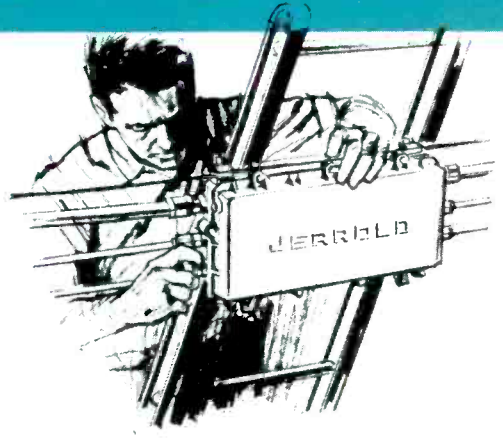
NOVEMBER 1965

TV & Communications

KAISER, COX FORM NEW CATV FIRM

Light years ahead...



INTRODUCING THE NEW JERROLD Starline™

SOLID-STATE CATV EQUIPMENT

CATV history has just been made. The exciting new Jerrold *Starline* Series has opened up an entirely new concept in CATV distribution equipment.

Now, for the first time, you can have plug-in prepackaged ultra-compact *groups* of solid-state components (trunkline and bridging amplifiers, AGC's) within a single weatherproof, radiation-proof cast aluminum housing—ready for mounting on messenger cable, pole, or crossarm. All active equipment for a complete station is now available in your choice of complete lightweight units.

But the new Jerrold *Starline* Series is far more than just convenient and easy to install. It represents the greatest electronic achievement in CATV . . . another giant step ahead in Jerrold 12-Channel system capability and unmatched picture quality. *Starline* is all new—the industry's most advanced, most reliable line. Look at these exclusive features:

- **50-amplifier main-trunk cascadability for 12 channels, at −57 db crossmod**
- **More than 1,100 db of main trunkline**
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- **Option of 1, 2, 3, or 4 outputs**
- **Full-wave rectification permits power supply to handle more amplifiers**
- **Seized center conductors for positive solderless connections**
- **Radiation-proof housing**

Gear up for increasing subscriber demand in the Golden Age of CATV. Talk with the man from Jerrold *now*, or write for complete information on the new *Starline* Series.

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JERROLD

CATV Systems Division
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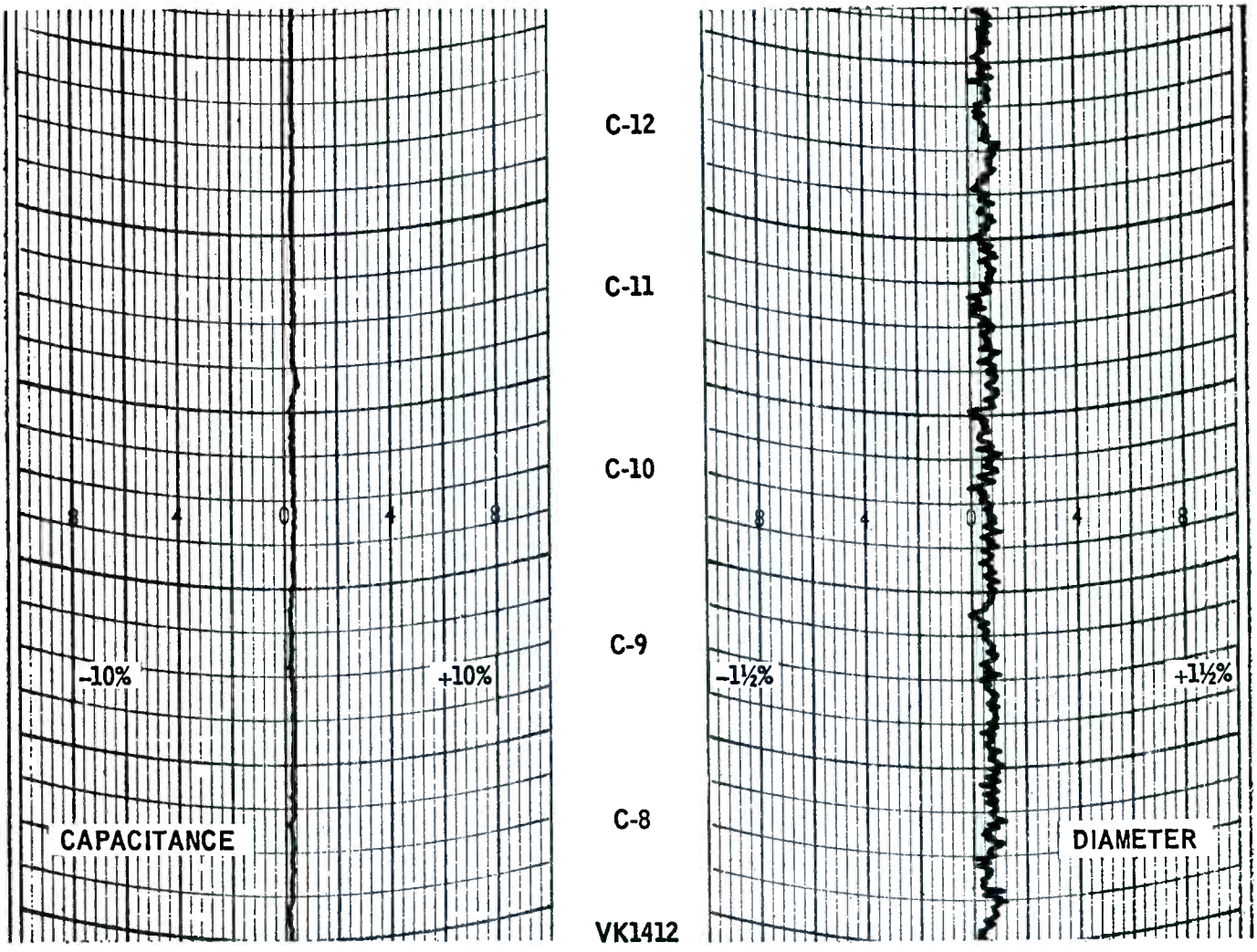

CAPACITANCE AND DIAMETER: every inch quality controlled

Developing Viking's precision testing program on Catv cables was not easy. Obviously, testing for dimensions, impedance, attenuation (vs. frequency) conductor resistance, capacitance and return loss (vs. frequency) effectively characterizes cable behavior in the field. And these tests were instituted immediately! These finished cable tests supplement Viking's rigid incoming inspection on raw materials and in-process inspections to offer a high degree of quality assurance to the customer.

To further insure the overall production uniformity of Vikal cables, Viking maintains a system of continuous measuring devices to monitor and record cable properties during the foam extrusion process. Utilizing this system, every inch of cable extruded is measured for density, concentricity, (in two perpendicular planes), diameter (which is also controlled automatically) and capacitance. With this data feedback, Viking assures its customers of reproducibility and uniformity in every reel of cable shipped.

The capacitance monitor and diameter gauge (recorder strip charts illustrated above) are Viking's tools for measuring and controlling the transmission characteristics of our foamed dielectric even before application of the Vikal seamless aluminum sheath. Capacitance (which is the tendency to store an electrical charge) is directly related to Impedance, VSWR and Return Loss. A 100% air dielectric would have the best transmission characteristics, i.e., lowest capacitance. Viking's 50-60% air dielectric (foamed polyethylene) is the closest approach to air, consistent with the mechanical requirements of the cable. The Viking monitoring system measuring capacitance and capacitance variations, or discontinuities in a running length of cable. will also measure those reflection points affecting VSWR and Return Loss. Furthermore, constant surveillance of capacitance ensures a very close tolerance to the 75 OHM impedance rating of the cable, virtually eliminating problems caused by mismatching of cable lengths and between cables and fittings.

The capacitance is measured inch-by-inch in a 42 inch noncontactive or sensing head which is mounted in the cooling water trough of the extrusion line. The sensing device houses the outer plate of the capacitor, while the copper conductor in the cable serves as the inner plate. Capacitance is measured by balancing against a known capacitance and feeding the resultant signal to a high speed recorder. The capacitance as a function of cable length is read from the recording charts.

The success of Vikings overall quality assurance program has been demonstrated by our consistent manufacture of high-quality matched cables and by our strict adherence to delivery schedules.

viking

THE STANDARD OF THE CATV INDUSTRY

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IN THIS ISSUE . . .

CATV SYSTEM FINANCING

Financing problems face almost every CATV operator at some time. Author James Ackerman considers the subject from the viewpoint of what finance companies can do for the CATV operator desiring to build a new system or rebuild an old one. For suggestions on borrowing money to build, renovate or expand, see page 23.

MICROWAVE ECONOMICS

This article by author Ralph Howman is not specifically about microwave costs or how to afford it, but rather it explores the question of whether you can afford to do without it. The costs versus revenues of non-microwave cable systems are compared with those of systems that use microwave to improve signal quality and provide additional stations. For the author's view of how microwave can improve your service as well as your bank account, see page 26.

OUR COVER

The photos for this month's cover were supplied by the parent companies of the new Kaiser-Cox Corporation. The pictures show president J. Leonard Reinsch of Cox Broadcasting with Kaiser president, Edgar F. Kaiser, who are respectively the president and chairman of the board of Kaiser-Cox. The buildings are "White Columns". home of CBC, and Kaiser Center, headquarters of Kaiser Industries. For the complete Kaiser-Cox story, turn to page 32.

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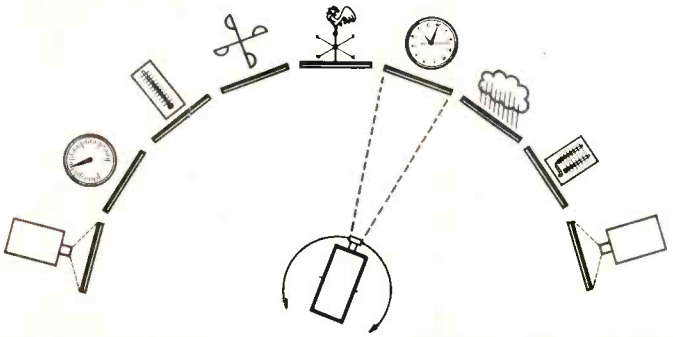

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TV&C

NOVEMBER 1965
Volume 2, Number 11

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CATV TECHNICIAN SECTION

DEPARTMENTS

TV&C

CIRCULATION: TV & Communications is circulated through United States and foreign mails on the tenth day of each month, to individuals and firms dealing in products and services for closed circuit and community antenna television, television broadcast, and microwave. A detailed circulation breakdown is available upon request. **SUBSCRIPTIONS:** TV & Communications subscription rate in the North American continent is $5.00 per year for surface mail. Subscriptions outside continental North America are $7.00 per year, remittances to be made by bank money order or check, negotiable in United States banks. TV & Communications is published 12 times per year. **ADVERTISING:** Commercial display advertising is accepted from manufacturers and suppliers of electronics equipment and allied services, at the discretion of TV & Communications management. Advertising rate card and circulation breakdown are available upon request. **TV & COMMUNICATIONS** (title registered at U.S. Post Office). Second-class postage paid at Oklahoma City, Okla. Subscribers should allow six weeks for change of address. **PUBLISHERS:** Patrick T. Pogue and Stanley M. Searle. **GENERAL OFFICES:** 1839 N.W. 16th, Oklahoma City, Okla. 73106. (405) JA 8-3523. **WEST COAST REPRESENTATIVE:** Albert D. Shonk Co., 681 Market Street, San Francisco, Calif. 94105, Phone: San Francisco 932-7144, Los Angeles 388-2981.

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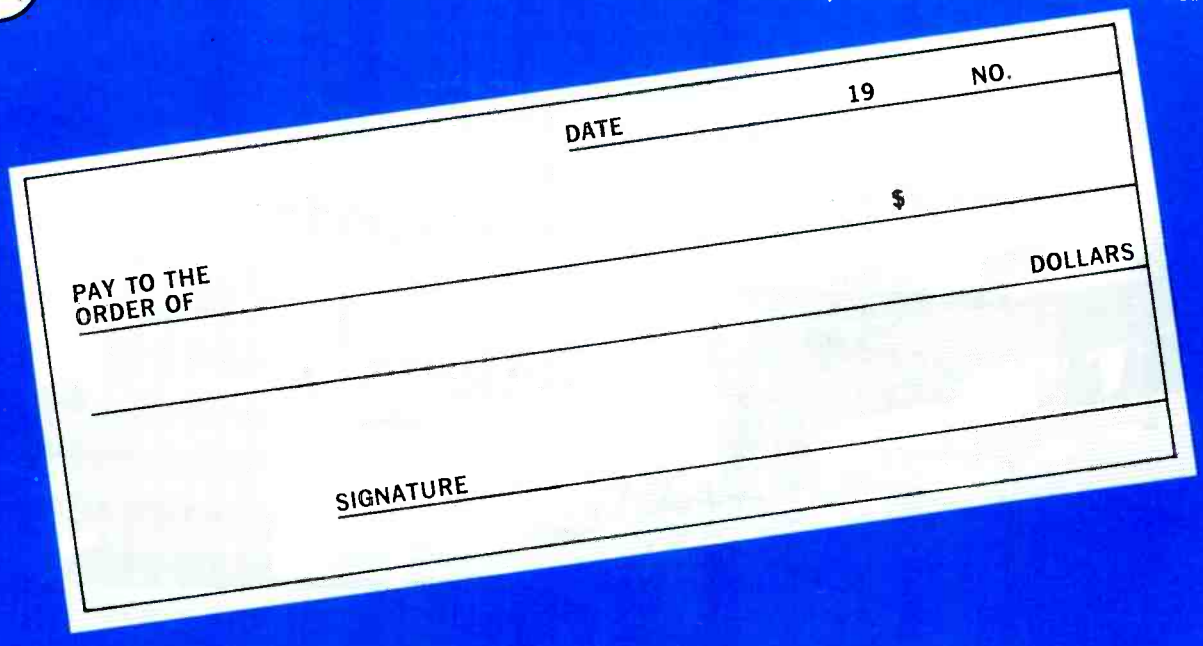

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With AMECO you can write your own terms

AMECO "Custom Finance Plans" enable you to obtain CATV financing with terms tailored to your particular needs. You can finance AMECO equipment components or a complete turnkey installation. It is the fastest, easiest, most convenient way to finance. There is no red tape — no delays — you can get the money you need within 7 days.

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OFFICES IN ALL PRINCIPAL CATV AREAS

EDITORIAL

Educational Program Needed

The biggest obstacle encountered in selling the idea of CATV is ignorance. Whether you are trying to sell a cable connection to a housewife . . . present a franchise proposal to the city council, or convince a law maker not to back anti-CATV legislation . . . you're faced with the same basic problem in each case. Most people, unfortunately, know woefully little about cable television.

The men in government who will vote on Federal CATV legislation — and those at the FCC who already claim regulatory powers — seem to have scant knowledge of CATV in actual operation. Lacking first-hand observation of cable TV, these officials form an *opinion* which must be based solely upon what they are *told* about cable television. Since some legislators and regulators choose to believe those who are alien to CATV interests, our industry faces the threat of discriminatory government controls.

The answer to this dilemma is *truth.* The true facts about community antenna television will sell the cable connection to the housewife . . . will convince the city council . . . and win the vote of the Congressman. As an industry we must provide knowledge of what CATV is—in terms of education, culture and entertainment.

We must begin by educating our officials at every level of government, from the local city manager to the Congress and the FCC.

Several months ago the business leaders of the two-way radio industry succeeded in getting the FCC commissioners to travel across the country, as a group, to study first-hand the frequency congestion problems of the Land Mobile Services in Los Angeles.

As a result, the Commission has allocated part of the television broadcast spectrum for two-way radio use in the Los Angeles area! This FCC field trip was not easily arranged. But the results were obviously well worth the efforts expended by the communications people.

A similar effort designed to realistically demonstrate CATV to the FCC commissioners and staff must be undertaken. Congressmen should also be given the opportunity to visit a cable system. A working model can be placed on display in Washington D.C. to show exactly how a cable system operates, and the complex problems which would be created by proposed non-duplication and copyright restrictions. The same approach could be effectively employed to educate officials of state and local government.

A special effort should be made to inform educators of the true nature and benefits of cable television, so that at least the next generation of Americans may have some understanding and appreciation of wired television. And, meanwhile, let's not forget the general public — the folks whose interests are really at stake. With imagination, a public information campaign can be mounted without tremendous cost. State and regional CATV associations can help by distributing literature through civic and social organizations, thereby reaching individuals and community leaders in every corner of the land. And let's remember that these are the people with the final say . . . on candidates and CATV referendum votes.

Is our young industry equal to this challenge? Will we tell the country's citizens and leaders about cable TV — or will we leave the job to the broadcasters and antenna manufacturers, to AMST and TAME?

We believe that the cable television business *will* make its voice heard. The National Community Television Association has the talent and organization to accomplish this vitally important job. But NCTA is not composed of just a Washington Staff and a Chairman and board of directors. It is a collection of system operators; representing *you* and your interests. If you want NCTA to get a job done, first become a member (if you have not already done so). Then help your association by expressing your wishes and shouldering responsibility when called upon.

If you are interested in adding cable subscribers . . . if you are desirous of fair treatment from your city, state and federal governments . . . if you want to be part of a healthy, profitable industry that is free from discriminatory regulation, then you undoubtedly recognize the crucial need for an organized public information and education program for CATV.

The machinery necessary to achieve these objectives is already in motion. All that is needed is the cooperation of each NCTA member (and potential member) system.

Stan Searle

Mr. M. D. McGuire and the reliable CAS TRA-217 amplifier.

Let CAS stop your amplifier problems

More than 250 CAS amplifiers in Abilene, Texas, CATV system operate for 12 months without a single failure. That's over 1,500,000 amplifier hours of trouble-free operation.

How's that for reliability? CAS performance-proved TRA-217 solid state amplifiers are unaffected by lightning surges, transistor or other circuit failures . . . reduce subscriber downtime and keep component maintenance to a minimum.

"No Failures"

Listen to what Mr. M. D. McGuire, chief engineer of TV Cable of Abilene, Inc., says:

"We now have more than 500 CAS TRA-217 amplifiers in our system. Most of them have been in use since November 1964. After all that service we have had no failures. The CAS amplifiers continue to deliver signals with no deterioration and require a minimum of technical attention."

The TRA-217 amplifier has trunk line capability, yet is priced low enough for use as an extender. It is especially well suited for use in limited cascade (10 or less) or as a high-level extender with practical output of +40 db with at least 6 db reserve.

CAS reliability is available in a wide range of CATV products and services . . . from temperature compensated solid state equipment to experienced system design and construction.

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1454 Cloverfield Boulevard, Santa Monica, Calif.
Phone: (213) 393-9501

News SPECTRUM

FILINGS ON PART II OF PROPOSED CATV RULES

Pay-TV took up an inordinate amount of time and attention as the filings arrived for Part II of the FCC's CATV proceedings. Part I had to do with application to cable systems of rules applied to microwave. Part II went into whether additional regulations should be adopted.

NCTA

NCTA repeated its argument that the FCC doesn't have the legal power to regulate non-microwave systems. It said that even with respect to microwave systems, the Commission must first exercise its power to get confidential financial data from stations or from its own files, to prove or disprove adverse economic effect before it can act. So far, it was argued, there hasn't been one proven case of adverse economic impact.

NCTA said "the outcry for the stringent regulation of CATV systems is basically a callous demand by self-interested businessmen for the perpetuation of mediocrity in television reception in many areas and for the restriction of the public's right to have access to the largest and best sources of information and entertainment." The Commission's job is the reverse, not to favor one entrepreneur over another, but to ensure that the public's desire for the widest TV selection is satisfied, it was argued.

NCTA said "the vague fear that a present system might be displaced eventually in favor of a better one should not cause agencies of the government to place restrictions upon business enterprises in order simply to guard against a change of the status quo." The argument that CATV might one day outbid the TV industry for programs was dismissed as "not worthy of mention."

NAB

NAB was chiefly interested in convincing the FCC that it should prohibit origination of any kind of programs or advertising by CATV's, that they should be limited to relaying signals without insertions or deletions of any kind, consistent with their own claims to be no more than a master antenna service.

The association said CATV should be a supplement to and not a substitute for "free TV." "To allow CATV to originate any kind of programming, including time and weather reports, is the equivalent of subsidizing a Pay-TV system via the use of advertiser-supported free broadcast signals.

SMITH & PEPPER

E. Stratford Smith of the law firm of *Smith & Pepper*, charged that much of the concern about alleged CATV impact "originates with entrenched entrepreneurs whose views can charitably be described as self-serving." He noted the worry of *ABC* about Pay-TV, and charged that networks are allied against CATV with the film theatre owners who killed Pay-TV in California with dubious "Proposition 15."

AMST

AMST termed "the heart of the problem" the importing of programs from distant stations by CATV. This practice is increasing rapidly and the Commission must act quickly, it was argued. Except for areas which don't receive adequate service, the FCC was told, CATV's should be prohibited from extending station coverage beyond the B contour. AMST was also much worried about Pay-TV and it said CATV's should be limited to simultaneous transmission of TV station signals so as to prevent Pay-TV.

JERROLD

Jerrold Electronics, speaking about encouragement or discouragement for new TV stations, said that if present station revenues are good, then the outlook for new stations must be good. The lower rates in UHF will probably attract new advertisers, without cutting the earnings of established stations, it was argued. Also, most markets are growing. "In sum, the assumptions of those persons who are so pessimistic concerning UHF success in markets with CATV systems ignore the realities of a dynamic and ever-expanding society . . ."

AMERICAN CABLE TELEVISION

American Cable Television, Inc., owned by Bruce Merrill said "broadcasting is a free competitive enterprise, and free competition is in the public interest . . . even while ACT denies the premise that CATV poses a serious threat to existing stations, it also suggests that, even if such a vague, undefined threat exists, protection of the status quo of broadcasting is not the Commission's function." Merrill demanded to know if every new development is to be measured in terms of protection for the vested interests.

INTERNATIONAL TELEMETER

International Telemeter said "it is no doubt natural that those who own and operate the conventional television systems and conventional television program sources, such as the networks, would urge that the status quo be preserved against outside competition . . . this is not to say that preservation of the status quo is necessarily in the public interest." It conceded networks have done a laudable public interest job over the years, but "few would contend that there is no room for improvement . . . few would deny that the public is entitled to the best programming that television technology and economics can make available to it."

BLACK HILLS VIDEO CASE TESTS NON-DUPLICATION RULES

Black Hills Video Corp. has appealed in federal court the refusal by the FCC to reconsider non-duplication and local station carriage rulings contingent to renewal of the firm's microwave license renewals. In denying the request for reconsideration, however, the FCC did make two important concessions. The ruling stated that the CATV systems involved need not afford non-duplication protection to CATV color programs not carried in color on local stations, and that prime time network programs not carried in prime time locally need not be protected.

In the court action, started last summer, both Black Hills and the NCTA have filed briefs recently—the latter filing as an intervenor. Counsel for Black Hills put forth extensive documentation of the points argued in the original petition filed with the court. NCTA presented a chronology of FCC action and comment on CATV regulation, and concluded, as did Black Hills, that the Commission was without statutory authority in its CATV - microwave rulemaking. Both parties gave particular attention to lack of sufficient fact-finding investigations by the FCC prior to enactment of the rules.

A sidelight to the Black Hills case has developed into a bitter exchange between that firm and Duhamel Broadcasting, a firm opposing the license

FCC ENACTS CARS RULES

The FCC has taken final action creating a new class of of service, to be known as CARS — Community Antenna Relay Service. All CATV microwave facilities will be shifted to the 12700-13200 mc television auxiliary band, with an interim allocation of 250 mc in the lower half (shared with TV auxiliary stations) and interim technical standards (the same as TV auxilary standards) pending further decisions on these points.

Applicants for commbn carrier frequencies to serve CATV systems by microwave relay will have to make a showing that at least 50 per cent of the customers on the microwave system involved are unaffiliated with the applicant and that the proposed usage by such customers constitutes at least half of the applicant's microwave usage. Applications which don't make this showing won't be accepted, and existing licensees in the common carrier service unable to make such a showing will be shunted into the CAR service, where they will have grandfather rights covering their present customers and operations.

Present licensees will have until February 1, 1971 to transfer to the new frequencies. No new applications for CATV microwave facilities will be accepted after the effective date of the new rules, November 22, 1965. Pending applications will be processed, but the 1971, date for shifting applies to all, business radio service and common carrier frequencies, alike.

Incorporated in the new CARS rules are the provisions relating to carriage of local stations and non-duplication of local station programming. Commisisoner Robert Bartley was the dissenter in the 5-1 vote and commissioner Rosel Hyde was the absent member.

In an associated further rulemaking, the FCC asked for written briefs by Nov. 15 on the question of whether CARS licensees and TV stations should be permitted to interconnect their relay facilities and whether they should share the program material obtained from their microwave facilities.

grants. Duhamel accused the microwave firm of bringing ex parte pressure to bear on the Commission. This charge was evidently the result of FCC staff comment to the same effect. Black Hills' counsel Max Paglin has filed an extensive statement with the Commission, in which Duhamel is said to be using foul tactics. Paglin called Duhamel's accusations, which concerned letters from Black Hills principals to certain congressmen, "scandalous and scurrilous" and asserted that the FCC should purge its files of the "irresponsible and reckless" allegations.

NCTA BOARD AND COMMITTEES MEET

The board of directors and several standing committees of the NCTA met at Nassau in the Bahamas last month for consideration of routine association business. Committees meeting there were the Executive Committee; Utility Relations; Budget and Audit; Membership; Standards; Industry Planning; Rural Services; Bylaws; and International Liason.

A nominating committee was formed for recommendation of 1966-67 NCTA officers and board members. This committee consists of Bruce Merrill, Robert Clark, Bob Magness, Charles Fribley, Jr., and Buford Saville. Also selected at the Nassau meeting was a new site for the 1967 NCTA National Convention. Previously scheduled for Minneapolis, the convention is now to be held at the Palmer House in Chicago. The next board meeting will be held in Carmel, California in February of next year.

LOUISIANA ASSOCIATION MEETING

The Louisiana Association of Cable TV Operators met last month in Alexandria for their first general meeting since the group was organized six months earlier. Some forty operators and manufacturers' representatives were in attendance, and heard presentations by John E. Mankin of Tyler, Texas and Stan Socia of Stan Socia Corp. Most of the two day convention was devoted to general discussion sessions. Virgil G. Evans, Association president, reported that the next general meeting has been scheduled for April 1966 in Lafayette, La.

CATV'ERS WIN FAIRNESS DOCTRINE COMPLAINT

Two of three Scranton-Wilkes Barr, Pennsylvania telecasters were ordered to correct their practices under the Fairness Doctrine regarding attacks on CATV operators in that area. The complaint was filed with the FCC by the Pennsylvania Community Antenna Television Association, and was lodged against WBRE-TV, WNEP-TV, the stations found in error by the Commission, and against WDAU-TV which was exonerated by the FCC.

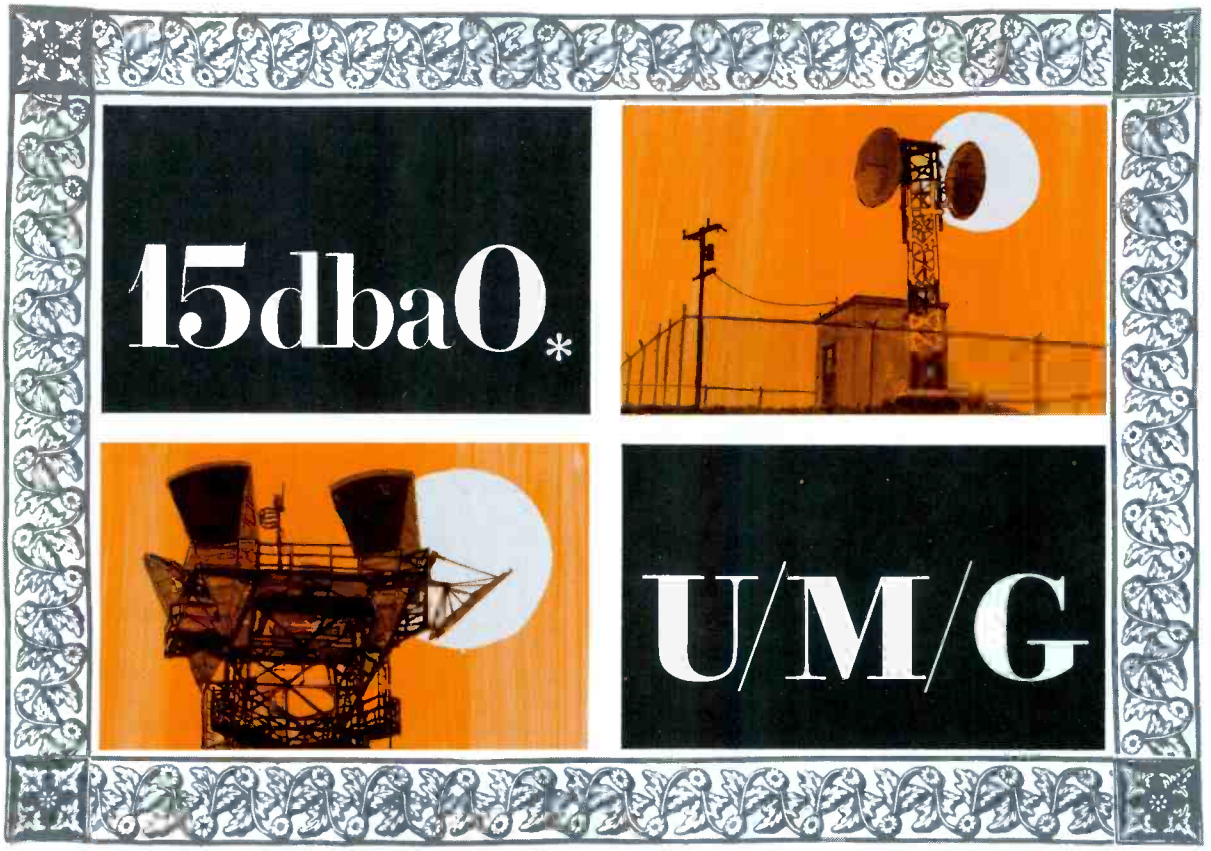
Under the fairness doctrine, the CATV association has complained to the Commission and had asked it to issue a cease-and-desist order against further anti-CATV broadcasts without reasonable opportunity for contrasting viewpoints. Among the findings as to WDAU, the Commission said the station had offered to include pro-CATV comments from the association on program complained of, and it couldn't see that the remarks of a maker of UHF antennas that CATV'ers were scavengers amounted to a personal attack. WNEP and WBRE were told, however, that "you have not shown compliance with the fairness doctrine with respect to your coverage of the CATV issue," although both were equally absolved of personal attacks.

All three of the stations had televised a jointly produced program entitled "The Facts about the CATV Crisis." The program also plugged the stations jointly owned Total Television Cable, Inc. formed to provide cable service in the Scranton area.

PCATA OFFICERS NAMED

The Pennsylvania State CATV association met in State College, Pa. for three days last month, and elected new officers as follows: president, Frank H. Nowaczek of TeleSystems; vice president, James R. Palmer of C-COR Electronics; secretary, George F. Gardner, TV Cable of Carlisle; and treasurer, Joseph Gans of Cable TV Inc., Weatherly. Directors named were John

Mr. Nowaczek



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COMMUNICATION / COMPUTATION / CONTROL

COLLINS

COLLINS RADIO COMPANY / WORLD HEADQUARTERS / DALLAS, TEXAS

Arnts, John F. Booth, Kaywood Colley, Bill Dimmerling, Arthur Reagan, Claude Reinhard, John Rigas and Robert Tarlton.

VERMONT PSC WANTS CONTROL OF CATV

Public Service Commissioner Earnest W. Gibson has announced that he will introduce legislation at the next session of the state legislature to give his commission control of Vermont's cable systems. A bill along these lines was defeated by a fair margin on the final day of the Vermont Legislature's last session. Gibson bases the alleged need for his bill on the charge that systems are sold and resold at the subscribers' expense — in violation of sound public utility management.

BELL WON'T STRING; CUSTOMER FILES SUIT

As a result of city ordinances requiring that CATV operations be franchised, Ohio Bell Telephone Company has ceased installation for systems in Fremont and Sandusky, Ohio. The stringing of cable had reportedly begun in Fremont before city officials had any idea that a system was to be installed. In Sandusky, surveys and preparatory work were underway before it came to the attention of the city. The CATV firms involved are Greater Fremont, Inc. and Greater Sandusky, Inc. who share a common office in the Edward Lamb Building in Toledo, Ohio.

As a result of city action, Greater Sandusky, Inc. is seeking an injunction against city officials claming obstruction of its efforts to build a system in that city. The firm claims the city knew of its contract with the telephone company when it passed the two emergency ordinances banning construction without a permit and requiring a franchise for a CATV system.

MISSOURI LEASEBACK TARIFFS FILED

Judge William R. Clark, chairman of the Public Service Commission of Missouri has announced that the commission has accepted the lease-back tariffs filed by the General Telephone Co. of Missouri and that they will go into effect if not contested. Southwestern Bell has had a similar tariff in effect in Missouri since November of 1963. General Telephone operates phone services in about 45 communities of that state.

SUPREME COURT REFUSES REVIEW

Jerrold Electronics Corporation has been refused a review in their anti-trust suit appeal. The lower court decision is therefore permitted to stand and Jerrold must pay $330,000 in treble damages and attorneys fees to Wescoast Broadcasting Co. Jerrold was charged by Wescoast of using its monopoly position to force Wescoast to sell its system in Wenatchee, Wash. to Jerrold.

Jerrold argued unsuccessfully that it had gained its lion share of the CATV business by open and bitter competition with RCA, Philco, Blonder-Tongue and Entron. It was also argued by Jerrold that they had managed to wire the whole community while Wescoast was only able to wire about a third and that Wescoast had waited for seven years before filing suit.

FLORIDA OPERATORS ORGANIZE; FILE PETITION

William F. Hemminger was elected president of the Florida State CATV Association at an organizational meeting of that group. Other officers elected by the thirty-plus CATV'ers representing almost all of the systems in that state were: vice presidents Harry Harkins, University City TV Cable, Gainesville; H. H. Harris, Jr., TV Cable Co., Fort Walton Beach; and Harry Bennett, Universal Cablevision, Cocoa Beach, and secretary-treasurer O. E. Brillante of Florida TV Cable Co., Melbourne.

Among the first action taken by the new organization was the filing of a petition objecting to the proposed leaseback tariffs of Florida's General Telephone Co. The short, pointed petition was addressed to the state Railroad and Public Utility Commission.

U.S. COURT OF APPEALS RULES AGAINST IDAHO MICROWAVES

Judges Miller, McGowan and Tamm ruled against Idaho Microwave and Cable View, Burley, Idaho, in their appeal from the Federal Communications Commission's non-duplication condition in microwave grants. The court rejected the claim that the FCC lacked jurisdiction because Idaho Microwave facilities were all in one state. They also denied that freedom of speech is violated in the non-duplication rule. The ruling is expected to be appealed.

ROME CABLE TO BE HANDLED BY AMECO

Rome Cable Division of the Aluminum Company of America has appointed Ameco, Inc., Phoenix, Arizona, as national distributor for Rome Unifoam CATV Cable. Rome Unifoam has become well established as a quality product in the CATV industry, according to J. R. Woods, Rome Cable sales manager for power, communication, and control cables, but that advances in the development of this new medium of communication will depend primarily on the joint efforts of cable and equipment manufacturers.

INFAMOUS FRANCHISE GRANTED IN ASHEVILLE

The city of Asheville, North Carolina has granted a cable television franchise on the basis of sealed bids—the terms of which have been the subject of much discussion among CATV'ers in that area. Robert O. Hofland, recipient of the grant, offered the city 16 per cent of the system's gross revenues up to $600,000, and 50 per cent of revenues above that amount. In addition, the system will become the property of the city, when the 20-year franchise expires. Hofland hopes to wire as many as 18,000 homes in Asheville, at a cost of nearly $1 million.

SCHLUSSELL HEADS TAME

TAME has elected Sam Schlussell as president to replace Morton Leslie, who had been president of the group since its inception. Mr. Leslie's company, JFD Electronics Corporation has entered the CATV field. Mr. Schlussell is an official of Channel Master Corporation.

Mr. Schlussell announced that "TAME will continue its efforts to mobilize understanding of the threat community antenna systems pose for free off-the-air television, concentrating its efforts as before, on alerting public and officials in areas where installation of such systems is contemplated. We shall continue to seek local and federal regulation of CATV."

AMECO DOUBLES PLANT SPACE

Ameco, Inc., 2949 West Osborn Road, Phoenix, has more than doubled its operating space, according to Bruce Merrill, president. The addition of the

The above photo shows the building expansion for Ameco, Inc. which doubles their facilities.

Gandler Building has increased the overall plant from 38,000 square feet to 82,000 square feet. The production area has been increased from 17,000 to 42,000 square feet, more than doubling production capacity. Although

Ameco now employs 415 persons in their Phoenix plant, the new expansion will allow for 1,000 employees, according to the announcement.

The new Ameco building contains the warehouse, purchasing, receiving and production facilities. An open house for the public was held October 31, at which time numerous exhibits gave a visual presentation of the entire Ameco operation.

KAISER-COX FORMED FOR CATV MARKET

Kaiser Aerospace and Electronics Corp. and Cox Broadcasting have formed the Kaiser-Cox Corporation to manufacture and market CATV equipment. No stock will be sold publicly in the firm as it will be owned equally by the two parent firms. The new firm will be based in Phoenix, Arizona, and is said to be a $3 million venture.

JERROLD ANNOUNCES RECORD EARNINGS

The Jerrold Corporation had record sales and earnings for the first half of the current fiscal year, it was announced by Milton J. Shapp, President. Consolidated sales for the six months ended August 31, 1965 rose to $15,441,426 and net income was $1,294,949, equal to 61 cents per common share, based on an average of 2,128,613 common shares outstanding. No provision is required for Federal income tax due to a tax loss carry over of approximately $3 million from previous periods.

Last year Jerrold reported sales of $12,999,770 and a net loss of $241,440 for the first half. However adjustments to reflect the sale of the assets and business of the Pilot Radio Corporation subsidiary last March, sales for the same period a year ago would have shown $11,126,548, with net income of $459,188, equal to 22 cents per share, based on an average of 2,114,547 common shares outstanding.

SYSTEM CITED FOR EXCESS RADIATION

The FCC has ordered Service Electric Cable TV, Inc., which operates a CATV system in the vicinity of Bethlehem and Allentown, Pa., to show cause why it should not cease and desist from operating its system in a manner to radiate energy in excess of that permitted by Commission rules. The FCC said the CATV is causing harmful interference to regular TV reception in that area. The system has 30 days in which to answer charges based on an FCC field investigation of complaints about TV interference—complaints which the Commission said were called to the attention of the CATV system without result. □

AMERICAN CABLE TELEVISION OPENS CHANNEL FOR NEWS SERVICE

Who hasn't wondered about the variety of communication services a community system could be capable of rendering to the public? To some in and around the industry the suggested answers have been matters of apprehension; to others, an enthusiastic dream of all the capabilities that could be developed within a closed circuit system.

One vision of the future that keeps cropping up again and again is the printed newspaper that will be written during the sleeping hours by an auxiliary typewriter attached to the TV set. The TV newspaper would be ready for breakfast table reading. Now, this kind of future has arrived in the form of the Associated Press News Channel Service. Bringing this service into the homes of a cable town is indeed a unique breakthrough in mass communications.

News tickers are installed in brokerage houses, in the press rooms of the news media, and in the homes and offices of a few very wealthy individuals who follow the stock market. The Associated Press in seeking out the cable television industry has taken a long stride toward placing the average individual, in all his great numbers, one step closer to the source of news.

The citizen will be better informed, and then have the incentive to go further in depth by looking to the specialists on the staffs of newspapers, television and radio stations. It is a recognized axiom in journalism that an informed reader or viewer will continue to dig even deeper for more information. The more a person reads or sees on a subject, the more he will continue to do so. This was emphasized in Miles City where an AP News Machine brought this conclusion from a newspaper publisher, "People are made more news-conscious."

The fact that the same publisher had an interest in other mass media in the same town gave him the chance to evaluate the full impact of such a channel on listening and reading audiences. The results of a professionally conducted survey in Miles City, Montana showed that the television news ticker stimulated interest. People became motivated to turn to the newspaper or radio station for more intensive and more detailed background coverage.

The psychology behind such motivation seems comparatively simple. As a person becomes more conversant with a topic he moves closer to the areas occupied by established experts. He has more in common with them and therefore greater reason for refering to them.

The AP News Channel was introduced at the NCTA Convention in Denver, Colorado, where it became the center of concentrated attention. This dramatic innovation brought many questions. Basically News Channel is uncomplicated. A solid state camera is aimed at a special model AP teletype machine. The lettering hammered out on the machine is extra large so that the viewer can easily read the lines at home on the TV screen as the news is printed on the teletypewriter.

American Cable Television, Inc. operator of 32 CATV systems in 11 states has signed an agreement with the Associated Press for News Channel service. Don Atwell, President of American Cable TV, in expressing himself on the news service, says, "It is most unique; it provides a service that has never been duplicated in the home. It is not origination, because no one lends a hand to its exposure on the home screen. The cable company doesn't have to contend with the mechanics of production. Production certainly is not our business. Our business is opening channels of existing means of information into the home. And here is a helpful and meaningful source of a world of news made convenient and private for thousands and thousands of individuals, many of whom might live in areas where world wide news has not always been easily available."

FOCUS
...On Progress

CANTOR PROMOTED BY JERROLD ELECTRONICS AND HARMAN-KARDON

Lon Cantor has been named Director of Advertising and Public Relations for Jerrold Electronics and Harman-Kardon, both subsidiaries of The Jerrold Corporation. The announcement was made by *Selman M. Kremer*, Director of Advertising and Public Relations for The Jerrold Corporation. In this new post, Mr. Cantor becomes responsible for planning and executing the communications programs of the Jerrold Electronics and Harman-Kardon subsidiaries.

Mr. Cantor joined Jerrold Electronics as Public Relations Director in June, 1964, bringing with him an extensive background in the electronics industry.

Mr. Cantor

Prior to joining Jerrold, Cantor was Advertising Manager and Publicity Director for Blonder-Tongue, Newark, New Jersey. He was previously a technical writer for Westinghouse TV-Radio Division, Metuchen, New Jersey.

PREECE JOINS VIKING INDUSTRIES

Ben Preece has been appointed National Contract Manager by Viking Industries, Hoboken, N.J. Formerly with TeleMation, Inc., Preece will operate from Viking's new Salt Lake City office, and will concentrate his efforts to the expansion of Viking's entry into CATV "turn-key" operations.

Robert Baum, vice president (left) welcomes Ben Preece to Viking.

The establishing of this new office will provide greater assistance to companies contemplating the rebuilding of existing CATV systems or the construction of new systems, according to the manufacturer.

YEARICK AND CRIST AMECO V-P'S

Bruce Merrill, president of Ameco, Inc., has announced the appointments of *Richard F. Yearick* and *Duane W. Crist* as vice presidents. Mr. Yearick, who came to Ameco in 1961, was sales director of the CATV equipment division before his recent promotion. Previously he was national sales manager for Telco, a distributor for CATV equipment. He has been in the industry 11 years. As vice president he will be in charge of product sales, and responsible for the distribution and sale of CATV equipment to existing sys-

Mr. Yearick

Mr. Crist

tems through a network of six warehouses and twenty-two field sales engineers.

Duane Crist joined Ameco in January, 1963 as credit manager. He later became assistant treasurer. As vice president in charge of system sales, he is responsible nationally for new CATV system sales, seven district sales managers and a group of Phoenix based specialists. This group provides engineering services, financing, equipment, turnkey construction and training of customer personnel.

TELEPROMPTER NAMES SYMONS TO OPERATIONS POST

Robert H. "Hank" Symons was appointed director of operations for the CATV Division of TelePrompTer Corporation in an announcement by *Caywood C. Cooley, Jr.*, vice president of the division. Symons joined TelePrompTer as manager of its Liberal,

Mr. Symons

Kans., system in 1960, and since last April has been budget director of the division. Cooley said that Symons will have broad administrative responsibilities in his new position, which has been created because of the continuing expansion of TelePrompTer's CATV activities.

NATIONAL TELINE APPOINTS JERNIGAN

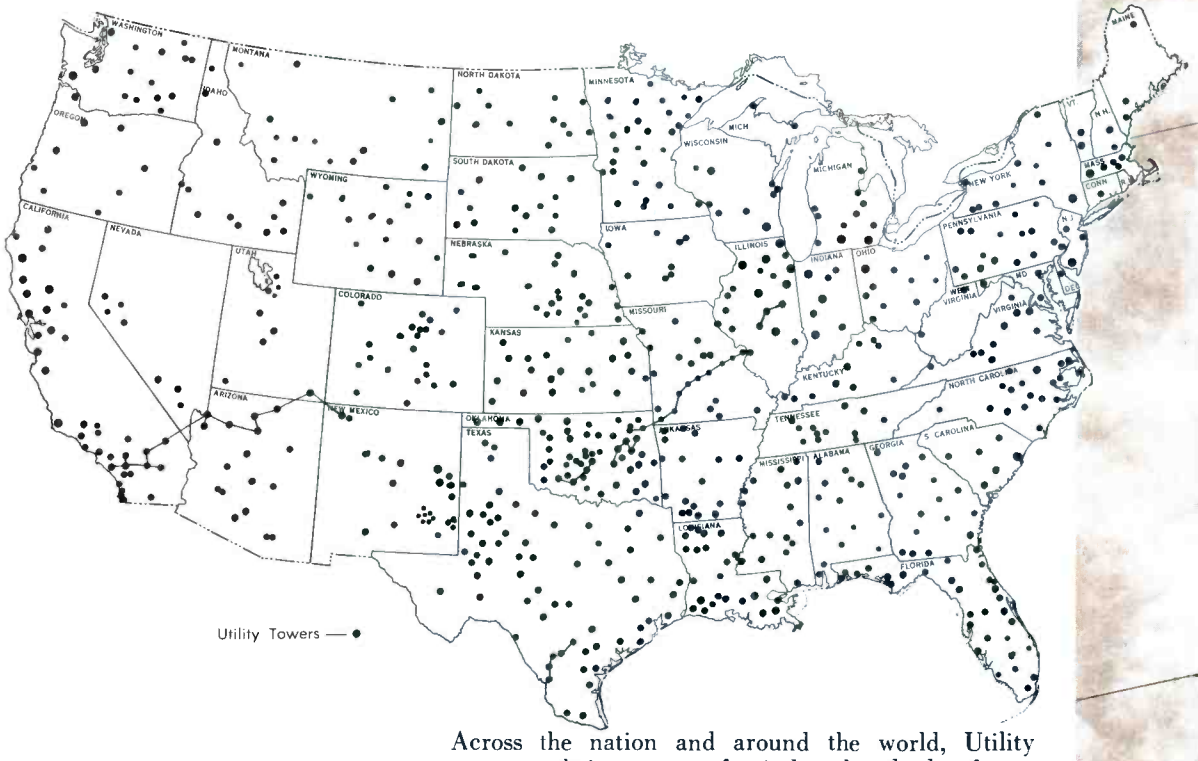
Robert F. Jernigan has joined National Teline Corporation as Manager of Operations. Mr. Jernigan will be responsible for general management of all the corporation's operating subsidiaries. This will include Systems' Inc., National Teline's engineering and construction subsidiary.

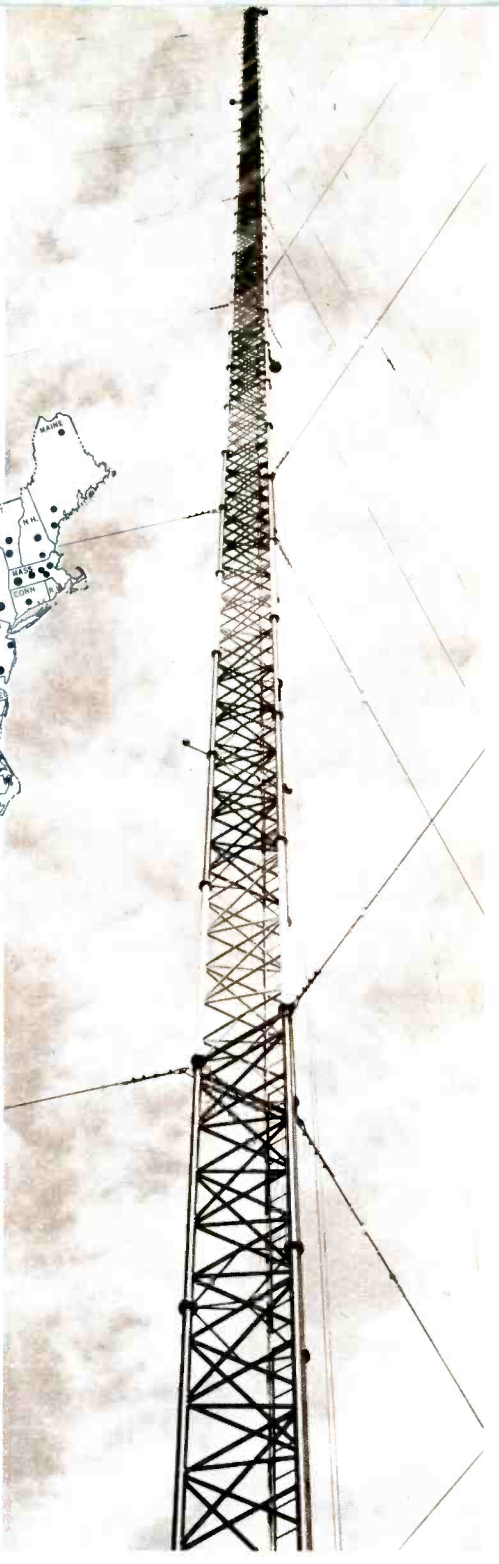
Jernigan is President of the Southern CATV Association and is on the Board of Directors of both the NCTA and the Mississippi State CATV Association. He is also president of Mississippi CATV Systems, Inc., and will continue his duties there.

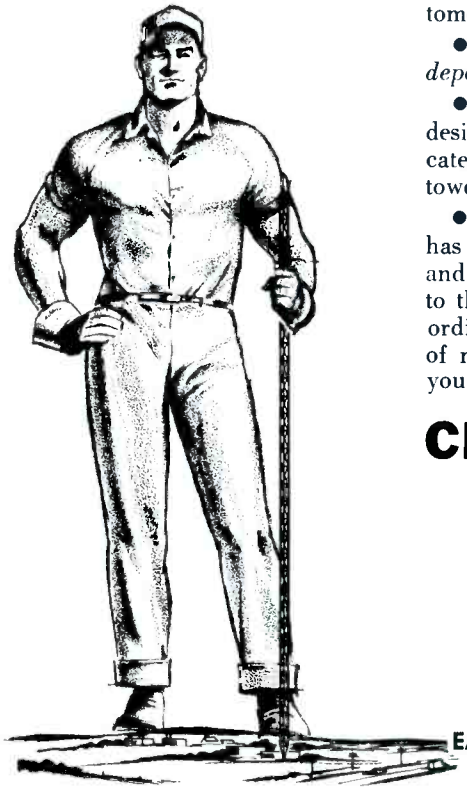
LASKY NAMED VICE PRESIDENT

United California Electronics has announced the appointment of *Bill Lasky* as vice president in charge of operations. Laskey had previously been with Entron, Inc. as western regional manager.

EACH DOT SAYS "PEACE OF MIND"







Across the nation and around the world, Utility towers now bring peace of mind to hundreds of customers.

- They know that each Utility tower has *total dependability* engineered and built into every detail.
- They are confident that all Utility towers are designed to meet rigid specifications, precision fabricated by certified welders, and erected by skilled tower erectors.
- They can rest assured that every Utility tower has Quality Certified engineering and workmanship and always meets or exceeds EIA specifications. Add to this the fact that Utility Towers cost no more than ordinary towers . . . and you have complete peace of mind. Call us for a comprehensive quotation on your CATV tower needs.

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

ASHBY NAMED SALES PROMOTION MANAGER

Robert D. Ashby was named Sales Promotion Manager of Ameco, Inc. in an announcement by President *Bruce Merrill*. Ashby had formerly been assistant advertising director. Before

Mr. Ashby

joining Ameco, Inc. Ashby was production manager of KPHO-TV, Phoenix, Ariz. He is a graduate of the University of Illinois and has done graduate work in Journalism, Advertising, and color television production.

WINDLE JOINS VIKING INDUSTRIES

Viking Industries has been joined by *Willis T. Windle* as vice president in charge of finance. In making the announcement, Viking management stated that the firm is determined to provide a financing policy that will be flexible so as to meet the requirements of all system operators whether it be for new construction or the rebuilding of an old system. Windle has specialized in finance since 1933, and prior to joining Viking Industries he was president of the Mundit Cork Corp.

FLORIDA ASSOCIATION ELECTS OFFICERS

William F. Hemminger was elected president of the Florida State CATV Association at its organizational meeting. The other officers elected were vice-presidents *Harry Harkins*, University City TV Cable, Gainesville; *H. H. Harris, Jr.*, TV Cable Co., Fort Walton Beach; and *Harry Bennett*, Universal Cablevision, Cocoa Beach and Secretary-treasurer, *O. E. Brillante*, Florida TV Cable Co. Melbourne.

Over 30 CATV'ers attended the meeting, representing nearly all operating systems in the state. January 14, 1966 has been set as the tentative date for the next general meeting.

BLONDER-TONGUE APPOINTS COHN

Harry A. Gilbert, vice president and general manager of Blonder - Tongue Laboratories, Inc., announced the appointment of *Jerome I. Cohn* as Eastern District regional sales manager. Cohn, formerly marketing manager of Radiation Materials in New York, specializes in the sale and marketing of electronic components, systems and equipment.

PARIS MANAGER NAMED

E. M. "Nick" Carter has been named manager of the Paris, Illinois system by Cardinal Telecable Corp. The Paris system is currently under construction.

10th PNCTA CONVENTION IN SEATTLE

One hundred forty-eight CATV'ers registered for the 10th Annual Fall Convention of the Pacific Northwest Community TV Association in the Olympic Hotel in Seattle. Representatives from the Pacific Northwest, Alaska and Canada gathered to hear the NCTA's *Frederick W. Ford* and *Benjamin J. Conroy, Jr.* as well as *I. Switzer* of Canada's NCATA Board and *Clyde Ellis*, Western vice president of NATESA.

Sam Haddock, Moscow, Idaho was elected president of the association for the 1965-66 term. Other officers elected by the convention are *Clay D. White*, Kennewick, Wash., Management Vice-President; *Robert J. Brown*, Everett, Wash., Technical Vice-President; and *H. W. McClure*, Toledo, Oregon, Secretary-Treasurer. Elected to the Board of Directors were *Glen Tarbox*, Missoula, Montana; *Everett A. Faber*, Medford, Oregon; and *Mrs. Pat Hughes*, Moses Lake, Wash. Spokane, Washington will be the site of the Spring Convention to be held in late March, 1966.

LEONARD GREGORY PROMOTED

Donald R. Atwell, president of American Cable Television, has announced the promotion of *Leonard C. Gregory*. Formerly general manager of American's Kentucky Cable TV, Gregory is now regional manager of that firm's Decatur, Alabama and Panama City, Florida systems. He became manager of Glasgow Cablevision, Glasgow, Kentucky in February and was later named general manager of the Company's system in Kentucky, Indiana and Tennessee. *Douglas Shank*, who succeeded Gregory as manager of Glasgow Cablevision, has also succeeded him as general manager of Kentucky Cable TV, Inc. in Glasgow.

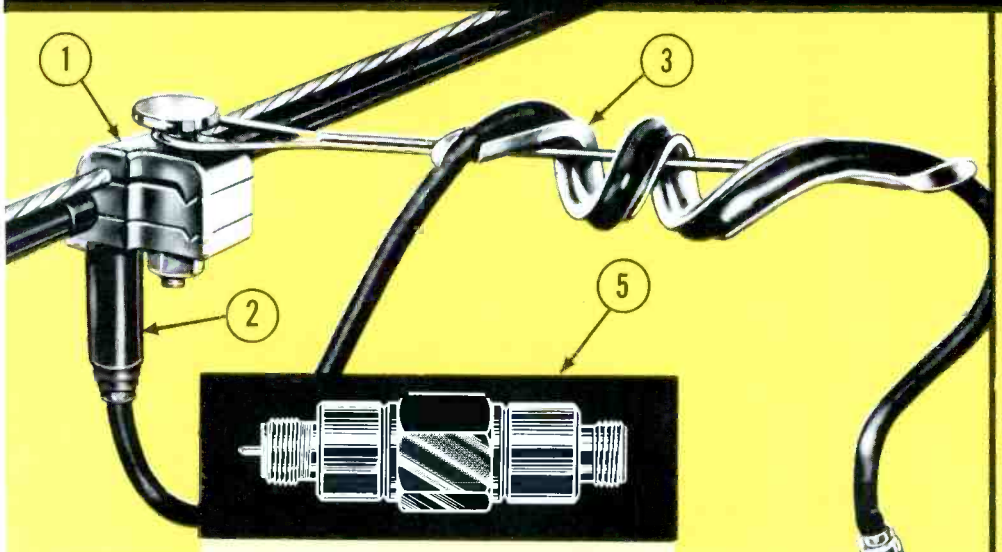
JFD ELECTRONICS ENTERS CATV

Previously among the leading opponents of CATV, JFD Electronics has become both a manufacturer of CATV equipment and an owner of CATV systems. The surprising about face was planned by *Ira Kamen* of Kamen Associates. *Mort Leslie*, Sales Manager of JFD, was head of TAME.

Kamen indicated that JFD plans to follow the FCC "philosophy" and not hurt UHF, AM or FM. JFD will extend TV to areas with inadequate serv-

CRAFTSMAN COMPLETE TAP-OFF Package..

$3.75 IN LOTS OF 100 **$3.95** IN LOTS OF 25



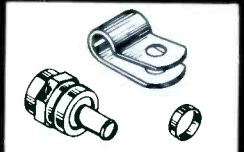
BACK-MATCHED TRANSFORMER TAP
Specify Type—Refer to Table A

YOUR PACKAGE INCLUDES:

1. **TAP BLOCKS** (refer to Table B)
2. **HEAT SHRINK BOOT**
3. **2 POSI-GRIPS**
4. **T-15 TRANSFORMER** (Epoxy-filled and Full-Shielding)

4a. **PLASTIC CLIP, MALE CONNECTOR and FERRULE**

5. **BACK-MATCHED TRANSFORMER TAP** (refer to Table A)



- PLASTIC CLIP
- MALE CONNECTOR
- 8 FERRULE SUPPLIED

EVERYTHING YOU NEED

for SINGLE HOUSE-DROP in ONE PACKAGE

WE SHIP WITHIN 24 HOURS!

TABLE A

BACK-MATCHED TRANSFORMER TAPS

TECHNICAL SPECIFICATIONS

Frequency response: ..... 8-220 MC
Tap-off flatness: ..... ± 2 db
Body: ..... Solid brass, silver plated tap output is AC/DC isolated
Tap VSWR: ..... 1.2:1 max.
Output connector: ..... F type
Dimensions: ..... 2-1/4" x 5/8"

Craftsman Order Number	Type	Insertion Loss
304-12	12 db	0.75 db
304-16	16 db	0.25 db
304-20	20 db	0.10 db
304-24	24 db	0.10 db
304-30	30 db	0.10 db
304-36	36 db	0.10 db
304-40	40 db	0.10 db
304-50	50 db	0.10 db

TABLE B

PRESSURE TAP BLOCKS

Type Cable	Construction	O. D. of Cable	Order No.
RG11U	SSSJ	.407	200
	DSDJ	.465	201
Strip-Braid 308/408	SSSJ	.465	201
	DSSJ	.465	201
Aluminum .412 O. D.	Unjacketed	.412	202
	Jacketed	.480	203
Corrugated CF480 Cables	Jacketed	.480	203

BE SURE TO STATE *BOTH* ORDER NUMBERS AS SHOWN ON CHARTS
(For ex: Order #201/304-20)

CEP

THE PIONEER CATV ACCESSORY MANUFACTURER

WRITE TODAY for complete catalog and price lists . . . .

CRAFTSMAN ELECTRONIC PRODUCTS, INC.

ice and avoid multi-station markets and areas that would require microwave, according to Kamen. A new plant that will manufacture a complete line of CATV equipment, including solid-state units designed by Kamen Associates, is planned.

WALLENSTEIN NAMED BY MERRILL

Ameco, Inc. president, *Bruce Merrill* has announced the appointment of *Arthur L. Wallenstein* to head Ameco's Solid-State Technician's School. The

Mr. Wallenstein

School started its fall and winter sessions in late October. Wallenstein, who will be Training Coordinator at Ameco, was formerly a test and alignment technician for that company.

TWO PROMOTED BY TV & COMMUNICATIONS

The promotions of *Robert A. Searle* and *Jean Schaefer* have been announced by TV & Communications publishers *Stanley M. Searle* and *Patrick T. Pogue*. Searle has been named as managing editor of TV & Communications magazine, for which he previously served as an associate editor. He is also managing editor of Cable

Mr. Searle

Mrs. Schaefer

Television Review, and editor of the Annual CATV Directory. Mr. Searle joined the Oklahoma City-based publishing firm's advertising sales department in May 1964.

Jean Schaefer has been named production director for all Communications Publishing Corporation magazines, including TV & Communications and Cable Television Review. Mrs. Schaefer has served as art director for the firm since its founding in January, 1964. She will remain in charge of art direction for the firm.

CENTRE VIDEO NAMES HENDERSHOT MANAGER

James Palmer, president of Centre Video, announced the appointment of *Russell Hendershot* as manager of Centre Video's Mingo Junction and Brilliant, Ohio CATV systems. Both systems were scheduled to begin service last month.

SPARKMAN APPOINTED BY VIKING INDUSTRIES

J. C. Sparkman, Technical Sales Representative for Viking Industries, will operate the recently established northwest regional CATV sales office and warehouse facilities in Portland, Oregon. Vice President *Robert Baum*, in making the announcement, said that

Mr. Sparkman

the sales division will handle all types of CATV coaxial cables, amplifiers and electronic equipment required by the industry. Prior to joining the sales staff of Viking Industries last Spring, Sparkman was a sales representative for Northwest Electronics. Previously he had been with the A. J. Distributing Co. in the same capacity.

CBS GETS CANADIAN NOD IN CATV

The Canadian Department of Transport has given Columbia Broadcasting approval on the purchase of a minority interest in a second Canadian cable operation. The system, TeleCable Inc., currently serves 600 subscribers in Quebec City. The 5-channel operation has an estimated potential of above 15,000. Columbia Broadcasting System already has a substantial interest in Canadian Wirevision in Vancouver, British Columbia.

ENTRON NAMES PRODUCTION VICE PRESIDENT

Anthony Vendemia has been promoted to the position of vice president in charge of production by the Board of Directors of Entron, Inc. The announcement was made by company president, *Robert J. McGeehan*. Mr. Vendemia is responsible for all activi-

Mr. Vendemia

ties connected with the production of Entron's CATV equipment. Before working for Entron, Vendemia was assistant to the president of the Ravenswood Corp., Annapolis, Md. He is a graduate of the University of Maryland and holds a law degree from Baltimore University.

SERVIES PROMOTED BY NATIONAL THEATRE SUPPLY

J. W. Servies, a vice president of National Theatre Supply Company, has been named Executive Vice President and Chief Operating Officer of that company in an announcement by president *Willard J. Turnbull*. He was, at the same time, elected to the Board of Directors. Servies began National Theatre Supply's CATV division For seven years he headed the nationwide theatre equipment company's activities in that field.

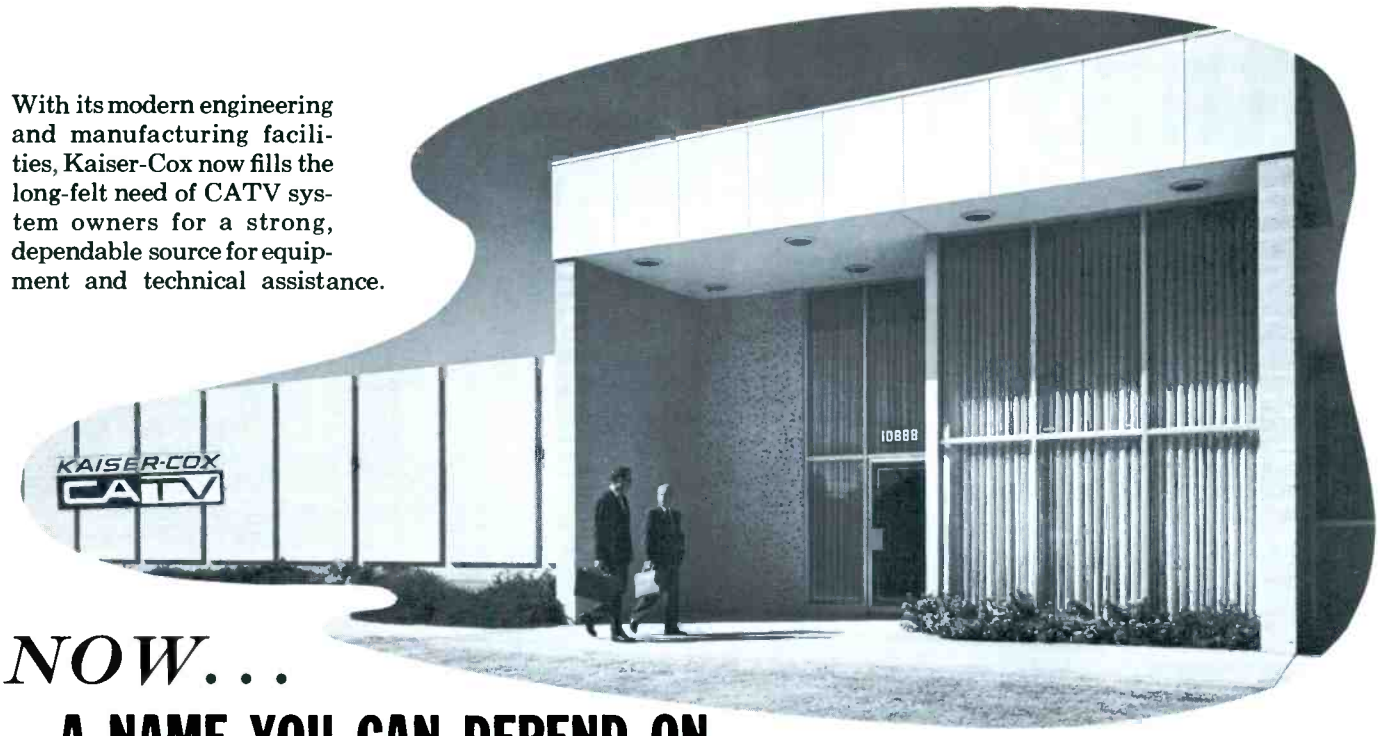
MILLER NAMED MANAGER

United Video Systems has named *Rodney Miller* manager of Falls City Cable TV Inc., Falls City, Nebraska. Miller succeeds *John Black* who has been transferred to United Video's Columbus, Nebraska system.

ANDERSON NAMED CATV ADMINISTRATOR

Carl E. Lee, Executive Vice President and General Manager of Fetzer Broadcasting Co., has announced the appointment of *Gordon Anderson* as Administrator of that firms expanding CATV interests.

With its modern engineering and manufacturing facilities, Kaiser-Cox now fills the long-felt need of CATV system owners for a strong, dependable source for equipment and technical assistance.



NOW...

A NAME YOU CAN DEPEND ON... KAISER-COX CATV

Here Are 6 FACTS About Kaiser-Cox to Remember in Planning and Building Your Complete CATV System. 6 Good Reasons Why You Can Depend on Kaiser-Cox for the Finest in CATV System Design — Financing — Engineering — Construction — Equipment — Service.

HERE'S WHAT KAISER-COX CATV MEANS TO YOU

THE KAISER NAME . . . internationally known and internationally respected for *quality control* and *quantity production.* Two "pluses" that have long made Kaiser a formidable giant in the industrial world.

THE COX NAME . . . A leader in broadcasting . . . the broadcaster who has taken the lead in CATV. The company that knows both fields. The company that will market *the ultimate* in CATV equipment.

THE KAISER-COX NAME . . . The combination that will not settle for "second best." The combination that will bring *a new way of business* in the big, bold, booming CATV industry.

THE SOLID PEOPLE . . . An excess of 25,000 man-hours . . . brain-power tapped from the aerospace world of close tolerances and rigid specifications . . . researched and developed this equipment.

THE SOLID PRODUCT . . . Unmatched engineering. Unrelenting purchasing standards. Unyielding quality control. All add up to an unequalled line of superior solid state CATV equipment.

THE SOLID SERVICE . . . Site surveys. System layout. Financing. Turnkey construction. Sales/Service Wagons for parts and technical assistance. Sales offices and warehouses throughout the nation.

Your Inquiries Are Invited. Write, phone or visit . . .

KAISER-COX CORPORATION

P.O. BOX 9728 PHOENIX, ARIZONA 85020 PH. (602) 944-4411

DEPEND ON KAISER-COX FOR CATV LEADERSHIP TODAY AND TOMORROW

LETTERS

Gentlemen:

The July, 1965, Volume 2, No. 7, *TV & Communications*, has a legal dissertation by Robert D. L'Heureux, Chief Counsel for N.C.T.A., starting on Page 72. If it is possible, I would appreciate receiving a copy of this article.

There are two errors which I noticed, Page 78, top of first column, should read Nevada and not Arizona Attorney General; and Page 79, last line of first paragraph, has the same error, and should read Nevada.

Calvin Webster
City Attorney
Tucson, Ariz.

• *The July Volume is on its way. Errors are noted and we stand corrected.*

Gentlemen:

We are neophytes in the cable business. Do you know or could you send any book, dictionary or pamphlet which would give us the meanings of the abbreviations used in the ads in your magazine?

Things like dbj, VSWR and other technical terms, in most cases, are a mystery to us.

Cameron Mann Fisher
Amenia, New York

• *Your local library should have books on basic electronics and radio propagation. However, we know of no single source for the definitions.*

Dear Mr. Searle:

In your September editorial you refer to NATESA as "self appointed guardians." For your information, not that knowledge of truth will make any difference to you, NATESA is an association of voluntary members, and we are the only national in our field, thus we are "appointed" guardians for the independent radio-tv service business operators.

Speaking of self appointed guardians, who appointed *you* as guardian of CATV? Very obviously you are a mere commercial publisher trying to profit from an industry through sale of advertising to gain which you are willing to print anything that might make potential advertisers grateful. In other words, you are a *rank opportunist.*

Were you to bother to learn the truth, you would find that NATESA opposes CATV *only* where it is not needed according to established standards. We have in our membership actual CATV operators who are serving the public by providing good reception in places where it is not available and not likely to be.

Wouldn't it be more honest were you to print our entire statement, rather than pick out of context what you feel serves your purposes?

We are opposed to opportunists who promote franchises where not needed and for the sole and express purpose of "sitting on them" until the AT & T or networks decide to move into CATV, at which time they hope to be able to sell their "paper" at a big profit.

Your editorials are the best example of "divide and conquer" tactics, and are the greatest disservice any publisher could commit.

We note your magazine has a "Letters to the Editor" department. We dare you to publish this letter entoto and without benefit of your editing. We will be pleased to answer any reactions in a forthright manner.

Frank J. Moch
Executive Director
NATESA

• *We dare!*

THE FINANCE COMPANY AND CATV

by James F. Ackerman
Economy Finance Corporation

In future years there is going to be a tremendous number of CATV connections made not only for present systems but also for systems that owners are contemplating in adjacent villages, hamlets, and cities. They will be buying out investors of present systems, partners and systems from other owners to expand their present complex. All of this will take money. And, the majority of this money will come from finance companies.

Most people normally think of a finance company as a place to borrow a few dollars or a place where one arranges to finance the purchase of a refrigerator, automobile, furniture or other goods. However, there are other companies known as commercial finance companies that provide capital for business investments.

CATV INTEREST GROWS

Commercial finance companies in the past fifteen years have had a fantastic growth as a result of being pioneers in finding new areas in which to safely lend money and finance the purchase of equipment, such as the CATV industry. We started making loans in your industry about five years ago. Commercial financing has increased 100 fold during the past decade—about the same as CATV.

There are many reasons why the commercial financing industry has grown at a pace similar to the CATV industry. Here are a few:

Commercial finance companies such as Economy Finance Corporation can offer to a new and fast growing industry such as CATV not only the use of its money, but also the experience it has gained in financing other growth industries. A commercial finance company will often train a few of its men to become financing experts in a particular industry.

A commercial finance company has no preconceived ideas as to how much or how little working capital is needed for a loan in order for a company to qualify. A financing expert in a particular industry can often give advice on how to take the maximum advantage of a small amount of working capital. Commercial finance companies often know where equity money can be obtained, when needed, in addition to making loans to an industry or company. In addition, a commercial finance company takes great pride in helping a company that has been borrowing from it to move its borrowing into a bank when it becomes bank-eligible, as a result of expanded earnings and increased net worth.

One of the greatest advantages in borrowing from a commercial finance company is that you do not sell part of your equity. Let me re-emphasize the fact that a true commercial finance company will not acquire stock in your company as a requirement of making a loan.

Commercial finance companies want you, as an owner or manager, to manage your company without interference or direction from others. They may occasionally offer advice with the objective of increasing your net profits. However, you are the boss in running your system. The objective of a commercial finance company is to have its clients make a satisfactory profit so the finance company can feel more secure.

MAXIMUM FINANCING

It is important to system owners to obtain the maximum financing possible because of the fast growth rate of the cable TV industry. Only through a commercial finance company can you obtain the maximum financing possible and achieve maximum profits. The reason is that other lenders often require that you limit your borrowings to an amount equal to your investment or give up 20 to 30% of your stock equity in order to borrow the amount needed.

With a commercial finance company you can borrow up to four dollars for every dollar you invest, depending on your costs and projected income. Your investment need not be all in common stock but some of the money can be in preferred stock, even though this is an expensive source of money, because the dividends are not deductible for

Federal income tax purposes. Other money can be in the form of subordinated debt. Subordinated debt includes notes which are to be paid after senior lenders (such as banks or finance companies) in case of bankruptcy.

Commercial finance companies will often consider this subordinated debt as though it were a part of the common stock equity for purposes of determining the amount of money that it will lend. Your advantage in borrowing from a commercial finance company is that you can borrow more dollars with less investment and, thus, achieve a higher rate of return on your common stock equity or maximize your profits on the dollars that you have invested.

LOAN CONSIDERATIONS

The cost of borrowed money is usually not the major consideration. In commercial financing the only cost that you have is the cost of money. You don't generally have to give up part of your equity. The finance company will tell you in the beginning exactly what the actual cost will be in dollars or on a simple interest basis. There are no compensating balances required and there are usually no other strings attached.

Commercial finance companys will frequently finance the full amount if equity in other equipment is adequate. Many times a complete CATV system can be financed with very little or no investment by using another CATV system that is already in existence as collateral. Sometimes the cash flow of the old system will furnish the new system with sufficient funds to make the monthly payments the first few years until enough new connections have been made to support the new system.

The finance company will want to know how many connections you are projecting in one, two, three, four, and five years hence and what you anticipate will be your cash flow from these connections after all expenses. It will also want a precise estimate as to the costs of operating and building the system. Certain other basic information will be requested by the knowledgeable financing company such as whose equipment you are using and what you are paying for the turn-key job.

Based upon these facts and forecasts, the finance company will then determine how much they can loan. This is somewhat different than other financing sources who look more at the amount of investment you have made. The finance company looks more at the future cash flow and less at the initial capital investment. The investment is needed but future estimated cash flow is the determining factor as to the amount of a potential loan to a CATV system operator.

CASE IN POINT

If we assume that a system is going to need $400,000 for building requirements and initial working capital to cover operating losses for the first year or two, there are several ways to raise the funds to finance the system. Let's assume that: 1) A bank will lend $1 for every $1 of capital funds, the latter being subordinate notes, preferred and common stock; 2) A finance company will lend on a percentage of anticipated cash flow regardless of capital funds; and 3) A customer has a personal net worth of $100,000.

Under the bank method our potential customer puts $37,500 into company, sells a 25% interest to an investor for $12,500. The investor also puts in $150,000 of subordinated notes at 8%. Now the bank will loan $200,000 with interest at 6½% simple or 3½% add-on per year. We assume that the cash flow of the system will pay off the bank debt in five years and will also pay off the debentures with interest. Assuming 4,000 connections at the end of five years and that the system is sold for $200 per connection, the investor owning 75% of the equity gets $600,000 or a return of 1600% before taxes on his investment of $37,500.

Now let's take a situation where financing was with a finance company. This time the CATV operator does not sell a part interest to an outside investor but, instead, borrows $75,000 from a bank on his statement and puts it into company on a subordinated basis along with $25,000 for common stock, or total capital funds of $100,000. The finance company can loan $300,000 if the cash flow of the system will amortize the $300,000 on a monthly amortization over five years at a 6% add-on rate. The owner pays himself 8% on the subordinated notes. Then assume that in five years the finance company is paid in full but the subordinated notes are still outstanding. Thus, the net cash flow in both examples is approximately the same.

Now let's assume that the CATV owner sells out at $200 per connection for his 4,000 connections and realizes $800,000, pays off his $75,000 of notes, and nets $725,000 on his investment of $25,000, or a return of 2900%. Under the latter method he gets over $135,000 more profit, before taxes, has no partners, and is his own boss.

This is an example of leverage.

MONEY TO MAKE MONEY

I would like to cite some of the excellent examples of operators who have made money with finance company money. One good example is a person who approached us approximately four years ago to obtain money to rebuild a run-down old system. Based upon the system itself and the net worth of the individual, a loan in the middle six figure was made. The system was rebuilt, from it other systems were financed and built, and a large complex was put together over a period of time.

Another time a man came into our office with one of our pieces of direct mail and said, "We would like to finance a new system!" We looked at one of the letters he had and said, "Look, you have just sold your system!" He said, "Well, we didn't think we could get any money to expand, so that is why we went ahead to sell it in order to take a $100,000 gain!" It turned out, however, that the sale did not go through. We were able to lend money to him on the basis of using the old system as collateral for a new system.

Today he has five such systems, a microwave complex and, obviously, has increased his personal net worth substantially. I am sure he is thankful he used finance company borrowings in order to expand and did not sell that system.

Finance company money is available not only to the small proprietorship, the individual who wants to build a system of 500 to 1,000 connections, but also to the large corporation who is doing business with other financial institutions and who can finance other new systems with finance company borrowings to increase their leverage.

If you can have your system paid for completely in five years and still retain ownership, then your cost of borrowing is a small part of your total cost. The biggest factor in determining your potential capital gain is the amount of money that you can borrow now. That is the factor that will determine the amount of your personal net worth a few years from now.

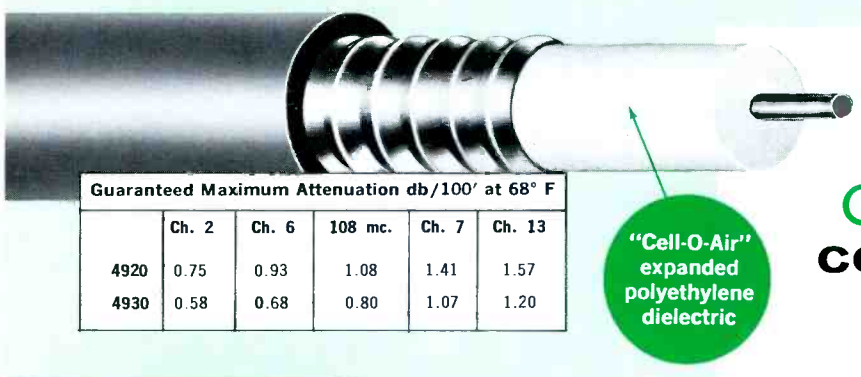
To sum it up: Sometimes a slightly higher cost of money is a small price to pay for freedom from ownership dilution, freedom of action, and freedom of anxiety when trouble may develop because you had knowledgeable lenders, and ability to pay a large capital gain based on a successful CATV system. □

Guaranteed for 5 years!

SUPERIOR COAXIAL CABLES
Guarantee the CSR in any CATV system!

1. *Full Spectrum Capability*
2. *Long-term transmission Stability*
3. *Outside plant Reliability*

Quality-controlled from raw materials through every critical phase in the manufacturing process, SUPERIOR Coaxial Cables with Coppergard offer you performance unmatched by any other cable! For aerial or direct burial use, buy SUPERIOR!



Guaranteed Maximum Attenuation db/100′ at 68° F

	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

"Cell-O-Air" expanded polyethylene dielectric

For Aerial Plant

SUPERIOR

Cell-O-Air®

COAXIAL CABLE

Every Reel Sweep-tested over its full length

Guaranteed Maximum Attenuation db/100′ at 68° F

	Ch. 2	Ch. 6	108 mc.	Ch. 7	Ch. 13
6020	0.74	0.91	1.05	1.38	1.55
6030	0.56	0.67	0.79	1.05	1.19

"Solid-D" solid polyethylene dielectric

For Buried Plant

SUPERIOR

"Solid-D"

COAXIAL CABLE

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5-YEAR GUARANTEE

Superior 75 ohm coaxial cable with "Coppergard" shield is guaranteed to be 100% sweep-tested prior to shipment, with no attenuation discontinuity greater than 1% at all frequencies up to 220 megacycles, and with high frequency impedance guaranteed to be 75 ohms plus or minus 3 ohms; and can be expected to show no excessive attenuation increase, provided jacket and/or outer conductor are not damaged during installation and remain free from damage caused by external sources.

The specific coaxial cable product manufactured in accordance with the requirements of the factory order number listed below, is guaranteed to be of first quality in material and workmanship. In the event of failure under normal service conditions, when such failure is proved to be caused by faulty material or manufacturing defects, Superior Cable Corporation will:

(1.) Replace material and pay for labor costs incurred for replacement, if such failure occurs within one year after date of installation.

(2.) Replace material only, if such failure occurs during the next four years after date of installation.

This five-year guarantee pertains to Superior "Cell-O-Air" expanded polyethylene coaxial cable only when utilized in aerial installation; and pertains to Superior "Solid-D" solid polyethylene coaxial cable when utilized in aerial or direct burial installations; and is applicable only when proper installation procedures and techniques are followed.

For detailed information and prices, write

SUPERIOR CABLE

SUPERIOR CABLE CORPORATION
HICKORY, NORTH CAROLINA 28601

CATV ECONOMICS and MICROWAVE

by Ralph W. Howman
Microwave Sales Engineer
Collins Radio Company, Dallas, Texas

It has been estimated that at least ⅓ of all viewers receive substandard signals more than 30 percent of the time. With color becoming more popular, this situation will become more critical. Community antenna systems today are reaching only 3 percent of the viewing public, a fraction of the potential CATV market.

Many CATV companies furnishing fringe quality pictures or insufficient program selection are feeling pressure from their subscribers for the addition of microwave relay to upgrade their service.

To properly discuss CATV economics, we should first look at the industry itself. The following averages were compiled by sampling data on 100 CATV systems from published information in the 1964 Television Fact Book. One hundred systems were selected at random from 19 states with each geographical region of the U. S. represented. Size ran from a low of 80 paying subscribers to as high as 9,400.

The average CATV system in 1963 (as indicated by a sampling from the 1964 Fact Book) had 1,676 subscribers with a potential of 3,101. Figures released by a cable equipment manufacturer show an average of 1,066 paying subscribers. The average installation fee was $36.14 with monthly rental of $5.01. (Later information indicates the average initial installation fee has dropped in recent months to about $25, average.) The average CATV operator offered 5 or 6 (5.4) TV channels along with one FM or background music channel.

There are about 1,500 CATV systems in the United States serving nearly 1.6 million homes. Capital invested has been estimated at $550 million or $366,660 per average system. Plant investment per paying subscriber is approximately $343. This should reduce to about $200 when saturation is reached. Gross revenue exceeds an annual $750 million with 15,000 or more new paying subscribers being added monthly. One large equipment manufacturer has estimated that CATV cable strung in 1964 is equal to that installed during the previous 3 years. This should give some idea of the phenomenal growth in this industry, and it may be only the beginning.

First, let's look at a few guidelines for establishment and evaluation of a proposed CATV system using only cable and head-end facilities.

A 3-year balance sheet then might appear as shown in table I.

It should be evident that a successful CATV operator will usually pay little income tax during the first few years of operation. Under present tax rules, it may be possible to fully depreciate the plant in 5 to 7 years and at the end of this period the equipment loan is normally retired. To the present, market value of the system has

A number of CATV experts use the following rough guideline formula for preliminary estimation of economic feasibility based upon 3-year operation:

Population figure of city divided by 415 = total number of miles of system cable.

Total cable miles x 40 = number of utility poles to be contacted.

Poles x 3 = number of potential homes to be covered.

0.5 x potential = number of probable subscribers (this number should be signed within 2- to 3-year period).

$5 = monthly rental charge

$20 = connection charge

$2,000/month = maintenance for systems of 10 to 30-mile cable length.

$1,000/month = maintenance for each additional 30 miles of cable.

$3 = average annual lease for utility pole contact.

General administrative cost, salaries, etc., = 20% gross revenue.

Sales promotion expense = 10% gross revenue.

Equipment Cost:

$4,000/mile = cost of cable facility (all-channel system).

$3,000/mile = cost of cable facility (low-band system).

Let's take a city of 50,000 population as an example of application of the formula outlined in the column at left.

$$\frac{50{,}000}{415} = 120.4 \text{ cable miles}$$

120.4 x 40 = 4,816 utility poles to be contacted.

4,816 x 3 = 14,448 potential homes.

0.5 x 14,448 = 7,224 probable subscribers (to be signed within 3 years).

3-Year Gross Revenue:

Rental Charges 7,224 x $5 x 20 months* =	$722,400
Connection Charges 7,224 x $20 =	144,480
Total Revenue =	$866,880

3-Year Operating Expense:

Maintenance and Operation $5,000/month x 36 =	$180,000
3-Year Pole Lease 4,816 x $3 x 3 years =	43,744
General Administrative Costs, Salaries 20% of $866,880 =	173,376
Promotional Expense 10% of $866,880 =	86,688

Equipment Cost

120.4 cable miles x $4,000 =	$481,600.00

*If no subscribers were signed at beginning of operation, then a 36-month revenue would equal one-half the operating period, or 18 months. The 20-month period represents a weighting factor assuming that advance promotion has produced a number of signed subscribers in advance of startup.

been at least equal to the original plant investment after that period.

MICROWAVED CATV

This gives us a close look at a CATV system consisting only of head-end and cable facilities. But how does microwave fit into the picture? For an answer, let's briefly compare the qualities and economics of microwave and cable when used as a trunk medium for relaying video.

Microwave is desirable for CATV relay from both a technical and an economic standpoint. Technically, it offers a means of relaying the signal over far greater distances than standard multichannel trunk cable systems and with much less signal degradation. In addition, microwave does not have the right-of-way problems that are associated with cable systems used for transmission purposes. Economically, the cost of relaying by microwave on systems of average length is considerably less than the $4,000 per mile average installed cost of trunk cable plus the annual pole rental and maintenance.

A 4-channel simplex (1-way) microwave relay will average about $1,600 per mile for towers, antenna and RF equipment installed. Land, access roads, primary power, and buildings will vary from system to system depending upon terrain, cost of land, etc.

Even with the latest techniques, cable length is severely restricted before signal degradation (especially for color) becomes unacceptable.

So, most manufacturers recommend location of the cable-head near the center of the distribution area. The trunklines can fan out to the residential areas like the spokes on a wheel, keeping them as short as possible. Unfortunately, this central location is usually downtown—an area of extreme electrical interference with noisy conditions for an off-the-air pickup.

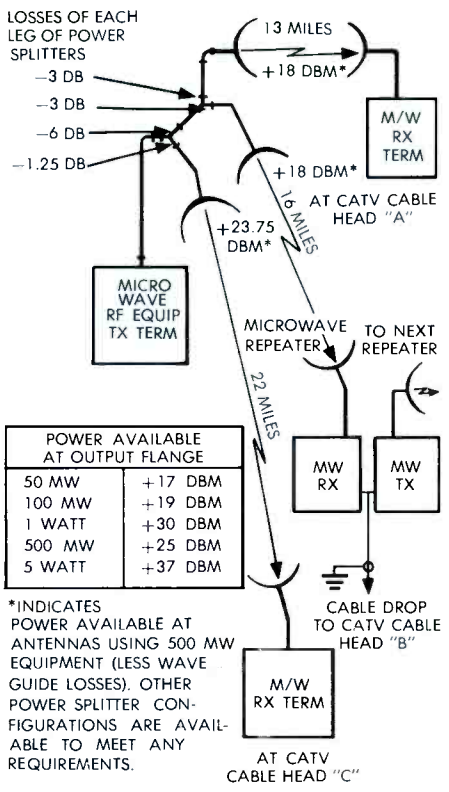
Obviously, a solution was required to improve quality and saleability of the product. CATV operators needed an economical method of extending off-the-air head-end equipment to good signal areas and relaying those signals to centralized cable heads without noticeable degradation.

Microwave is now proving successful for an ever-increasing number of progressive CATV operators.

Microwave can be used to relay signals for just a few miles or hundreds of miles. More sophisticated i-f heterodyne systems, such as Collins MW-109E, may be used for systems of great length (I-F heterodyne equipment is used for coast-to-coast relay of present television network programming.) By avoiding the demodulation step to video and audio and remodulation, much of the waveform distortions are avoided at i-f heterodyne repeaters. However, lower cost remodulating equipment, such as Collins MW-108D, can serve quite well for systems of average length requiring up to several repeaters.

Extra cost for microwave systems would normally result in higher saleability reflected in higher subscription rates, more paid subscribers or a combination of both.

Microwave can be especially attractive for future expansion. Power splitting techniques may be applied to existing microwave transmitter locations. This requires only the addition of a low-cost waveguide power splitter and antenna system to direct signals to a new receive terminal and service point. Additional services can also be offered by economical additions to the existing plant.



TYPICAL POWER SPLITTER ARRANGEMENTS FOR SIMPLEX ETV OR CATV APPLICATIONS

FIGURE 1

Figure I illustrates how this technique may be used to furnish CATV programs to several communities from a common head-end installation. The FCC has granted common carrier licenses in several instances to cable companies when the microwave has been used to furnish service to other independent cable companies comprising 50 percent or more of the total subscribers of the service provided by microwave. In fact, there are several companies in existence that provide microwave lease service only for CATV cable companies. Some of these same companies will serve as consultants or provide complete E, F, and I (engineer, furnish, and install) services.

MICROWAVE RELAY

Now let's examine the economics of the same cable system used in Table 1 assuming microwave has been added as a relay medium. For this evaluation we must be hypothetical since only a limited amount of factual data has been compiled to date.

Let us assume that a 50-mile, 4-

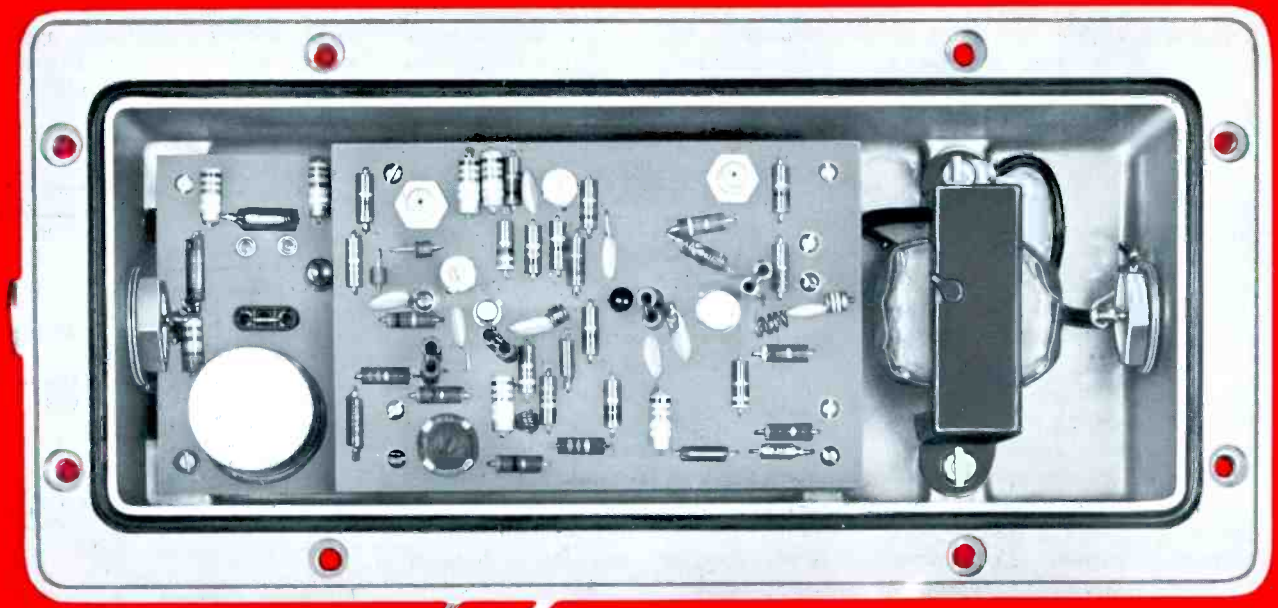
STATEMENT OF INCOME & EXPENSE
(THREE-YEAR PERIOD)

I. Operating Revenue		
Gross Revenue		$866,880.00
II. Operating Expenses		
General, Administrative & Selling	$173,376.00	
Advertising & Promotional	86,688.00	
Depreciation, Equipment	289,200.00*	
Maintenance, Operation	180,000.00	
Total Operating Expenses	$729,264.00	
Interest Expense	65,016.00	
Total Operating & Other		$794,280.00
Total Net Income		$ 72,600.00

* NOTE: Total Equipment Cost $481,600.00 based upon 120.4 miles of cable x $4,000. Balance of $192,400.00 to depreciate fully through 4th and 5th year.

Interest is based on 4.5% annual add on for five-year period or 22.5% of full purchase price.

TABLE I



SKL MODEL 265 WIDE-BAND TRANSISTOR TRUNK AMPLIFIER

The SKL Model 265 Trunk Amplifier is an all new high output, wide-band transistorized trunk amplifier with full 12-channel response. Its built-in, exclusive SKL TEMPERATOR*, gain and tilt controls, AC cable-powering and power regulation adapt it to both new system design and modernization of existing systems. Model 265 with TEMPERATOR* compensates for all losses in 20 db of cable over the band of 54 to 216 mc from −20°F to +120°F. Low noise output and low cross-modulation permit unusually high cascadability. In long line applications more than 50 Model 265 amplifiers may be cascaded. Model 265 is housed in a rugged, waterproof, cast aluminum box with a captive cover; it may be mounted on the messenger or on a pole, with a bracket. The unit is equipped with special sealed waterproof Type N connectors.
*Patent pending.

FEATURES

- High Cascadability
- Exclusive SKL Temperator*
- Gain and Tilt Controls
- Low Current Drain
- Cable-Powered AC
- Waterproof Housing and Connectors
- Compact — Rugged
- Messenger Mount

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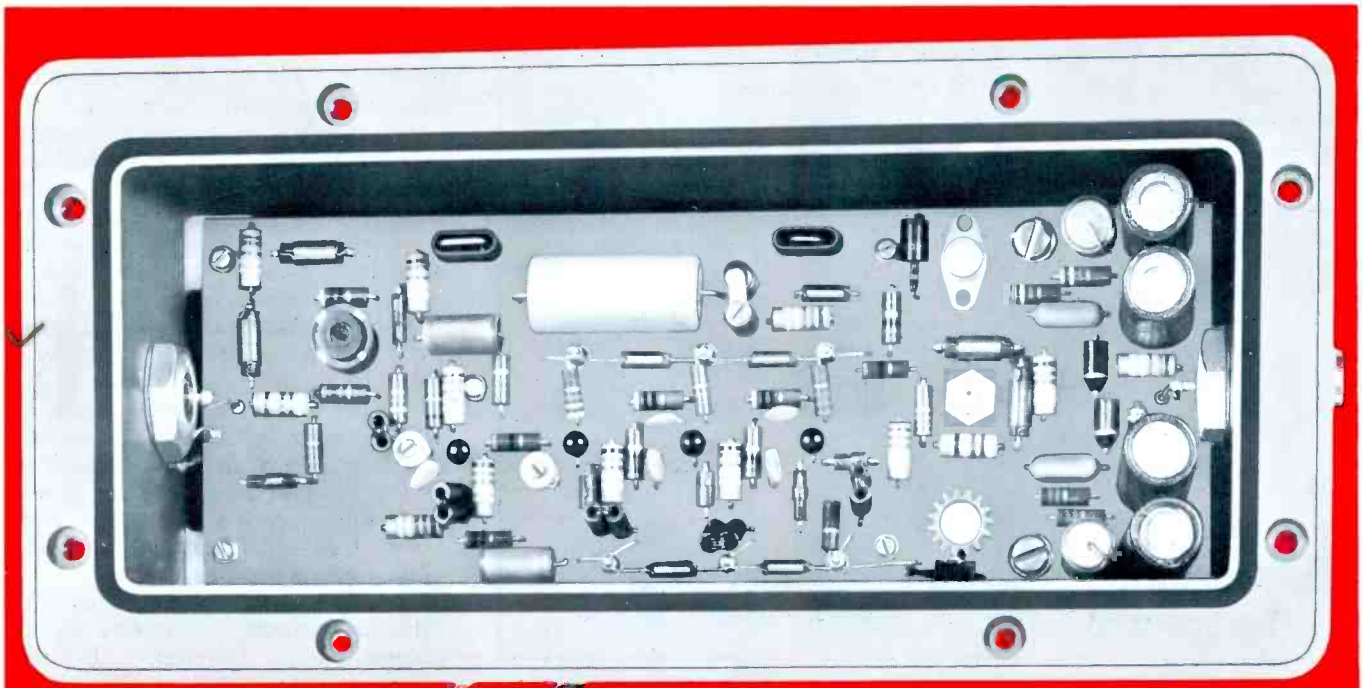


SKL MODEL 263 WIDE-BAND TRANSISTOR LINE EXTENSION AMPLIFIER

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.

FEATURES

- **All Channel, Plus FM**
- **High Output Capability**
- **Stable Circuitry**
- **Flat Gain Control**
- **Wide-Range Tilt Control**
- **Low Cross-Modulation**
- **Low Noise Output**
- **Internal Voltage Regulator**
- **Cable-Powered AC**
- **Waterproof Housing**

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

STATEMENT OF INCOME & EXPENSE
(THREE-YEAR PERIOD)

I. Operating Revenue		
Gross Revenue		$1,011,360.00
II. Operating Expenses		
General, Administrative, & Selling	$202,272	
Advertising and Promotional	101,136	
Depreciation, Equipment	336,960*	
Maintenance, Operation	198,000	
Total Operating Expenses	$838,368	
Interest Expense	75,816	
Total Operating & Other		$ 914,184.00
Total Net Income		$ 97,176.00

TABLE II

* NOTE: Total equipment cost $561,600.00 based upon 120.4 miles of Cable x $4,000 and $80,000 for microwave. Balance of $224,640 to depreciate fully through 4th and 5th years.
Interest is based on 4.5% annual add-on for five-year period or 22.5% of full purchase price.

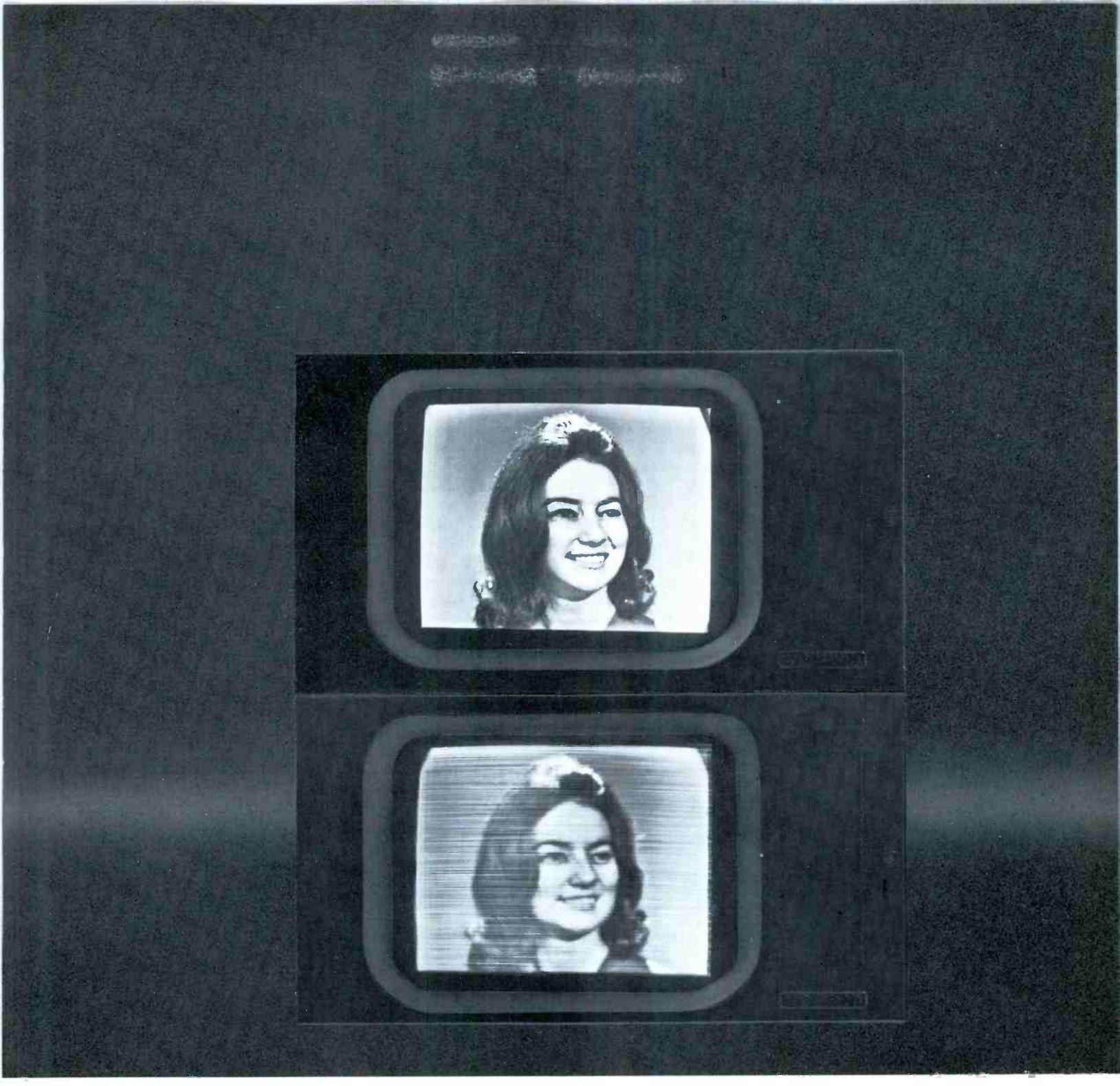
channel microwave relay link is required. The cost of microwave equipment installed for this link will approximate 50 miles x $1,600/mi. = $80,000. It is reasonable to assume that $6.00 monthly rental charges would enjoy higher customer acceptance than the previous $5.00 charge because two new TV channels have now been added and performance of two other channels has been upgraded. The two hops of microwave equipment should add less than $500 per month to maintenance and operation charges. Table II shows the results of adding those charges and revenues attributal to microwave to Table I.

You will note by comparison between Tables I and II that the addition of microwave has increased net income $24,576 or 33.8%. These results are conservative because they are based strictly upon economic experience with cable systems—calculated upon average 50% saturation after three-years operation. Certainly microwave will increase this proportion but no reliable data has been compiled to establish a definite figure.

Also certain fixed costs associated with cable systems should not increase with the addition of microwave. No additional service personnel should be required for a two-hop microwave system. Realistically, there should be little if any increase in administrative and advertising expenses—but the formula we used allows an increase on a percentage-of-equipment cost basis.

On very small systems it may be difficult to justify microwave on an economic basis. Of course, the very existence of some systems will depend upon microwave relay because of distance from television broadcasting stations or topography.

Then, too, there is the intangible benefit of microwave that is important to CATV operators—the knowledge that you are giving your customers the very best pictures available within existing technology. □



Which twin has the heterodyne?

IF you want to carry color programming for any distance at all you need clean color tones like those of our heterodyne "twin" in the top set above. (It *is* in color, in case your magazine's monochrome.)

Lenkurt's 75A microwave relay system will deliver color or black and white TV clear and sharp because its heterodyne repeaters are especially designed for heavy-duty long-haul routes.

Since there's *no* baseband demodulation enroute, there's less chance for degradation of signals on a long-distance hook-up. Yet you have the capability to drop TV channels for CATV or ETV operations along the way, which greatly extends the 75A's flexibility. It exceeds CCIR specs for noise performance, and meets both CCIR and NTSC requirements for monochrome and color television transmission. Frequency stability is held to within ±0.002%. And one-for-three path protection is available.

If top performance is what you're looking for, ask us about our true blue (not to mention red and green) 75A Microwave Radio. Lenkurt Electric Co., Inc., San Carlos, California. Offices in Atlanta, Chicago, Dallas, and New York City.

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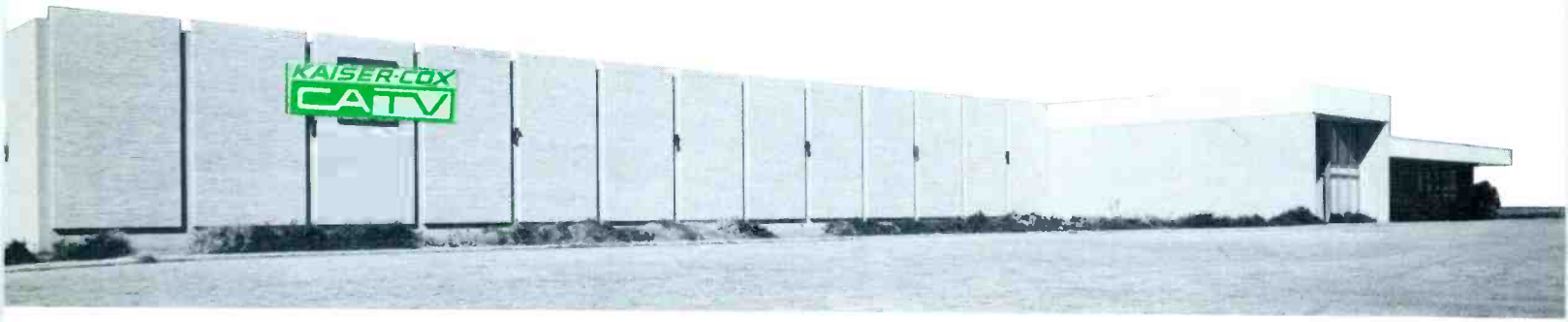
NEW TEAM IN THE CATV RACE



The year 1965 will most certainly be remembered as the year CATV made the "big time" in many ways. Telephone interests decided to shed their cloak of stoicism and admit that CATV, once considered an incubator baby, had indeed survived and grown to a healthy teen-ager.

In 1965, broadcasters who had previously considered the cable television industry a mere ingrate that would eventually go away if ignored, flocked by the hundreds to the annual NCTA convention in Denver, Colorado. For many, the fight was over and previous apathy turned to the attitude of "if you can't whip 'em — might just as well join 'em." Big names were present at the convention. Big plans were made. Big deals were consummated. And the CATV industry truly became of age in 1965 as new muscles were flexed.

The year may also come to be remembered as the one when an international industrial complex and a national group broadcasting leader got together to form a CATV manufacturing/marketing giant.

J. Leonard Reinsch (left), president of Cox Broadcasting and Edgar J. Kaiser, president of Kaiser Industries, shake hands to form the Kaiser-Cox Corporation.

Key employees prepare the new Kaiser-Cox production/marketing program.

True, plans do not a giant make, but trenchant and dynamic personalities such as Edgar F. Kaiser and J. Leonard Reinsch do not make plans lightly. Men of their caliber are not in the habit of settling for second place. Only time will tell, but an extremely compatible marriage seems likely in the recent announcement of a Kaiser-Cox venture into the manufacturing and marketing race for CATV equipment sales.

Kaiser engineering and production know-how go back to World War II days and Liberty ships that helped win the battle of supply logistics. The public laughed when Henry J. Kaiser said he would show the nation how to turn out supply ships and tankers every few days instead of the then existing one a month schedule. Before many months had passed, a force of 97,000 workers at Richmond, Calif. were turning out ships on the average of one every day and a half for Kaiser.

The start of what is now the Cox Broadcasting Corporation goes back to the early 1920's when WSB became known as the 50,000 watt clear-channel "Voice of the South." Under the competent guidance of J. Leonard Reinsch, the company eventually spread from coast to coast with radio and/or television stations in such key markets as San Francisco, Pittsburg, Miami, Dayton, Charlotte, and Atlanta. A wall 50 feet long in "White Columns," the gracious home office of CBC, is completely covered from ceiling to floor with awards accumulated from the broadcasting industry throughout the years and testify to the leadership enjoyed by this group broadcaster.

The posh setting of a recent press luncheon at "21" in New York City that was well attended by such members of the fourth estate as Dun's Review, Barron's, Forbes, The Wall Street Journal, AP, UPI, New York Times, Chicago Tribune, Business Week, and Variety, to name a few, was indication enough that the Kaiser-Cox Corporation announcement was a news-making event. CATV in general had become big news and here were big names in the news.

As usual, goals were set and predictions were made, but somehow or another Kaiser-Cox got across the message that they were really serious about becoming number one in the CATV equipment manufacturing business. Even though Kaiser CATV was not entirely new to the field, and even though Cox Broadcasting has hinted on several occasions

that they would become a manufacturer, no one in the past felt that they had serious designs on capturing a major portion of the market. These doubts have been dispelled as all indications are that Kaiser engineering and production, coupled with the Cox name in broadcasting, will support a major Kaiser-Cox effort to become a leading CATV supplier.

When questioned as to their seriousness in this new venture, Edgar Kaiser, president of Kaiser Industries, was quick to reply, "I think you will find that both companies have ample capital at their disposal and I assure you that we will use whatever monies necessary to maintain a steady production flow of quality CATV equipment and keep pace with the rapidly expanding CATV industry."

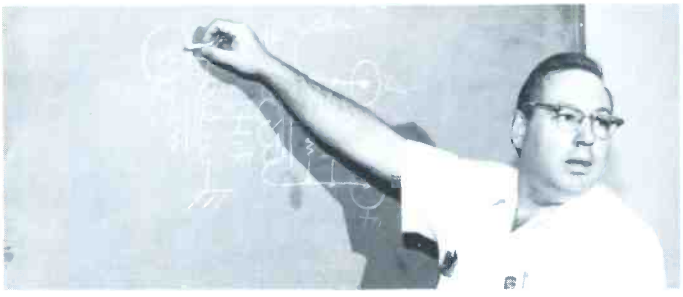
Perhaps it should be noted here that Kaiser's annual sales volume will be in the neighborhood of 1½ billion dollars for 1965. This in itself is some indication that financing will be no problem with Kaiser-Cox.

As explained at the press conference, the new corporation will be strictly a "fifty-fifty" proposition. Kaiser will own one-half of the company and Cox one-half. Kaiser brainpower will concentrate on research and development, engineering, and production. Cox will be the managing company and concentrate on product promotion and marketing. Kaiser-Cox feels that the broadcaster is fast becoming a significant factor in the future development of CATV. Cox Broadcasting Corporation is already the leading group broadcaster in CATV. In system subscribers, CBC is rated sixth in the CATV industry, and first among group broadcasters.

When asked the question in an exclusive interview by *TV & Communications* magazine as to what his company would do in Atlanta, Georgia if someone wired the city for cable television (this is the home office of CBC and Cox-owned WSB-TV), effervescent Leonard Reinsch parried the question without hesitation by replying, "If any of the Cox-owned television stations cannot successfully compete with CATV, they do not deserve to remain in business. We believe in free enterprise and do not request government protection." Few group broadcasters hold this charitable but sensible attitude toward the cable business.

When asked "why Kaiser?" Reinsch gave a twofold reason for Cox's enthusiasm over the new association. "We feel that Kaiser has developed the finest line of equipment on the market today and we further feel that the future belongs to the company who has the strongest research and development department. After talking to a number of manufacturers, we feel that the Kaiser brainpower and production record will allow us to move into the number one spot in the CATV equipment manufacturing business."

In an exclusive interview by your editor, it was further learned that only twenty days elapsed from the time Cox first approached Kaiser Aerospace and Electronics until the ink was drying on final agreements between the two companies. This would indicate both seriousness and compatibility on the part of the two parent companies as well as their ability to move quickly.



Solid state schooling is a vital part of training the Sales Engineers who will man the Kaiser-Cox Sales/Service Wagons.

Kaiser-Cox plans call for the establishment of warehouses for both technical assistance and sizeable equipment inventory on a nationwide basis. Warehouse facilities will be located in Atlanta, Pittsburgh, St. Louis, Portland, Oakland, and at the Phoenix plant. Sales/Service Wagons will work out of the warehouse and district office locations to provide "on the spot" parts delivery and technical assistance. These station wagons will be equipped with test gear as well as component parts and will be manned by Kaiser-Cox sales engineers.

The company has already moved into new, larger quarters in Phoenix and production is being substantially increased. New equipment is to be in a heavier aluminum housing and the line will be strictly solid state. According to Kaiser-Cox, all warehouses and the Sales/Service Wagons will be fully stocked with a new line of Kaiser-Cox equipment by December 31.

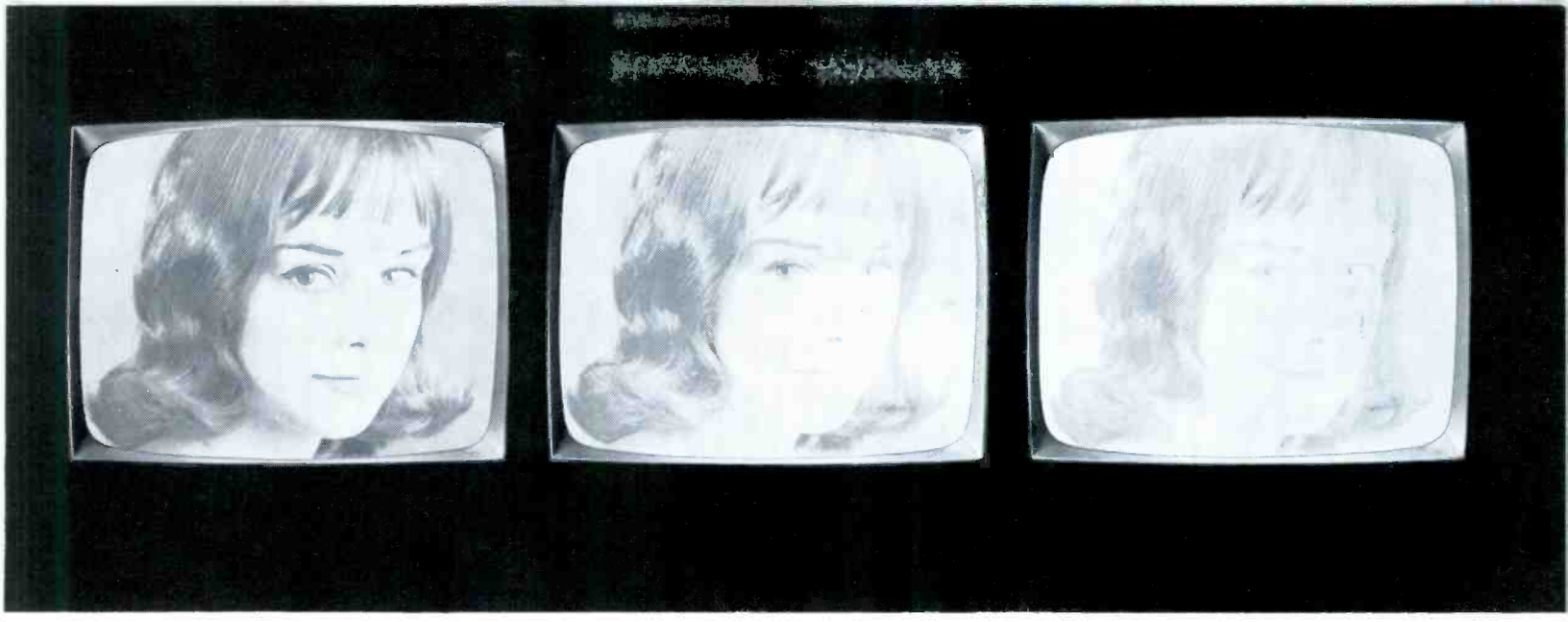
In regard to this delivery date, Reinsch said, "Kaiser-Cox will not make a promise of delivery or equipment performance that cannot be fulfilled as promised. Once a promise is made, Kaiser-Cox will fulfill it to the letter regardless of time, effort, or cost. We will not demonstrate or sell equipment until the quality is proven and until we are ready to supply on a line production basis." The company is presently organizing a construction department and turnkey operations will be part of the "new look."

The Kaiser-Cox engineering department is presently preparing system layouts for six major turnkey jobs.

The new Phoenix plant boasts a large, complete machine shop for proto-type equipment construction.

It has also been learned that Kaiser-Cox is on the verge of making an exclusive agreement with a major cable manufacturer to assure an uninterrupted source for coaxial cable.

Key officers and personnel for Kaiser-Cox include Edgar J. Kaiser, chairman of the board; J. Leonard Reinsch, president; Gary Langseth, vice president in charge of marketing; Clay Bedford, vice president; William Freistat, vice president; Marcus Bartlett, vice president, and Earl Hickman, vice president. □



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INSURANCE FOR CATV SYSTEMS

By A. A. Freeman
Associated Agencies, Inc.

Business organizations are confronted today with dozens of problems that make it difficult to earn a reasonable profit. CATV operators, like those in other businesses, are also confronted with many puzzling and disturbing situations. Obtaining franchises, getting proper financing, defending one's self from local stations and networks which may be trying to prevent the CATV operation from succeeding, telephone company interference and many other difficulties make the business a challenge and a cause for real concern.

One problem that need not cause the CATV operator worry is that of insurance. Adequate coverage is available and competent insurance underwriters are prepared to assume the risks.

But CATV is an unusual business. It's operations are unfamiliar to many insurance men, who may be well qualified in other fields. Many successful insurance underwriters avoid taking risks that are unknown to them, and for which little statistics are available. Forms of coverage and types of policies must be designed especially for the CATV industry, and because most of the insurance companies have had no experience and possess no knowledge of what is needed, many necessary provisions may be omitted and result in pitfalls for the operators.

Those agents who have served the industry for the past ten years, have learned by experience the problems that exist and can normally advise and represent CATV interests with competence. This can mean increased security and larger profits to the operator.

Bond Requirements

The first problem that presents itself to a new operation is one of financial responsibility. Communities which grant franchises and utility companies which grant pole line agreements usually want surety bonds and performance bonds to guarantee that the terms of the contract will be properly executed. This requires a bond which should be obtained from an acceptable surety company, and which is available to an operator who can show a satisfactory financial statement. A competent insurance agent can advise and obtain these bonds.

Property Coverage

The owned property represents large real values, many of which are exposed to the elements of fire, windstorm, tornado, lightning, explosion and damage done by vandals and rioters. Usually, one begins with the tower and "head end" equipment, and includes the run to town, with all the miscellaneous equipment used. Next there is the trunk line that is exposed to natural hazards. Few operators insure themselves for loss to the tap-offs, because service men who do installations can often make repairs without the need of extra expense to have damaged equipment replaced.

Owned property also usually includes office equipment at company headquarters and sometimes coverage for the building if owned by the company. Installation equipment and repair parts inventory can be easily lost, stolen or destroyed and insurance is readily obtainable. Automotive equipment can represent substantial values and, of course, insurance must be provided. Specially designed "All Risk" policies and multiperil contracts can give maximum protection at minimum costs.

Liability for Personnel

The responsibility to employees and non-employees for bodily injury or property damage is probably the most important consideration.

Workmen's Compensation insurance is essential. State laws must be observed and the insurance contract must follow the requirements of the law. Some states require that insurance be carried even if there is only one employee in the state. Others have different qualifications and regulations. One must be acquainted with the law in each state in which operations are conducted in order to be secure.

One must be concerned about the general public, or persons who are not employees. The danger of injury, real or imaginary, is great and the competence of the insurance underwriter is tested if he omits important provisions in the insurance policy. Courts today are more than generous to injured persons and the operator must be insured carefully and adequately to avoid disaster. Policies must cover all usual operations, products and completed operations, independent contractors, hold-harmless agreements which add all assumed liability as well as legal liability. Bodily injury, property damage, personal injury and in some special instances, loss of the means of support are hazards that must be considered.

Other Insurance

Losses from the interruption of service can be costly. If a storm breaks a line, or if fire or tornado destroys a tower, refunds would be expected by customers whose service was unavailable until the damage was repaired. This insurance must be carefully designed to protect where risk exists, and coverage avoided where there is no possibility of a loss.

A wide variety of miscellaneous coverages are also to be considered. Coverage for Burglary and Theft of money or equipment may be needed if values are high. Special contracts for valuable papers, plans and records that could be destroyed and replaced only at great cost, can be prepared.

Fringe Benefits

Finally, employees today look for fringe benefits, and in the competition for qualified men and women, the market usually includes Group Life insurance, Group Hospitalization including Major Medical benefits, accidental death and long term disability. In some cases profit-sharing and pension plans are important in building a valuable, competent staff. No item in the CATV business can be more expensive than poorly planned and improperly written insurance contracts. □

TIMELY! CONCISE! ACCURATE!

THE SINGLE, INDEPENDENT WEEKLY NEWS SERVICE DESIGNED FOR CATV EXECUTIVES

On October 13, the FCC enacted the Community Antenna Relay Service. The following Monday morning, Cable Television Review subscribers had detailed information on this action—several days before official FCC notices reached the industry. On September 27, subscribers read a statement by AT & T spokesman, denying reports that Bell would manufacture CATV equipment. This statement was reportedly exclusively in the Review, as the result of a staff interview of the AT & T official.

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The Weekly News Service of TV & Communications Magazine
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THE CATV TEAM

R. L. COWART
System Construction Company

One of the most frequently asked questions from recent entrants into the CATV field is for information relating to the establishment and operation of the system operating group. Efficient operation results from an organization designed to meet day-to-day problems with established businesslike procedures. The most successful form of operation has been the establishment of three distinct groups charged with definite responsibilities. These are Office Force, Chief Technician and Technical Group, Line Foreman and Line Group. These three groups are directly responsible to the System Manager for the following areas:

The Office Force is responsible for all routine office operations which includes receiving and recording of complaints, connect and disconnect orders, moves, etc. They are also charged with the responsibility of customer records, collection records etc., and assistance to the Manager in computation of material to be reported to the owner or central office. Any person in the office should have a general concept of the operation of a system so that they can intelligently and promptly answer customers' requests for information. They should be instructed in the common TV set faults so that they can avoid the issuance of service orders for such obvious complaints as black screen, dead set, etc.

The Chief Technician is responsible to the Manager for the technical operation of the plant. This includes the assignment and disposition of reception complaints, routine amplifier maintenance, determination of amplifier location for new construction and all other areas involving the actual electronic components of the system.

The Chief Technician is also responsible for the establishment of those maintenance practices required to assure continuing high quality signals delivered to the customers. This should involve the establishment of a series of test points through the system at which level checks and picture quality determinations are made.

The Line Forman is responsible to the Manager for the balance of the physical plant that does not fall into the electronic equipment or signal quality catagory. He is responsible for the assignment and disposition of connect and disconnect orders, moves, and trouble calls. In the case of extensions by local forces the Line Foreman is further responsible for the establishment of standard installation procedures in order to make the most installations with the least cost and time involved.

The Chief Technician and the Line Foreman are responsible for the material control for their respective areas. This means that each one should be aware of his inventory status and initiate his required purchase requisitions for the Manager's approval to insure enough material in stock for the work at hand and in anticipation of future work.

These three leaders should meet with the Manager at least once each week to coordinate activities and to provide for an orderly flow of work and exchange of information. ☐

ROHN® tower NEWS

Published by Rohn Manufacturing Co. for those who need communication towers for any purpose

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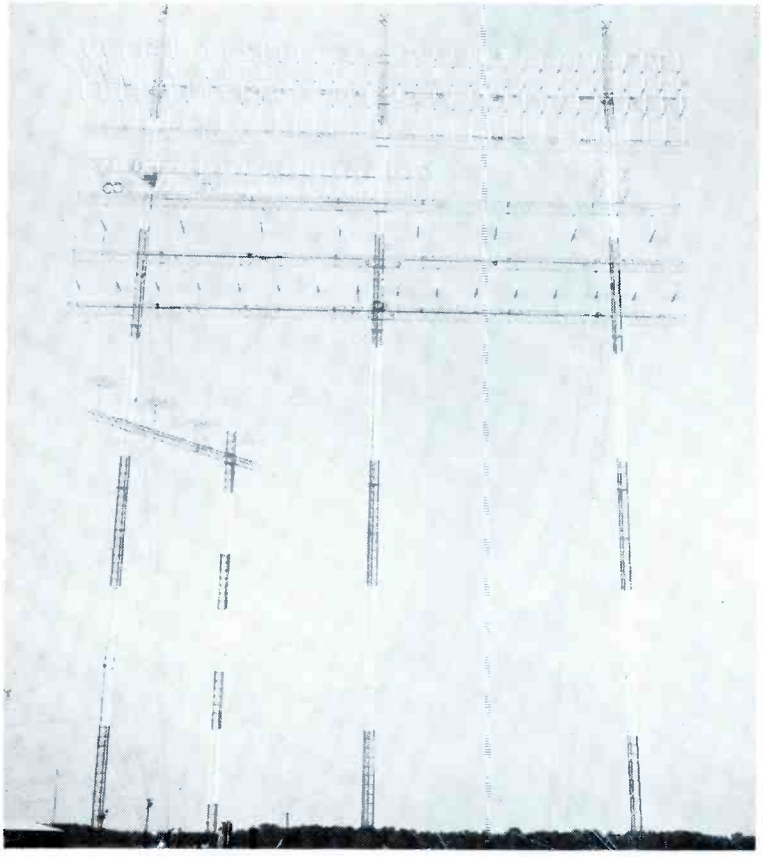
Shown below is a series of four special ROHN towers for a Jerrold-Taco CATV antenna installation. Towers are engineered, manufactured and installed under complete ROHN supervision for unsurpassed strength and dependability in CATV use.



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GULF COAST TV ORIGINATES PROGRAMS FOR

CATV PUBLIC SERVICE

(Editor's Note: Information on the Naples Tel-A-View was prepared by Richard L. Cox, General Manager of Gulf Coast Television. We invite other cable system operators to submit articles on their local activities that would be of interest to the CATV industry.)

Gulf Coast Television is located on the Gulf Coast of Florida, some 100 air miles from Miami. Our closest television station is 40 miles to the North of us in Fort Myers. There is a local radio station in Naples, but Naples does not have its own TV station since it is a relatively small town and cannot support one.

Shortly after Palmer Broadcasting acquired the cable system in Naples (March, 1964), we purchased and installed a weather channel to be used in the system. We also purchased a camera for use in local productions of public service programs. Our original programs were half-hour shows on subjects of interest to our community, such as: Chamber of Commerce activities, civic club projects, water conservation needs and many, many others. We have a rather interesting history in Naples and this history prompted us to have an "Old Timers' Night" on NAPLES TEL-A-VIEW during which Old Timers would have the opportunity to tell of the humorous happenings of the past. This program was a real hit with the people of Naples.

Finally, the City Manager, the Mayor and I proposed to the City Council that we televise the City Council meetings in their entirety. This would help create interest in city government and allow many people to view their government in action from their own living rooms. The idea was accepted and we now televise the regularly scheduled meetings each first and third Wednesday of every month. The first program of our NAPLES TEL-A-VIEW of a City Council meeting was truly a success since one councilman was in the hospital and was able to view the meeting from his bed.

Gulf Coast Chief Engineer (extreme left) operates TV camera televising Naples-On-The-Gulf City Council in action.

Our facilities are rather simple and uncomplicated. NAPLES TEL-A-VIEW emanates from City Hall. We use a Sylvania-400 camera and feed the video into a Jerrold Teletrol. Our audio equipment is tied directly into the councilroom public address system. A line was run from City Hall to our office (we are fortunate enough to be only a block from City Hall). We are utilizing spare feeder lines and amplifiers to transport the signal back to the beginning of the cable system where it is mixed with the other channels coming in from our antenna site.

We presently have another project underway which will add to NAPLES TEL-A-VIEW. We have a hurricane season in Florida each year which begins in early August and ends in September. During these months Floridians anxiously watch TV and listen to the radio for hurricane announcements. In Naples the radio station and the Civil Defense organization work very closely together. We have, in the past, installed equipment which allows our weather channel to provide up-to-the-minute information on hurricane activity. In addition to this, we are installing another cable line into the Civil Defense headquarters in order that we may televise the activity there if a hurricane is heading toward our general vicinity. We will be working very closely with the local radio station in providing this additional public service.

We have no commercial sponsors of any kind on our programs. Both the weather channel and NAPLES TEL-A-VIEW are strictly services provided by our company for the benefit of our subscribers.

In addition to the new hurricane advisory service, we have been contacted by groups within the city to televise the Chamber of Commerce Quarterly Reports, Meet Your Candidates (local elections) and Swamp Buggy Review (local celebration).

We feel that we are making a significant contribution to our city through our occasional shows on NAPLES TEL-A-VIEW. □

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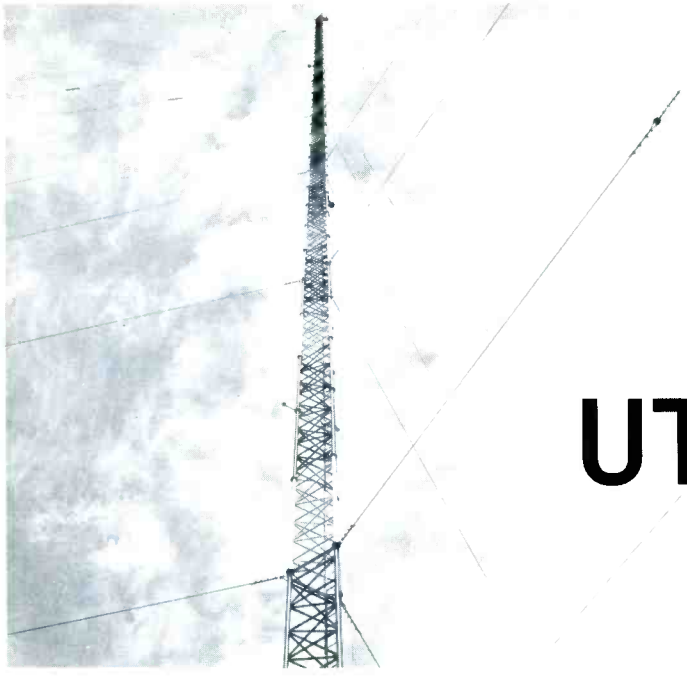


TV & COMMUNICATIONS VISITS

UTILITY TOWER

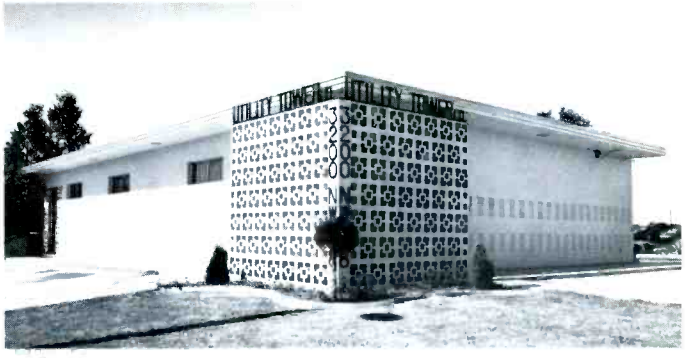
Bud Duval, the general manager of Utility Tower Co., leaned back behind his work-piled desk, smiled and asked, "Where do I start?" Already feeling completely at ease in his friendly office, we suggested that he give us a brief run-down on the history of the company. We were rewarded with a fascinating account of the growth of Utility Tower Co. "In 1919," he said, "Clete Nelson founded Utility Tower Co. Looking around at his modern office, he added ironically, "at that time we had a total capital of all of $53."

From where we sat, it was easy to see that this dynamic Oklahoma City based industry had come a long way from that start. From every room in Utility's modern office building, one can look out over sprawling plant facilities — all bustling with activity.

Proceeding with his story, Bud continued to display the warmth and humor that we found to be characteristic of every employee of the company. "Clete had, at that time, 14 years of tower experience and the aforementioned money.'" He also had, we later found, a dream of producing modern, streamlined towers to replace the bulky, inefficient, unattractive models then being used. And, although neither Bud nor Clete Nelson ever stated it in the course of our visit, we discovered that they were literally pioneers in the production of the type of towers we are familiar with today!

Prior to 1949, this company was a distributor and erector.

Clete Nelson, president and Bud Duval, general manager of Utility Tower.



Upon the formation of Utility Tower Co., however, the facilities for producing its own towers were acquired. First serving the Southwest, they grew fast and now have towers around the world.

Bud turned and gazed happily at a map of the United States. Each one of the red pins which completely covered the map represented a Utility tower. He estimated that approximately 85% of the broadcast towers installed in the past several years in America were made by Utility tower.

Also in wide use, he added, are CATV towers produced by Utility. In reference to this, we asked how many sales representatives were now on the road for them. "None!" he answered. "We are in a rather enviable position in that respect. Even though we have no direct sales representative on the road, we are actually struggling to fill the orders for CATV towers for independent owners and companies like Jerrold. In addition, orders for broadcast towers are constantly coming in from organizations such as Collins Radio, Gates, and RCA whose salesmen include Utility towers in their package sales."

To keep up with this demand, Utility maintains a separate office and plant in Mayfield, Kentucky ably managed by Nate Sholar, to serve the eastern states. "We have found it necessary to employ between 60 and 100 people at all times depending on the need for erection crews across the country and around the world." Even though Bud made the entire process sound simple, we were well aware that we were sitting in the office of one of the largest tower manufacturers in the world.

After this brief but informative account we were treated to a grand tour of the facilities by both Bud and Jerry

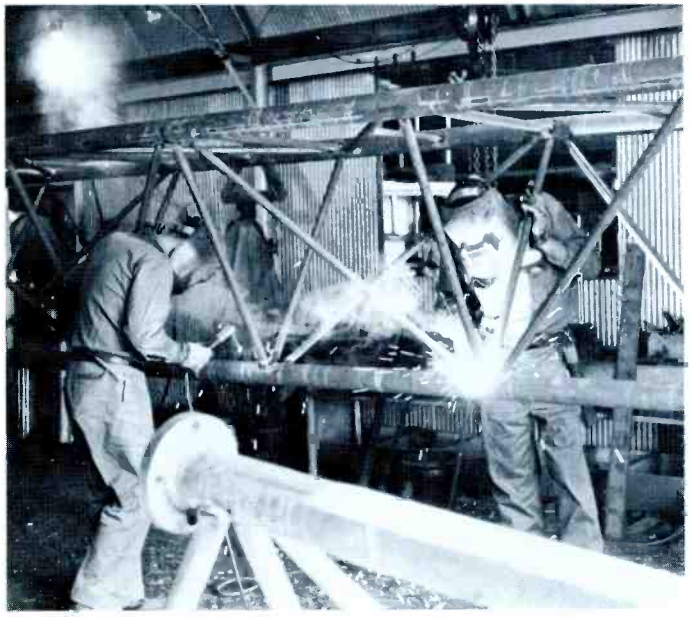
Clete Nelson, president of Utility, points to remote tower site for Phil Cook (left) and Patrick Pogue of TV & Communications Magazine.

Bennett, Utility's structural engineer. First stop was the engineering department where, Jerry explained, "every tower is born on a blackboard." We observed, that from there, the idea goes into Jerry's hands and evolves into a massive collection of facts and figures which indicate (even to the layman) exactly how the tower is to be designed, fabricated, and erected. "It's not unusual", Jerry commented, "for us to spend weeks on the specifications for one tower—one which we may or may not sell. This way, though, we can show our customers exactly what the job will require and exactly what the expense will be."

After this planning phase, Utility Tower performs a service which they feel is unique—a complete, quality, ink drafting of the job for presentation to the customer. This service is ably performed by Carol (Kookie) Cox.

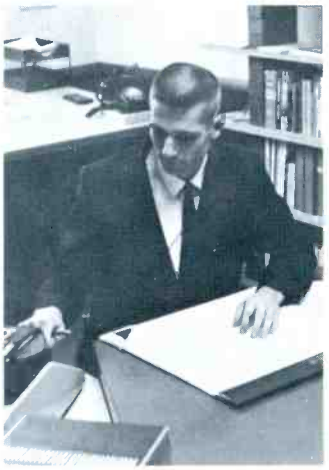
Duly impressed with the engineering department, we were then guided to the plant itself which is headed by C. H. (Chet) Moseley, plant superintendent. He is responsible, according to our hosts, for every facet of the fabrication of the towers. Working from the engineer's detailed plans, he orders the materials required and oversees their assembly.

When asked about "quality control" Chet smiled and said that that was a pretty fancy term for what was just standard operating procedure at Utility. He reminded us that each man working there represented years of tower experience, and that, under their watchful eyes, it was not unusual for towers to be completely reconstructed because of some minor flaw. This on-the-job inspection is also supported by a five year guarantee, he said.



Rusty Taylor and M. L. Kennedy add their welding skills to the construction of a Utility tower.

Perhaps the biggest surprise on our tour came when Bud Duval referred to their "solid-state towers". Noting the puzzled look on our faces, Bud led us over to a tower composed of what looked like very slender but conventional pipe. Upon examination, however, we found that the tower was actually made of solid round steel bars! Bud indicated that this was expensive, but that it paid off in the long run because it eliminated internal corrosion, was much stronger than conventional angle iron and reduced the wind load area. "Much more labor is involved in fabrication," he said, "because the greater number of supports required. But many of our customers wouldn't have anything but solid round steel towers!"



Jerry Bennett compiling the numerous calculations necessary before each job.

Carrol Cox deliberates over an ink drafting.

We were intrigued by this discovery, and asked if any other tower manufacturer was presently making towers of this sort. Bud said that he knew of only one other company which is involved in this type of fabrication. We remembered that towers composed of steel tube were a tremendous advance over angle-iron towers. And we wondered whether solid steel towers might be heralded as the next major improvement in CATV towers.

Another interesting stop on our tour was at Utility Tower's complete facilities for constructing reflectors. Each reflector, Jerry Bennett announced, "is built for the particular requirements of the individual order, and is engineered to a

Tower section in tack-up jig.

If you're buying a "turn-key" CATV system, make them prove you're getting Plastoid welded aluminum sheath co-ax; it's stronger than seamless!

It's the same whether you buy or build. If something should go wrong later, recourse can be difficult indeed. So you want to start with the very best.

With Plastoid welded aluminum sheath co-ax, you get the ultimate in strength and lasting performance. We're years ahead in cable-making.

Plastoid bends precision rolled aluminum strip into a uniformly concentric sheath, then welds it together by means of UHF-radio frequencies. This way we avoid crystalizing the metal grain structure, avoid the pushing and pulling that goes with making seamless cable and that makes for thin spots, thick spots—points of potential breakage.

Plastoid's UHF weld is actually stronger than the metal in the rest of the sheath; yet the seam is the same thickness as the wall.

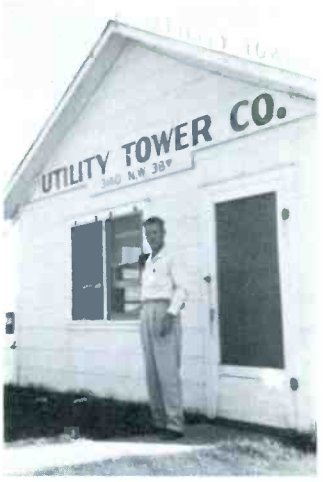
Further, the exclusive Plastoid manufacturing process permits unequalled lengths—up to a mile for our TA-5 half-inch trunks and TA-4 .412-inch feeders, 2,000 feet for TA-8 three-quarter inch head-end cable. Less need for splicing where moisture can penetrate, radiation leak out.

As color TV comes in, you owe it to yourself to know that your CATV system is built for technical stability. Whether you are buying a "turn-key" system, or building your own, we will be glad to provide you with complete information about the finest aluminum sheath cable made today. It's UHF-welded. It's by Plastoid. Exclusively. Write, wire or call us today.

PLASTOID CORPORATION

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

Plant supervisor, C. H. (Chet) Moseley checks the specifications for a tower.



The very first Utility Tower building.

guaranteed flatness of face of plus-or-minus 1/32 of an inch!" At this point Bud became quite serious and commented that, "the reflectors we build are among the finest made. We take a lot of pride in our work here."

Also on hand was what must be the world's longest lawn mower. Designed for trimming the grass under long stacks of supplies, it is actually a very useful tool. "We may not be pretty but we're practical" Bud joked as he posed for our camera with the twenty-foot long machine.

After this entertaining and highly informative tour, we sat down with Bud Duval, Jerry Bennett, assistant manager Jim Nelson, Ronald Nelson, and the head of the company, Clete Nelson, for a cup of coffee in their plush conference room. The Western Division manager, Dutch Giroux, was out of town.

In Mr. Nelson, we found more of the warmth and humor which we had noted in every one of our hosts that day. He turned out to be a very cordial host. Relaxed and friendly he, like Bud and the rest of the staff, seemed eager to make us feel at ease and welcome.

Most entertaining was his account of the unusual construction jobs handled by Utility Tower. "It might be worth mentioning, he said, "that we constructed the communications tower at President Johnson's Texas ranch—too bad we had to build it in Lady Bird's flower bed."

Although modest about his company's accomplishments, we pressed him into admitting that "it can honestly be said that we were pioneers in the design and construction of streamlined and durable towers. And, we are still experimenting and moving ahead. Each new job is a challenge to our staff to construct the best tower for the smallest amount of money. This quite often requires innovations in design and construction. Bud, for instance, once stayed up all night to design our first self-supporting tower for a customer that wanted almost immediate delivery."

Listening to this seemingly relaxed but very dynamic man, we came to realize that he is very enthusiastic about the remarkable capabilities of his company. "We believe that service to the customer is the only way to build a company," Mr. Nelson said.

As we left Utility Tower, perhaps the predominant feeling we had gained was the "pride in accomplishment" evident in every member of the firm's staff.

We found no pretenses here. In fact, the company seems to function with a minimum of formality. We found, instead, a group of people intently dedicated to producing quality equipment. Their avowed aim? To produce the best product for the lowest price through constant testing and experimentation. ☐

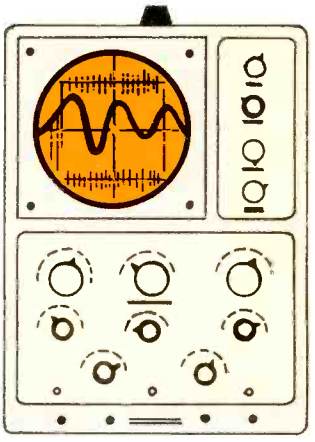
NOVEMBER 1965

CATV TECHNICIAN

DAVCO crew at work adjusting antenna arrays at Winthrop Rockefeller home, Winrock Farms, Petit Jean Mountain in Arkansas.

- Impedance Discontinuities in CATV Cables
- Newest CATV Equipment

IMPEDANCE DISCONTINUITIES IN CATV CABLES



By Walter L. Roberts
Superior Cable Corporation

Demands for improvements in signal transmission uniformity have probably been experienced in every CATV system operating today. The need for upgrading existing service through additional channels has often exposed system non-uniformities which were not at all obvious while carrying only a few channels. Similar problems have become evident only after initiation of color transmission. In recent years, new systems involving longer cable trunk runs have shown effects from irregularities which would probably have gone undetected in shorter runs.

Some of the factors affecting uniformity in coaxial cable plant are reviewed in this article. Except for the effects on cable impedance characteristics, no attempt is made to describe nonuniformities in associated electronic equipment inserted into the cable system. Most of the descriptions are based on the effects the discontinuity produces on a transient pulse traveling along the line. These are much easier to visualize than in the case of steady-state alternating currents and, anyway, the two modes are completely correlated mathematically.[1]

The effect of impedance discontinuities on steady-state operation is best determined through input impedance measurements (and calculations). Input impedance of the line may be measured at a particular discontinuity or it may be at a point along the cable remote from the location of the nonuniformities. The performance of the line, or its deviation from normal, is determined by the impedance it exhibits at a frequency or band of frequencies.

Also presented are charts showing relationships between cable impedance uniformity and attenuation uniformity. These are shown both for the case of discrete discontinuities and for the case of periodic, distributed discontinuities along the cable.[2] These two sources do not result in equivalent impedance deviation attenuation relationships.

One of the most common source of discrete discontinuities in trunk cable results from the use of jumper cables, usually at amplifier locations. Actual test data showing effects on return loss and transmission uniformity are given for some typical jumper — amplifier combinations. Also displayed are curves showing effects of moisture in connectors at these junctions and, particularly, the frequency dependence of these effects.

Single and Double Impedance Discontinuities

Consider a "long"* coaxial cable whose impedance is uniform along the length but which abruptly increases to a larger value at a single point, then remains uniform over the remainder of the length. The cable is "long" in both directions from the discontinuity.

Assume a positive polarity pulse is traveling at the velocity of propagation of the cable and suppose it passes through the junction into the larger impedance portion of the cable. At the junction some of the energy is reflected back toward the origin. Encountering an impedance increase at the junction, the reflected pulse is also of positive polarity and its shape is a replica of the pulse just as it encountered the junction. (The pulse shape may be distorted from its original shape but this is a result of attenuation and phase distortion while traveling from the point of origin along the cable.) The magnitude of the pulse is proportional to the impedance change . . . for small impedance difference. In the extreme case of an increase in impedance (i.e., an open circuit) all of the energy is reflected.

If the pulse were traveling from the opposite direction and thus encountered an impedance decrease, the only difference from the above case would be that the polarity of the reflected pulse would become reversed. In the extreme case of a short circuit, again all of the energy would be reflected but the voltage amplitude at that point would be zero.

Instead of one, imagine two discrete impedance increases separated a short distance from each other but otherwise located a long distance from either cable end.

Again, assume a positive pulse traveling from the smaller toward the greater impedance section of cable. A portion of the energy is reflected from the first junction without polarity reversal and an additional portion is similarly reflected from the second junction. If the transit time of the pulse between the two junctions (round trip) is small compared to the time duration of the pulse, then the amplitudes of the two reflected pulses tend to add together. As the separation between junctions increases (or if the width of the pulse is decreased), the two reflections tend to resolve into distinct pulses.

If a signal of positive and negative pulses alternating at a fixed frequency is applied to this cable, a special case arises where the pulse transit time between discontinuities is comparable to the time between successive pulses.

1Fuchs, G., "Reflection in a Coaxial Cable due to Impedance Irregularities", Proc. IEEE, Vol. 99, Part 14, 1952.

2Fuchs, G. and Peltier, Y., "The Influence of Small Systematic Impedance Irregularities on VHF Performance of Coaxial Cables," presented at IEEE Electronic Division Symposium, London, February 1964.

*Here a "long" cable refers to one which has appreciable attenuation at the frequency or band of frequencies under consideration say, perhaps, a 15 or 20 db section.

When the junction separation and pulse repetition rate are such that a pulse returns to the first junction just as the next pulse reflection occurs (a quarter-wave section) the two reflections tend to subtract by virtue of their opposite polarity. If the distance between junctions were doubled (producing a half wave section), a reflected pulse would return to the first junction at the instant a reflection of like polarity had occurred at the first junction. Thus the amplitudes add to each other and produce a very pronounced effect under this set of circumstances.

Another form of double discontinuity occurs when an impedance increase is followed by a second junction at which the impedance decreases. Here polarity reversal of a pulse occurs at one junction and the two reflected pulses tend to cancel when the transit time between junctions is small compared to the pulse duration. As the separation between junctions increases, the time delay becomes sufficient that separate reflected pulses are resolved.

For a repetitive set of alternating pulses as described previously, the results applied to this case must be interchanged because of the polarity reversal; i.e., reinforcement of the reflections occurs for a quarter-wave section, subtraction occurs for a half-wave section.

One other variation of the double (increase - decrease) discontinuity which is of practical importance can arise when two short (compared to the pulse width) double discontinuities occur separated by a distance compar-

TABLE I

RETURN LOSS (db)	VSWR	REFLECTION COEFFICIENT	ATTENUATION DEVIATION PERIODIC (%)*	JUNCTION (db)
1	17.15	0.890	860	6.8
5	3.56	0.562	92	1.7
10	1.93	0.316	83	0.45
13	1.57	0.224	11	0.22
16	1.38	0.158	5.0	0.10
19	1.25	0.112	2.5	0.056
21	1.20	0.090	1.6	0.036
24	1.14	0.063	1.0	0.020
27	1.09	0.045	0.5	0.006
30	1.064	0.031	0.2	0.004
32	1.057	0.025	0.1	0.003

* AT THE "RESONANT" FREQUENCY OF THE CABLE PERIODICITY

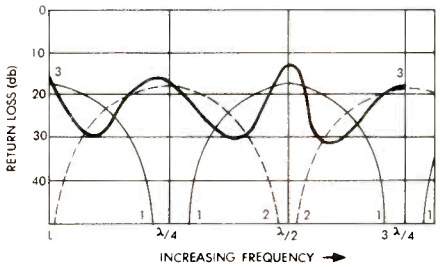
able to the quarter- or half-wave sections already discussed. Two double discontinuities representing impedance increases (or decreases) affect repetitive alternating pulses much as in the case of the stairstep type discontinuity just discussed. Pairs of double discontinuities changing in opposite directions are similar to the double (increase-decrease) discontinuity. In such cases as these, the resultant reflected pulses are not replicas of the incident pulse shape.

Many combinations of these discontinuities can be conceived but the preceding illustrate some of the more common forms encountered. A simple rule for visualizing results of various combinations of discontinuities is to remember that phase reversal accompanies reflection from a decreasing impedance junction—no reversal from an increasing impedance junction.

Input Impedance Deviations

The input impedance of a line containing discontinuities can vary radically over even a narrow band of applied frequencies. In fact, measurement of input impedance deviations of cables provides one of the most sensitive known means of detecting discontinuities. The most common technique employs swept-frequency equipment and results are usually reported as return loss in decibels or as VSWR (See Table I). In practical work only the modulus of the input impedance deviation is determined.

A single impedance discontinuity



CALCULATED RETURN LOSS VS FREQUENCY OF VARIOUS DOUBLE DISCONTINUITY CABLE SECTIONS. (1) 90-OHM CABLE, 75-OHM SECTION L, 90-OHM CABLE, (2) 90-OHM CABLE, 75-OHM SECTION L, 90- OHM CABLE, (3) 125-OHM CABLE, 75-OHM SECTION L, 60-OHM CABLE

FIGURE 1

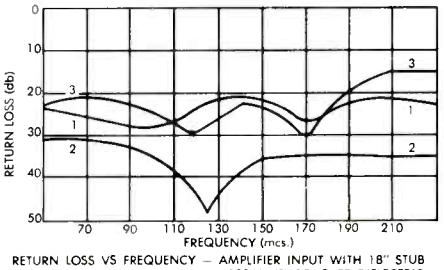
along an otherwise uniform cable produces an input impedance deviation whose modulus is constant even though it contains non-constant real and imaginary components. Naturally the magnitude is a function of the size of the impedance step at the junction. But it is also a function of the distance between the junction and the point of measurement. If this distance is too great, the effect on input impedance is small even for large junction steps. The reflected energy is attenuated on the way back from the junction and therefore produces little effect at the point of measurement. This particular effect, incidentally, is responsible for one major limitation of the use of return loss measurements to determine cable uniformity — the method is sensitive only to discontinuities located near the ends accessible for measurement.

Figure 1 shows impedance deviation (return loss) for several combinations of double discontinuities as measured from a point along the cable not too far away. Curve number 3 in Figure 1 is of special interest — the magnitudes of the impedance steps are not equal. At no frequency does the impedance deviation become zero. Complex variants of such curves as this are the rule while idealistic curves such as numbers 1 and 2 are seldom encountered in system measurements. As in the cases described for alternating pulses, oppositely directed discontinuities result in interchanged input impedance deviations — compare curves 1 and 2.

Terminations at electronic devices may exhibit mismatches which act in conjunction with nearby discontinuities to produce double discontinuities generally showing characteristics of some of the pairs just discussed. In the following section are presented details of just such effects.

Coaxial Jumper Cables

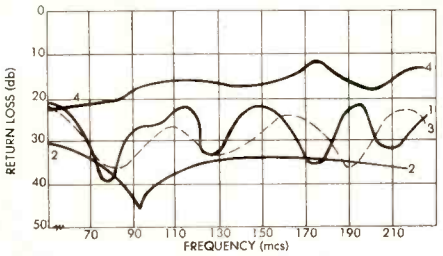
Though it is highly desirable to avoid the use of jumper cables in CATV systems, conditions arise where the practice cannot be avoided. However, the chances for creating a substantial double discontinuity are provided by the terminal equipment and conditions in the connector or splice. The use of an impedance matched connector avoids the more obvious source of mismatch at this junction but environmental conditions (such as the presence of water in the connector) can readily spoil the matched connection. Input and output terminals of typical amplifiers show substantial impedance deviations which also vary considerably over the working frequency range.



RETURN LOSS VS FREQUENCY — AMPLIFIER INPUT WITH 18" STUB CABLE. (1) AMPLIFIER INPUT (SKL 222A), (2) SOLID PE DIELECTRIC 75-OHM 18" JUMPER CABLE, (3) AMPL. INPUT INCL 18" JUMPER, WITH DRY 75-OHM "N" CONNECTORS.

FIGURE 2

The combination of moist connectors and amplifier terminals can produce some startling effects. Figures 2 and 3 are drawn from data measured on actual jumper cable-amplifier combinations. The amplifier specifications indicate better than 20 db return loss, a fact which was substantiated by measurement. However, results as poor as 17 db (Figure 2) were obtained with jumper cable-connector combinations which measured 32 db minimum be-



RETURN LOSS VS FREQUENCY — AMPLIFIER OUTPUT WITH 24" JUMPER CABLE. (1) AMPLIFIER OUTPUT (SKL 22A), (2) SOLID PE DIELECTRIC 75-OHM 24" JUMPER, (3) AMPL. OUTPUT INCL. 24" JUMPER, WITH DRY 75-OHM "N" CONNECTORS, (4) SAME AS (3), EXCEPT CONNECTOR MOISTENED WITH WATER

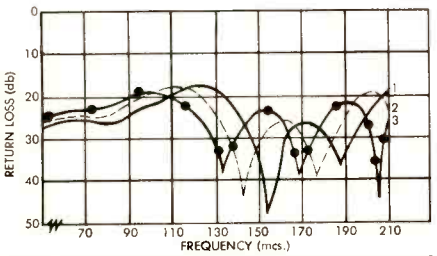
FIGURE 3

fore connecting to the amplifier input. As can be noted in Figure 3, extremely poor return loss values can result when the connector has been moistened.

The effects on an operating system can be better compared if the actual attenuation component resulting from a particular value of return loss is selected from Table I. For example, in Figure 2, a total of 0.026 db would be suffered at 175 mcs. for the two junctions while a total of 0.12 db would occur at 210 mcs. If a long cascaded trunk utilized the same length input jumpers at each location several decibels differential loss would show up even from a very well matched set of jumpers.

A more serious situation is shown in Figure 3, curve 4. Attenuation at 175 mcs. may exceed that at 195 mcs. by as much as 0.2 db per output location. Six or eight decibels of differential attenuation could accrue in a long run. Furthermore, transient dry and moist conditions can cause unpredictable and quickly changing differentials. Obviously this would represent an intolerable situation and most certainly the moisture must be eliminated.

If jumper cable lengths are to be limited to less than a quarter wave length, their utility is lost. A solid polyethylene dielectric jumper would be limited to less than about 8 inches



RETURN LOSS VS FREQUENCY FOR VARIOUS LENGTH JUMPER CABLES CONNECTED THROUGH HALFSTEP EQUALIZER (SKL 499) TO AMPLIFIER INPUT (SKL 222A) (1) 12" SOLID PE DIELECTRIC JUMPER CABLE (2) 18" SOLID PE CABLE, (3) 24" SOLID PE CABLE.

FIGURE 4

at 210 mcs. Figure 4 illustrates one means of reducing the frequency sensitive results which would accrue with a large number of equal length jumpers. By deliberately varying the lengths, the effects can be spread over the working frequency range. Note particularly that jumpers 2 to 1 in length ratio produce effects which approximately annul each other so long as the same terminal impedance is used.

Certainly the most desirable practice is to eliminate jumpers wherever possible. Where they must be used, only a well-matched connector should be employed and all possible precautions should be taken to maintain the connector dry and physically stable.

Cable Periodicities

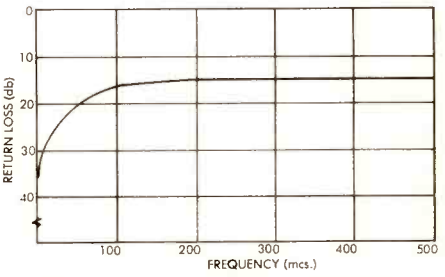
An impedance change does not have to occur abruptly to produce a discontinuity and accompanying reflections. Smoothly changing cyclic variations in local impedance along cable lengths have plagued cable manufacturers at almost every stage of cable fabrication. The resulting effects on input impedance and transmission properties are, in principle, much as has already been described for discrete discontinuities. At a frequency for which the impedance variation period equals a half-wave section, the input impedance increases and a significant increase in attenuation occurs for extreme cases.

At the frequencies encountered in CATV systems, these discontinuities (or suckouts as commonly termed) occur over very narrow frequency ranges — in the order of a couple megacycles. The impedance variations, cycling every few feet, can repeat several hundred or thousand times throughout a cable length. In practice, the narrow band width of the suckout is the primary feature distinguishing this type of discontinuity from the types discussed above.

Almost unbelievably small cable diameter variations, if periodic, can cause a substantial impedance and attenuation discontinuity. Cable diameter variations in a half inch cable of the order of one mil (0.001") can cause intolerable impedance discontinuities in finished cable.

The fourth column in Table I shows the percent variation in attenuation corresponding to a given return loss value *if* the impedance deviation resulted from periodic impedance variations distributed uniformly along the length of the cable. Notice that the attenuation differential (from normal) is proportional to the cable length while that resulting from a single junction is a fixed quantitiy. If a cable containing a periodicity is inserted into an otherwise uniform system, the distributed attenuation excess would occur and, in addition, junction reflections would occur at the terminal ends of the cable because of the mismatch in input impedance at that band of frequencies.

Figure 5 shows another trait exhibited by a cable with a periodic impedance discontinuity. The effective value of the return loss increases with cable length only over a limited length. This is natural because the attenuation of the reflected energy far-



RETURN LOSS AT 148 mcs. VS LENGTH FOR RG 58/U WITH A PERIODIC DISCONTINUITY. PERIOD OF DISCONTINUITY, 26.7". AMPLITUDE OF DISCONTINUITY, ±0.0008" (NORMAL ATTENUATION AT 148 mcs., 7 db/100 FT.

FIGURE 5

ther down the length prevents a substantial contribution to the energy reflected from points nearby. A single discontinuity located a reasonably short distance from a cable end can produce the same apparent return loss as would a set of small but periodic discontinuities. Yet, if these should persist, the small variations can accumulate a large attenuation discontinuity while the effect of the single discontinuity would have been negligible by comparison.

Conclusions

Undesirable signal reflections occur from all sources of impedance discontinuities in coaxial cable. The most serious sources of reflections for the CATV system are those resulting from double discontinuities which, in turn, arise from any number of sources. The most objectionable problem created by double discontinuities is the frequency sensitivity of the input impedance.

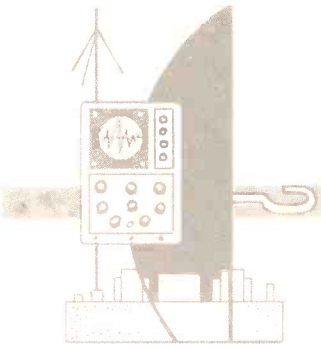
Coaxial jumpers in conjunction with equipment terminal impedances can result in serious double discontinuities in trunk runs, particularly if all jumpers are of equal length. Staggered jumper lengths and well matched and protected connectors will alleviate problems of this source.

For a given input impedance deviation, periodic impedance variations in a cable can produce far more serious attenuation variations than would a single or double discontinuity. □

Acknowledgments

The author is indebted to Mr. F. N. Wilkenloh of Superior Cable Corporation who performed all of the return loss measurements on cable jumper—amplifier combinations.

The descriptions of pulse reflection effects of discontinuities are borrowed from the paper by Mr. G. Fuchs, cited in reference 1. The impedance —attenuation relations for systematic discontinuities listed in Table I are based on work published by Mr. Fuchs and Mr. Y. Peltier, cited in reference 2.



PRODUCT REVIEW

NEW ANTENNA SERIES ANNOUNCED

R. F. Systems, Inc. has announced the development of a series of CATV antennas. The single channel units are tuned for low VSWR and utilize 2" diameter booms and ¾" diameter elements. All materials are corrosion resistant, high strength aluminum and each antenna is electrically tested and field proven, according to the manufacturer. Engineering services are available from R. F. Systems to assist in solving special site problems. For complete specification sheets, contact **R. F. Systems, Inc., 155 King Street, Cohasset, Mass.**

VIKING INDUSTRIES DIRECTIONAL TAP

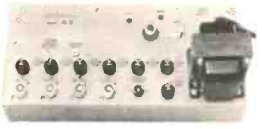
The #935 Viking Directional tap is specifically designed for: trunk lines; as a multiple tap source; or as a bridging device. It is said to provide an output which can be used for distribution amplifiers or hybrid splitters. The construction of the #935 Viking directional tap permits these to be installed without any additional insertion loss or to be removed or changed without effect on the line.

Ghosting and interference is reportedly eliminated by the 30 DB isolation of the tap to the outgoing line. An additional 25 DB isolation between outputs is said to be provided by the Viking 2 and 4 way splitters, #932 and #933 which are designed to be used with the tap.

For more information, write **Viking Industries, 830 Monroe Street, Hoboken, New Jersey.**

ALL-BAND TRANSISTORIZED AMPLIFIER

A fully transistorized, continuous bandwidth bridging amplifier is available from Entron, Inc., according to Edward P. Whitney, vice president. Known as the Model B-2, the new Entron solid state amplifier is directly powered and covers channels 2 through 13 and the entire FM band. It is said to feature 30 db gain and has four fused distribution line outputs. Insertion or omission of one of these fuses determines whether or not power is fed down a particular distribution line.



The B-2 is designed for mounting in a pole equipment housing adjacent to a trunkline amplifier; the amplifier section may be removed without disturbing the trunkline signals. The Model B-2 includes seven "long-life" transistors and a built-in 28 volt or 60 volt transformer for feeding power down the distribution cables. Circuitry also includes changeable pads and manual gain and tilt controls. For additional details and price of the Model B-2 write **Entron, Inc., 2141 Industrial Parkway, Silver Springs, Maryland.**

C-COR CERAMIC TUBE AMPLIFIER

C-COR Electronics, Inc. has announced its new Model 2155 Low Noise Ceramic Tube Amplifier. It is intended for use as an antenna preamplifier, or in any application where it will be subjected to weather. It is available in center frequencies between 50 and 500 mc/s, with bandwidths up to 40% of center frequency. Gain is said to run

between 15 and 30 db, depending on bandwidth. The Model 2155 is designed to operate from 115 volts ac over the temperature range of −30°F to +130°F. Further information is available by writing to the factory at **C-COR Electronics, Inc., 60 Decibel Road, State College, Pennsylvania.**

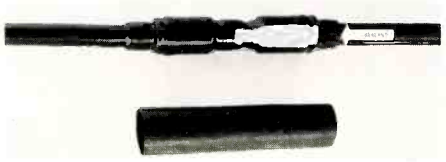
NEW AUXILIARY SERVICE BY WEATHER WARNINGS

Weather Warnings, Inc., has introduced a new concept into CATV weather service in the Southwest. It supplies a continuous live audio report to be carried on an FM or TV channel from 6:30 A.M. to 10:00 P.M. daily. It features present weather conditions and a 24-hour forecast of weather developments in Texas, Oklahoma, Arkansas, Louisiana and New Mexico. This includes: local weather reports and forecasts; winds over lakes and the Gulf of Mexico; travelers and private pilot's weather reports; and forecasts and

radar reports of storm and rain areas. These are reported in relation to the CATV systems serviced. For more detailed information write **Weather Warnings, Inc., P.O. Box 5570, Dallas, Texas.**

SIGMAFOAM SPLICE COVER

Sigma Industries has announced the first thick wall heat shrinkable tubing for waterproofing, insulating and protecting in-line coaxial cable splice connectors as used in CATV aerial and underground systems. The tub-



ing, a modified polyolefin material, has a factory applied sealant which melts and flows at the cable entry points as the cover is shrunk over the connector. The Sigmaform splice cover is available in 3, 6, and 9 inch lengths for application over all standard in-line connectors and cable entrys to amplifiers and splitters. For more detailed information and price write **Sigma Industries, Inc., Menlo Park, California.**

NEW CABLE SUPPORT KIT

GFC Engineering and Sales Corp. has announced its new G-707 Cable support kit. The kit is said to eliminate the need for stocking all the different sizes and types of lashed cable supports normally used in plant construction operations. There is a material savings on a per-foot basis, of over 50% when compared with pre-cut supports according to the manufacturer. The kit has recently been approved by the REA. With the kit, small short straps can be made eliminating the need to cut and waste larger straps. Suggested list price of the G-707 Kit is $3.81 FOB Los Angeles. For additional information write **GFC Engineering and Sales Corp., 11725 Mississippi Ave., Los Angeles, Calif., 90025.**

NEW CAMERA CHAIN ANNOUNCED

TeleMation, Inc. has announced the availability of a low-cost Vidicon camera chain. This chain, designated Model TMC-214, is an adaption of the GE Model TE-14 camera. The addition of TeleMation's Model TMV-101 EIA Camera Control Unit converts the TE-14 camera to full EIA and FCC specifications. A 5-inch transistor viewfinder, Model RE-575, is available for live applications. The TMC-214 is said to feature solid-state circuitry, high resolution, low power consumption, and stable performance. The chain is suited for live, remote, or film application. For additional information and price, write **TeleMation, Inc. 2266 S.W. Temple, Salt Lake City, Utah.**

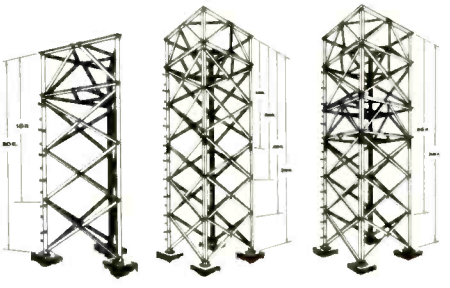
"CATV? Never heard of it.
Now here's a good uranium stock we're recommending."

PREFORMED LINE MAKES MOVIE

Preformed Line Products Company has released a new 16mm motion picture featuring three types of helically formed hardware for overhead distribution. Entitled "End of the Line", the new color movie demonstrates the application of Preformed's Distribution-Grip dead-end, developed especially for primary distribution, open secondaries, and short-span feeders. The film is available through Preformed representatives or by writing directly to **Preformed Line Products Company, 5349 St. Clair Avenue, Cleveland, Ohio 44103.**

MICROFLECT ANNOUNCES NEW MICROWAVE TOWER DESIGN

Microflect Co., Inc. has announced production of a new microwave tower design. Designated "Q" Towers, they are said to offer maximum versatility by allowing multiple parabolic antenna mounting in almost any configuration. Eight models range in height from 15 to 30 ft. Pipe mounts are available for corner,



side or overhanging installations. Figure-four mounting kits are also included.

All hardware, step-bolts and anchor-bolts are supplied with each unit. Material is hot-dip galvanized after fabrication. Designs are in accordance with E.I.A. Spec. RS-222 and have adequate rigidity for 13 Gc applications. For additional details and prices write **Microflect Co., Inc., 3575 25th Street, S.E., Salem, Oregon 97302.** □

ADVERTISER INDEX

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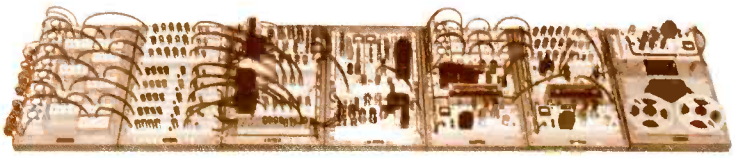
IT TAKES PEOPLE
+EQUIPMENT
+INVENTORY

DAVCO HAS ALL THREE!

HEAD-ENDS THAT REALLY WORK



are being turned out at DAVCO all the time. Shown at the left is a recent 12 channel DAVCO Functional Design Head-End. In addition to the 11 channels of television off the air, there is a Weather Channel, a Background Music Channel and several FM off the air channels. Note the efficient layout of components and the neat wiring and assembly. These head-ends are being customized for systems all over the country, every day at DAVCO! There must be a reason!

PRIDE OF WORKMANSHIP

is evident in this photo made in the DAVCO laboratory. At the time the picture was made, there were more than thirty racks of Functional Design Head-Ends being put together for DAVCO customers in five states!

Here are the features that have been responsible for so many system operators looking to DAVCO for their head-end requirements: (1) First, they do work! (2) They are customized for your system. (3) Color? Certainly! (4) Up to 12 channels plus FM. (5) Lab aligned, fully integrated components. (6) Delivery and installation to your antenna site. Our philosophy is simple. We first consider the requirements of your system . . . then design a head-end that meets these requirements in the simplest way. We say the least we can do to the incoming signals in order to achieve the desired results, the better off we are. Want proof? We can show you hundreds of systems that use our Functional Design Head-Ends. They are stable and trouble-free.

INVENTORY . . . We doubt if there is a comparable "in stock" variety and quantity of all Catv supplies in existence anywhere else. At Davco you'll find large stocks of cable, amplifiers, connectors, transformers, mixers, splitters, directional couplers, test equipment, pole line hardware, and all other miscellaneous items used by system operators. Rely on Davco for fast delivery of your requirements. In addition, you'll find that DAVCO has a large fleet of construction trucks, service vehicles and all maintenance and construction tools and equipment. Latest addition to the service fleet is the new "Tech-Wagon", shown here. It is a laboratory on wheels, and carries all necessary equipment for system maintenance.

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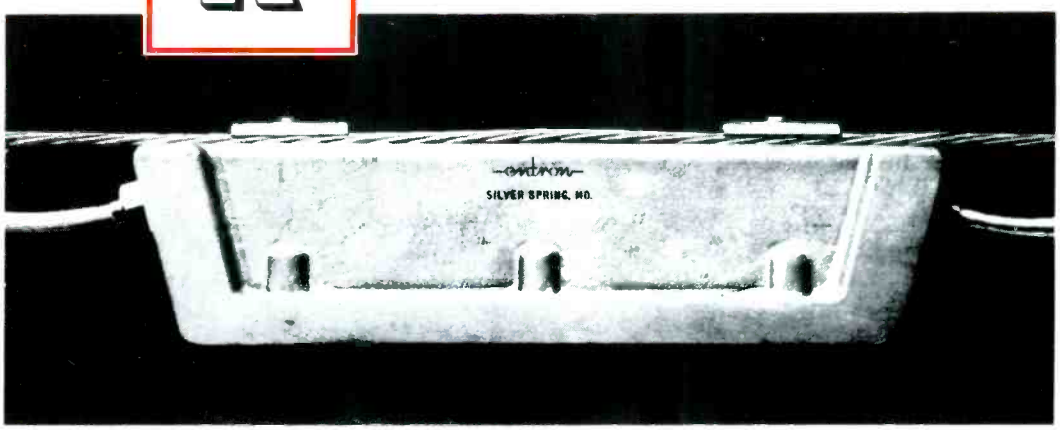

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The R-3 has automatic gain control and R-4 includes Equatrol° automatic tilt control in addition. Both are spaced 25 db in the trunkline.

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