent	47.3
Fine	42.6
Passable	37.2

A signal-to-interference ratio of 48 db has been set as the CATV system objective; and since antenna location is not always an effective factor in minimizing co-channel interference, the largest part of interference rejection must be provided by the antenna array.

Definitions

In a discussion of basic antenna array theory and design, the following definitions are quite helpful.

ARRAY—A radiating or receiving system composed of several spaced radiators or elements. In a broadside array the principal direction of radiation is perpendicular to the axis of the array and to the plane containing the elements. In an end-fire array the principal direction of radiation coincides with the direction of the array axis.

DIRECTIVITY—The ratio of the maximum radiation intensity to the average radiation intensity. For an antenna that is 100% efficient (i.e., no conductor, dielectric, or mismatch loss), directivity and gain are the same. For an antenna with losses, gain will be lower than directivity by a factor corresponding to the efficiency.

Specifically,

$$G = KD,$$

where G is gain as a power ratio; K is

*Report to Federal Communications Commission, March 16, 1959.

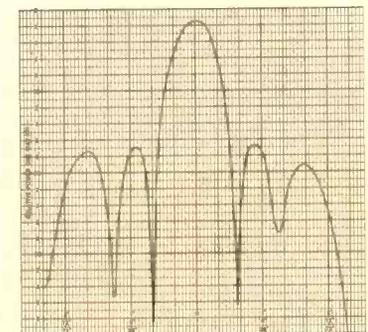
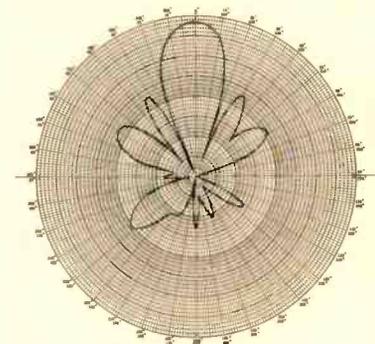


FIGURE 1 POLAR AND RECTANGULAR PLOTS OF AN ANTENNA RADIATION PATTERN

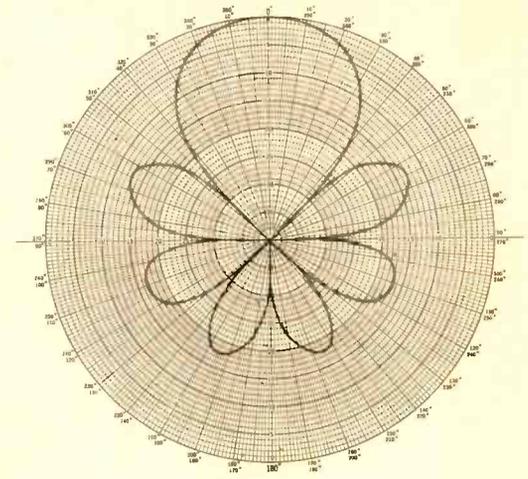
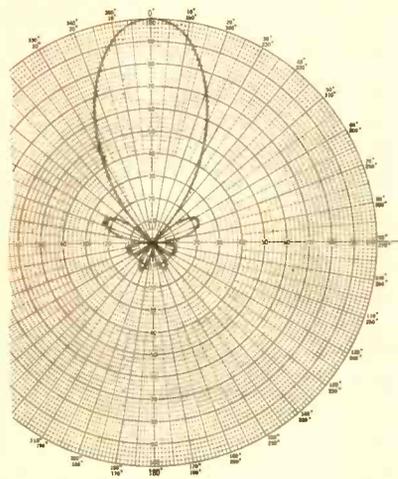
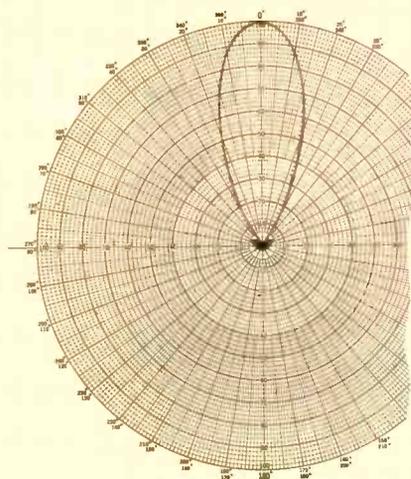


FIGURE 2 POWER, FIELD AND LOG PLOTS OF AN ANTENNA PATTERN

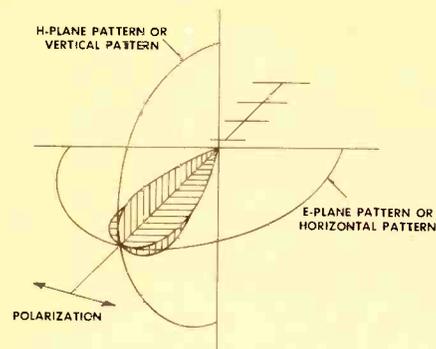


FIGURE 3 ANTENNA RADIATION PATTERNS, E- AND H-PLANE

the efficiency factor; and D is directivity.

GAIN—The ratio of the maximum radiation intensity in a given direction to the maximum radiation intensity produced in the same direction from a reference antenna with the same power input. Gain is frequently used as a figure of merit; it is closely associated with directivity, which in turn is de-



FIGURE 4 EFFECT OF ANTENNA PATTERN ON SIGNAL-TO-NOISE RATIO.

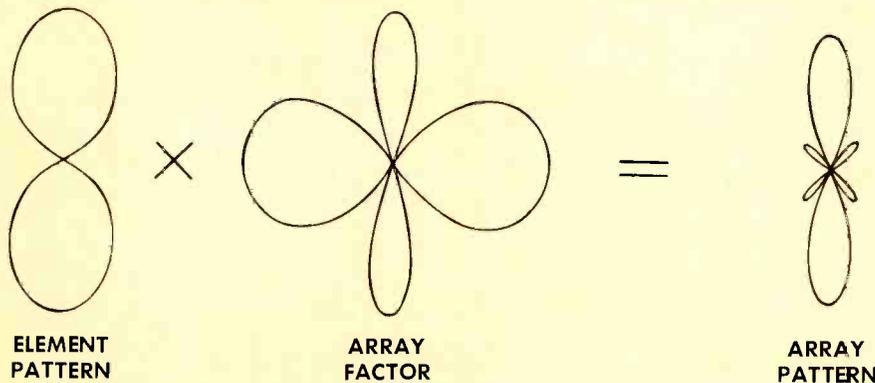


FIGURE 5 PATTERN MULTIPLICATION

pendent on the radiation patterns of an antenna.

The most common reference antenna used to calculate gain is the isotropic radiator, a hypothetical, lossless antenna that radiates uniformly in all directions. The half-wave dipole antenna is sometimes used, however, and the following formula is useful in converting from either reference:

$$G_{iso} = G_{dipole} + 2.15 \text{ db,}$$

where G_{iso} is the gain in decibels reference to an isotropic radiator, and G_{dipole} is the gain in decibels referenced to a dipole antenna.

RADIATION PATTERN—A graphical representation of the radiation of the antenna as a function of direction. Patterns may be taken in polar form (see Fig. 1a) or rectangular form (see

Fig. 1b). The following three patterns are most commonly used.

(a) **Power Pattern**: Shows the variation of power density at a constant distance from the antenna as a function of angle. (See Fig. 2a.)

(b) **Field Pattern**: Shows the variation of the electric field intensity at a constant radius from the antenna as a function of angle. (See Fig. 2b.)

(c) **Log Pattern**: Shows the variation of the logarithm of power density or electric field intensity at a constant radius from the antenna as a function of angle. (See Fig. 2c.) The logarithm of field intensity, E , in any direction can be expressed as

$$20 \log \frac{E}{E_{max}}$$

The logarithm of power, P , in any direction can be expressed as

$$10 \log \frac{P}{P_{max}}$$

The same antenna pattern is plotted in three forms in Figs. 2a, 2b, and 2c.

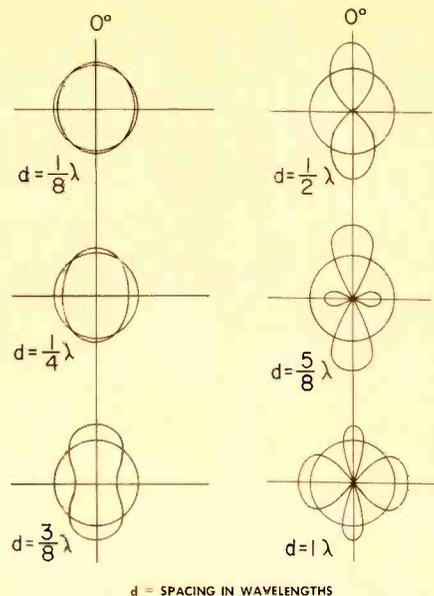


FIGURE 6 EFFECTS OF ELEMENT SPACING ON AN ARRAY FACTOR

Note how useful the log pattern is in displaying the sidelobes of an antenna.

An antenna radiation pattern is a three dimensional figure, and patterns can be made in an infinite number of planes. The most important planes in a CATV system are the E-plane (horizontal), in which co-channel signals arrive, and the H-plane (vertical), in which ghost signals usually arrive. (See Fig. 3.)

RECIPROcity THEOREM—A theorem stating that the directional pattern of a receiving antenna is identical with its directional pattern as a transmitting antenna.

CATV Array Design

In the early days of CATV, co-channel interference was not a major problem; and CATV arrays and antennas were designed for maximum gain, based on the criterion that signal increases linearly with gain. Today,

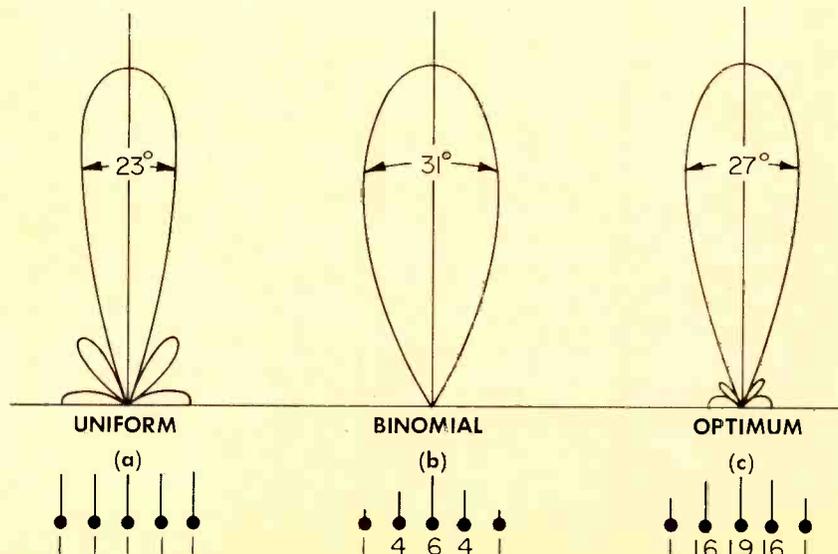
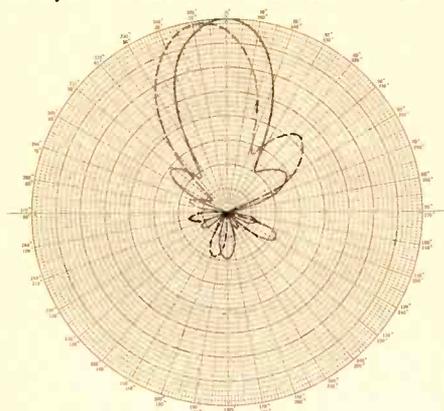


FIGURE 7 CONTROL OF SIDELobe LEVEL BY CURRENT AMPLITUDE

however, CATV arrays must be designed to operate in receiving systems where interference is present; in these systems gain is desirable only insofar as it improves the signal-to-noise ratio.

The important factor now is the overall directivity pattern of an array. For example, a receiving antenna with the pattern shown in Fig. 4a may be preferable to a higher-gain antenna with the pattern shown in Fig. 4b if there is an interfering signal or noise arriving from the back direction as indicated. The antenna pattern shown in Fig. 4a has a null directed toward the source of the interference and thus may provide a much higher signal-to-noise ratio.

Designs for efficient arrays can be developed on the basis that the total field developed by an array at a distant point in space is the vector sum of the fields produced by the individual array radiators. Since the relative



SOLID LINE: ZERO SKEW. DOTTED LINE: 10-DEGREE SKEW.

FIGURE 8 ELECTRICALLY SKEWED PATTERN

phases of these component fields are determined by the relative distances to the various radiators of the array, the pattern will depend on the direction to the point in space. Therefore the component fields tend to add in some directions and cancel in others. By properly utilizing this characteristic of spaced radiators, it is possible to concentrate the radiated energy in the desired direction and attenuate the energy in the undesired direction.

To determine the overall directivity pattern of an array, pattern multiplication can be used. By this method the array factor for the particular element spacing is multiplied by the element pattern (see Fig. 5).^{*} Usually the element patterns are relatively broad, and the array factor determines the half-power beamwidth of the array. Side-lobe level and front-to-back ratio of the array are determined by the individual element pattern.

Control of Array Sidelobes and Null Positions

The sidelobe level and null positions of an array can be controlled by any

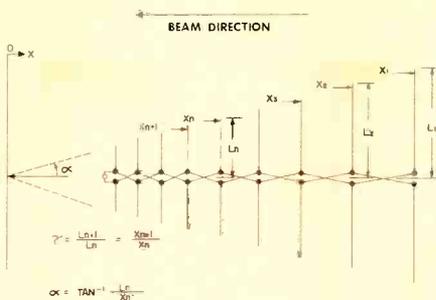


FIGURE 9 SCHEMATIC DIAGRAM OF A LOG-PERIODIC ARRAY

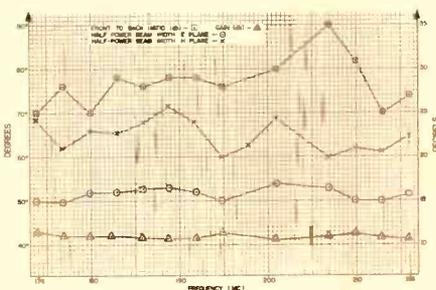


FIGURE 10 PERFORMANCE OF CHANNEL 7-13 ANTENNA

one or a combination of the following parameters:

- (a) Element spacing.
- (b) Relative element current amplitude.
- (c) Relative element current phase.

With a given element directivity, as the spacing between elements increases beyond the optimum (i.e., maximum gain), the sidelobes increase rapidly until they are at the same level as the main beam. (The sidelobe level for maximum gain condition is approximately 13 db down.) As the element spacing is decreased, the sidelobe level decreases; however, the array gain decreases, the main beam increases, and the mutual impedance increases. (See Fig. 6.) The directivity of the element pattern must be sufficient to reduce the sidelobes of the array factor to the level desired.

Another method of controlling the sidelobe level of an array is through

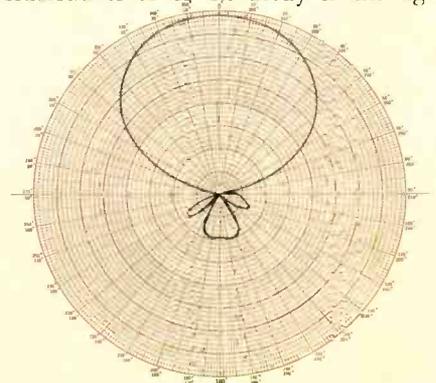


FIGURE 11 TYPICAL E-PLANE PATTERN OF CHANNEL 7-13 ANTENNA

the control of the power or current amplitude fed to each element of the array. For example consider a linear array of five isotropic point sources with $\lambda/2$ spacing. If the sources are in phase and all equal in amplitude, it is designated as a uniform array (see Fig. 7a). A uniform distribution yields the maximum directivity for a given array size. The pattern has a half-power beamwidth of 23 degrees, and the sidelobes are relatively large (12.5 db down). The sidelobe levels of the array can be reduced by tapering the current or power distribution along the array, at the expense of reduced gain and larger main beamwidth. The shape of a typical current distribution is such that the current tapers from a maximum value at the center of the array to some minimum value at the edge of the array. If the element current amplitudes are proportional to the coefficients of a binomial series, the array pattern has no minor lobes (see Fig. 7b). This has been achieved, however, at the expense of an increased beamwidth (31 degrees). If the current distribution is between the binomial and the uniform, a compromise between the beamwidth and the sidelobe level can be made. That is, the sidelobe level will not be zero, but the beamwidth will be less than that for the binomial distribution. An amplitude distribution of this nature, which optimizes the relation between beamwidth and sidelobe level, is based on the properties of the Tchebyscheff polynomials and is referred to as the Tchebyscheff distribution. The pattern and current distribution for a specified sidelobe level of 20 db below the main

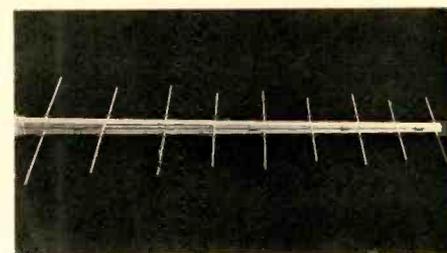


FIGURE 12 CHANNEL 7-13 ANTENNA

beam is shown in Fig. 7c. The beamwidth between half-power points is 27 degrees, which is 4 degrees less than that for the binomial distribution. Therefore Tchebyscheff distribution is optimum in the sense that it will produce the narrowest beamwidth for a given sidelobe level.

In addition to sidelobe-level control for minimizing interference, a null can be placed in the array pattern in the direction of an undesired signal. This can be accomplished by the adjustment of element spacing, mechanical rotation

^{*}A universal pattern chart of array factors is contained in ANTENNAS, by J. D. Kraus (McGraw-Hill, 1950).



FIGURE 13 QUADRATE CHANNELER ANTENNA, INSTALLED ON TOWER

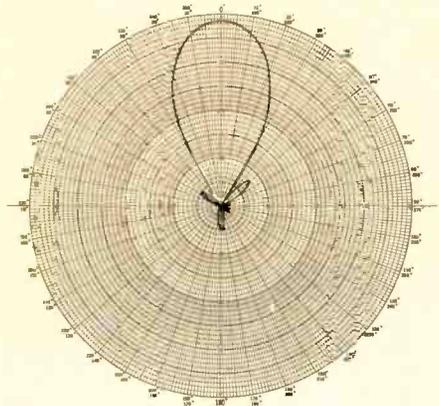


FIGURE 14 TYPICAL E-PLANE PATTERN OF QUADRATE CHANNELER

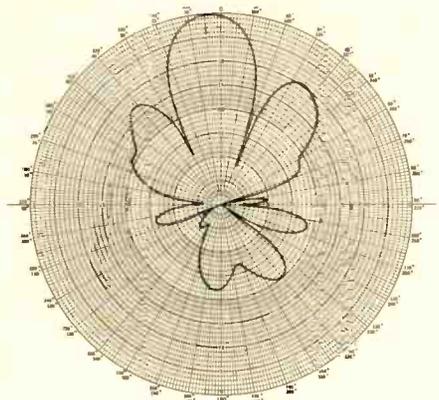


FIGURE 15 TYPICAL E-PLANE PATTERN OF QUAD-YAGI ARRAY

of the array, or electrical rotation or skewing of the array beam by feeding the array elements with currents of unequal phase. (See Fig. 8; note that the overall sidelobe level is raised and the main beam is skewed.)

Yagis and Yagi Arrays

In 1927 the Yagi, or Yagi-Uda, antenna was introduced; and from the late twenties to the late fifties, it had little competition as a lightweight, high-gain VHF antenna.

Yagi antennas are still widely used in CATV systems, because they provide maximum gain for a given antenna size and weight and are considered to be economical; however, they do have the following performance shortcomings:

(a) Yagis tend to have a narrow bandwidth in both impedance and patterns, and some do not maintain a VSWR less than 2 to 1 over the 6-Mc bandwidth of a single TV channel. The front-to-back ratio of a Yagi is also frequency sensitive. Some Yagis that have 20-db front-to-back ratios at the center of the TV channel fall off to only 15 db or less at the edges of the channel.

(b) Long Yagis designed for maximum gain have sidelobe levels of 10 to 15 db.

(c) The pattern of a Yagi is susceptible to influence by support structures, and this influence is virtually impossible to predict.

New Antennas, Arrays, Techniques

In the late fifties, Government research produced a breakthrough in antenna state-of-the-art. This breakthrough was the concept of "frequency-independent" antennas and was based on the theory that if a structure is made proportional to itself by scaling of its dimensions by some ratio τ , it will have the same properties at a frequency f and at a frequency τf . Therefore the patterns and impedance of the antenna are periodic functions of the logarithm of frequency with a period of $\log \tau$. By the proper choice of τ , the properties of the periodic type of antenna will vary only slightly over the frequency band f to τf .

A schematic diagram of a log-periodic dipole array is shown in Fig. 9. The antenna consists of parallel, linear dipoles arranged side by side in a plane. Practical considerations of construction, however, dictate that the dipoles do not lie exactly in a plane. The length of the dipole elements and the spacing between elements form a geometric progression. (The common ratio τ and taper angle α are shown in the schematic.) The dipole elements are energized from a balanced constant-impedance feeder, with adjacent elements connected to the feeder in an alternating manner to obtain 180

degrees phase shift between elements. The antenna is fed by a coaxial line running from back to front through one of the support members, and the center conductor of the coaxial line is connected to the other support members. This type of connection forms an infinite balun, since the external portion of the antenna structure past the resonant element carries negligible current. Radiation from the antenna is end-fire in the direction of the decreasing elements.

For satisfactory operation the antenna must contain a dipole at least 0.5 wave-length long at the lowest operating frequency and a dipole element shorter than 0.38 wavelength at the highest operating frequency. Theoretically, there is no limit to the bandwidth of a log-periodic antenna. The lower frequency cutoff is determined by the size of the antenna, while the upper frequency cutoff is determined by how accurately the elements are scaled. Scientific-Ailanta has made log-periodics with bandwidths in excess of 23 to 1.

The performance of a frequency-independent antenna designed to operate over channels 7 through 13 (174 to 216 Mc) is summarized in Fig. 10. Note there are no dropouts in the performance; gain varies only 1 db over the band. The E-plane beamwidths vary from 50 degrees to 54 degrees, and H-plane beamwidths vary from 60 degrees to 72 degrees. The front-to-back ratio varies from 25 db to 35 db. A typical E-plane pattern of this antenna is shown in Fig. 11 and a photograph in Fig. 12. Similar antennas covering channels 2 through 3 and 4 through 6 are also available.

A new array configuration available to the CATV industry is shown in Fig. 13. This array, a "quadrate channeler," is designed to minimize co-channel interference: Frequency-independent antennas are utilized as elements, and low sidelobes are maintained by control of the amplitude of current distribution. By comparing the E-plane pattern of this array with a typical pattern of a "quad Yagi" array (see Figs. 14 and 15), one can see how co-channel interference arising from sidelobes is greatly reduced by the new array. (Also note how the array and elements are mounted.) By cantilever support of the elements, the array pattern of the quadrate channeler is not susceptible to alterations or influence by the support tower or other support structures.

By the application of basic antenna array theory, more efficient CATV arrays are being developed. The objectives of better reception of wanted signals and greater rejection of unwanted signals are now possible. □

ALUMINUM-SHEATHED CATV CABLE



Maximum-Minimum Limitation

By
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 Rome Cable Division of Alcoa
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There is now enough knowledge of manufacturing techniques for foamed polyethylene, aluminum-sheathed CATV cable to make the promulgation of complete cable specifications desirable. "Complete" means specifications that define maximum or minimum limits for each property of the cable. Thus the manufacturer will know that the cable will meet his customer's needs, and the customer will know he has received what he ordered.

This article: (1) discusses in a very limited way the theoretical considerations in cable design, (2) in somewhat more detail, outlines the process variables with which the cable manufacturer must cope, and which limit his ability to establish close tolerances, (3) proposes a cable specification complete with tolerances, and (4) analyzes test data on many millions of feet of cable and compares these data with the proposed specification values. The specification presented is intended to cover only those cable characteristics about which there may be some difference of opinion. There are a number of relatively minor properties that properly belong in such a document, but it is believed that they are neither controversial nor critical.

THEORETICAL CONSIDERATIONS

Figure 1 identifies the components

and general configuration of aluminum sheathed coaxial cable.

- O. D. = Outside diameter of the cable
- t = Thickness of the aluminum sheath
- D = Diameter over the insulation (inside diameter of the aluminum sheath)
- d = Diameter of the copper conductor

The *nominal or design characteristics* of such a cable are defined by the following interrelated equations.

Since the dielectric constant of foamed polyethylene is essentially constant with frequency, these three characteristics are not dependent on frequency.

Attenuation of cable is defined by a more complex equation, not given here, which shows attenuation to be dependent on:

- 1) Dielectric Constant of the insulation (E)
- 2) Diameter of inner copper conductor (d)
- 3) Diameter over the insulation (D)
- 4) Resistivity of copper
- 5) Resistivity of aluminum
- 6) Dissipation factor of the insulation
- 7) Frequency

PROCESS VARIABLES

The resistivities of copper and aluminum are fairly well fixed by industry specifications, and for the purpose of this discussion may be considered to be constant.

The *dielectric constant* of foamed polyethylene insulation, when properly extruded, is remarkably constant. However, applying the aluminum sheath compresses the insulation, which increases the dielectric constant. Since the amount of compression is a matter of choice, and varies in the course of manufacturing and among manufacturers, dielectric constant must be considered a variable in developing cable specifications. In finished aluminum-sheathed cable, the dielectric constant usually lies between 1.50 and 1.55. Since it appears in the basic equations mostly as a square root function, the effect of a variation of this magnitude on the electrical characteristics of the cable normally is minor, probably less than $\pm 1\%$.

The *diameter of the inner copper conductor* will vary during manufacture. Wiredrawing dies wear and cause conductor diameter to increase. Also, some stretch or "drawdown" must be expected in handling the conductor during manufacturing operations. The final electrical characteristics of the cable, particularly Z_0 , are quite sensitive to variations in the diameter of the inner conductor. For example, with 0.412" 75 ohm cable, a change of 0.001" in conductor diameter will change Z_0 by about 0.6 ohms. Therefore, the ability of the cable manufacturer to hold close tolerances on conductor diameter has an important bear-

Characteristic Impedance (Z_0) in ohms where ϵ = Dielectric constant of the insulation	$= \frac{138.2}{\sqrt{\epsilon}} \log_{10} \frac{D}{d}$	(1)
Capacitance (ϵ) in picafarads/ft.	$= 1016 \frac{\sqrt{\epsilon}}{Z_0}$	(2)
Velocity of Propagation (V_p) in percent	$= \frac{100}{\sqrt{\epsilon}}$	(3)

ing on his ability to hold Z_0 within any given limits.

The *O. D. of the cable*, of course, is arbitrarily chosen. Cables 0.412, $\frac{1}{2}$, and $\frac{3}{4}$ inches in diameter are common in CATV. The thickness of the aluminum sheath is chosen to give suitable mechanical properties; therefore, the inside diameter of the aluminum sheath is established once the O. D. is determined. O. D. is subject to variation during manufacture, principally due to gradual wear of the dies used to swage the sheath onto the cable. This variation also must be considered in establishing tolerance limits for electrical characteristics. A change in O. D. of

from nominal values. One fact, predictable from the theoretical equations, has been confirmed by observation: Those factors that cause variations in attenuation have an effect which is proportional to frequency. It is therefore much easier to evaluate degree of uniformity by attenuation measurements made at relatively high frequencies. For this reason, it is desirable for specification purposes to establish attenuation limits at a frequency slightly above Channel 13, where the effect will be greater. This is why we have established a specification which gives maximum acceptable attenuation at 220 mc.

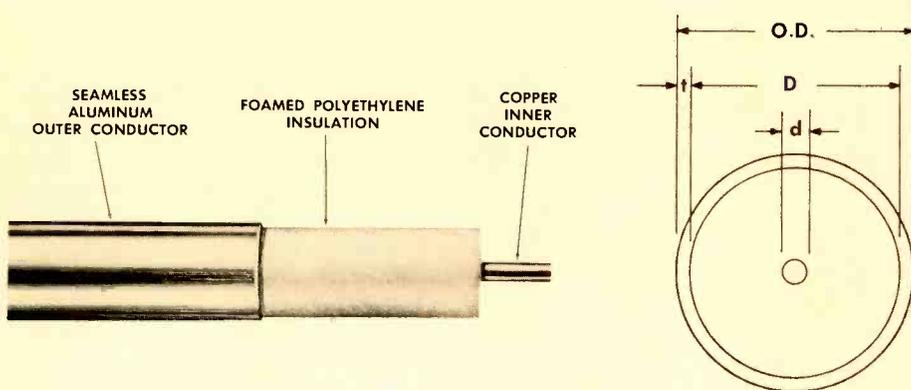


FIGURE 1
ALUMINUM SHEATHED CATV CABLE

0.005" on 0.412" 75 ohm cable will change Z_0 by slightly more than 0.6 ohms.

The *diameter over the insulation*, as extruded, is an important variable, since it directly affects the amount of compression or squeeze to which the insulation is subjected when the aluminum sheath is applied. Since this changes the dielectric constant of the insulation, all electrical characteristics of the cable are affected, including Z_0 .

The relationship between *attenuation* and manufacturing practices is more difficult to analyze. Each of the dimensional variations discussed above has a predictable effect on cable attenuation. However, within the limits of practical dimensional tolerances, the magnitude of this effect may be almost insignificant compared to other factors. To achieve uniformity and low levels of attenuation requires careful attention to and control of many of the procedures and processes involved in manufacture, or wide variations in attenuations will occur. At the upper end of the TV frequency spectrum this variation can easily be as much as 30%

One other property of cable is of great importance to proper functioning of CATV systems. *Periodicity* is the smoothness of the attenuation vs. frequency curve. It usually is checked by means of a sweep test. Cable contains many minor structural irregularities*, each of which by itself is too minute to have any significant effect on electrical characteristics. If these irregularities occur with random spacing along the cable, they are of no special concern, since they tend to cancel each other. Any effect they may have will be detected in the measurement of attenuation. If, however, they occur with periodic spacing, they are of special interest. Under these conditions there is one frequency at which the effect of these minor irregularities will be additive. At that frequency, reflections caused by these minor mismatches will be additive, and the attenuation of the cable will be higher than it should be. Such a cable is said to have "periodicity." The spacing of these periodic irregularities determines the frequency

* small changes in impedance along the length of the cable

at which their effect is additive. Periodicity will affect CATV system performance if the frequency at which it occurs is within the frequency spectrum over which the cable will be used within the frequency spectrum of interest, it is important to establish specification limits for this characteristic.

In the manufacturing process, control of periodicity requires meticulous study and analysis of every step where the cable or its components are physically handled. Location of the elements in the process which introduce the periodic defects generally is easier than their elimination once they have been identified. Some have handled the problem by moving the frequency at which periodicity occurs to unused parts of the spectrum. Others have attempted to solve it by reducing the magnitude of the irregularities or eliminating them completely. One method is as good as the other, if the cable performs satisfactorily over the frequency range of intended or prospective use.

In view of present and probable future use of CATV systems, we feel the frequency range for which cable should have stated quality should extend from the bottom of Channel 2 (54 mc) to the top of Channel 13 (216 mc) and should include the FM band (88-108 mc) and the band 88-174 mc between FM and Channel 7. In order to bracket this spectrum completely, we recommend that cable periodicity requirements be established for the frequency range 50-220 mc. Where there is interest in trunk cable suitable for sub-channel use, this fact should be stipulated as a special requirement.

Until recently it was common to evaluate cable periodicity in terms of a sweep attenuation test. A sweep signal was introduced at one end of a length of cable, and the signal emerging from the other end was displayed on an oscilloscope. If there was periodicity at any frequency within the range being swept, it would show as a "hole" or "suck-out" in the display at that frequency. By rough calibration the depth of the hole could be determined, in decibels. There was no universal acceptance standard, but engineers spoke of limits of 0.5 db. or 0.25 db on the depth of the hole. Then "percent deviation from the smooth curve" was introduced, first with a 5% limit, later 2.5%. As cable manufacturers improved their manufacturing techniques, it became possible to reduce the magni-

tude of periodicity effects more and more, until the depth of the holes become less than the resolution possible on the oscilloscope display. We could still see the holes, but we couldn't measure their depth. The best we could say was "no measurable deviation from the smooth curve"—certainly an imprecise statement to include in a specification.

for any given cable design and quality, there is a length beyond which the return loss sweep will not give any useful evaluation.

PROPOSED SPECIFICATION

The following is proposed as a partial specification for the three popular sizes of foamed polyethylene, aluminum-sheathed coaxial cable.

More discussion may be needed on

Cable Size	0.412"	1/2"	3/4"
Characteristic Impedance, (Ohms)	75 ± 2	75 ± 2	75 ± 2
Capacitance (pf/ft.)	16.7 ± 1	16.7 ± 1	16.7 ± 1
Velocity of Propagation (%)	81 ± 3	81 ± 3	81 ± 3
Attenuation @ 20°C, 220 mc (db/100 ft.)	1.70 Max.	1.40 Max.	1.00 Max.
Return Loss, 50-220 mc (db)	25 Min.	25 Min.	25 Min.
Inner Conductor Dia. (inches)	0.077 ± .001	0.098 ± .001	0.146 ± .001
Nominal Sheath Thickness (inches)	0.025	0.025	0.037
Nominal O. D. (inches)	0.412	0.500	0.750
Maximum Outside Dimension (inches)	0.418	0.507	0.760
Minimum Outside Dimension (inches)	0.406	0.493	0.740

One manufacturer recently made a significant contribution to the industry by adopting the "Return Loss Sweep Test." This technique is an extension of well known methods for measuring VSWR, and is applicable over a relatively wide frequency range. This

the matter of outside dimensions. Thickness tolerances for the aluminum sheath can be added, if they serve any useful purpose. However, this is a difficult dimension to check without special tools, and usually does not vary widely. If it did, there would be difficulty in

should be adequate. One further comment on this specification concerns the 75 ± 2 ohms proposed for Z_o . This parameter has sometimes been expressed in terms of "Average VSWR." If this method of expression is used, the equivalent to $Z_o = 75 \pm 2$ ohms would be "Average VSWR, 50-220 mc, not more than 1:03 to 1."

ANALYSIS OF TEST DATA

The tolerances proposed above for the electrical characteristics of foamed polyethylene aluminum sheathed CATV cable were arrived at through analysis of actual production test data on Rome "Unifoam" cable. The technique of analysis is a very simple and useful one familiar to all quality control engineers. From each sizable production run of a given size and type, a random sample of recorded test data is selected. The number of test measurements selected for the sample depends upon the quantity of cable in the production run. From this sample of data, and for each characteristic, we calculate the Average (\bar{X}) and the Standard Deviation. This latter quantity is known by statisticians as the sigma (σ) for the lot. From these two quantities, \bar{X} and σ ,

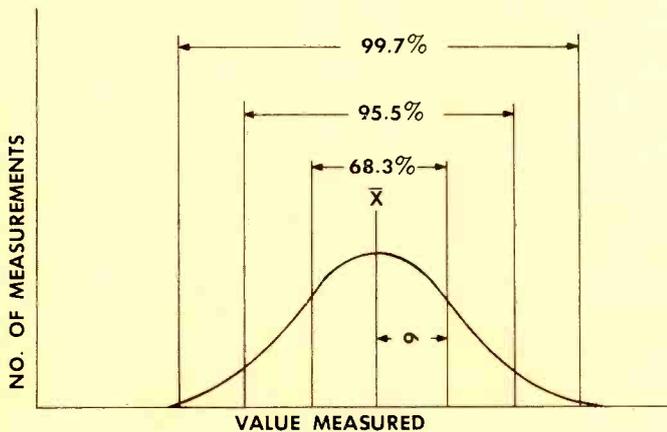


FIGURE 2
NORMAL DISTRIBUTION OF DATA

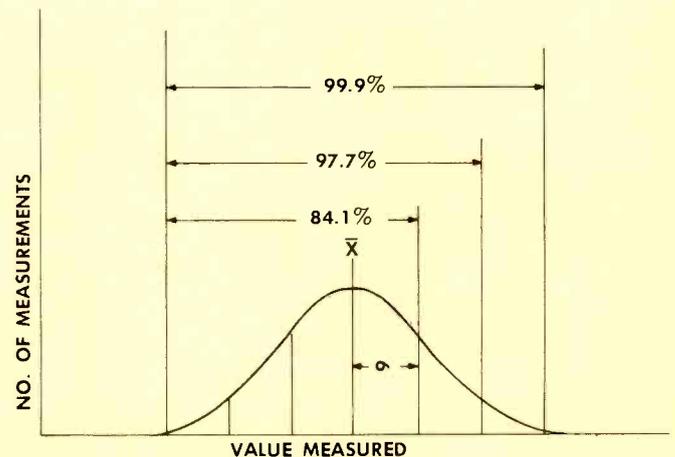


FIGURE 3
NORMAL DISTRIBUTION OF DATA

method has the higher sensitivity needed to evaluate the effects of periodicity in cable of high quality. The return loss test, while of tremendous value, has limitations which need to be recognized. For one thing, test technique is extremely important, and must be spelled out in detail if test values are to have any meaning. Another limitation is the length of cable that can be evaluated with the test. This latter is a highly complex subject, too lengthy to treat here, aside from noting that

meeting tolerances on characteristic impedance. Tolerances on average O. D. could also be added, and would probably not of themselves be difficult to meet. However, minor adjustment of O. D. does give the manufacturer one last method of adjusting characteristic impedance, which is sometimes desirable. It would appear that O. D. is most important as it affects connector fit, and we believe the ovality limits proposed, which establish a maximum and minimum outside dimension,

we can predict quite accurately what the rest of the data in that lot will look like. \bar{X} and σ completely define the shape of the bell curve shown in Figure 2. This curve predicts the grouping or distribution of all of the test data in the lot, for the particular characteristic being studied. Figure 2 predicts that:

- (1) 99.7% of the lot will lie between the limits $\bar{X} \pm 3\sigma$
- (2) 95.5% of the lot will lie between the limits $\bar{X} \pm 2\sigma$

- (3) 68.3% of the lot will lie between the limits $\bar{X} \pm \sigma$

In some cases the characteristic being analyzed is one where we are interested only in establishing a maximum value, rather than plus or minus tolerances. Then, as shown in Fig. 3, \bar{X} and σ enable us to predict that:

- (1) 99.9% of the lot will be equal to or less than $\bar{X} + 3\sigma$
- (2) 97.7% of the lot will be equal to or less than $\bar{X} + 2\sigma$
- (3) 84.1% of the lot will be equal to or less than $\bar{X} + \sigma$

In this manner we have determined \bar{X} and σ for each major cable characteristic, for each cable size, covering many millions of feet of production over a long period of time. We can observe how each varies from lot to lot and establish tolerances representing the capabilities of the production operation.

Characteristic Impedance: This characteristic is obviously of major importance to system design, since each time the cable is spliced, connected, or terminated, the degree of mismatch to the hardware has significant bearing on the functioning of the system. In this context we are talking about Z_0 of the cable as a "lumped" constant over a wide frequency range, and are disregarding structural irregularities in the cable. Examination of test data discloses two things:

A) The Average Z_0 varies from lot to lot over a range from about 74.5 to 75.5 ohms.

B) The Standard Deviation (σ) for Z_0 is remarkably stable from lot to lot, and is substantially the same for all cable sizes. σ has varied between 0.3 and 0.6 for several years, but with reasonable effort can be kept consistently below 0.5.

This means that we can establish and maintain a tolerance of 75 ± 2 ohms for characteristic impedance and predict that no more than 3 lengths of cable out of a 1000 will be outside these limits. Based on 75 ohms nominal impedance, this provides an average VSWR over the 50-220 mc frequency spectrum of slightly less than 1.03:1.

We have found 75 ± 2 ohms to be a satisfactory specification tolerance for characteristic impedance that imposes no unreasonable economic penalties on the manufacturer.

Capacitance. The capacitance is capable of very close control. Close limits

are important if we are to hold characteristic impedance within tolerance, but capacitance by itself is not of crucial importance to the user. This latter fact has resulted in wide description of 75 ohm foamed polyethylene aluminum sheathed cable as having a capacitance of 17 picafarads per foot. Actually, the theoretical equations show it to be closer to 16.7 pf/ft. Analysis of test data shows that average capacitance varies from lot to lot and from size to size between 16.7 and 17.1 pf/ft., but that σ is again remarkably stable at 0.10-0.20. We have worked to a capacitance specification of 17 ± 1 pf/ft., and have found no difficulty whatever in manufacturing to this requirement. We propose, however, that the more precise value 16.7 ± 1 pf/ft. be established for specification purposes. This would be very important if it becomes desirable to hold characteristic impedance to limits tighter than 75 ± 2 ohms.

Velocity of Propagation (V_p). This characteristic is normally of little interest to users of CATV cable. It is useful to cable manufacturers, however, because it is easy to measure and affords an accurate process control. Minor variations in velocity give us important clues as to necessary adjustments in manufacture. In such a situation, there is little to be achieved by adopting rigid tolerances, as far as the user is concerned. We therefore have established a specification value of $81 \pm 3\%$ for velocity of propagation. This is deliberately intended to be a wide enough tolerance to avoid problems in meeting the stated limits.

Attenuation. The importance of cable attenuation is self-evident and needs no explanation. Here we are interested in establishing maximum values only, since no user will object to cable having abnormally low attenuation. Attenuation is affected by process variables that are more difficult to control than the dimensional variations, which affect other electrical characteristics. For this reason the spread between average and maximum values is predictably greater than for such characteristics as Z_0 , C, and V_p . We propose establishing specification limits at the single frequency of 220 mc for two reasons. Tests on millions of feet of Rome Unifoam show that if attenuation at 220 mc is normal, it always will be normal at lower frequencies; the reverse is not always the case. A frequency of 220 mc has been selected

because it is slightly above the highest frequency at which the cable will be used. This eliminates the need for frequent, precise calibration of signal generators, marker generators, etc.

Analysis of test data for three sizes of Rome Unifoam CATV cable shows:

1) For $\frac{3}{4}$ " cable, \bar{X} has varied between 0.85 and 0.88 db/100 ft.; σ has been constant at 0.010.

A maximum value of 1.00 db/100 ft. at 20°C is proposed.

2) For $\frac{1}{2}$ " cable, \bar{X} has varied between 1.20 and 1.27 db/100 ft.; σ has varied between 0.017 and 0.028.

A maximum value of 1.40 db/100 ft. at 20°C is proposed.

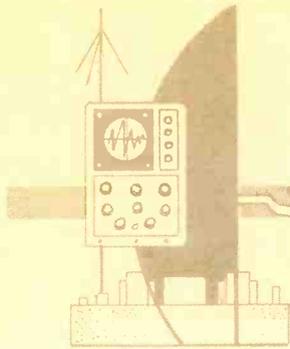
3) For 0.412" cable, \bar{X} has varied between 1.54 and 1.58 db/100 ft.; σ has varied between 0.014 and 0.020.

A maximum value of 1.70 db/100 ft. at 20°C is proposed.

It is believed that as more knowledge is developed about the art of cable manufacture, some of these maximums can be reduced without greatly increasing the cost of the cable.

Return Loss Sweep. This test is of great value in making a qualitative comparison among lengths of cable. As a quantitative requirement for specification purposes, its introduction is probably premature. Test techniques are neither standardized nor fully understood. The relationship between return loss test results and cable performance has been only partially developed, and on a theoretical, rather than a practical, basis. Also, the validity of the test as a means to evaluate cable quality is related to the length of cable under test. However, with the improvement achieved in cable quality, the old sweep attenuation test has just about outlived its usefulness, and something better is needed. The return loss test is presently the subject of constructive and vigorous study among electronic engineers; it is certain that the controversial elements of the test will soon be resolved.

For Rome Unifoam CATV cable, we have established a minimum return loss of 25 db at any frequency between 50 and 220 mc. We have found that cable made under carefully controlled conditions will meet this test without difficulty. The 25 db requirement is valid across the entire 50-220 mc spectrum, since the effect of periodic reflections is independent of frequency. By testing our standard 1200 ft. lengths twice, once from each end, we are able to check the entire length. □



PRODUCT REVIEW

KAISER FEATURES NEW AMPLIFIERS

The new Kaiser all-band, mainline amplifiers were featured in Kaiser CATV's Cascadeability demonstration and exhibit at the NCTA Convention.

The transistorized, all-silicon Kaiser amplifiers, Models KAA-25 (AGC) and KMA-25 (with manual gain control) are designed for service in CATV systems with up to 12 channel TV and full FM band capability. Among the features of the amplifiers are 30 db gain, high output, low cross-modulation and 15 db noise figure. The 25 db spacing, A.C. cable powering and weatherproof, messenger-mounted housing are designed to permit flexible application in a variety of trunk line situations. The gain of both models at Channel 13 is 30 db.

Kaiser has also announced a new mainline, all-band bridging amplifier, Model KBR-4. High output levels,

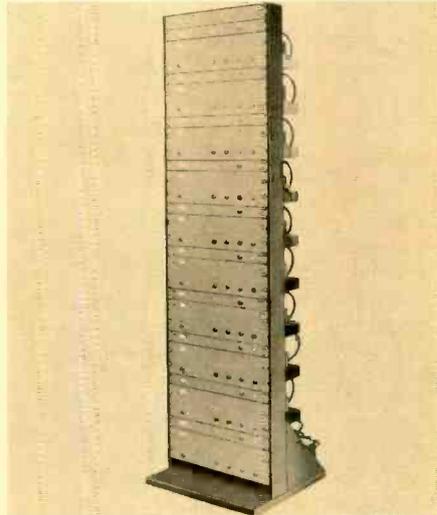


matched input and output and end-mounted fittings are among the features of the KBR-4 — permitting four 75 ohm high level outputs with trunk line insertion loss of 1 db maximum. The messenger-mounted, weatherproof, aluminum case has end-mounted fittings for popular sizes of aluminum or corrugated copper cable. Gain and equalization permit flexibility in layout and system design.

Write **Kaiser Aerospace & Electronics, Phoenix Electronics Plant, 2222 West Peoria Avenue, Phoenix, Arizona** for specification sheets and prices.

DYNAIR 12-CHANNEL HEAD-END SYSTEM FOR CATV

Dynair Electronics, Inc., 6360 Federal Blvd., San Diego, Calif. Dynair Electronics, Inc. has combined its Model TX-1B Closed-Circuit Television Transmitter and Model AS-1A Aural Separator for simultaneous cable



transmission of up to twelve television channels. The head-end system is equally compatible with the demodulated outputs of a microwave-link transmission system, or direct off-the-air pickup provided by a demodulator such as Dynair's new Model RX-4A TV Tuner (TV & COMMUNICATIONS, July, 1965).

Distant television signals are delivered to the CATV head-end via a microwave-link. The video and 4.5-mc aural outputs from the microwave receiver are applied to a transmitter which produces an on-channel television signal.

Local television signals are received by an RX-4A TV Tuner and applied directly to the transmitters.

The systems are available on all standard VHF channels or can be adapted to special frequencies. Complete systems are available for immediate delivery from Dynair at the above address.

NEW TV RELAY

Microwave Associates has announc-

ed a new all-solid-state microwave TV relay for STL, inter-city, multi-hop or portable pickup. The new MA-7 operates in the 6,875 to 7,125 Mc TV relay auxiliary broadcast band where it meets or exceeds FCC and CCLR standards for color and black and white visual and program audio subcarrier. Tight differential gain and phase characteristics are achieved through use of broadband solid state design throughout.

Transmitter RF power output is ¾ watts with only 35 watts input power required. Receiver is crystal controlled for stable performance with 25 watts continuous duty power consumption. Noise figure is 12 db nominal and 7 db with RF preamplifier (optional). Standard rack mount size is 19" by 8½" for both units. Equipment is in production for fall delivery.

Contact **Microwave Associates, Burlington, Mass.** for further details.

B-T HAS TWO NEW PRODUCTS

Blonder-Tongue Labs., Inc. 9 Alling Street, Newark, New Jersey has announced the addition of two new products — a high-output, 75-ohm detector and a switchable attenuator. The Model 4123 detector may be used wherever a high output for small RF input is required. It can be used with the Blonder-Tongue Model 4124 VHF VSWR bridge, or for aligning BTD-44 tunnel diode converters.

The detector, a five-diode instrument, operates over the 20 to 220 megacycle range and provides 10 db greater sensitivity than Model 4104 detector. The Model 4121 switchable attenuator features the standard 75-ohm impedance from DC to 900 mcs and type "F" compatible connectors. The manufacturer states that the attenuator is easily mounted and designed to give up to 62 db of attenuation in 1 db steps.

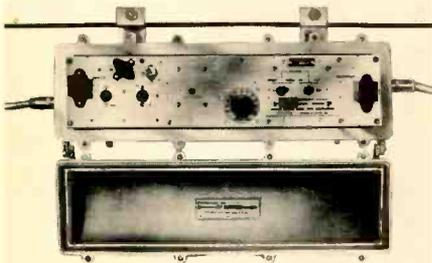
The 6½-ounce detector is available to users for \$90.00, and the 11-ounce switchable attenuator for \$42.00.

JERROLD INTRODUCES NEW PRODUCTS AT NCTA CONVENTION

Jerrold's new Starline transistor system, solid state line extender, solid-state field strength meters and solid state microwave were introduced at the Convention. According to the company, the new Starline system is capable of carrying a full 12 TV channels through 50 amplifiers at -57 db cross-modulation. An important mechanical feature of the system is compact, unitized locations. All equipment for each complete main station is contained within a single aluminum housing. The housings are airtight, waterproof, vapor-

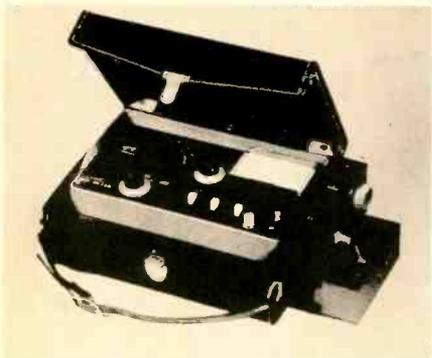
proof and dustproof. Another important feature of the Starline system is that changes in gain control settings cause very little deterioration in noise figure or cross modulation. Another feature is a series of plug-in "Feeder Makers." These units plug into the bridging amplifier stations to provide a choice of up to four feeder line outputs. Model SA-1, \$635.00; SA-2, \$540; SA-3, \$485; SA-4, \$390; SA-5, \$345.

As part of this new Starline CATV system, Jerrold has introduced a new solid-state line extender. The outstanding characteristics of the unit are a gain of 24 db minimum, flat response and high output capability.



Two new portable solid-state field strength meters were also presented at the Convention. According to Jerrold, the new meters are more than a match for the 704-B, Jerrold's standard meter. The two new units are Model 727, a deluxe field strength meter, and Model 720, a smaller economy unit.

The Model 727 uses 20 transistors and 12 diodes. It covers 5 to 220 mc, and a plug-in UHF adapter extends the range to cover 470 to 890 mc. The 727 includes a separate video amplifier and detector, providing a video output jack. Audio output can be monitored through a built-in speaker. The small, economy Model 720 uses eight transistors, four diodes, and four thermistors. The frequency range is 54 to 108 mc and 174 to 220 mc. Plug-in adaptor model UH-720 extends the range to cover 470 to 890 mc. Price of the meters respectively are \$595.00 and \$120.00.

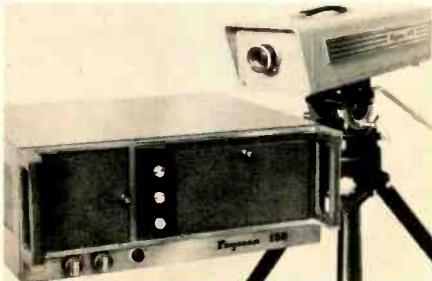


Also introduced at the convention was a new solid state system for micro-wave communication. Designated Model 440, the new equipment is especially suited to the needs of CATV. Features of the 440 system include: full two watt transmitter output; completely solid-state receiver — no klystron; 960 voice-channel capacity; and 12 mc base band, flat within 0.25 db. A new packaging concept provides a complete transmitter or receiver, including power supply, in 10½ inches of rack space. Video units assure optimum color and monochrome performance. Write **Jerrold Electronics Corporation, 15th and Lehigh Avenue, Philadelphia, Penn.**

RAYTRONICS INTRODUCES RAYSCAN 150 CAMERA

Raytronics has introduced a high resolution, image-orthicon television camera chain called the Rayscan 150 closed circuit television system.

The Rayscan 150 is a high resolution, low light level image orthicon television system. By choice of pickup tubes, pictures may be obtained from scenes illuminated only by



light from the stars, yet adequate bandwidth is provided to obtain 900 TV lines horizontal resolution with 875 scan lines per frame.

Fixed scan rates from 525 to 1,023 may be obtained for the two-piece system. The camera, weighing only 35 pounds, is 5½" high by 7½" wide by 20" long. The camera control is 7" high, 17" wide and 15" deep. The system operates on 115 volts AC and draws only 175 watts. Accessories include full EIA synchronization, a wide range of optics, and automatic light control.

For further information, contact **William P. O'Connor, Raytronics Division of Diecraft, Inc., Sparks, Maryland.**

ARMADILLO SHOWS BUILDING

Armadillo Manufacturing Co., 847 East Colfax Ave., Denver, Colorado introduced its line of fiberglass microwave package buildings at the NCTA convention. Armadillo has just recently entered the community television field. The company included one of its small, unequipped



Series 601 utility buildings in its display during the convention due to space limitations. The Armadillo package includes engineering and manufacturing to the customer's requirements in their Denver plant. The exterior skin of the package buildings is seamless weatherproof fiberglass. Factory equipment installation at the time of construction eliminates the necessity for field installation costs. The package concept also allows for complete testing procedures to be carried out prior to final delivery of the package building to the customer's job site. Upon delivery to the site, commercial power is connected to the package, and electronic equipment is given a final lineup.

NEW PRODUCTS FROM CAS

CAS Manufacturing also introduced new products at the NCTA convention. The first was a strand mounted housing to accommodate transistor line extenders, splitters, and in-line taps. Also new from CAS is a directional in-line multiple tap. (See July 1965 TV & COMMUNICATIONS for more complete details.)

STATE LABS, INC. PRESENTS NEW ELECTRON TUBE

A new, long-life version of the 6CY5 electron tube is now available from stock at State Labs, Inc., United States sales agents for the manufacturer, L. M. Ericsson. Designated 6CY5/CATV-6, the new tube was specially developed as the result of a survey conducted by State Labs to determine the CATV industry's tube requirements. The technical data for 6CY5/CATV-6, included on the following pages, is also available on request from: **State Labs, Inc., 215 Park Avenue South, New York, New York 10003.**

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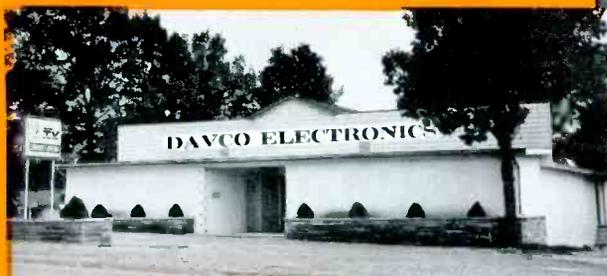
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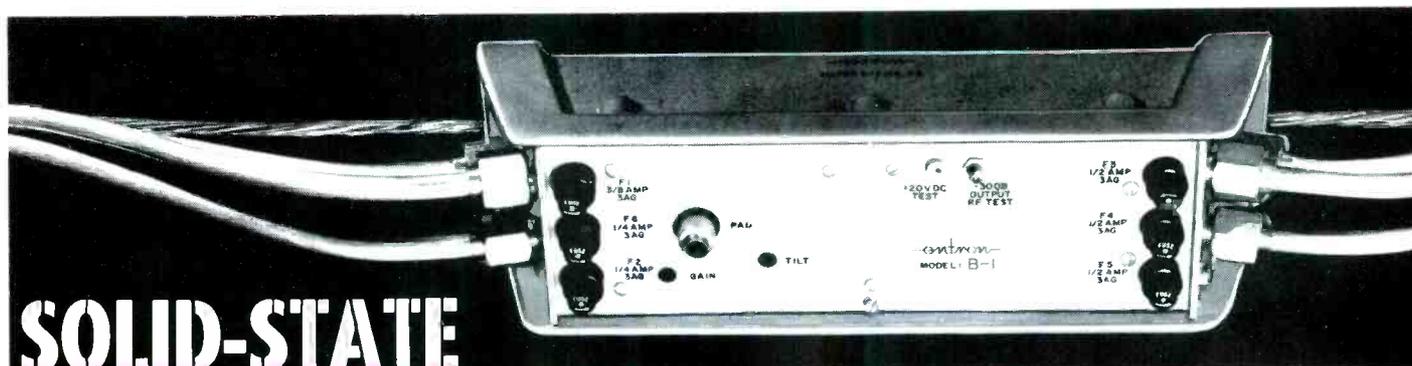
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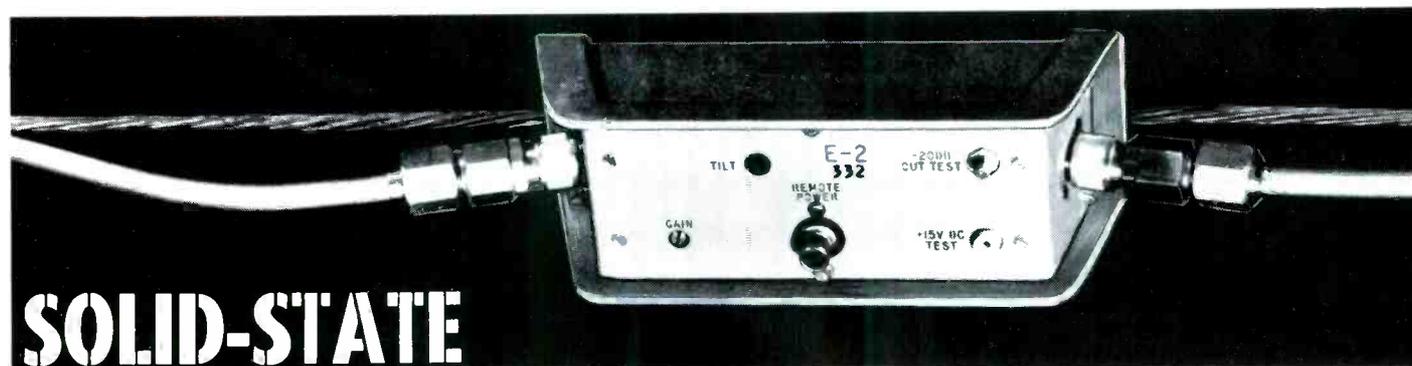
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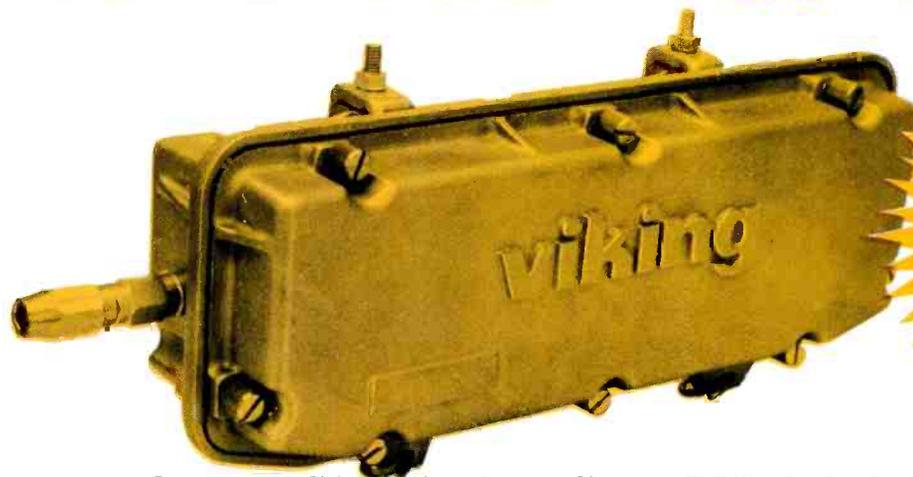
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CASCADABILITY – The Viking Solid State amplifiers have been designed with one goal in mind – cascading. A 12 channel system bigger than 60 main line amplifiers in series or better than 1400 db of cable can be built for a system signal-to-noise ratio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

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

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

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

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



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

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

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