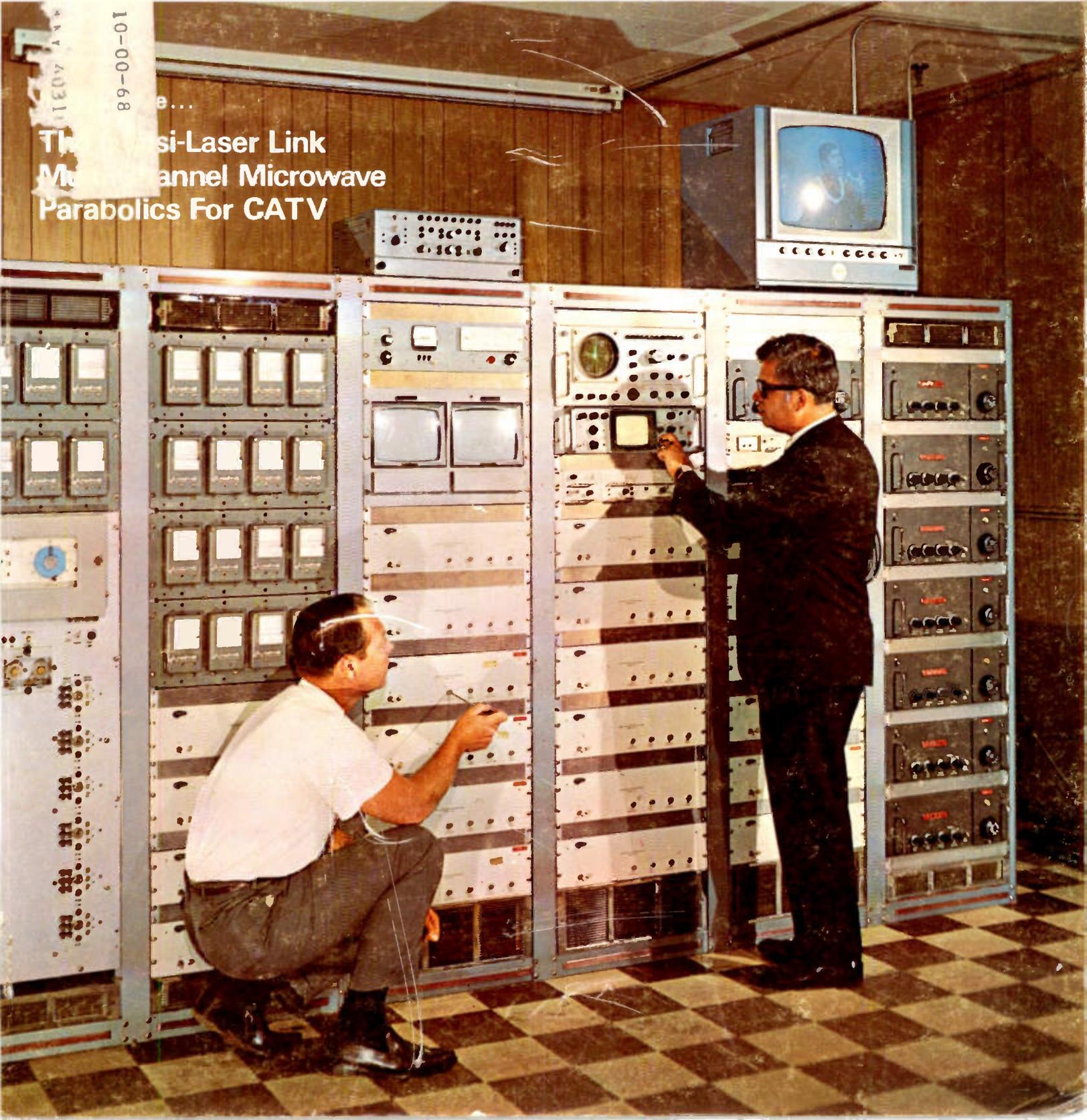


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Communications

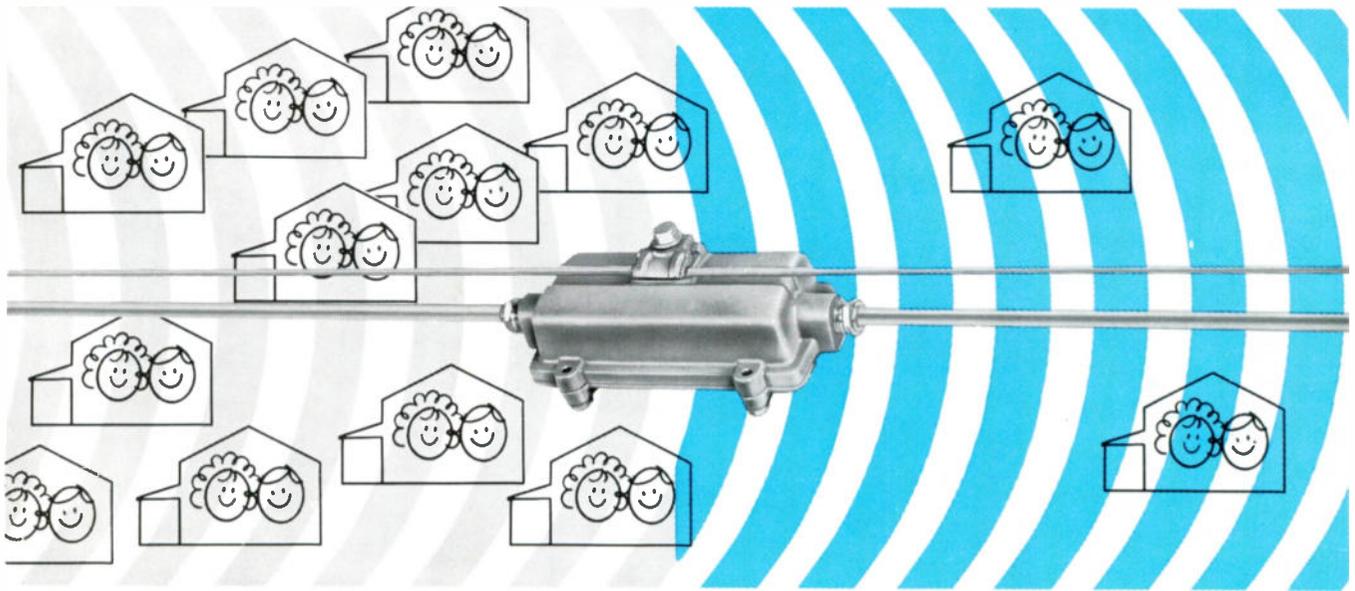
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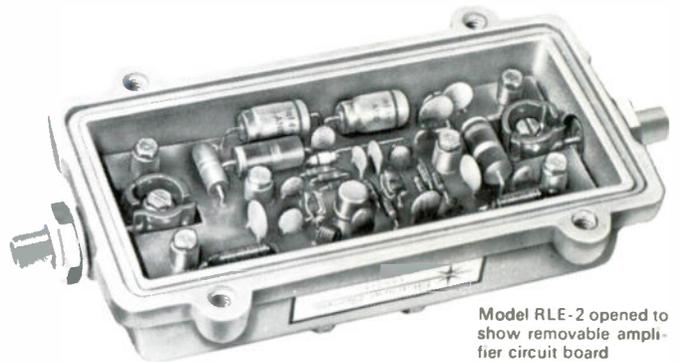


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Jerrod Model RLE-2 amplifiers are such excellent performers they can be cascaded to create a low-cost feeder system. They are housed in weather- and radiation-proof diecast aluminum housings. Access to the housing requires removal of only four hexhead stainless steel bolts. The printed-circuit board of the RLE-2 can be removed from the housing for inspection without disturbing the cable connections.

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Model RLE-2 opened to show removable amplifier circuit board

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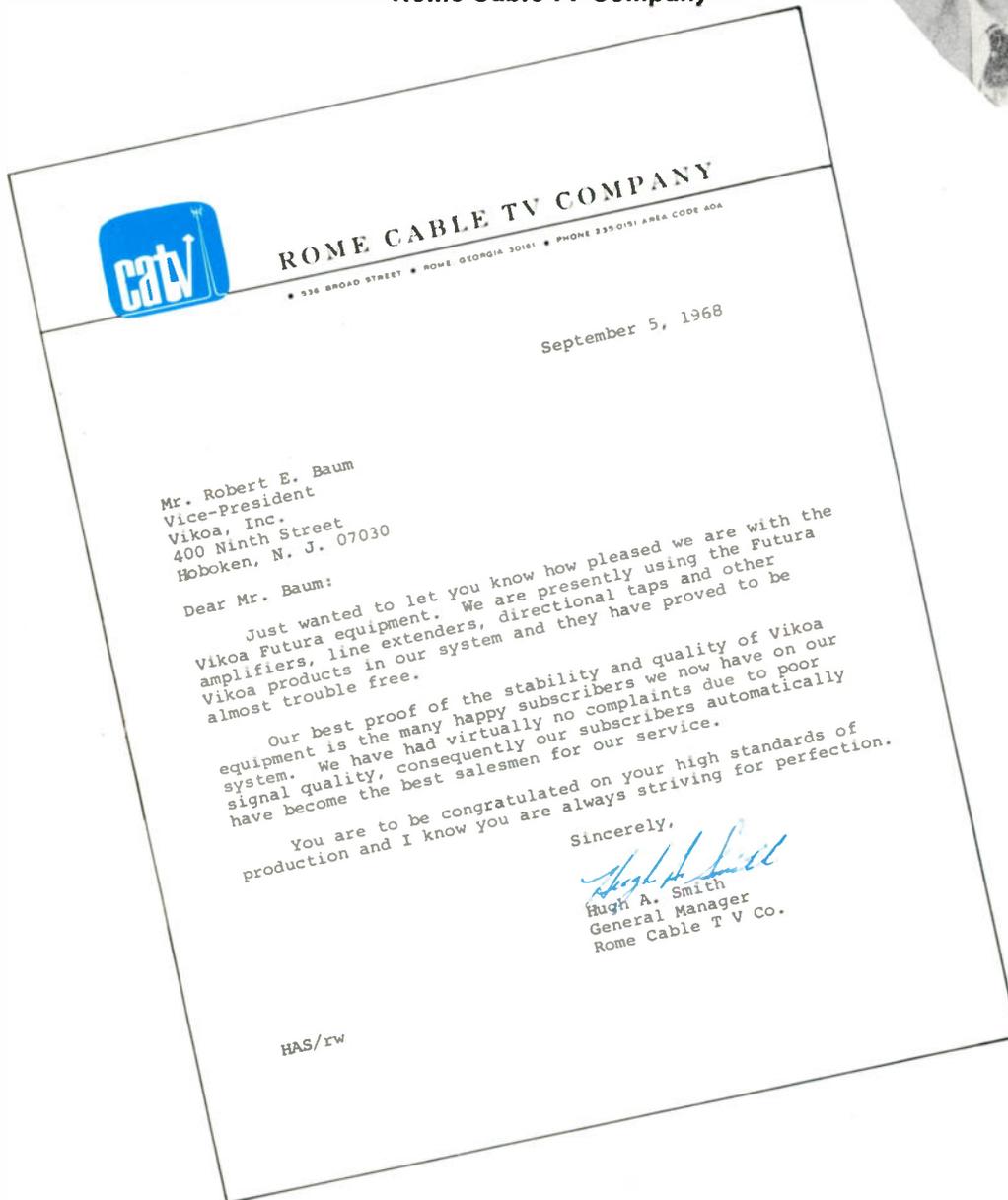
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The Most Respected Name in CATV

IN THIS ISSUE

Pre-Sales Campaign Nets 25%

Of the roughly 4,000 potential subscribers in Middlesboro, Ky., over 25 percent were signed up and waiting for cable service when the new system there was energized. To serve the mountain-



locked town, system operator Jerrold Electronics had to overcome some unusual problems—both physical and legal—as described in the story beginning on page 44 of this issue.

Complex Microwave System

Close frequency tolerance and high stability are the ingredients which allow Quincy Cablevision's microwave relay system to use single waveguide and antenna operation in their five-channel, five-system network. Chief technician Richard Ashpole describes the relay system, beginning on page 54.

Tech Questions Answered

A new feature has been added to the CATV Technician Section of TVC this month, in which readers' technical questions will be answered. Fielding the questions in the inaugural edition of this column is pioneering cableman and engineer Archer Taylor. See "Trouble Shooting" beginning on page 92—and take advantage of this new reader service feature by submitting technical problems which you have encountered.

Our Cover Photograph

Shown with Vikoa, Inc.'s new 21-channel test head-end installation are Bob Cowart (left) and Mike Rodrigues, both of Vikoa. The new signal processing system, installed at the manufacturer's Hoboken engineering facility, is used for engineering research and product evaluation. A complete description of the installation and its use begins on page 90.

TV Communications

The Professional Journal of Cable Television

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ANACONDA electronics

The TVC Viewpoint

EDITORIAL



Stanley M. Searle
Editor

Bell Giveth... Bell Taketh Away

With fitting fanfare, the Bell System recently told the CATV industry that it will "essentially eliminate the restrictions which currently apply to local program origination." This was welcome news, indeed. But only the naive or uninformed would interpret this move as evidence of a meaningful change in the *corporate personality* of Bell Telephone.

The truth of the matter is that pole agreement restrictions on local origination were relaxed in order to avoid a serious confrontation with the Justice Department.

Far from being charitably inclined toward CATV, Bell has been making its true attitude clearly evident in drastic rate hikes to cable operators. New England Telephone has hit a Massachusetts CATV leaseback customer with a 240% tariff increase. Meanwhile, Mountain States Telephone, another Bell affiliate, has announced a 60% escalation in pole rental rates.

Against a backdrop of astounding rate increases being levied on cable operators, a grudging concession on local origination restrictions is unimpressive so far as the Bell System's

motives are concerned. The AT&T monopoly is placed in an even worse light by the fact that as recently as April, AT&T vice-president William Ellinghouse promised NCTA representatives that pole attachment agreements would be negotiated on a good faith basis. Almost simultaneously, Mountain States Telephone proclaimed an arbitrary pole rental increase from \$2.50 to \$4 per year. Telephone officials flatly refused to negotiate the pole rate with operators in its six-state service area.

So, Bell giveth . . . Bell taketh away.

It matters little to the cable operator facing a rate increase whether the problem is insincerity at AT&T headquarters or an arrogant disregard for national company policy by a Bell affiliate. To the individual businessman, the net effect is still a giant corporation that talks about negotiation and fair treatment . . . while its actions reveal only the desire for increased corporate profits and greater control over communications facilities.

Those dealing with the Bell System should understand that, by its very nature, this huge monolith can only operate in self-interest. To avoid anti-trust action or other legal consequences, Bell is willing to make concessions on the restrictions of a pole attachment agreement. But, just as readily and for the same selfish reasons, the Telco will renege on a previous commitment or double your rate. Whether Bell giveth . . . or taketh away depends entirely upon what is good for AT&T.

GUEST EDITORIAL

Cablemen must look to **Congress, not the FCC** for key decisions regarding the future of CATV. Veteran Washington attorney and industry leader Bob L'Heureux develops this and other ideas in the guest editorial beginning on page 58 of this issue.



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Perspective

on the news



Robert A. Searle
Executive Editor

Political parties' use of CATV facilities in presidential race will have far-reaching positive effects on cable industry. Even though only a minority of systems were equipped to use the tapes provided by Nixon and Humphrey forces, the fact that the candidates made special use of CATV coverage lends considerable prestige to the industry. As a result, candidates for congressional, state and local offices will place much more importance on cablecasting exposure in the future. Credit for selling the idea of using cablecasting in the presidential campaign goes to Roger Zylstra and Jay Baraff of the firm of Cole, Zylstra, Raywid.

Local origination restrictions from Bell pole line agreements will encourage more operators to begin cablecasting activities. There is a move underway at the Federal Communications Commission, however, to curb originations by outlawing the sale of advertising on CATV channels. If majority adopts such a rule, litigation is a certainty. Without any question, cable operators would carry the issue to the Supreme Court if necessary.

Unfortunately broadcast executives were too busy to attend the proposed Temple University seminar on CATV-Broadcasting relations. The inter-industry forum was cancelled due to lack of interest on the part of broadcast people. The broadcast business is under considerable pressure these days, with critics closing in from all sides and even FCC "friends" threatening to get tough in certain areas. But broadcasters as a general rule, have had it so good for so long that they're not accustomed to needing much in the way of public relations. Cable television and broadcast interests will eventually ally themselves--and constructive seminars will take place. But 1968 is too early; broadcasters don't feel any need for a dialogue with CATV interests.

Canadian cablemen are encouraged by knowledgeability, fact-finding posture of new Canadian Radio-Television Commission. First license-granting hearing evidenced CRTC's efforts to come up with best telecommunications policy for all TV viewers. CRTC, which isn't buying any group's ready-made solutions, pointedly slapped down a bid for telco monopoly on CATV voiced by Maritime Telephone representative.

Cable operators exhibit reluctance to spend hard-earned cash on potentially meaningless Commission procedures. Consensus at the NCTA Legal Seminar reinforced what has been inferred by inside sources for some time: that Second Report and Order is doomed and that the life expectancy of the Top-100 Market Rule is extremely short. At least two system operators have asked for delays on their waiver hearings until some new policy is decided on.

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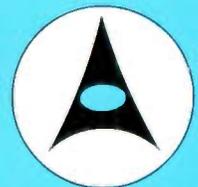
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LETTERS

● I feel that a note of recognition is in order for Mr. Switzer's editorial in the August issue of *TV Communications*. I have also noticed the tendency of convention speakers being either manufacturing or manufacturer oriented people. I will be the first to admit that the CATV industry is growing much faster than it is capable of training its personnel, but I firmly agree with Mr. Switzer in that the NCTA would be just one of the ways of resolving this very serious problem.

I would also like to commend the intestinal fortitude you display by printing the articles and editorials that obviously do not necessarily please all of the individuals and groups associated with the CATV industry.

C. E. "Chuck" Swehla
The Catel Corporation
Belmont, California

Your support for Mr. Switzer's viewpoint is most welcome, Chuck. He is one of the leading proponents of a mature CATV technology, as well as

one of the outstanding engineers in the operating end of the cable business. We feel justifiable pride in having Mr. Switzer's name associated with this publication as Associate Technical Editor, and we fully support his efforts to upgrade the level of CATV technical information available from all sources.

● I would like to take this time to congratulate the staff of the National Cable Television Institute on the courses offered to CATV employees. We have two such employees working for our system out of a total of ten. Each week our system holds meetings for our technicians and installers, covering everything from electronics theory to installs. On August 27th we held one of these meetings. Larry Becker and Jack Joyner, employees of General Electric Cablevision and students of NCTI, requested the opportunity to lead the discussion on CATV system safety procedures. The material covered in this discussion was thorough and precise. The men knew their material and the material was pertinent to CATV systems. This is the only safety program that is strictly CATV to my knowledge.

An organization as large as General Electric Co. has many safety regulations that we must follow. The problem with some of these regulations is that they

are not strictly associated to system operation. With NCTI's course I can submit a program similar to what Jack and Larry presented to our employees.

In my eyes it seems that NCTI has started the industry towards a specialized field, and in doing so has helped the technical staff in each CATV system, mine included. Our thanks to NCTI for making a better working force out of our employees.

Richard Mardock
Chief Technician
General Electric Cablevision Corp.
Walnut Creek, Calif.

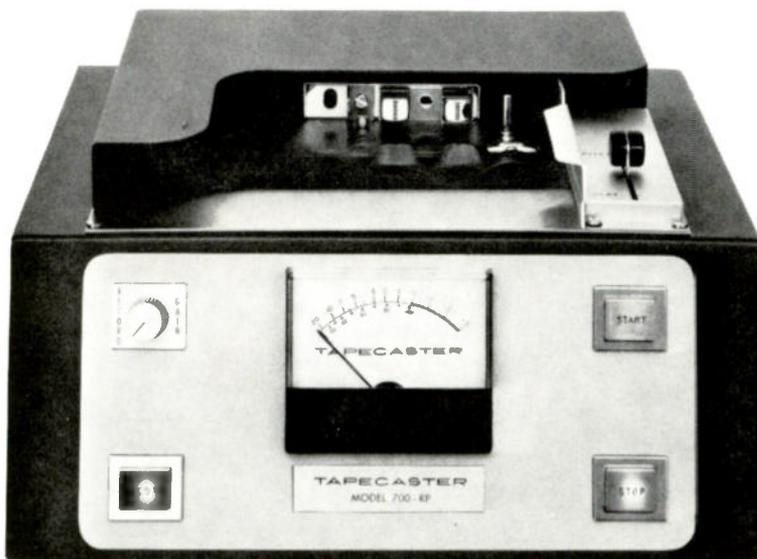
Thank you, Richard, for the most encouraging comments on the NCTI correspondence courses. Cablemen have become increasingly concerned over the shortage of qualified CATV technicians. Much has been said on the subject; various programs have been proposed to meet the problem in one way or another. NCTI is offering a tangible program now, and its reception by men in the field like yourself, is the best possible endorsement of its effectiveness.

Readers are invited to address their views to: Stanley M. Searle, Editor, TV Communications, 207 N.E. 38, Oklahoma City, Oklahoma 73105.

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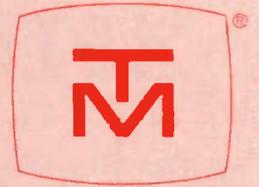
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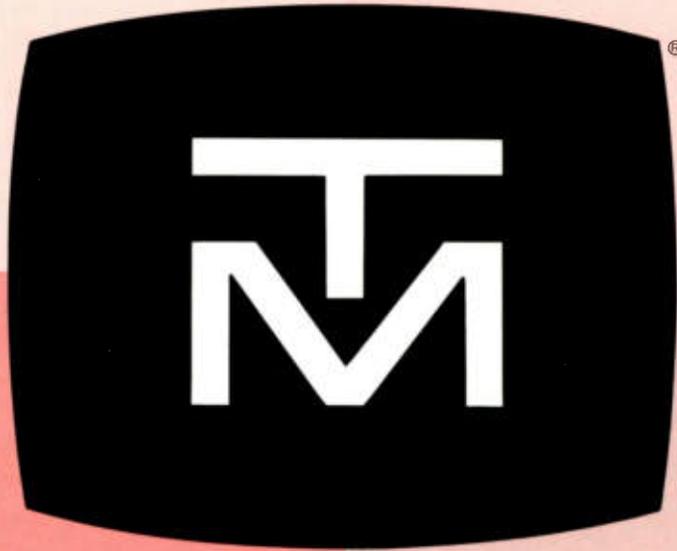
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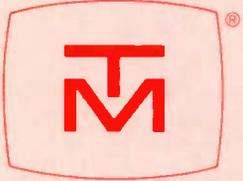
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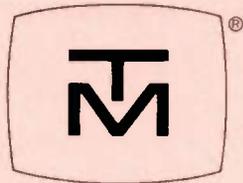


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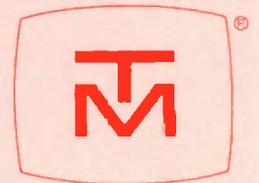
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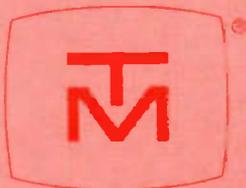
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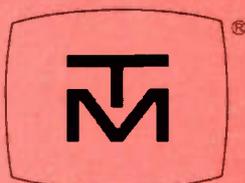
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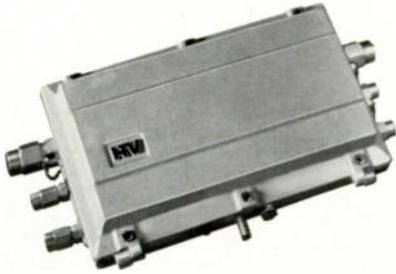
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Management Guidelines

Patrick T. Pogue



Improve Communications... Say It Like It Is!

Some of the letters and reports that cross my desk in a normal work-week cause more confusion than the confusion they were intended to alleviate. This business of communication has many facets and we, in business, must understand all aspects of it if we are to be competent managers.

Why do routine assignments around your system have to be explained time and again? Why are so many things done wrong? Much of the answer lies in the attitude of the system manager who says, "You know what I meant." What he is really saying is, "Why should I bother to express my meaning precisely? Anyone with any sense can figure out what I mean." . . . *Are you sure?* The fact that an idea is clear in your mind doesn't mean that it is clear in the mind of the person with whom you're talking. Remember, he hasn't had the opportunity to mull over the idea, consider the alternatives, and make the decision. It's probably a completely new idea to him.

Fortunately, we can improve our communications skills, including the ability to think, to speak, to write, to draw, to gesture. Whenever we write or talk, we have to make choices. We have to choose one word rather than another, one paragraph rather than another, one sequence of paragraphs rather than another.

The essence of good communication lies in the ability to *make the right choices*. The natural thing is to choose the word or group of words which will result in the exact response you desire from the listener. But if your choices disregard the listener and his personal and unique

way of looking at things, you will defeat your purpose.

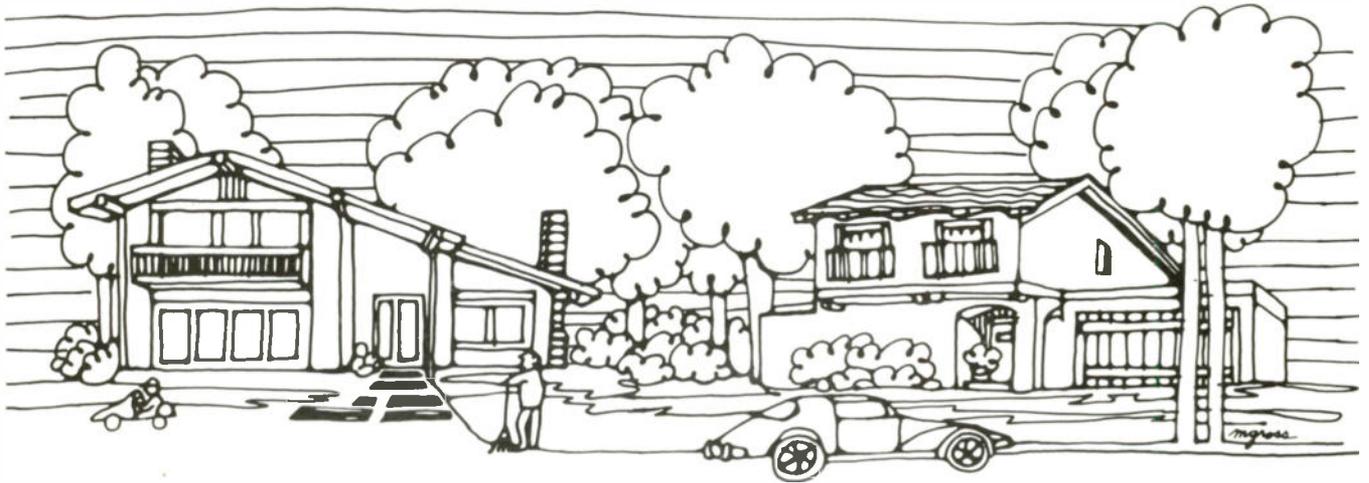
Your attitudes: how you feel about your audience, your subject, and yourself also enter into the communications picture. If a system manager believes that hard work has to be unpleasant, he will decide the cheerful employees are always wasting time and should be given more and tougher assignments. If he believes that good work and cheerful attitudes go together, he will expect *and get* both from system personnel.

Let's look at the receiver of your message, the person with whom we are trying to communicate. What factors influence him? How well does he listen or read? Is he prejudiced against you, the "source," or against the idea? What preconceived assumptions, opinions, or feelings does he have about the situation or you, the system manager? Does he typically resist change or welcome it? What does he know about the situation, or the subject matter of the message?

In short, every communication process begins with a source, someone who starts things going. Whatever concept is in his mind must be passed on to another individual and must result in a certain response from that individual. How successful the communications effort will be depends entirely on the originator. He must carefully choose the right words and expressions and must consider the perception of the listener, taking into account the way *he* sees things. For some this comes naturally. Others of us have to work hard at it. But the returns in time (money) saved and good working relations are easily worth the effort.

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NABCAT, a National Broadcasting Company community antenna television subsidiary, is installing in Valencia an underground dual coaxial cable system with a 40 channel capability. Four new types of cable were developed for this system by Plastoid and NABCAT engineers, including Heavy Jacketed aluminum cable for direct burial and Siamese house drop cables.

If you are installing a new CATV system or extending an old one, remember the Valencia story. NABCAT was pioneering a new dual cable concept. And they chose Plastoid. Find out all the reasons why. Call us: (212) 786-6200.

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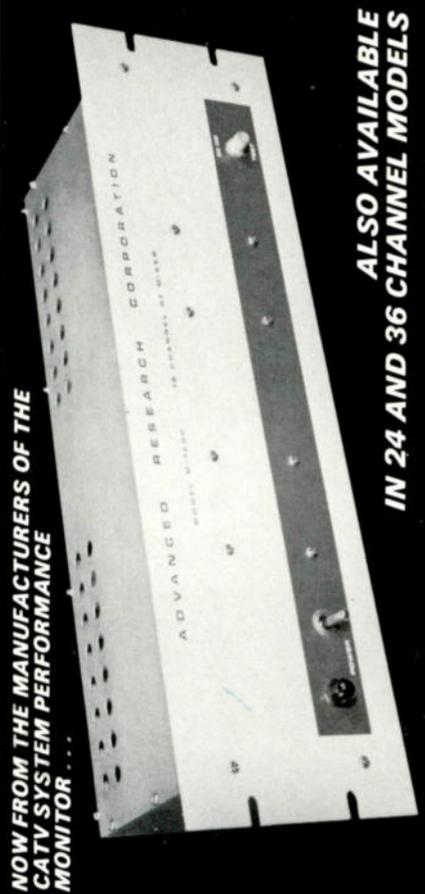
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FINANCIAL REPORTS

Ameco, Inc. reports per share losses of \$.76 for the year ending June 30, 1968. This compares with per share losses of \$2.16 for the same period last year. Earnings figures are based on net losses of \$907,001 and \$2,591,220 for the two periods respectively. Sales were \$5,916,816 for 1968 and \$5,451,663 for 1967. Ameco president Bruce Merrill noted that the company's loss was reduced "to slightly more than one-third of what it was in the prior year."

Scientific Atlanta, Inc. reports per share earnings of \$.14 for the year ending June 13, 1968. This compares with per share earnings of \$.75 for the same period last year. Earnings figures are based on net profits of \$118,000 and \$591,000 for the two periods respectively. Sales were \$11,012,000 for 1968 and \$12,717,000 for 1967. Of the more than \$1.5 million decline in sales, \$1.1 million represented sales volume of a subsidiary which was sold in fiscal 1967.

Vikoa, Inc. reports per share earnings of \$.18 for the quarter ending June 30, 1968. This compares with per share earnings of \$.05 for the same period last year. Earnings figures are based on net incomes of \$248,365 and \$62,000 for the two periods respectively. Sales were \$4,813,387 for 1968 and \$3,070,149 for 1967. Also reported were figures for the 6-month period ending June 30, 1968. Per share earnings for this period were given as \$.41 as compared with \$.17 for the same period last year. Net incomes for the two periods respectively were \$558,777 and \$238,000 with sales at \$9,538,692 and \$6,455,788.

American Finance Management reports per share earnings of \$.80 for the 6-month period ending June 30, 1968. This compares with per share earnings of \$.88 for the same period last year. Earnings figures

are based on net incomes of \$3,667,518 and \$4,010,583 for the two periods respectively. Revenues were \$264,190,385 for 1968 and \$261,626,704 for 1967.

Lamb Communications, Inc., in its first semi-annual report, announced operating profit of \$51,681 for the first half of 1968 and a total income of \$163,433 for the period. This compares with a \$32,830 loss in the similar period of 1967.

Burnup and Sims, Inc., has filed 250,000 shares of common stock with the SEC. Proceeds from the sales—62,050 shares will be offered by the company and 188,950 by selling stockholders—will be used for construction and working capital.

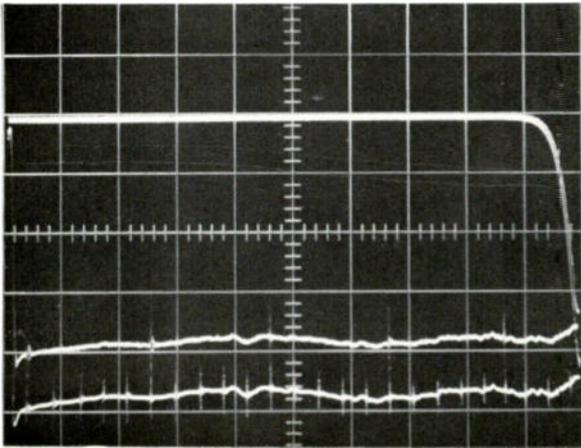
Collins Radio Co. reports per share earnings of \$4.44 for the year ending August 2, 1968. This compares with per share earnings of \$4.42 for the same period last year. Earnings figures are based on net incomes of \$13,014,000 and \$12,093,000 for the two periods respectively. Sales were \$447,026,000 for 1968 and \$438,962,000 for 1967.

Jamaica Water & Utilities reports per share earnings of \$.41 for the last 6-month period. This compares with per share earnings of \$.27 for the same period last year. Earnings figures are based on net revenues of \$186,114 and \$169,856 for the two periods respectively. Operating revenues were \$6,000,000 for 1968 and \$3,900,000 for 1967.

Mid-Continent Telephone Corp. reports per share earnings of \$.56 for the 6-month period ending June 30, 1968. This compares with per share earnings of \$.44 for the same period last year. Earnings figures are based on net earnings of \$2,638,403 and \$2,094,095 for the two periods respectively. Operating revenues were \$21,226,308 for 1968 and \$18,101,609 for 1967. (NVC)

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CH 13 Output Capability—44 dbmv
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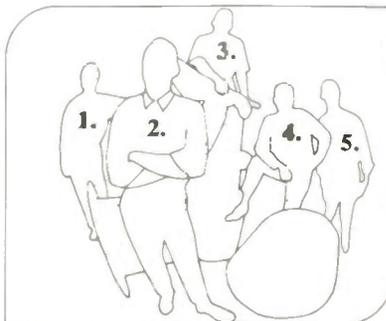


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TIMES
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FCC SENDS HINT TO NEW YORK

The Federal Communications Commission has given a broad hint to New York City's Mayor John Lindsay, Board of Estimate and Advisory Task Force on CATV that they might do well to take no action on cable system origination and advertising pending a forthcoming Commission ruling on the subject. A letter to this effect followed receipt by the FCC of the Task Force report which was highly favorable to CATV in New York. In the letter, the FCC pointed out its authority over cable television as established this past summer in the Supreme Court, and said "we have undertaken studies which, when completed in appropriate proceedings, will clarify the Commission's policies in a number of areas."

Referring to origination and advertising specifically, the FCC said, "this issue will be further considered in an appropriate rule making proceeding," and that CATV operations will be subject to the outcome of that proceeding. "In short," the Commissioners concluded, "we recognize our obligation to discharge our responsibilities in this area and specifically to clarify our position on matters coming within our federal jurisdiction as soon as possible."

CATV HITS NAB MEETING AGENDA

Two FCC representatives--Commissioner James J. Wadsworth and CATV Task Force Chief Sol Schildhause--were headline speakers at the National Association of Broadcasters' first Fall Conference of the year. Schildhause warned broadcasters that "goal line stands against cable are not in TV's best interest," and urged that NAB members join cablemen in search of conciliation. He confirmed that the Commission is re-examining its Second Report and Order, hoping to get into the next phase of regulation. Schildhause also outlined his own short-term recommendations including a proposal to limit the present top-100 market rule to only the top-50 markets.

Commissioner Wadsworth also spoke of cable television, using it as a "classic example" of FCC "vacillation" on policy decisions. Wadsworth went on to say, "A sample of failure initially to exert control, CATV also became the cogent example to some critics of subsequent FCC overreaching."

TPT CHOOSES AML TEST SITES

As authorized by the FCC some months ago, TelePrompTer Corp. has announced its selection of two "rural or suburban" test sites for the Amplitude Modulated Link system. The multi-channel, super-high-frequency microwave system operating in the 18 GHz range will be tested in Eugene, Ore., and Farmington, N. Mex. if the FCC approves the selection.

Late News (Continued)

Last May the Commission granted approval of limited commercial use of the system developed jointly by TPT and Hughes Aircraft, and AML equipment is currently being tried in New York City where it is expected to enable the transmission of 12 or more signals simultaneously and avoid extensive trunk cable construction in the congested urban area.

In its application for Farmington, TPT told the FCC that about 414 homes will be reached by the AML system in the towns of Round Valley, Flor Vista, Fruitland and Kirtland. The Eugene system would reach nearly 6,000 homes in the communities of Elmira-Veneta, Alvadore-Fern Ridge, Coburg, Marcola, Mohawk, Camp Creek, Walterville, Henricks Ridge, Jasper, Goshen, Pleasant Hill, Trent, Dexter, Lowell, Creswell, Saginaw and Cottage Grove.

UA REACHES END OF COPYRIGHT ROAD

The United States Supreme Court has refused, without comment, to reconsider its earlier decision in the United Artists v. Fortnightly case. The petition for reconsideration was United Artists' final hope of reversing that court's stand that the service performed by CATV systems is not a "performance" under the present Copyright Act. Despite UA's warning of "dire and unintended consequences of the decision on creative and performing artists in all fields," the judgment stands.

HAWAII FORMS STATE CABLE GROUP

Newest of the state cable television associations is the Hawaiian group. D. W. Carter, of Hawaiian Cable Vision announced formation of the organization and said the first officers are: Lloyd F. Char, president; Z. E. Sailer, vice president; Joel Fleming, secretary; and Paul Hancock, treasurer. According to latest statistical information, there are presently about half a dozen systems operating in Hawaii, the largest of which is at Waianae with 1800 subscribers.

GEORGE GREEN HEADS CONTINENTAL

George Green, former vice president and general manager of Jefferson-Carolina Corp. has accepted the post of president of Continental CATV, Inc., MSO subsidiary of Vikoa, Inc. He succeeds John Gault who resigned to head Commonwealth United Corporation's entry into the cable television field. Green has been in the industry since 1963 and with J/C since September, 1967. Under him, J/C completed construction of 12 systems in North and South Carolina, and initiated construction projects on 4 other systems.

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News SPECTRUM

Cablemen Host Lively Panel, Important Speakers at NY Meeting

A major speech by an influential FCC Commissioner, a sober warning on the dangers of CATV leaders being shortsighted, and a lively panel discussion on cable problems highlighted the New York State Cable Television Association Convention.

Delivering a stout defense for UHF television, FCC Commissioner Robert E. Lee reiterated his well-known position that uncontrolled CATV is a serious and immediate danger to fledgling UHF stations. (See separate story.) With Lee's noon speech still very much the topic of discussion, a banquet audience heard NCTA Chairman Fred Ford declare that the FCC was the "least of our worries" in contemplating future CATV growth. Pointing out that the history of federal regulatory commissions was one of "pendulum" type restriction, Ford noted that

regulations were first too lenient, then too harsh, and so on through the cycle.

He delivered a strong plea for system support of state and national CATV groups combined with a stout defense of the NCTA position on copyright. Condemning the idea that CATV had "won" the copyright battle, Ford called for "eternal vigilance" and continued efforts to negotiate acceptable settlements with concerned groups.

Four well-known industry leaders headlined a panel discussion on "The Problems of CATV." Al Stern, chairman of the board of TeleVision Communications Corporation; Hamilton Shay, executive vice-president of Gilmore Broadcasting; Bruce Merrill, Ameco president and chairman of the board; and Irving Kahn, president of TelePrompTer, served on the panel.

Attempting to bring the audience

up-to-date on "What's Happening in Copyright," Stern, who serves on the NCTA copyright committee, began the discussion by noting that CATV had a choice after the Supreme Court decision. The industry could sit back and say, "OK, forget it, we've won," or they could decide to continue discussions toward finding an equitable solution for everyone involved. Praising the decision of NCTA to continue talking about the problem, Stern stated, "The future of our industry is tied to a solution of copyright."

Shay, representing the broadcast industry, has spent several years negotiating with ASCAP for the NAB. Stressing the intricate and often unclear nature of the copyright problem, Shay defined the test of copyright liability as, "are you involved in a performance for profit . . . and if so, has a fee already been paid by someone else which should be paid by you?"

Turning to CATV, Shay stressed that the industry must provide a permanent organization to deal with the entrenched groups.

Merrill provoked considerable discussion among listeners by offering strong thoughts on "CATV and Politics." "The future of CATV lies in the hands of the politicians . . ." and I think "we'd be foolish not to conduct ourselves as though the solution to the copyright problem will not be negotiated but settled in Congress," the Ameco executive began.

Urging that all CATV personnel keep in constant contact with politicians through letters, calls, and submitting articles for review, Merrill noted another opportunity to exert influence in that candidates for office always need money. Your duty to the industry is "to identify yourself with some monetary obligation to men seeking office," he said. "And you might do it for both sides in a campaign. We have the strength to be very influential."

"Problems of System Operation" were reviewed by TelePrompTer's Kahn. Arguing that "CATV is . . . close to a necessity in people's minds," Kahn stated his belief that the industry is at a critical point. On the one hand, he noted, is the established, small-city CATV and on the other are the new possibilities in large cities.



FCC Commissioner Lee delivers major UHF/CATV speech to interested New York Cable TV Association members.

NCTA Officials Address Pacific Northwest Meeting

A mood of reserved optimism seemed to hang over the Pacific Northwest Cable Television Association fall meeting held in Portland, Ore. As outgoing president Clay White put it, "We feel reasonably secure in the Pacific Northwest. Our three lobbyists, Al Dougherty, Gene Kelty, and association General Counsel Pat Sutherland have done an excellent job in maintaining good telco and broadcaster relations."

One hundred fifty-three cable operators registered for the four-day event and heard reports ranging from the future potential of the Pacific Northwest to high-level distribution amplifiers. Kicking off the



White congratulates President Faber.

opening remarks to the convention were Dougherty and Sutherland who urged every cable operator to "know your Congressman, legislator and make sure they know you and your problems. Now is the time," Sutherland said, "to make your services available to all lawmakers running for office." Ray Fountain, a member of the Washington Utilities and Transportation Commission, spoke on the fundamentals of utility rate making. Fountain told the cable operators, "There is no fixed level for rate of return. The six percent figure is no longer a magic number. If CATV is a high-risk business then I see no reason why your profit rate should not be adjusted."

One luncheon speaker was Ancil Payne, Portland TV station manager, who said that ETV and CATV could greatly add to the nation, state, and community: "CATV work-

ing with ETV provides an amazing possibility and you're sitting right on top of it." Payne concluded his talk when he quoted a Chinese proverb to the cable operators: "I pray you shall live in interesting times."

Another speaker, Norman Penwell, Director of Engineering at NCTA, told the convention: "Maintaining engineering excellence means keeping abreast of all technical factors that could influence CATV—it's the price we have to pay to stay alive as an industry."

NCTA general counsel Bruce

Lovett, via video tape discussed telco relations, 214, and copyright negotiations. Gary Christensen, assistant general counsel, talked about the possibility of a Third Report and Order, and the President's Task Force Report. Named as officers of the association for the coming year were: Everett Faber, president; Ian Elliot, vice president; Bill Elkins, technical vice president; Carl Spaulding, secretary-treasurer. New directors are: Dee Miller, J. B. Dyer, and Clay White.

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CRTC Grants First Licenses For Cable; Rebuffs Telco Monopoly Plan

In a highly encouraging hearings session that ran 11 hours a day for 3 days, the new Canadian Radio-Television Commission granted the country's first CATV licenses in Moncton, New Brunswick. The Commissioners proved to be remarkably well informed on both cable television and broadcasting, and particularly well informed concerning CATV-telephone company problems.

The representative of Maritime Telephone and Telegraph came in for severe questioning by the Commissioners when he proposed that the telco be given a monopoly in constructing and operating cable systems in Nova Scotia. The Commission not only indicated rejection of any such monopolistic plan, but proceeded to delve into such problem areas as pole attachment agreements with pointed questions to cable operators regarding rates, alternative means of construction, etc.

Since these hearings are designed not only to pass on cable system applications for license, but to formulate broad telecommunications policies for Canada in such areas as alternative television, a primary focus of interest was CATV-broadcaster relations. Two Ontario broadcasters made flat declarations that they see no conflict with the cablemen operating in their specific areas.

This harmony, however, was not reflected in the brief presented by the CBC, which devoted considerable time to a statistical examination of the impact of cable television on local broadcasting. W. Z. Estey, counsel for the National Community Antenna Television Association of Canada, rebutted CBC's arguments with what appeared to be favorable reaction from the Commissioners.

NCATA's brief, prepared by Estey in collaboration with the association's board of directors, emphasized CATV's advantages and benefits to Canadian television viewers. Points emphasized by Estey were that CATV makes no demand on the taxpayer by way of subsidy or program assistance;

that it provides alternative television without making use of frequency; and that there has never been proof that any broadcaster has suffered by reason of CATV. He further urged that the lifting of microwave limitation would extend the ability of CATV to bring maximum service to all parts of the country.

The Commissioners' questions at the conclusion of the NCTA presentation dealt chiefly with program origination, exclusivity, effect of CATV on local broadcasting and the use of microwave. According to an NCTA spokesman, license applicants should expect in the future to be questioned extensively.

Interested parties who were unable to attend the Moncton public hearing were invited by the Commission to comment on all issues at further sessions held at Regina, Sask., and at Ottawa, Ont.

H. Rex Lee To Assume Commission's Vacant Post

Although President Johnson dallied long enough in selecting a Commissioner to fill the FCC's



Commissioner Lee

vacant seventh seat, the Senate confirmed H. Rex Lee in an uncharacteristic rush. A little-known Wash-

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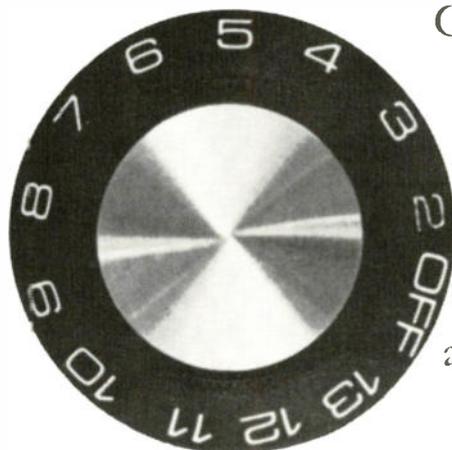
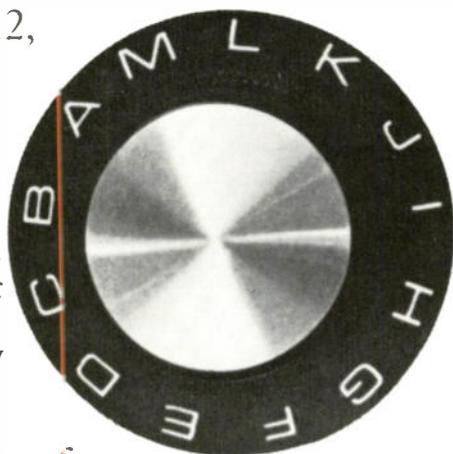
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ington administrator, Lee was with the State Department's Agency for International Development at the time of his appointment to the Commission.

Lee, a former governor of American Samoa where he introduced educational TV, received only praise from both Republicans and Democrats at the confirmation hearings and he was approved without objection. So completely non-controversial was the nomination of the Idaho Democrat that his name was brought up with only a half-dozen Senators on the floor.

FCC's Lee Restates Position on CATV vs. UHF

The idea of an allocations table for CATV to insure protection for fledgling UHF stations was advanced seriously by FCC Commissioner Robert E. Lee in a speech to the New York State Cable Television Association.

In a hard-hitting speech with very little hint of a velvet glove even for a CATV industry audience, Commissioner Lee said he is now, as he always has been, an advocate for UHF television. He said that as the capability of the public to receive UHF stations under the all-channel-set law increases, his position on CATV versus UHF will change.

The Commissioner put forward eight questions he would like CATV operators to answer.

"One: Can you accept the premise that all viewers should have an opportunity for multiple-off-the-air choice of TV?"

"Two: Under the Supreme Court affirmation of the FCC jurisdiction, should the Commission find a place for CATV which is consistent with an obligation of insuring free TV to those who do not care to pay or are unable to afford CATV?"

"Three: If so does this infer some kind of licensing by the Commission?"

"Four: Could it follow from this that the Commission should consider some form of CATV allocation table? If we should consider an allocation table, should we also consider the ARB market rather than station contours?"

"Five: Should we pick specific

population figures and allocate a CATV to communities above that figure?

"Six: Should allocations be restricted to within a specific number of miles of the present cities in the top one hundred markets?"

"Seven: Should any formula be considered as to the number of channels a CATV system may carry, based on the number of homes in the market?"

"Eight: Should we permit program origination with local advertising on the closed circuit channel where there is no local TV station?"

He said, "Clearly some reasonable way had to be found for controlling an almost explosive growth in CATV," if the promises of UHF to become a fourth network and to bring local services to new areas were to be realized.

"At the present time, I encourage expansion of CATV in areas which are considered distant to licensed stations and allocated channel assignments," he said. He said as to CATV entry into UHF markets, "I anticipated using a sliding set of values which will gradually

Calendar

November 5-6. The annual meeting of the Alabama CATV Association will be held at the Guest House Motor Inn, Birmingham.

November 8. The Colorado CATV Association is holding its annual meeting in Colorado Springs at the Antlers Hotel.

November 10-13. The fall meeting of the California CATV Association will take place at the Del Coronado Hotel, Coronado Island.

January 16-18, 1969. The Florida CATV Association will meet at Marco Island.

January 17. The Community TV Association of New England will meet at New Hampshire Highway Motel, Concord, New Hampshire.

January 24-25. The Georgia CATV Association will hold its annual meeting at Macon.

March 23-25. The Southern CATV Association will meet at the Monteleone Hotel, New Orleans, La.

June 22-25. The NCTA will hold its annual convention in San Francisco at the San Francisco Hilton Hotel.

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change over the next three to five years," as the all-channel-set law results in more and more homes equipped to receive UHF, reaching 85 to 95 percent in three to five years. He said his reasoning is based "on the premise that all viewers should eventually be given an opportunity for multiple television choice."

After sufficient UHF set penetration, if there are no bids for available UHF channels, he said, he would conclude that economic forces discourage UHF and "CATV may then be the correct solution in such a market."

To aid UHF and the cause of local TV stations generally, he said, "Rules must be devised that promote the orderly growth of the entire industry. This includes CATV as well as UHF . . . I remain confident that over a reasonable period of time . . . UHF will prosper ."

As to the future he said, "I expect that I will be able to support accelerated growth of CATV commensurate with the growth of UHF. In short, as UHF comes to maturity, I expect that the presumptions which I now accept for protecting UHF will be reduced or eliminated."

Lawyers Probe Copyright, Other Problems at NCTA's Legal Seminar

Distinguished members of the communications bar and government staff members meeting at the NCTA Legal Seminar in Washington amply fulfilled association president Frederick W. Ford's anticipation of "serious but friendly conflict." Panelists in half a dozen sessions took issue with one another on many points, but reached agree-

ment on one: The FCC's Second Report and Order is in its death throes. Speaker after speaker characterized the present time-consuming, unwieldy regulatory processes as "a shambles." Arthur Scheiner, of Wilner, Scheiner & Greeley, who tried the first case under the Report's evidentiary hearing rules, noted that the FCC never really expected the top-100 hearings to solve CATV problems. The Commission, he said, expected to achieve their aim of cable containment through copyright liability.

Copyright and CATV was the



Barbara Ringer, Assistant Register of Copyrights, outlines position for attentive listeners including fellow panelists Gerald Phillips (l.) and Herman Finkelstein (r.).

ment on one: The FCC's Second Report and Order is in its death throes.

Speaker after speaker characterized the present time-consuming, unwieldy regulatory processes as "a shambles." Arthur Scheiner, of

subject of one of the most interesting panels, with all sides being represented. E. Stratford Smith, of Smith, Pepper, Shack & L'Heureux, led off for CATV. He said that copyright owners should recognize

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that a regulatory scheme which can promote small CATV systems while recognizing the problems of copyright owners, can enable CATV and copyright holders to make common cause.

Exclusivity, by far one of the thorniest problems in the copyright picture, was discussed by Gerald Phillips of Phillips, Nizer, Benjamin, Krim & Ballon. Phillips left no doubt about his position for copyright owners on the question. He stated point blank that every showing of a film in a market diminishes its value for later showings, and every importation from a distance dissipates the value. "Hard-nosed bargaining," he said, "is the only answer."

Barbara Ringer, Assistant Register of Copyrights, who had more to do with drawing up the last copyright amendment bill than almost anybody else, expressed the hope that the cable television industry would not withdraw to the position of strength which the *Fortnightly* decision allows. Miss Ringer took the occasion to announce that the Copyright Office is now in favor of dropping the so-called trigger provisions, the instances under which full copyright liability of CATV would be "triggered" (e.g., local origination). She conceded that such provisions were less copyright concerns than policy matters more appropriate for FCC consideration.

The final panelist, Herman Finkelstein, general counsel for ASCAP, changed the pace with a disclaimer of any interest in the topic of exclusivity. He said, "The people I represent are interested in money, not exclusivity."

Other features of the two-day seminar were a presentation by Robert D. L'Heureux of the solid concrete arguments he has found to be successful in dissuading state officials from the public utility concept; a wry and witty dissertation by attorney Arthur Stambler on "the dirty words of FCC regulation"; and an explanation by the FCC Common Carrier Bureau's J. Malcolm Lothschuetz of the interim procedures for handling telephone company Section 214 leaseback applications.

Thomas Dowd, of Pierson, Ball and Dowd, created perhaps the

greatest stir of the seminar with a suggestion of a public utility future for CATV wherein the hardware and software would be separated by law. The plant owner, he said, might retain one channel for his own use.

Sol Schildhouse, chief of the FCC's CATV Task Force, closed out the seminar on something of the same note with which it began—that the "Second Report and Order has just about had it" and that the FCC will soon "take a new look" at the situation.

Republicans Set Up First National CATV-Use Program

The Republicans are the first major political party to utilize the cable television medium on a nationwide basis. Persuaded by the growing subscriber figures and the local programming efforts of system operators, the United Citizens for Nixon-Agnew has set up a Nixon-Agnew Cable Television Network under the directorship of attorney Jay Baraff.



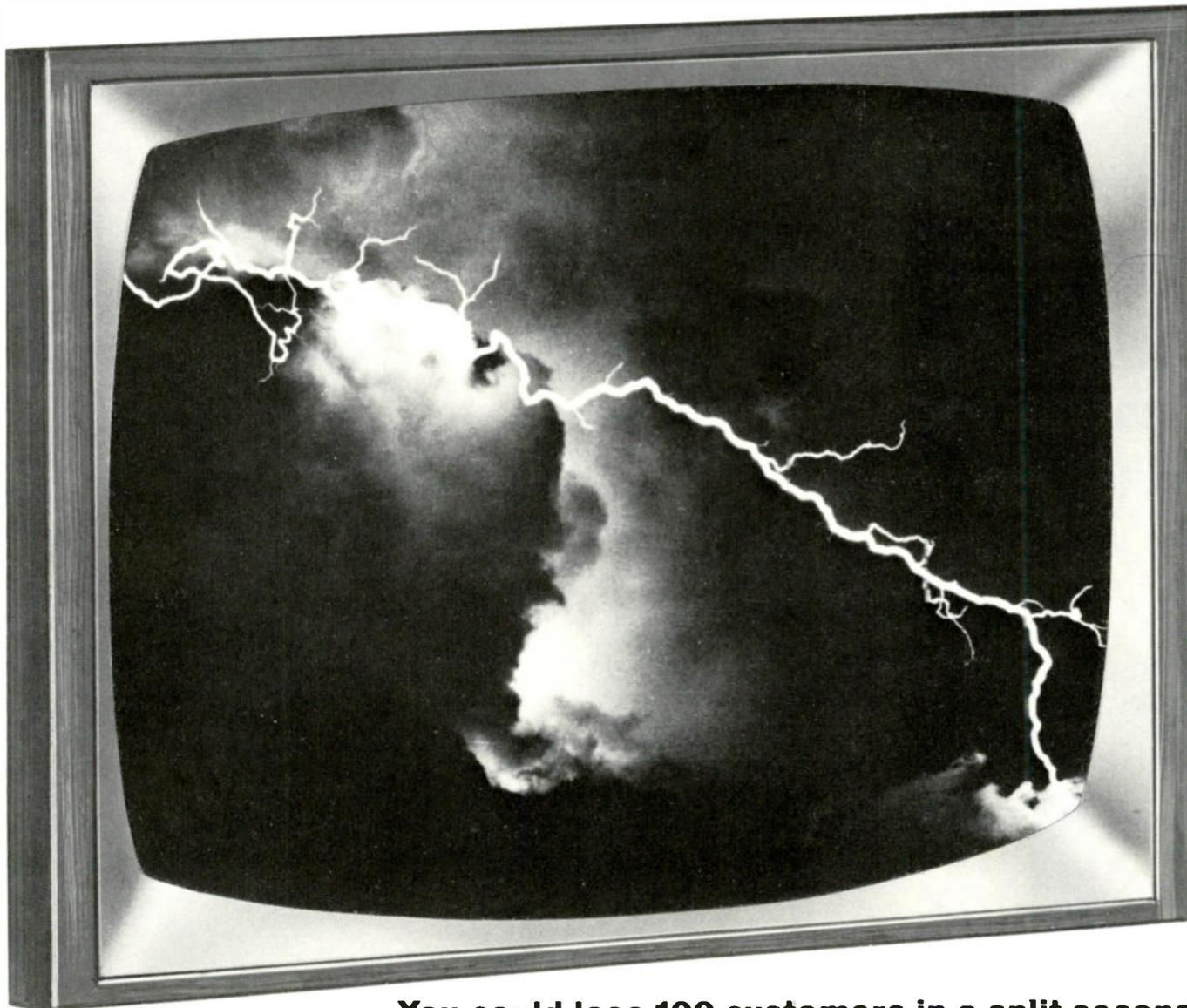
Jay Baraff (l.) discusses campaign plans with Jim Koerner (r.).

Baraff, on leave of absence from Washington communications legal firm of Cole, Zylstra and Raywid, is responsible for the network's central project—a video tape produced exclusively for showing on cable origination channels.

The half-hour tape features selected film clips from speeches, press conferences and other public



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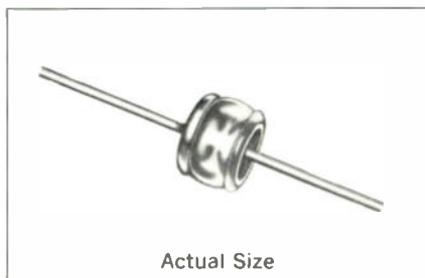
When something goes wrong with the reception of a CATV subscriber's TV, he may not blame it on the elements. And if you take him out of the TV watching business during his favorite program, he's likely to blame you.

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Also in grounding blocks, Siemens gas tubes provide low-level protection particularly important in systems with more than 13 channels.

If CATV is your business, Siemens Gas-filled Surge Voltage Protectors will help to keep it running smooth. So be sure to specify CATV equipment with Siemens protectors built in.



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appearances of the Republican presidential and vice presidential candidates. System operators who agree to show the tape several times will receive one tape free from network headquarters in Washington.

According to Baraff, all systems known to be originating will be contacted by letter, and will be provided with a return post card requesting the tape. He noted that operators must provide information on what type of equipment they use so that the appropriate type of film can be provided. Originating

systems which are not contacted can obtain the tape by writing or telephoning the Nixon-Agnew CATV Network, at the Willard Hotel, Washington, D.C.

Response so far from cablemen has been highly enthusiastic, according to Baraff. "No one has turned down the offer," he said, "and we hope to distribute 250 to 300 tapes.

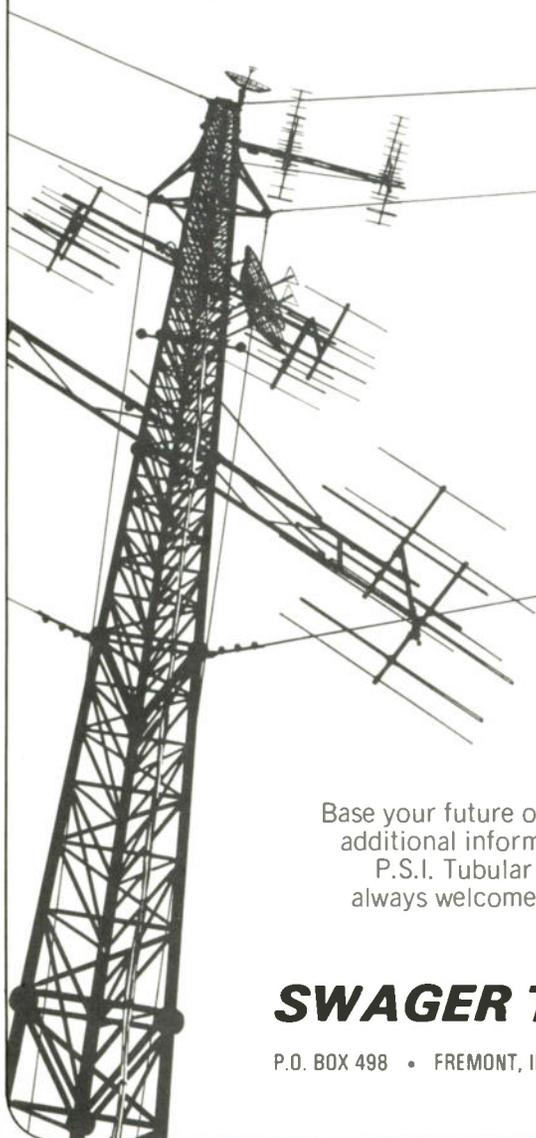
Assisting Baraff as coordinator on the project is James Koerner, a law student at Georgetown University.

Olean Throws Switch For Police Surveillance System

The first closed-circuit surveillance system operated by a police department to monitor the main business district of a U.S. city was inaugurated in Olean, N.Y., September 27. The formal ceremonies activating the system were staged during the New York State Cable Television Association's annual fall meeting.

Top city and communications officials were on hand to throw the

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System Sales

American Finance System, Inc. of Silver Springs, Md., has expanded its CATV interests with the acquisition of systems in Alexandria and Pineville, La. and in Martinville, Va.

Commonwealth United Corp. of Los Angeles, Calif. has acquired two New Mexico systems located in Artesia and Carlsbad from Storer Cable TV, Inc. Broker for the sale of the systems which serve 3,000 subscribers was Hugh Ben LaRue of LaRue Media Brokers, Inc., New York.

Gulf & Western Industries, Inc. has purchased all of the outstanding stock of King Community Television Co., Inc., Nederlands/Port Neches, Tex.; Orange CATV, Inc., Orange, Tex.; and Liberty-Dayton CATV, Inc., Liberty, Tex. The cash transaction exceeded \$2.5 million.

H & B Communications Corp. has announced the purchase of Intercity Cable Corp., which serves Galena and Hanover, Ill.

Jerold Corp. has reported the acquisition of Cablevision of Virginia, Inc. The system, which operates in Clifton Forge and Covington, Va., already serves 3,500 subscribers out of approximately 6,000 of the system's total potential.

Multimedia, Inc., of Greenville, S. C., has acquired one-third interest in Columbus Communications Corp., which operates a system in Columbus, Ind. The system, which serves about 28,000 subscribers, represents Multimedia's first venture into the CATV industry.

FVC

switch activating the nine GBC closed-circuit TV cameras mounted 20 feet above the ground on utility poles in downtown Olean. Those participating in the ceremony at the Olean city building included: Olean Mayor Harvey Scheiderman; Frederick W. Ford, NCTA president; FCC Commissioner Robert E. Lee; and Alfred R. Stern, president of TeleVision Communications Corp.

Five city blocks, representing 75 percent of the city's business section, will be kept under 24-hour-a-day surveillance to combat crime, speed police to traffic accidents and tie-ups, and provide other emergency services. Monitoring will be done at police headquarters by one man.

The closed-circuit TV system was



Olean Police Chief and Al Stern view monitors on new city surveillance system.

designed and installed by the Allband Cablevision Division of TeleVision Communications at the request of the Olean Merchants Bureau and Common Council. Allband, which provides cable TV service to some 5,500 homes in the area, will maintain the system under a five-year contract with the city for \$6,500 annually—less than the salary of one policeman.

Plans call for expanding the surveillance system to cover the remaining 25 percent of Olean's business district in the near future. The initial area to be covered is the most concentrated—and one in which the crime rate has been rising

lately, according to Allband manager Michael Arnold.

Allband also plans to offer banks and other business firms in Olean a special hookup to the primary surveillance system. Three banks, for example, have indicated an interest in the cameras at a cost of about \$25 a month.

Other firms will be able to subscribe to a burglar alarm system, tied in with the main surveillance network, for "probably \$5 to \$10 a month," Arnold said. Both the bank surveillance and burglar alarm sys-

tems would be monitored at police headquarters.

Chief advantage of the new system is that it will free more foot patrolmen and squad cars to police other areas of the city. The system will not replace any policemen on Olean's already-understaffed force.

In statements during the opening ceremonies, industry and political figures praised the progressive outlook of Olean civic leaders in approving the new system and also commended Allband Cablevision for their technical achievements.

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The Time Saver!

The Halline Model EME aerial ladder is especially designed to improve the efficiency and profit picture of your system. Time-saving economy and easy, one-man operation are built in features of this versatile CATV unit.

The EME gives you full controls at both working platform and base. Continuous rotation; elevation from 10° below to 75° above horizontal; infinite

position of ladder. Construction is of steel and reinforced fiberglass for added strength, light weight. The base requires minimum area for mounting. Optional foot pedal top-side controls. Added safety features include double chains, slip clutch, emergency controls and 12-volt D. C. Heavy Duty Electric Motors.

Designed for any type of maintenance or construction work, a choice of four models provides extended platform heights of 25' to 35'. Four types of work platforms and baskets are available. There's an EME exactly suited to your CATV system... Write for full information today!



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NCTA Forms Ad Standards Committee Under Bartlett

In view of the San Diego decision, the Greensboro decision and uncertain days ahead of the FCC, the NCTA Board of Directors has formed a committee to establish advertising standards for cable systems involved in program origination. The Directors, meeting in Washington, appointed Marcus Bartlett, vice president of Cox Cablevision, Atlanta, to develop the proposed standards. NCTA reports that the target date of the standards is January 1.

Specifically, the board action took note of four developments in connection with advertising by cable systems. First, in late August, the FCC refused to take action blocking the acceptance of commercials by a Greensboro, N.C. cable system. Second, at the time of this decision the FCC announced that the issue of cable TV commercials, along with a number of related questions would be made the subject of a general rulemaking proceeding to be initiated shortly.

Third, earlier in the year, in a case involving three San Diego cable systems, the FCC banned commercials by cable operators in the area. Fourth, published reports have indicated that the staff of the President's Taks Force on Telecommunications has recommended that cable systems be allowed to accept commercials in markets with four or more TV stations.

In commenting on the NCTA board's action, association president Frederick W. Ford expressed his "strong conviction that constitutional guarantees of free speech support the cable television industry's position that it should be allowed to accept commercials as a means of defraying the cost of program origination which provide a means of community expression which many of our citizens would have to do without." Ford added, "We are particularly concerned about the lack of access by small businessmen to the audio visual medium as a means of advertising their products and services in the limited areas from which they draw their customers. The little man, as

much as large corporate enterprises, should have the right to advertise products by whatever manner he considers most appropriate. Cable television can fill the void that now



Marcus Bartlett

denies many businessmen the opportunity to compete in the marketplace on the same terms as large corporations.

"There is little justification for the argument that cable television systems should be prohibited from carrying advertising on the grounds that such a ban is necessary to protect the revenues of TV stations. Advertising on cable systems because of its economy and high efficiency may create a whole new advertising medium."

NYC Report Pro-Cable; Commissioners Counter

On the heels of a pro-CATV New York City Mayor's Advisory Task Force report, two FCC Commissioners have called for a rule making to "restrict" all cable television origination of advertising.

According to Washington sources, Commissioners Kenneth Cox and Robert Lee urged early signing of such a rule making proposal, apparently so the Commission could notify the NYC Board of Estimate before the Board could take action.

The Task Force, headed by former CBS News chief Fred Friendly, submitted a 75-page document to Mayor John Lindsay calling for the entire city to be wired for cable in two to three years. Specific recommendations were:

GREAT FIELD STRENGTH METER WE'D LIKE YOU TO USE IT - FREE



To help you realize the many benefits of having and **FM-1B PORTABLE FIELD STRENGTH METER** at your system, we will be happy to send you one for a **FREE TEST**. Backed by a 90 day warranty and a reputation as one of the very finest portable field strength meters available... the **Model FM-1B** ensures that your system's level stability will always be accurately maintained. See for yourself... Send for your demo-test model now. Don't delay!

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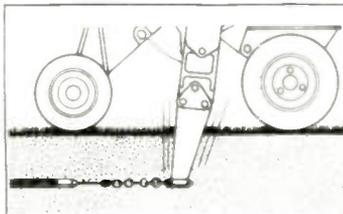


the only totally satisfactory way to lay service cable, wire, or pipe underground!

Nature made the mole a fairly efficient tunneling machine but it cannot compare to the PIPE PIPER. Unlike the mole or any trenching machine, the PIPE PIPER lays cable, wire, flexible or semi-flexible pipe underground *without removing turf or earth*. Lay TV cable right under the finest lawn without any fear of turf damage or customer dissatisfaction. There is no costly turf repair work and you *save at least 80% on cable burial time*. There is only *one* PIPE PIPER and it is the *one* machine that provides *total satisfaction* to both the contractor and the customer!

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Cable, wire, or pipe is *pulled* through an underground tunnel, formed by the oscillating forming element, at constant depths of from 5 to 12 inches (deeper under certain conditions). No turf or earth to replace. Total customer satisfaction!



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The PIPE PIPER is easy to maneuver uphill, downhill, and sidehill, and around obstacles, bringing the cable to exactly where it is wanted. Simplified controls are within easy reach of the operator. Burial can be done at a rate of 110 feet per minute. With burial blade neutralized, the PIPE PIPER can be moved and loaded under its own power. Easy to transport on trailer or truck.



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1. "Cable television service should be made available to every home in New York City wishing to subscribe. This goal can and should be achieved within the next two or three years. The City should be divided into approximately ten areas, each serviced by a separate company to be authorized.

2. "Competitive bidding should be on the basis of a percentage of the gross revenues to be derived from cable television operations. A bidder must guarantee to pay the City Government over the first ten years of operations a sum equal to \$5 for each television home within its area. For each area, the aggregate sum would be at least \$1,000,000.

3. "Each area would comprise at least 200,000 television homes and thus provide an incentive for venture capital. The City Government should regulate all rates to subscribers.

4. "State legislation should be sought clearly establishing that any company providing cable television service to individual subscribers in New York City must have the prior authorization of the City Government, whether the company would lay its own cable or use New York Telephone Company cable.

5. "Any cable television company that is financially and technically qualified, is of good character, and does not have an interest in a local television station may seek authorization . . .

6. "The City Government is able to secure for all authorized cable television companies the right to lease space in the duct system in Manhattan and the Bronx.

7. "To meet the opposition of landlords, the City Government should, where necessary, take legal action to secure the right of way . . .

8. "The City Government should seek to ensure that there is no economic discrimination . . .

9. "The City Government should set the technical standards for all cable television companies.

10. "Each authorized cable television company should be required to provide its subscribers with a minimum of eighteen channels." Recommended are: eleven for local TV broadcasting, three for use by the City Government, two for use by system, two for lease to common carriers.

11. "The City Government should authorize programs to be originated on cable television with the support of advertisers or by resort to special payments by subscribers, commonly called pay television. The authorization should be on a test basis to determine the kinds of programs that are presented and the receptivity of the viewing public. The City Government should receive a minimum of twenty-five percent of the gross receipts from all pay television programs.

12. "The Board of Estimate should continue to exercise all major functions with regard to cable television. A new municipal office for cable television and cable telecommunications should be established."

LVO Moves Cable HQ; Schneider Heads Group

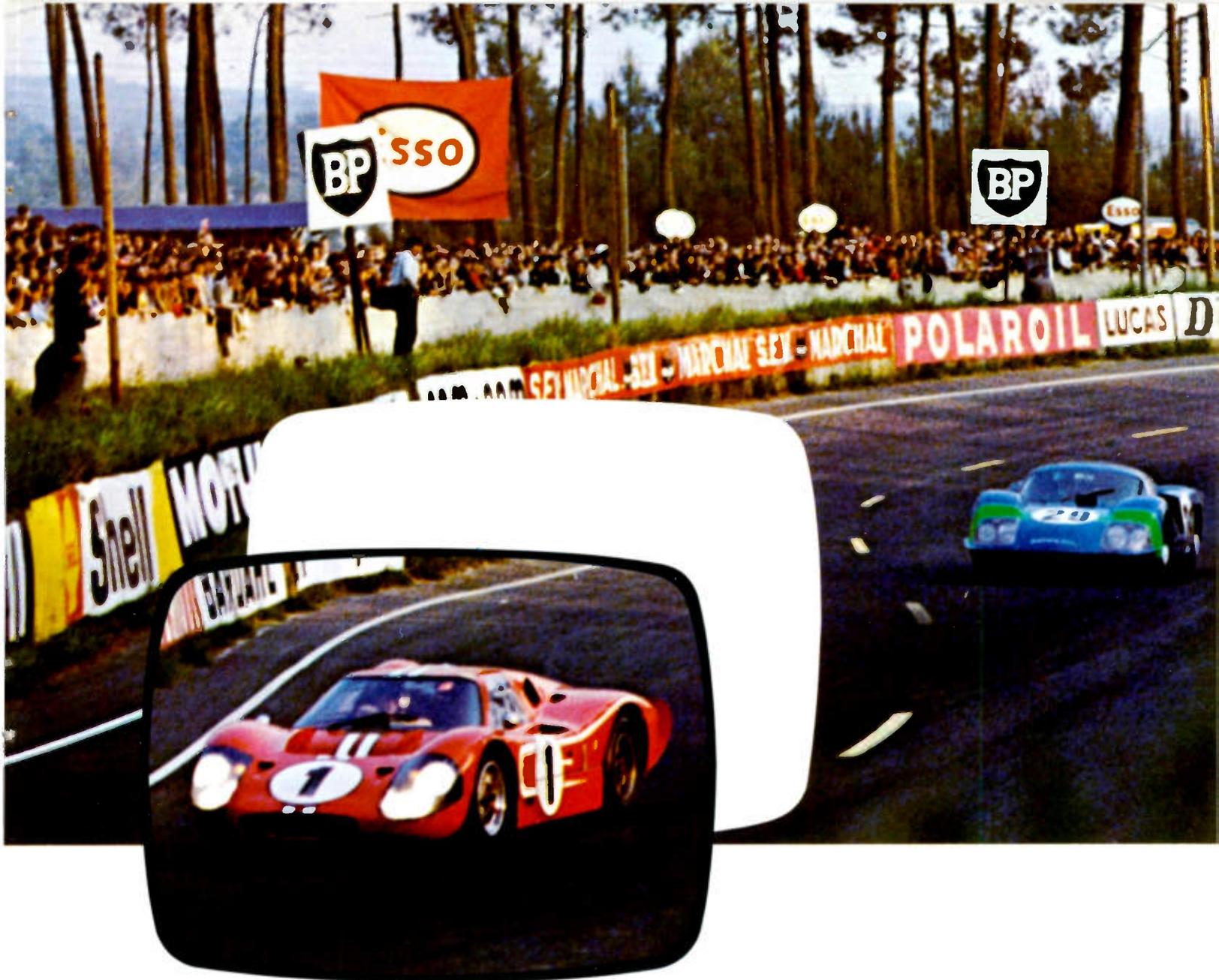
Gene W. Schneider has been elected president of Livingston Oil Company's CATV division; Jack Crosby and Ben Conroy have stepped down from the board of directors; and division headquarters are being moved from Austin, Tex. to Tulsa, Okla., in a series of moves



Gene Schneider

announced at LVO's 13th annual shareholders' meeting.

The move to Tulsa is aimed at consolidating LVO's management functions in the headquarters of the multi-divisional corporation, according to president Wayne E. Swearingen. The company's cable television division operates 15 systems with several others now under construction.



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Profit to you. Lively, crisp color for your CATV subscriber. That's what you get with Collins' new MW-808D CARS Band Microwave System.

Profits accrue from: *Color quality* that builds subscriber lists through word-of-mouth advertising. *Design features* that require the least expensive maintenance in the industry. *Manufacturing excellence* that gives you long, trouble-free, uninterrupted service.

Let us show you how the MW-808D's solid-

state, crystal-controlled transmitters and receivers—its low differential gain, low phase distortion and excellent linearity—can put you and your subscriber in the profit picture.

The same benefits are available in other new Collins systems—both IF heterodyne and remodulating—operating in the 3.7- to 13.2-GHz bands. For a new "Video Systems" brochure, write to Collins Radio Company, Microwave Marketing, Dallas, Texas 75207.

COMMUNICATION / COMPUTATION / CONTROL



New division president Schneider has been vice president of GenCoE (which merged last year with LVO) and manager of the GenCoE-Wentronics system group. Another GenCoE executive, Edward E. Drake of Moab, Utah, was elected vice president and general manager of the division.

Crosby, formerly LVO board

chairman and CATV division head, did not stand for reelection to the board. He and Conroy, also of Austin, and a CATV division vice president, stepped down from their positions because of the "press of other business." Following Crosby and Conroy's announcements, the board reduced its director positions from 11 to 9.

Staff Report Recommends Role For Cable in Telecommunications

In a 155-page internal staff report, the President's Task Force on Telecommunications has recommended a substantial for cable television in the national communications scheme. However, the staff said that over-the-air broadcasting would continue to be the basic medium and CATV was not intended to replace conventional broadcasting.

The staff report is part of a nine part study that is being written into a final report and forwarded to the president. The report again and again referred to the "multi-channel capability" of cable television and how it might best serve America's future needs.

The Task Force said that they intended to formulate a suggested national broadcasting policy and

ideally that policy should (1) cater to as wide a variety of viewers as possible; (2) serve as varied as possible an array of social needs; (3) provide an effective means of local expression and advertising; (4) provide these ends to the public at as low a cost as possible; (5) provide communications to all people (rural and urban, poor, and affluent); and (6) preserve a healthy measure of decentralized control of broadcasting.

Early in its report the Task Force staff said that it had considered low-power UHF stations, pay-TV, a fourth network, and direct satellite-to-home broadcasting but concluded that generally "the most promising is the distribution of television to the home by cable." The report further read that "cable

television is already a thriving business. There is a proven commercial demand. This means not only that cable television can be expected to spread without government subsidy or other forcing, but also that its commercial revenues may be available to support non-remunerative public uses of some of the channels."

The authors, who devoted almost 25% of the report to cable television made it abundantly clear as to "our own estimate of the benefits of cable television." The staff said, "Our conclusion is that the problems inherent in the widespread adoption of cable television can be satisfactorily resolved while permitting market forces to guide its future growth."

The Task Force departed from its otherwise rosy picture of the future CATV role and said that full copyright liability should be imposed; limitations on distant signal importations in markets where four stations have been assigned but where the fourth station is not yet on the air; and a stipulation that when a cable system operates in markets where one station fails (out of four), the system owner must guarantee the operation of the faltering station; and that the FCC's duopoly rules should apply.

"The thrust of our analysis in this paper," the report read, is that "cable television offers great promise in terms of the goals of a national policy for broadcasting . . ." Of prime consideration to the future use of CATV is to assure "for those who cannot or choose not to pay the cable subscription fee—an adequate level of over-the-air television service."

ATC Offers Public Stock

ATC, new and rapidly growing MSO firm, has filed a registration statement with the SEC for public offering of 482,409 shares of stock at a maximum per share price of \$16.50.

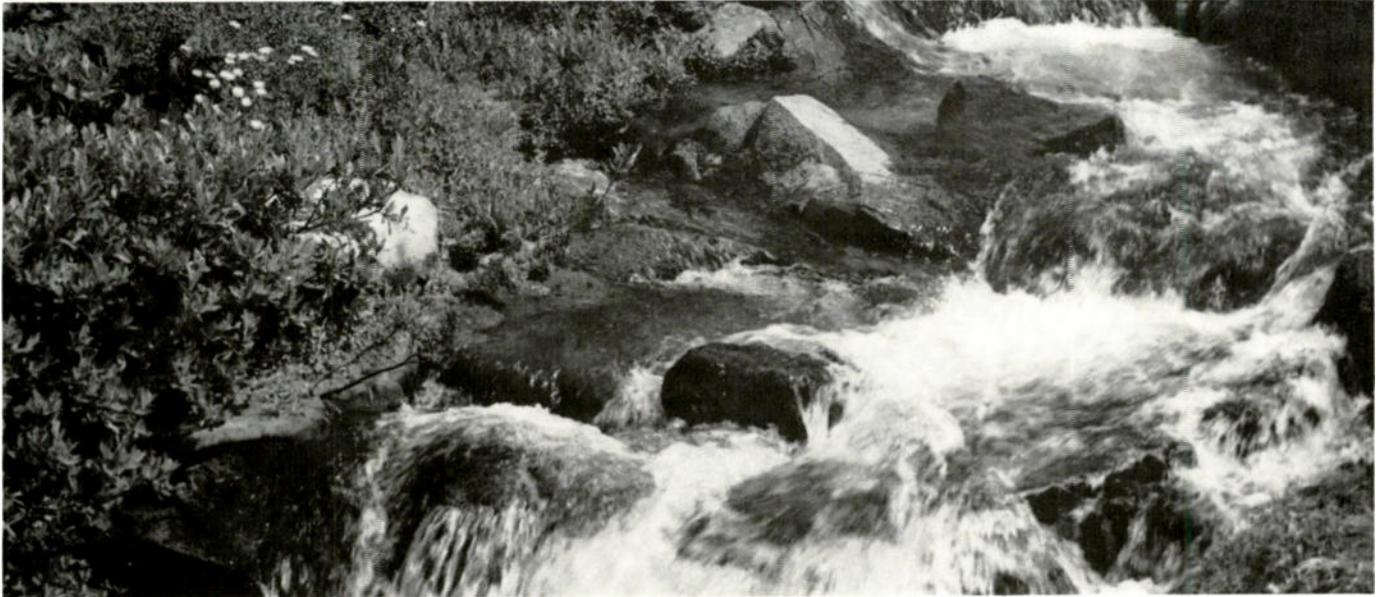
Of these shares, 333,333 are being sold by the company and 149,076 by certain individual stockholders. According to company president, Monroe Rifkin, public offering will be handled by an underwriting group headed by Paine, Webber, Jackson & Curtis.

TVC

Town Meeting Attracts Cable Viewers



Percy Sutton (r.) hosts Regional Plan Association's Boris Pushkarev on recent Manhattan Cable "town meeting" cablecast concerning rapid transit systems for New York City.



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No single failure can disable the system because of redundant power supplies and sectional fusing. Test points are accessible from the front. Cards are interchangeable

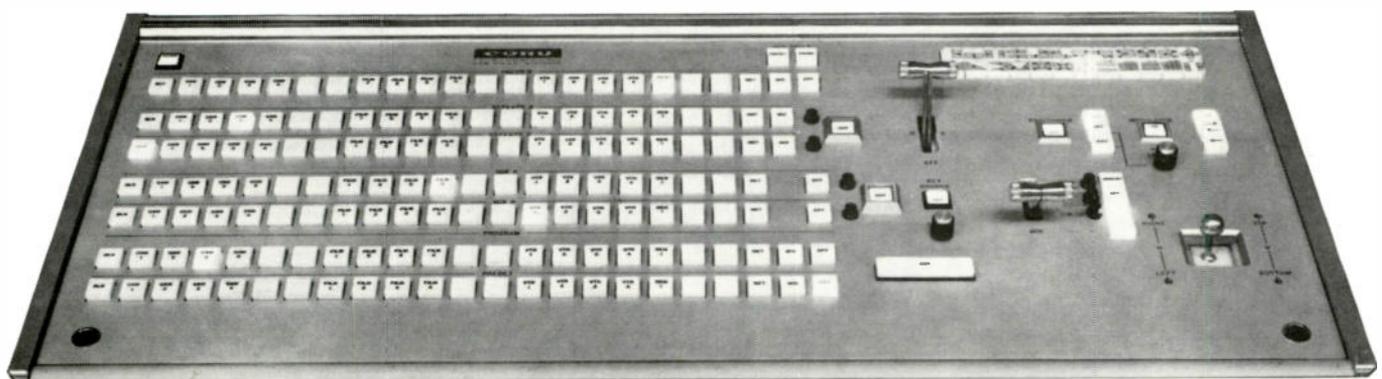
plug-ins. Adjustable, preprogrammed delay sections provide interchangeable output amplifiers.

Designed especially for broadcasting, the 9300 Series Video Switcher features integrated circuits and modular design with a convenient form factor for typical studio requirements and expansion capabilities.

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FOCUS

... On People

Systems

Bob Williams has been appointed general manager of Community Antenna Co. of Reno, Nev. His duties in Reno will include development of program origination on the cable system.

Roderic M. Smith has been appointed business manager for the CATV Division of Storer Broadcasting Company. He joined the Storer organization in 1966 with extensive experience in broadcast finance including 10 years with Westinghouse Broadcasting. He was most recently financial analyst and budget administrator for Storer.

American Finance Management Corporation has announced the appointment of **John I. Hanly** to the position of director of CATV, responsible for company cable television activities including the five present systems. Hanly was previously president and general manager of Television Cable Co., Chevy Chase, Md., and Monocacy Broadcasting Co. of Md.



Mr. Hanly



Mr. Tatta

Manhattan Cable Television last week announced four executive promotions and appointments effective immediately. Promoted to newly created posts are: **John Tatta**, formerly general manager, to vice president and director of operations. **Irwin B. Polinsky**, formerly real estate manager, to marketing and

real estate director. **Charles D. Snider**, formerly construction manager to director of engineering. Joining Manhattan as general manager of Channel 6, the system's origination channel, is **John A. MacPherson**.

Ralph E. Hembree, general manager of the CATV division of United Transmission, Inc., has been elected vice president and general manager of the company, effective October 1. In his new position, Hembree will be in charge of the entire United Transmission operation.

David B. Rose has joined Kaufman and Broad, Inc., as the company's new controller of CATV operations.

Derek White of Warren, Pa., has been named general manager of Pittsfield Dalton (Mass.) TV Cable. Manager of Warren Television for the past year, he has 12 years experience in cable television in several communities. White succeeds **Fred Schwab** as manager. Schwab will be the new manager of the Warren system and is also assuming new duties as a member of the corporate engineering staff of TeleVision Communications.

Lloyd E. Schrencengost has been named general manager of Valley Master Cables, Inc. in Kittanning, Pa., and will also be in charge of Direct Channels Associates at nearby New Bethlehem. He has been with Kittanning Telephone Co. since 1953.

Jack Harper has been transferred from Storer Cable in Carlsbad, N. Mexico., to Sonoma, Calif. He will be responsible for extending Storer service in the areas of Sonoma, St. Helena, Calistoga, Rohnert Park and Cotati as franchises are obtained.

Dale W. Allen has been named general manager of WHJB Cable

Vision, Greensburg, Pa. Allen was previously president of SVTV and has worked in cable television as a consultant.

J.C. Woods has been appointed manager of the G'TEC CATV system for Brownfield/Levelland, Texas. Woods was previously manager of G'TEC Cable TV in Winchester, Ind.

Jack McEvoy has been named general manager of the CATV Division of KAYS, Inc., owners of KAYS-TV and KLOE-TV in Kansas.

Mike Owen has been appointed manager of the American Cablevision system in Graham, Tex. He has been in CATV for four years, first in Washington, most recently in California.

Carol Wailes has been promoted to the position of service representative for the Tele-Vue cable system serving Snohomish County, Wash. She joined Everett Cablevision last year.

Suppliers

Craftsman Electronic Products, Inc. has announced the promotion of **Matthew J. Lysek** to the position of general sales manager. Lysek, who has been with Craftsman since 1966, was formerly national sales manager handling national CATV accounts. His new responsibilities include establishing and administering marketing programs for all of Craftsman's CATV and MATV products. **Gerald M. Small** has been appointed regional sales



Mr. Lysek



Mr. Small

manager for the midwest by Craftsman. Small will represent the company's line of CATV equipment to cable system operators in the twelve central states.

Dynair Electronics last week announced three appointments: **John J. Crowley** to vice president-operations, **William Fisher** to controller, and **Don Peck** to manager of material.

John L. Buchanan has been elected to the board of directors of Ameco, Inc. Buchanan serves as vice president of marketing-sales and has an extensive background in communications management.

Cascade Electronics has appointed **Thomas V. Goodall** as western regional sales manager. He will be responsible for Cascade sales activities in the western states, and will continue to personally cover northern California and Nevada.



Mr. Buchanan



Mr. Goodall

Carroll Courtmier has been named sales engineer for Cascade. His territory will be Arizona and Southern California. Most recently a system manager with Storer Broadcasting, he has had 28 years in electronics, including 10 in CATV.

Jack Daniels has been named to the new position of operations manager for TeleMation, Inc. Daniels' new responsibilities include administration of 10 production departments. He has been district sales manager for ELSCO Arizona, Inc., assisting cable operators, educators and broadcasters in planning and engineering TV systems.

Television Presentations, Inc. has appointed **Burton A. Kittay** to the new position of marketing manager where he will be responsible for assisting TPI clients in making use of Alphamatic News. Kittay comes to the company from Sweet and Co. Advertising, Inc., where he was account executive for TPI. Prior to joining Sweet, he was assistant advertising manager for BVD, a subsidiary of Glen Alden Corp.

Professional

Stan F. Brooke has joined Communications Publishing Corporation as assistant managing editor of *TV Communications*. Brooke is a former journalism instructor and superintendent of the Arkansas City, Kansas, Recreation Commission.

Frank N. Cooper has joined Marlarkey, Taylor & Associates, CATV consulting and brokerage firm, where he will be responsible for brokerage and financing activities. He was previously manager of CATV system development for Jerrold and has participated actively in industry affairs. 



Mr. Brooke



Mr. Cooper

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Cable Television Comes to Daniel Boone Country

Overcoming some extreme physical obstacles, CATV has arrived in Middlesboro, Ky. where over 1,000 pre-subscribers were waiting for it. In the first unanimous action of its kind, the FCC granted a distant signal waiver for the mountain-locked community just two weeks before system start-up.

An oasis in Appalachia—that's what the *Wall Street Journal* called the city of Middlesboro in the southeastern corner of Kentucky. The label results from the "bootstraps" industrial comeback staged in recent years after a long period of economic depression. New industry, a new population boom, a new outlook for the future—all pointed to a genuine revival for this city surrounded by the Cumberland Mountains.

The high peaks of these very mountains, however, made an otherwise revitalized Middlesboro a deprived area in the TV Age: only two or three television stations served the city, with the closest

stations coming from Knoxville, Tennessee, 45 miles away. The signals, relayed via translators, were relatively poor. Moreover, not one of the signals came from a Kentucky station.

On July 19, 1968, Middlesboro, part of the first great frontier to the West, again defied its mountain barriers as its new cable system turned on its signals. Down from the mountain came 10 channels of top quality television, including five Tennessee stations, one Virginia station, a locally originated public service channel, a 24-hour time-and-weather channel, and two channels from Lexington, Kentucky.

So whetted were the appetites

in this community for improved television service that over 1,000 (24 percent) of the 4,200 potential subscribers had already signed for the service by the time the Jerrold-built and owned system began operation.

A Formidable Task

Middlesboro is Daniel Boone country. Boone passed that way in the 1770's, blazing the famed Wilderness Road through the Cumberland Gap as a pioneer passageway westward. It's doubtful that Boone's task was any more formidable than that which awaited the Jerrold crews in this rugged mountain country.

In order to provide comprehensive CATV service, including Lexington channels, it was necessary to select and construct an antenna and head-end site at an extremely high elevation.

Nate Levine, chief engineer of Jerrold's community operations division, personally directed the selection of the site. After consulting topographical maps of the area, Levine and Dick Bumgarner, assis-

At left: Stan Ogen and Len Mecca prepare window display at Middlesboro Cable TV office prior to grand opening.

Far right: Head-end for Middlesboro, Ky. system stands atop nearby mountain; provides eight channels off the air, including 100-mile distant Lexington signals.



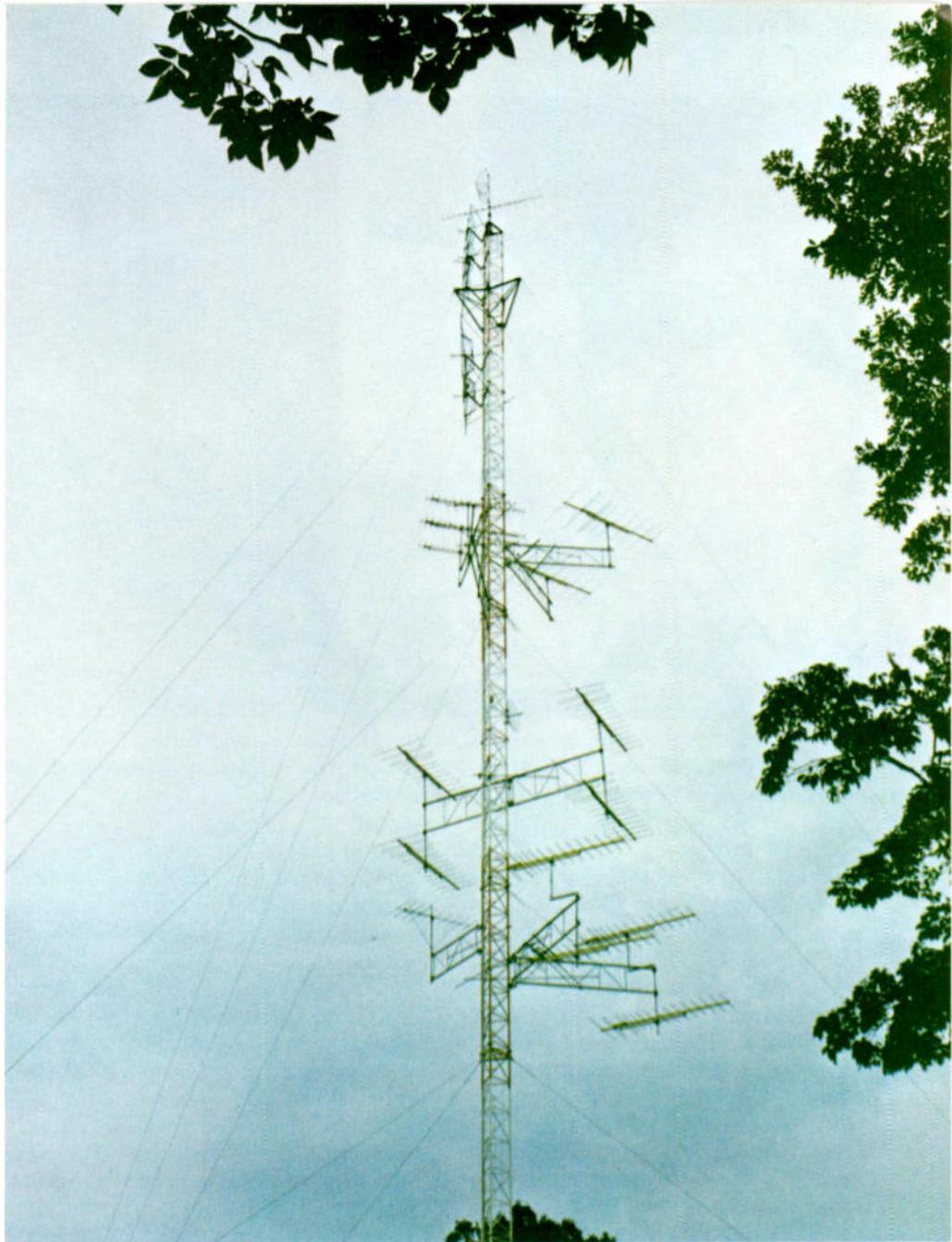
tant chief engineer, toured in a jeep for three days making preliminary surveys. Then, equipped with a portable TV receiver and a field strength meter, Bumgarner circled for several hours in a helicopter to narrow the possible choices for the prime location.

These choices were checked against computerized signal survey data in the company's home office in Philadelphia, to determine the exact signal reception and interference conditions at each site.

Finally, a field-test truck set out to verify the findings. For two days, the vehicle scouted with its 60-foot tower equipped with VHF and UHF antennas. Two sites within three and a half miles of Middlesboro were found to be practical for CATV reception. One of the two proved completely inaccessible. And the other, the 3,030-foot-high Willard's Knob on Log Mountain, was surely never scaled by Daniel Boone.

But scaled it was by members of the construction department of Jerrold's CATV systems division. These men, led by field supervisor Huston Ross, not only performed the arduous task of mountaintop construction mostly in extremely cold weather, but also completed the installation of the 65-mile cable system and balanced it electronically in just 89 days.

To reach the top of the Knob, these "trailblazers" had to bulldoze a road ten miles long through rattlesnake-infested woods, an ordeal requiring 200 hours to complete. Then, equipment—including com-



ponents of the 200-foot tower, antenna arrays, head-end signal processing gear and building materials—was placed on a trailer and towed up the road by bulldozer.

The 8,000-foot pole line from the head-end site to the foot of the mountain was led down a precipitous face with grades as steep as 75 percent. Poles and cable were pulled up the face by rope.

The construction department's installation of the aluminum main trunk and distribution cable is a source of particular pride to Middlesboro Cable TV. Strung on power and telephone lines, the cable is exceptionally neat, with not one abnormal kink or bend throughout the entire 65-miles of system. All

necessary loops are unusually uniform in size and contour.

At the downtown headquarters of Middlesboro Cable TV are two separate cablecasting studios for the time-and-weather channel and the public service channel. These signals are sent back to the head-end on a separate cable and then processed and mixed with the off-the-air signals and fed through the system to subscribers.

FCC Unanimous on Waiver

Jerrold undertook construction of the system "on faith," confident that the Federal Communications Commission would render a fair decision of the proposed importa-



At left: Earl Crumley, chief technician for the Middlesboro operation, adjusts controls on automatic time/weather service equipment. At right: bulldozer stands by to assist cement truck and truck with tower sections (far right) as they struggle up newly dozed road to the head-end site at Middlesboro.

tion of distant Kentucky signals. In petitioning the FCC for permission to carry the two Lexington UHF stations, Jerrold noted that the most "compelling reason" for such carriage was the "opportunity Middlesboro residents will have for viewing television programming from within their own state for the first time. Carriage of these two UHF stations will permit subscribers to become acquainted with the local coverage from their state capital including Kentucky news, sports and public events, all of which they have never been able to view on a Kentucky station since the inception of television . . . Denied Kentucky programming for so long, these citizens have expressed a great and natural desire to view these stations. Bringing these stations to residents of Middlesboro is surely in the public interest of broadcasting and of the local residents . . . The proposed carriage of the two Lexington, Kentucky stations by the Middlesboro system fills this . . . programming vacuum in the viewing spectrum of local citizens, in addition to providing further exposure for two UHF stations in a vicinity where they would not otherwise reach."

Two weeks before the opening of the system, the FCC granted the re-

quest for waiver. This was the first unanimous decision ever reached by the FCC on a CATV waiver request.

The unveiling of the Lexington stations during the pre-opening banquet brought cheers from the civic leaders in attendance. Mayor Chester Wolfe, who had officially proclaimed two "TV Cable Days," heralded the system as another step forward in Middlesboro's program for the future. John P. Rucker, president of the local Chamber of Commerce, addressed the banquet saying that CATV will "tie Middlesboro, via the electronic medium, into the happenings of the state. We've become a part of Kentucky again."

All-Out Promotion

By the time the Middlesboro system began operations, the residents of the city were fully aware of the advantages of CATV service. A full-scale promotional effort was staged by Jerrold under the leadership of Dave Brody, manager of the community operations division, and Stan Ogen, promotion manager for the division. The program included newspaper advertisements on a regular basis, billboards, radio commercials and handbills. All promo-

tions emphasized the "TV Cable Days" special installation charge of \$5—a savings of \$20.

On the day before the grand opening, the Middlesboro *Daily News* distributed a 16-page special supplement about the new system. Except for a Bell County Centennial issue in 1967, the CATV supplement is believed to be the largest issue ever published by that paper.

On Thursday, July 18, the system entertained some 200 civic and government leaders at the pre-opening banquet in the Middlesboro Country Club (the oldest golf club in the nation). In addition to Mayor Wolfe and Chamber of Commerce President Rucker, dignitaries included Congressman Harry M. Hoe; members of the Middlesboro City Council, Board of Education and Industrial Commission; and heads of television broadcasting stations whose programs are carried on the Middlesboro system.

The ten channels were demonstrated at the banquet on color TV sets lent by the ten local TV dealers. These dealers cooperated enthusiastically in promoting subscriptions. One dealer went so far as to offer a free hookup and free CATV service for six months with the sale of each color TV set.

Grand opening events for the

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At left: Pre-opening banquet was staged for community leaders, with ten cable channels on display. At right: Jerrold community operations manager Dave Brody signs up subscribers at sidewalk sales location.

public began Friday night, July 19, at the cable company's office headquarters. Hosting the events were system manager Skip Cole, Miss Cable TV (Frances Williamson, a clerk in the system's office), and Jerrold officials.

Throughout that evening and all day Saturday, visitors were entertained by a country and western band, served refreshments, given a chance to try their "magic keys" in the treasure chest of prizes, and invited to guess the number of pennies in a TV picture tube for prizes including a color TV console, a portable TV and an AM-FM radio.

Hundreds inspected the able-casting studios throughout the weekend. Visitors viewed themselves on the local channel as they passed in front of the TV camera strategically placed near the entrance to the office. Ten color and ten black-and-white TV sets were on display demonstrating the system's programming.

Joining in the festive spirit of the city's annual Sidewalk Sale held that weekend by local merchants, Middlesboro Cable TV moved a sign-up desk outside of the office. Hundreds of subscribers responded, both at the sidewalk set-up and inside the office.

One local businessman summed up the enthusiasm of Middlesboro

residents over their new CATV service, saying it will save him many miles and hours of travel. He and his friends have been accustomed to traveling regularly to the nearest Kentucky CATV town, renting a motel room with a television set, and watching major athletic events on Kentucky channels. His traveling days are over.

An All-Kentucky City

Middlesboro is steeped in history, its importance going as far back as 1606 when King James I of England granted the area to the Virginia Colony. The Cumberland Gap area was inhabited by colonizing groups as far back as 1750. At that time it was known as the Gateway to the West because of the narrow passage it offered to the Wilderness Road. Daniel Boone surveyed these settlements in 1769, 1773 and 1775.

Coal mining, so important to the area's early development, remained the major economic prop until after world War II when that industry began a serious decline.

Today, Middlesboro is diversifying its economy, and the situation has improved markedly during the last five years. Active civic groups have succeeded in luring three new major industries to the city in that period. A mobile home plant, a flake board plant and a

shirt manufacturing plant provide more than 500 new jobs for Middlesboro residents. The population has grown significantly, and now numbers approximately 15,000.

For these successful efforts, the Kentucky Chamber of Commerce in 1964 named Middlesboro the "Number One Kentucky City" in community development. The Chamber also listed Middlesboro as one of several All-Kentucky Cities in both 1965 and 1966.

Other long-established industries in the city include a tanning company, an elastic webbing plant, a foundry and a plastic pipe plant. Some 85 coal mines now operate in Bell County.

Tourism, too, is a growing industry, with increased civic promotion of the beautiful Cumberland Gap National Historic Park (largest in the nation) and popular Pine Mountain State Park.

Thus, Middlesboro citizens, so conscious of their area's needs, welcome CATV not only as an improved source of entertainment but also as another new industry that creates employment for local people, promotes the health of the local economy through increased TV advertising, and stimulates sales of TV sets for local dealers.

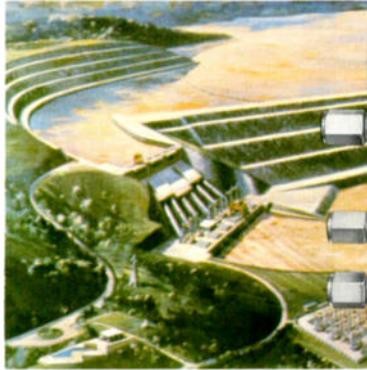
Middlesboro Cable TV bids to be another successful new enterprise in the city's revival. nvc



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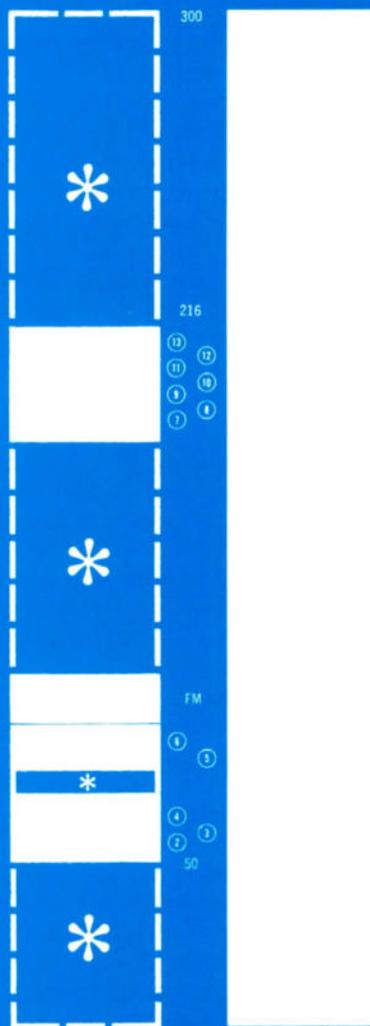


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The Quasi-Laser Link System For CATV

The growth of CATV in urban areas has precipitated the need for short-haul microwave systems. The following is an up-to-date report of the latest developments of one such system still in experimental stages.

By Dr. Joseph Vogelman, Vice President of Research, Chromalloy American Corp. And Ira Kamen, President, Laser Link Corp.

The need for community antenna television in certain urban areas has been created by the steel and concrete canyons where rooftop antennas on many multiple dwellings are masked from the transmitter and where reception is adversely affected by reflected signals bounced from adjacent buildings. These basic problems have been made more acute by the growth of UHF-TV, the more critical needs of color TV, and the fact that apartment house master antenna systems cannot cope with the stringent requirements created by the additional channels, color transmission, etc.

The classic CATV system successfully employed in suburban and rural areas cannot be practically employed in modern municipalities. In these urban areas municipal regulations usually require the cable to go underground as external poles generally are not permitted, and the CATV operator is faced with the problem of the high cost of making underground installations. In urban areas there is usually a labyrinth of underground ducts, conduits, or tunnels. However, the telephone companies usually own all suitable underground facilities and generally insist that any cables or amplifiers installed in their ducts must be owned, operated and maintained by them in order to protect the vital message services installed in their common ductwork. There-

fore a CATV operator is limited in his title to his antenna system and the connection between the telephone company's installed outlet and the subscriber's television set. It is highly desirable that the CATV operator be independent of the telephone company in order that he may have flexibility in meeting installation dates and in order to avoid the necessity for paying expensive cable construction charges and recurring tariffs.

To bypass this complication and provide an urban CATV service which can be installed, maintained, and controlled by the CATV operator, it became apparent that an air link of some kind was needed. All the standard and known modulation techniques employed for microwave were examined and found to require excessive power levels and special frequency assignments in a crowded spectrum. Also, microwave systems presently in use require receiving terminals of great complexity and high cost to overcome the inherent bandwidth and noise limitations. Even under the most favorable conditions, the results would be highly subject to distortion and fading as well as being prohibitively expensive to construct and maintain.

As a result of the foregoing facts the following requirements were developed for a viable air link system: (a) The modulation must be independent of wavelength of the carrier beam used and have a ca-

capacity of 12 to 20 channels. (b) It must employ a simple inexpensive master receiver for each location and use low power transmitters. (c) It should be directly applicable to existing master antenna distribution systems. (d) It must be unaffected by high frequency, low-level fading associated with rain, hail, etc. (e) It should cost less than \$100 per customer rate of rural CATV to insure profitable operation at \$5.00/month subscription rate.

The Quasi-Laser Link system meets the above requirements with a modulation technique on which multiple patents are pending. This system can provide air link for all buildings in an area. It has a potential of 20 channels, when required, from a single radiating source. The system functions independent of frequency and can work with carriers consisting of long wave, infra-red lasers, and other quasi-optical wavelengths, including microwave. It also overcomes the high linearity problem inherent in microwave systems and is designed to provide reliable short-distance links through rain, fog, and smog and also to allow broadcasting in an uncluttered spectrum not susceptible to distortion from aircraft. The system will be operative under all atmospheric conditions and could even compensate for very rare periods of hurricane rain, of large particle size hail, or extremely dense fog.

Overall, the system is expected to have a greater service reliability than a conventional CATV wired system.

For patent protection purposes it is not possible at this time to describe the exact techniques employed; however, the following are some of the facts on the quasi-laser system.

Transducers used to direct the beam create and disperse beams to insure no hazard. Narrow beam transducers at the receiving end are less than one foot in diameter. Reflecting mirrors are used to get the signal to shielded buildings. Transmission range is limited to 3 miles in extremely bad weather, and is greater in a normal environment.

The transmitter terminal consists of a high-grade television antenna system and a proprietary modulation system used to translate TV channels to quasi-optical wavelengths on which signals are transmitted. Additional channels can also be added to available TV channels to send special material. The narrow beam technique allows the use of the same wavelength over and over in adjacent areas without interference.

The receiving transducer is narrow beam and can be fairly remote from the rest of the receiver if desired. The output of the receiver is identical to signals received directly from the station, and can be fed into a receiver or master antenna distribution system.

The initial system being developed for demonstration to the FCC will be a 12-channel system. This version will serve the immediate needs of the industry, but development of a more-than-twelve channel system will continue. The system features allow channels to be added without disturbing the operational or physical integrity of the 12-channel installed system.

The Quasi-Laser system which has been demonstrated was developed to achieve these objectives: (1) To check out the predictions of the proprietary concept. (2) To gain insight into the product engineering necessary for making 12 and 20-channel air link CATV systems. (3) To prepare information



Above top, Dr. Joseph Vogelman demonstrates the effect of reflecting the quasi-laser beam away from the receiving transducer by use of a copper plate. The picture as normally transmitted is also shown.

for the FCC under an experimental license which could lead to rule-making in this little-used frequency range above 40 GHz.

The system now being packaged for demonstration employs a combination of proprietary developments. The system means for dispersing the quasi-laser signals is a proprietary concept of Dr. Joseph Vogelman. The disc-rod arrays

employed in Dr. Vogelman's radiating system are the creation of Laser Link consultant and principal, Richard D. Bogner, and are covered by US Patents 2955287 and 3015821 and additional patents pending. The modulation technique and systems applications were brought forth by Laser Link's vice-president, Harold R. Walker. (nvc)

Utilizing Microwave for Multi-Channel Transmission

A transistorized microwave system which covers 70 path miles is making it possible for Quincy Cablevision to provide five additional channels from St. Louis for its three Illinois and Indiana cable systems.

*By Richard Ashpole
Chief Technician
Quincy Cablevision, Inc.*

The Quincy Cablevision network utilizes a microwave system, which allows the combining of several channels for transmission on the same waveguide and antenna system, a job which requires close frequency tolerance and high stability. In this installation, five channels, dual polarized, each carry a video and audio signal for transmission.

Engineered, furnished and installed by Lenkurt Electric Co., Inc., San Carlos, Calif., the microwave network, which utilizes Type 76 radio, extends from the CATV system's off-the-air pickup sites at Louisiana, Mo., to Quincy, via a repeater station at Hannibal,

Mo. From Quincy, the microwave system extends to Keokuk, Iowa.

From Keokuk, the signals are carried via a $\frac{3}{4}$ inch coaxial cable to Hamilton, Ill., over a distance of some 2,500 feet (see Figure 1). The cable from Keokuk to Hamilton is attached to a bridge which crosses the Mississippi River at this point.

In addition to the off-the-air pickup facility at Louisiana, Quincy Cablevision also has off-the-air pickups at Quincy and Keokuk so its subscribers will be afforded full network telecasting as well as local programming.



Figure 1: Quincy Cablevision Microwave Network

TV Channels Available

In Quincy, CATV subscribers have their choice of four commercial St. Louis channels and one part-time educational channel from St. Louis as well as the Kirksville-Ottumwa (Iowa) channel and two Quincy-based channels.

In both Keokuk and Hamilton, subscribers have a selection of three commercial St. Louis channels, the part-time St. Louis educational channel, a Kirksville-Ottumwa channel, three channels from the Tri-Cities of Davenport, Iowa; Rock Island and Moline, both in Illinois; and the two Quincy channels.

In addition, Quincy Cablevision offers a 24-hour channel devoted to weather and time. This channel also provides continual FM music.

Construction on the microwave network was started in December, 1967, however, it was delayed because of weather conditions. Following the delay, it was completed in March of this year. The path survey for the radio system was completed in December, 1966, by Lenkurt.

The equipment buildings housing the microwave equipment at each site are constructed of prefabricated aluminum and are 10' x 16' x 8' structures. All the buildings are air-conditioned and also have heaters.

Towers utilized for off-the-air pickups and for the microwave passive reflectors and antennas vary in height from the tallest, 405 feet at Quincy, to the shortest, 240 feet at the Hannibal repeater station. Advanced Industries of Sioux City, Iowa, furnished the buildings, passive reflectors and towers for the system.

Microwave Equipment Utilized

In the transistorized microwave equipment, the linearity of the baseband and radio circuits results in very low values of differential phase and differential gain. All the microwave radio system components are accessible from the front and most of the system circuits are on plug-in cards. In the Type 76, each transmitter and receiver has a built-in meter which monitors all the necessary functions for normal maintenance. Test jacks are provided in the system at the input and output of all active units for lineup and maintenance.

Should maintenance be required on the microwave equipment, it is relatively simple to perform. Using the built-in jacks and meters, a faulty module can be quickly located and replaced.

Power Source

The equipment at each microwave site utilizes a 48-volt battery plant which can provide primary power to the system for operation of the equipment for eight

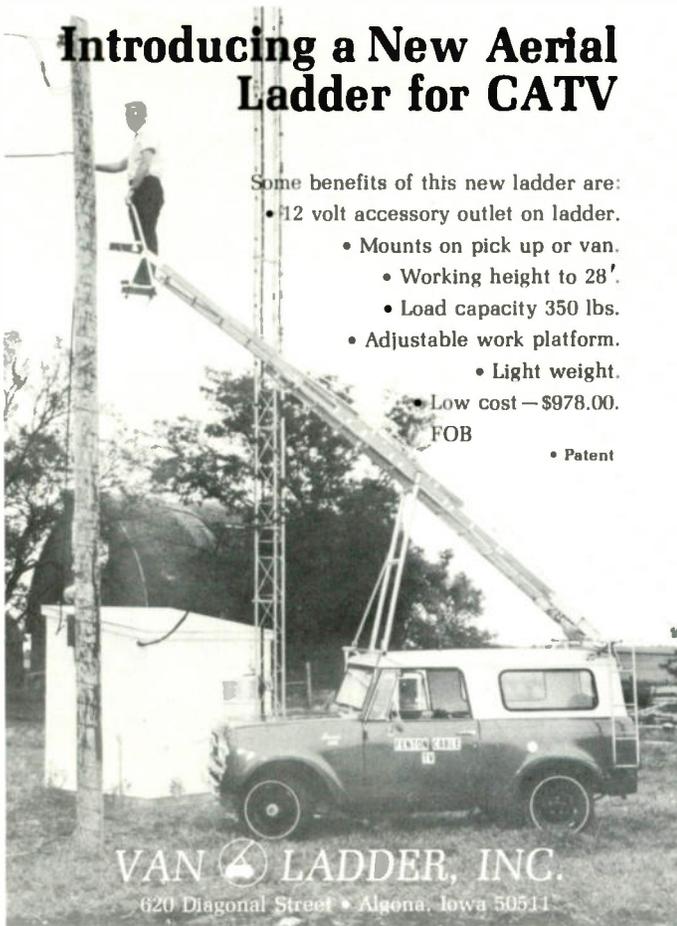


Meter readings are recorded at the Louisiana microwave radio site by Richard Ashpole, Chief Technician, Quincy Cablevision, left, and James A. Teslik, Senior Sales Engineer, Lenkurt. Signals are relayed from Louisiana to Hannibal.



Bill Hinton, Chief Technician, Keokuk Cablevision (sister company of Quincy Cablevision) enters the microwave building at the Keokuk site. The site is the terminal point of the microwave system. Coaxial cable carries the signals on to Hamilton.

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hours if commercial AC power should fail. Total cost of the microwave system including towers, antennas and buildings was approximately \$274,000.

Improvement in Reception

In addition to the improvement in color TV transmission in all three cities, the utilization of cable and microwave radio has brought about a great improvement in black and white TV reception in the three cities. Several additional channels are also available to residents.

An Outstanding CATV Leader

Quincy Cablevision has received a number of awards, including two from the National Cable Television Association and one from the Downtown Quincy Chamber of Commerce.

Quincy Cablevision, which serves more than 5,250 subscribers in Quincy, and some 2,520 subscribers in Keokuk and Hamilton, is a subsidiary of Continental Cablevision, Inc., Fostoria, Ohio. The firm was granted a CATV franchise for its Quincy operations in June, 1965, and it received a license to operate in Keokuk in August, 1965. In July, 1967, it obtained a franchise for its Hamilton operations.

Only a few miles of buried cable are utilized by Quincy Cablevision for transmission into the residences of its subscribers. Most of its cable is strung on power and telephone pole lines under leased agreements. 



Dramatic!

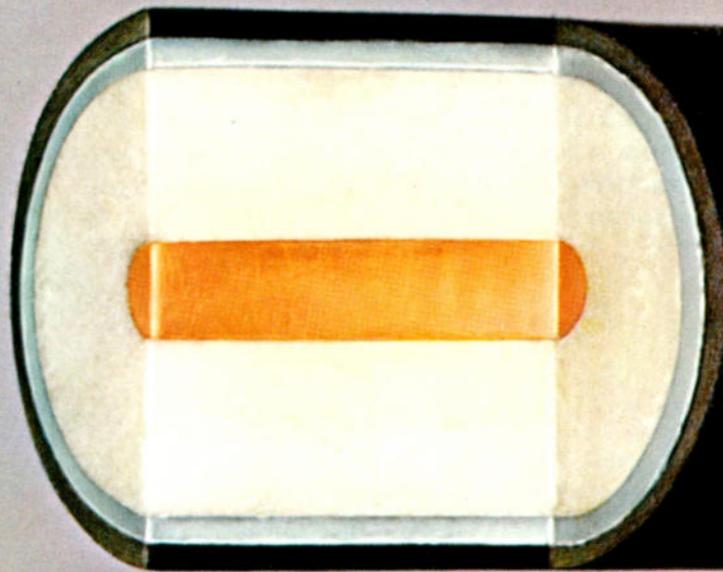
Events of the first nine months of this year have already proved 1968 to be a dramatically important year for Cable Television. Dramatic in the impact of Supreme Court decisions, FCC rulings, legislative battles in capitols across the nation . . . Important in its challenge to cable people to stay on top of each new development and controversy and to keep pace with CATV growth.

And while the future and the history of cable television are being made, **CATV Weekly** is capturing the drama of the present for involved cable people. You owe it to yourself . . . \$33 brings you complete coverage of this important year, and does it week, after week.

To subscribe, turn to page 109.

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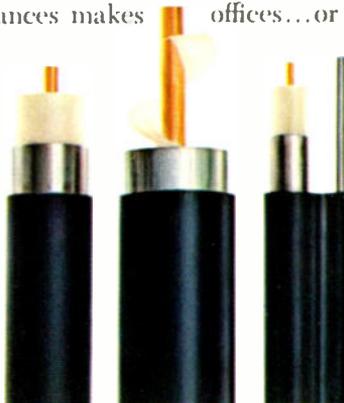
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Special Guest Editorial: Cablemen Must Look to Congress

Lack of foresight among Commissioners, and submission to broadcasters' pressures, rule out remedial action from the FCC. CATV operators should focus their attention on the legislative solutions available in Congress.

By Robert D. L'Heureux

The CATV industry reached two very important legal milestones when the Supreme Court of the United States decided the cases of *U. S. v. Southwestern Cable Co.* (June 10, 1968) and *Fortnightly Corporation v. United Artists Television, Inc.* (June 17, 1968).

In the *Southwestern* case, the Supreme Court decided that the Federal Communications Commission's "authority over 'all interstate . . . communication by wire or radio' permits the regulation of CATV systems" under Section 152(a) of the Communications Act. The Court went on to say: "It is enough to emphasize that the authority which we recognize today under § 152(a) is restricted to that reasonably ancillary to the effective performance of the Commission's various responsibilities for the regulation of television broadcasting. . . . We express no views as to the Commission's authority, if any, to regulate CATV under any other circumstances or for any other purposes."

For the present, the Commission's authority over CATV is only for the purpose of aiding it in the effective performance of its regulation of television broadcasting. In order to be upheld on the basis of the precedent in the *Southwestern* case, the Commission's CATV rules must be shown to be reasonably ancillary to the regulation of television broadcasting.

This is still much too vague a criterion to be of any use to the CATV industry in resisting even patently unreasonable rules in most courts. When the Commission's lawyers tell the courts that the Commission is simply trying to protect struggling UHF television stations, or trying to maintain the possibility—as remote as that is—of UHF television stations eventually getting a start in large and small communities all over the country, or in maintaining the allegedly sacred "Table of Allocations," the judges shrug their shoulders and cringe at the thought of taking the time to try to master the intricacies



Robert D. L'Heureux

of these various terms of art. The courts' calendars are so crowded that the judges simply do not have the time, as they did some forty years ago, to call for long supplementary arguments or additional briefs to determine whether these arguments hold water. In case of uncertainty, they will resolve the doubt in favor of the greatly exaggerated myth of "administrative expertise."

It will do CATV interests no good to attempt to tell the court that the Commission's alleged expertise has been found egregiously wanting whenever

a decision affecting a new industry has had to be made in the past. The courts will not even listen to arguments that the Commission blundered time and time again when it had the chance to prefer UHF television over VHF television; that it made the wrong decision at first about color television; that it erred with respect to the possibilities of FM radio; and that it held up the development of commercial television unnecessarily in the giant freeze of 1948-1952. In a hearing before the Subcommittee on Communications a few years ago, ex-Chairman William E. Henry and Commissioner Robert E. Lee conceded to Senator Pastore that the Commission did not have a very good record of anticipating problems ahead of time. The courts are not interested in that.

Remedy Must Come from Congress

So, what is the remedy? The answer is to be found in bringing the facts to the attention of Congress. There is a very good reason for this. Under Section 152(a) of the Communications Act, the Commission virtually has a carte blanche criterion to regulate the CATV industry as it sees fit. Mr. Justice Fortas, in the *Fortnightly* case, referred to CATV as "one of the recent products of scientific and promotional genius." This industry with perhaps the greatest potential of

Note: TVC is pleased to bring its readers the following critical analysis by CATV attorney Robert D. L'Heureux. He is an astute and colorful observer of the Washington scene (in which he has long been an active participant) and his knowledge of CATV legal questions—like his confidence in our industry—is unsurpassed.—Ed.

any communications medium to bring to the public a fathomless variety of television signals, information and innumerable other services, has been brought to a grinding halt by an agency which does not have or does not take the time to determine its potential in the public interest.

Still, this very important CATV industry is the only one subject to the Communications Act which is not protected by criteria limiting the Commission's authority and discretion. The Communications Act has both general and detailed standards for the regulation of radio communications and common carriers. The licensing power which the Commission exercises with respect to radio under Title III must be administered in the "public interest, convenience, or necessity." The courts have found this standard adequate because of the context and purposes of the Act and the other requirements which it contains. Numerous provisions of the Act deal with the substantive, procedural and remedial matters with respect to the regulation of common carriers and radio communication, but there is none of this which pertains to the CATV industry. This leaves the Commission free to choose from one or the other of the large number of objectives contained in the Act—some relating to radio communications and others to common carriers—as it sees fit, and the courts cannot gainsay the Commission.

This absolute lack of specific standards with respect to the CATV industry is the latter's best excuse for seeking an immediate amendment to the Communications Act from the new Congress early next year. This is a battle which the CATV industry cannot lose, because it is only fair and just that it too should, like other regulated industries, be afforded the protection of limitations upon the Commission's presently unlimited dictatorial power. Whatever such limitations it does obtain are all to the good, because there is now no limitation upon the Commission's authority and I submit that there is no other regulated industry in this country which is left entirely to the whim and caprice of a governmental authority.

CATV Must Be Willing To Accept Regulation

What then should the CATV industry try to obtain as a bare minimum? First, it must recognize that so long as the Congress supports the Commission's attempts to encourage local broadcast television stations *which provide truly local interest programs on a continuing basis*, the CATV industry must be willing to accept regulations which are *realistically* designed to protect these local television stations from being injured economically to the extent that the public interest is adversely affected. However, Congress should be invited to take another look at how this policy has worked. If recent statements by FCC Commissioners Cox and Johnson are correct, local television stations present very few programs of truly local interest with the possible exception of local news—and then these pertain largely to the city of assignment only and are offered strictly on an occasional basis. If the Congress finds that these are the facts, then the whole regulatory scheme has gone awry and it should be replaced by another one which is apt to produce local TV stations which originate programs of a truly local nature. Or, as an alternative, CATV systems should be allowed to come in and provide the local service. It would not be difficult to enlist the interest of CATV operators in providing CATV service to all the cities to which TV stations are now assigned and many more. They would be more than willing to originate programs of a truly local and public interest nature. In such case, the Allocation Table could be revised to bring more television signals with a variety of programs to the rural areas, or CATV systems could be required, as a condition of their being allowed to op-



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erate in the larger cities, to maintain a number of translators to beam to the rural areas a variety of television signals. The Commission could do any or all of these things, if it was not wed to the policies of the past.

It is more likely that the Congress, unless it contains many more new faces than is anticipated presently, will move more cautiously and ride for a while longer with the concept of local TV stations. If it does so, the CATV industry must be prepared to support non-duplication protection on a simultaneous non-duplication basis only and upon a written request by a television station placing a Grade A contour over the CATV community. This should be true only if the local television station's signal is available off-the-air in over 50% of the homes in the CATV community, and is at least as good as the duplicating signal which the CATV system wishes to bring in. Also, it should be provided that the duplicating signal is not available and of viewable quality off-the-air in over 50% of the homes in the CATV community.

The burden of proving these provisos should be placed upon the television station requesting protection, because the main and primary emphasis should be upon the interest of the public. There should be no restriction upon persons obtaining television signals of their choice, unless the interest of the greater number of the public is adversely affected. Unless the television station requesting protection can prove that its signal is at least as good as the signals of more distant stations, it should not obtain non-duplication protection. The Commission should require of the TV broadcaster that he provide as good a signal as is possible, and he should be able to obtain and put out at least as good a signal as the one obtained and made available by the CATV system. Obviously, as under the present rules, he should not obtain protection for a black-and-white signal over a color broadcast.

Simultaneous Non-Duplication Adequate

Simultaneous protection should be the most that is obtainable automatically upon a mere request, except where different time zones are involved. Prior or post-broadcast protection is too involved, requires too costly, too intricate and too unreliable time-dock mechanisms and too much skilled and administrative personnel expenditures to warrant the very small amount of protection which it would conceivably afford because of the very small percentage of programs involved. A study by NCTA to that effect was presented to the Commission in the pleadings which culminated in the *Second Report and Order*. Experience under that Report and Order has proven this point, as CATV operators generally will attest.

The policy of affording non-duplication protection simultaneously is based upon a sense of justice and fair play. If you were a television broadcaster, you would properly be incensed over the fact that you were paying copyright fees to make certain programs available to your viewers and one or more CATV systems within the Grade A contour of your television station were carrying the same programs on another channel with the credit going to some other TV station placing a Grade B contour or less over the CATV community. The fact that CATV systems do not pay copyright fees for programs received off-the-air adds to the sense of injustice present under these circumstances. Why then, one might ask, do you not make non-duplication obligatory before and after the broadcast? The answer is that if the public is to be offered the choice of a variety of television programs which CATV service makes possible, there must be a reasonable accommodation between the desires of television broadcasters to have an exclusive showing for a lengthy period of time and the wishes of the public to view television programs of their choice at convenient times. There can be no realistic demon-

stration of a tangible and appreciable benefit to be derived by the television broadcaster, after he has once made his showing of his programs, through an enforced blackout of the program for the remainder of the same day and much less for a longer period of time thereafter. Certainly, the right of the public to have access to programs at times more convenient to them overbalances the conjectural benefits to be derived from an enforced blackout after the TV station's showing. The Commission recognized this need for an accommodation of some sort when it required same day non-duplication only.

What then of blackout prior to the TV station's showing of its programs? Except for the particularly difficult problem posed in communities where programs are affected by different time zones, the solution is equally simple. The time which is really valuable to the local TV station is prime time, from 6:00 to 11:00 p.m. This time is almost exclusively filled up with network programs which are not generally shown ahead of time. Simultaneous non-duplication is adequate to protect the local TV broadcaster and it would be difficult, if not impossible, to prove that he is injured financially and appreciably by a Mickey Mouse cartoon, for instance, being shown at some time prior to his broadcast of that program. Again in this instance, the broadcasters' desires have to be counterbalanced by the right of the public to have access to television programs of its choice. "Same day" or longer prior blackout of programs will destroy CATV systems or make them able to serve solely as the handmaiden of local broadcast stations—as a super antenna. This is to foreclose irrevocably the potential of the CATV industry to render to the public the myriad additional services which it could provide and which the American public has a right to expect.

Of course, the type of non-duplication discussed above implies at least the carriage of Grade A contour television signals of high quality and actually present in over 50% of the homes in the CATV community. CATV systems should not object to such carriage. The CATV industry should be willing to go further with respect to carriage and agree to legislation or regulation which would require systems to carry all the stations which actually place a high quality signal over a CATV system within its Grade B contour, except that the CATV system would be allowed to substitute for any duplicating network affiliated station the signal of an independent television station. In other words, if the CATV system carried two or more CBS network stations, the CATV system would have to carry only one of them, provided he could substitute an independent television station for the others. However, the system could not take them off in order to substitute a distant CBS station. Of course, the system would be allowed to carry all the various network stations, even if this required the bumping off of another duplicating network station. Also, in order for the carriage and non-duplication rules to work smoothly, any cherry-picker television station entitled to non-duplication would have to choose one particular network and would be protected against that one network's programs. Without this, the task of non-duplication becomes too onerous and costly and the interest of the public should outweigh the desires of the local broadcaster in this respect. Finally, any CATV system having less than 2,000 subscribers should be exempted from regulation by the Commission. It is impossible to show that these small systems can have an appreciable adverse effect upon television stations.

Except for the situation involving different time zones, carriage and non-duplication of the type described above should be the only protection extended automatically, for the mere asking, by CATV systems. This is a reasonable balancing of the rights of TV stations and of the public and it allows a local television station a fair amount of exclusivity for

the programs for which it pays copyright fees. In addition, the local TV stations would still maintain, virtually untouched, their present ability to obtain advertising for their programs. No waivers of these rules would be granted by the Commission to either the TV station or the CATV system, except that the local television station could in effect waive the protection of the rules by not requesting either carriage or non-duplication. The station could revive its right at any time by requesting such carriage or non-duplication.

Solution to Time Zone Problem

Now, what could be done about the nasty problem of situations involving different time zones? This is the hardest nut to crack. It must be recognized that many existing CATV systems which are involved in this time zone problem were in business before the FCC even considered regulating CATV systems. They expended their money relying upon the fact that the service they were to give to the public was perfectly legal. The local television stations which they carry either developed after these CATV systems were constructed or continued their existence thereafter and most of them are reasonably profitable television stations. The CATV subscribers have become accustomed to the service which they receive and a careful balancing of the public interest would dictate that their viewing habits not be disturbed unless this becomes virtually necessary in order to prevent the demise or the impairment of the service of a local television station.

At the time the *Second Report and Order* went into effect, any new CATV system which was not yet in operation knew that it would not be allowed to carry on the same day duplicating programs. From that moment on, any CATV system which went into operation was on notice. Such CATV systems should not be allowed to carry within three hours before the broadcast by the local television station a duplicating network program. This would apply only within the Grade A contour of such local television station. This prohibition would take care of the real problem facing local TV stations which are plagued by the different time zones which allow a distant network program to be brought in from one to three hours before its own broadcast of the same network programs.

The net effect of this would be to "grandfather" the CATV systems which did carry the earlier broadcasts before the *Second Report and Order* went into effect. However, even in these cases the Commission should be given the right to require, upon the request of a local TV station, that the earlier broadcasts be dropped by the CATV system as a condition to allowing said system to bring in the signal of a more distant independent television station. In time, subscribers will demand these independent signals and the situation will right itself. The CATV system will be faced with the choice of remaining small and of inviting ruinous competition by another CATV system which is willing to bring in the signals of distant TV stations, or of expanding its service to the public and foregoing its early acquired privilege.

The only exception which should be added to the above is that such a local TV station (one placing a Grade A signal over the CATV community) affected by this time zone problem should be allowed to petition the Commission for a waiver based upon its precarious financial condition. The burden of proof in such a case should be borne by the TV station with respect to showing that it is in a precarious financial condition largely because of its programs being shown ahead of time by the CATV system and that a prohibition of a showing for three hours prior to the local station's broadcast of the same programs would extricate the station from that financial position and would permit it to fulfill its obligations under the Communications Act. After a hearing in which the TV

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station did succeed in proving this, the Commission would be allowed to issue a cease and desist order against the prior showing by the CATV system.

100 Rule Should Be Stricken

Finally, the top-100 television rule should be stricken from the Commission's regulations. It makes no more sense than for the government to prohibit the circulation of the New York Times or the Wall Street Journal in order to protect local newspapers. If the carriage and non-duplication rules, as outlined above, are enforced, television stations have all the protection to which they are entitled. The 100 rule contravenes the spirit, if not the text, of the Communications Act, as it does not allow the public to obtain all the information which is available and for which they are willing to pay. If the Congress cannot be convinced of the folly of this rule, at most it should be applied for two or three years only in the top twenty television markets, which are the only ones in which experts agree that a few UHF television stations will have a realistic chance of eking out a reasonable operating profit. Microwave grants should be made to CATV systems so that they may make available to their subscribers the greatest amount of information available. The current trend must be reversed. There is a freeze and a censorship on the circulation of information under the *Second Report and Order*.

CATV can convince Congress of the fact that the FCC pays only lip service to the public interest and that it is bent only upon the stifling of CATV development for the benefit of large and powerful television broadcasters. If it had been truly trying to protect the local television broadcaster in order to benefit the public, why did it not simply ban the carrying of the advertisements in the programs of distant TV stations and allow CATV systems to place public service announcements in the vacant slots? Or why did it not allow the local TV stations to place their advertisements equitably in those vacant slots? It could have done this in a way to favor struggling local UHF stations. The regulations to accomplish this would not be more involved than the *Second Report and Order*. If the Commission was truly worried, although not admittedly so, about the copyright holders getting their payments, why did it not allow them to fill in the empty advertising slots or to sell them to local stations or business enterprises? These solutions were too simple. It was much better from the powerful broadcasters' viewpoint to stifle the growth of CATV systems. If the Commission, not acting in character, felt it needed additional legislation to accomplish these simple solutions, it could have obtained it with the concurrence of the CATV industry. CATV service could have continued uninterrupted and prospered. It would have enough subscribers to enable it to originate and put on excellent public service programs.

Copyright Problem Not Solved

The *Fortnightly* case did not put an end to the copyright holders' claims. Its great contribution to the CATV industry is that it put an end to the danger of past liability for the type of reception involved in the Clarksburg CATV system. There is still unresolved the problem of whether copyright must be paid for programs of distant TV stations which are microwaved to the CATV system. The argument can be made that this, also, is off-the-air reception. However, the same logic which caused the Supreme Court of the United States to conclude that the reception of the signals of local TV stations and of those signals received beyond the Grade B of the television stations by use of a master antenna by the Clarks-

burg CATV system was "on the side of the viewer," could conceivably compel the court to rule that the use of microwave transmitting equipment places the CATV system on the side of the transmitter of programs and more on the side of the broadcaster who must pay copyright fees. Accordingly, it is sincerely hoped that a reasonable compromise can be reached by the CATV industry and the copyright owners in recommending legislation to the Congress. It would seem that such a compromise could take into account the fact that the great bulk of programs now received by CATV systems are not subject to copyright payments. Still, many CATV systems, including small ones, are dependent upon microwave service, and the development of the CATV industry for the future is almost entirely dependent upon microwave. Therefore a reasonable compromise for all concerned would seem to be an across-the-board payment of two percent of gross for all existing systems and those to be constructed in communities of 50,000 population or less to be paid into a central fund. Negotiations would be required, as in this case of broadcast stations, between CATV systems to be constructed and the copyright owners in larger communities for the carriage of microwave-fed signals.

These are all possible solutions and the CATV industry could forge ahead to fill the Commission-created communications gap now existing throughout the land.

The only way this can be accomplished is through a massive effort to turn all the energies of CATV operators, of their subscribers and of the large companies now in CATV, who have their legislative liaisons in Congress, towards convincing the legislators of the righteousness of our cause in the interest of the public. Many of these larger companies have divided loyalties, in that they have television broadcast interests which far outweigh their CATV interests. They must be persuaded that their own good, the real interests of the broadcast industry, as well as of the CATV industry happen to coincide with that of the television viewer, the American public who will eventually have his way and view the television programs of his choice. Why not all unite and make this possible for him in the quickest time?

Station Affluence Recognized By Congress

There is one thing running in CATV's favor this year. The Congress is beginning to realize at long last that the Commission was quite naive in concluding that the average television broadcaster is in need of protection when he has been making between 95% and 105% return on his station's capital investment each year before taxes and depreciation, as the Commission's own files and releases attest. The Congress is more aware than it ever was that networks and certain television stations make use of this affluence to affect political developments. The Congress is less likely to adopt criteria which are designed to protect primarily the television broadcasters. If CATV does not succeed in having the Congress write into legislation or in a committee report all the criteria outlined above to guide the Commission, they are bound to obtain some of the requests. What do they have to lose? At present, CATV has absolutely no protection against the Commission.

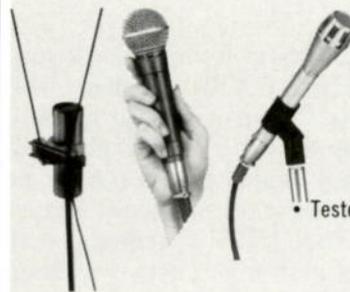
You should demand from industry leaders that a massive effort be made in the coming Congress to obtain such criteria. Let the plans be well laid and call upon everyone who can help. Insist that you be made a part of those plans, so that hopefully every CATV operator can stand shoulder-to-shoulder when the CATV industry presents its cause to the Congress, or that at the very least, the opposition among us be so small and inconsequential that the CATV industry can assure the Congress that the vast mass of CATV operators favor the recommendations. (TV)

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To inform, to instruct and to entertain—these are the prime ingredients that will make up effective CATV programming in a day when it is essential that we be made citizens aware of the world around us.

*By Thomas E. Keith
Internet Productions, Inc.*

With the increase in demand by local government for program origination, CATV operators will be taking a long look at how they can best provide good community service programming via their closed-circuit channels. This new aspect of the CATV business generates an entirely new set of values and community involvement for the CATV operator. He now, in effect becomes a television producer providing an exciting and original form of communication to his community . . . and with this involvement comes the responsibility of responsiveness and sensitivity to the needs of the community.

The essential key to CATV programming contains three important aspects—to inform, to instruct, to entertain. All three aspects are inter-related and comprise the most important ingredients for responsive programming. Broadcast television does a splendid job in its news coverage, but there is a need for in-depth analysis of community events, their causes and their effects. The CATV programmer must seek out the unique, the unexpected, the below-the-surface ingredients, the human aspects, the community-related causes, the “reality” of the situation. There is drama and often humor in local business meetings, city council debates, commission hearings, service club activities, church functions, social gatherings, sandlot sports, grammar school and high school programs and little theatre rehearsals. All are potentially exciting ingredients that can be used in local programming to make a community come alive and attain a true identity for itself.

In this way, the CATV “producer” is not only providing information, but he is producing it in an entertaining way. Local high school and college experimentation in science, sociology and the arts can be produced in such a way as to provide truly entertaining, instructional material. Creative and imaginative presentations by local police and fire personnel can instruct the community in safety procedures as they

apply to that specific community, with its unique hazards or advantages. This type of programming will involve the people of that community with the pulse, the progress, the “reality” of their home, and will acquaint them with the satisfying rewards of community service as they become better informed.

Each CATV system is a potential political platform from which local constituency can be confronted by local candidates for office. CATV can be a “two-way television” media of communication providing the opportunity for more responsive local government to a more aware population.

CATV operators must also be aware that their subscribers are becoming a more sophisticated viewing audience. The average American televiewer today is aware of production values, and understands the meaning of professionalism in programming and production. An amateurish approach to a Little League baseball game can be as devastating as a bad camera move or inadequate lighting or poor audio modulation on the Johnny Carson Show. The CATV subscriber will be watching his children, his neighbor, his relative on that closed-circuit channel. He wants them to look good and to sound good.

Programming and production of a local origination channel is not a simple matter, technically or aesthetically. Operators should proceed with caution when purchasing equipment and hiring a staff. Most equipment sold by CCTV manufacturers today was not designed for production purposes. It does not have the necessary versatility or durability required for good CATV production. There is also a great shortage of talented personnel available for good programming and production. The potential, however, is unlimited, and as more CATV systems begin program origination, manufacturing standards will rise, more personnel will be trained and available, and a vast new communications network will unfold, offering responsible and responsive community service. 

November 1968

TV Communications

CATV Technician



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The descriptions and specifications for each brand of signal processing equipment in the following special review were furnished by the respective manufacturers, and are published without editorial analysis or endorsement, for the general information of system operators.

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The Ameco Channeleer is a heterodyne signal processor designed to convert any standard television channel to any other standard channel or to any one of certain other non-standard channels between channels 6 and 7 or above channel 13. At present, the Channeleer is available with any one of 27 different output channels. Another model designed for low-frequency, long-line application is not described here.

The Channeleer is composed of six basic modules. These are Down Converter, Visual Carrier IF Amplifier, Aural Carrier IF Amplifier, Substitution Oscillator, Up Converter, and Power Supply.

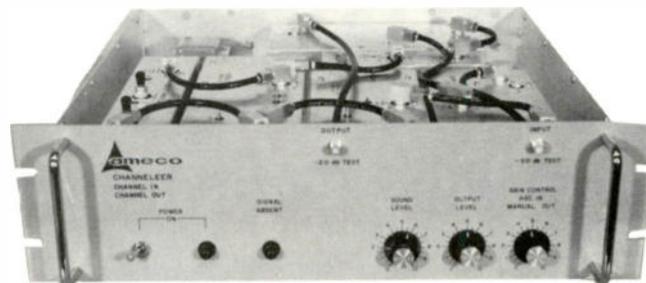
The Down Converter amplifies the incoming television signal and converts it to the IF, which is 41-47 MHz, with the visual carrier at 45.75 MHz and the aural carrier at 41.25 MHz. A crystal-controlled local oscillator is used in order to stabilize the output frequency. The noise figure of the Channeleer is primarily determined by that of the input RF amplifier. Automatic gain control of this stage is derived from a special circuit which allows this stage to operate under low noise figure conditions up to a point where the gain must be reduced to prevent overload. This keeps the signal-to-noise ratio high even with weak signal input. A bandpass filter on the input helps to prevent cross-modulation from strong adjacent channels.

The Visual Carrier IF Amplifier shapes the response curve and gives excellent selectivity. It also builds up the RF voltage to the proper level to operate the AGC circuitry. The AGC holds the output level of the Channeleer constant over a wide range of input levels.

The aural carrier is removed from the Visual Carrier IF and fed to the Aural Carrier IF Amplifier where it is amplified, clipped, and filtered to remove any amplitude modulation components and to stabilize its level. It is then re-combined with the visual carrier and fed to a switch in the Substitution

Oscillator. This switch is essentially a single-pole-double-throw switch which feeds either the off-the-air signal or the Substitution Oscillator frequency to the Up Converter. The switching function is governed by the AGC voltage developed by the AGC amplifier.

The Substitution Oscillator supplies an unmodulated carrier of the same frequency as the visual carrier of the IF (45.75 MHz) to the AGC controlled switch in the Substitution Os-



Ameco's Channeleer is available with any of 27 output channels. It is transistorized, and features modular construction.

illator module. When the incoming television signal falls below a pre-determined level, the Substitution Oscillator supplies its signal to the Up Converter.

The Up Converter converts the television signal from the IF to the desired output channel. It supplies a signal level up to one half volt or +54 dBmv. Combining networks using hybrid transformers are used to combine Channeleers.

The Power Supply of the Channeleer supplies both a positive and a negative voltage. The Channeleer consumes 30 watts of power from a 117 volt, 60 Hz source.

Benco's Benavac-Mark II

Benco Television Corporation has placed on the market a successor to its well-known Benavac. The new version, called the Benavac Mark II, is a fully transistorized, automatic video/audio head-end control unit featuring modular construction and modern design. Nine separate plug-in units simplify maintenance, channel changing and operations necessary for

Note: not included in this review is the head-end signal processing equipment manufactured by Dynair Electronics for which up-to-date specifications were temporarily unavailable. For additional information on any of this equipment, the manufacturer should be contacted directly.

special programming to comply with non-duplication requirements.

The Benavac Mark II has a low noise input stage (6dB maximum highband or lowband) and will process any TV channel 2 through 13 to any 6 MHz output between 54-240 MHz. Input handling capability is as high as +38 dBmv, (with adjacent channels at the same level), and the overall gain of the complete equipment ensures an output of +57 dBmv when input signals are as low as -26 dBmv (50mv). A keyed type AGC with a range of 64dB, enables output levels of both video and audio carriers to be held constant within $\pm \frac{1}{2}$ dB.

Input and Output convertors are crystal controlled. Adjacent channel rejection is specified at 50dB down and spurious beats in the output 60dB down or better including local oscil-



Benco's Mark II replaces the Benevac. Its design features modular construction and nine separate plug-in units.

lator. A plug in bandpass filter is optional for locations where extremely strong and undesired adjacent carriers are present.

The Benavac Mark II utilizes a switching mode power supply resulting in low current drain and negligible heat generation. In addition, a built-in trickle charger maintains standby battery at full charge where desirable.

Non-duplication switching, or channel processing for local

origination, is simplified by the provision of IF inputs and outputs, with internal solid-state switching. All printed circuit boards are protected against overload to minimize maintenance and service problems in the field. Routine maintenance checking is simplified through the use of a built-in metering facility with references to each section of the equipment.

The complete unit, which weighs 16 pounds, is supplied for 19" rack mounting, 5 1/4" high and 12" deep. Power requirements are 90-130 VAC 25 Watt 60 cycle, or 24 VDC 0.8 Amps. The first production run of the new equipment is now on hand and deliveries are expected to be made later this year.

CAS Channel Control And Modulator

The CAS CC-213 transistorized Channel Control receives, controls, processes and delivers any VHF channel to the trunk system. It also provides for local origination, duplication switching and remote emergency alert.

The CC-213 is an all transistorized head-end device in which specific consideration has been given to provide simple interchangeability through modular construction, as well as adaptability to future requirements for multi-channel operation beyond the existing television bands. In addition, exceptional frequency stability is achieved through crystal control of all frequencies generated in the CC-213.

The Channel Control also provides facilities for emergency alert communications and non-duplication switching. In the first case, each unit has provision for the insertion of audio and video announcements on any or all channels. Secondly, non-duplication switching between off-air channels or between microwave and off-air channels are possible within the CC-213

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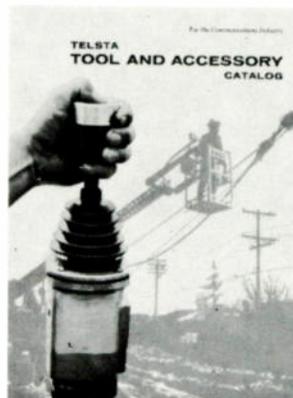
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itself. In either case, the switching necessary to accomplish these functions can be controlled remotely.

All controls and necessary test points are accessible on the front panel of each module. Plug-in modular circuit boards make possible reduced overall size, ease of replacement and maintenance. Each module plugs into a mother circuit board which features strip line coaxial interconnection of all the modules.

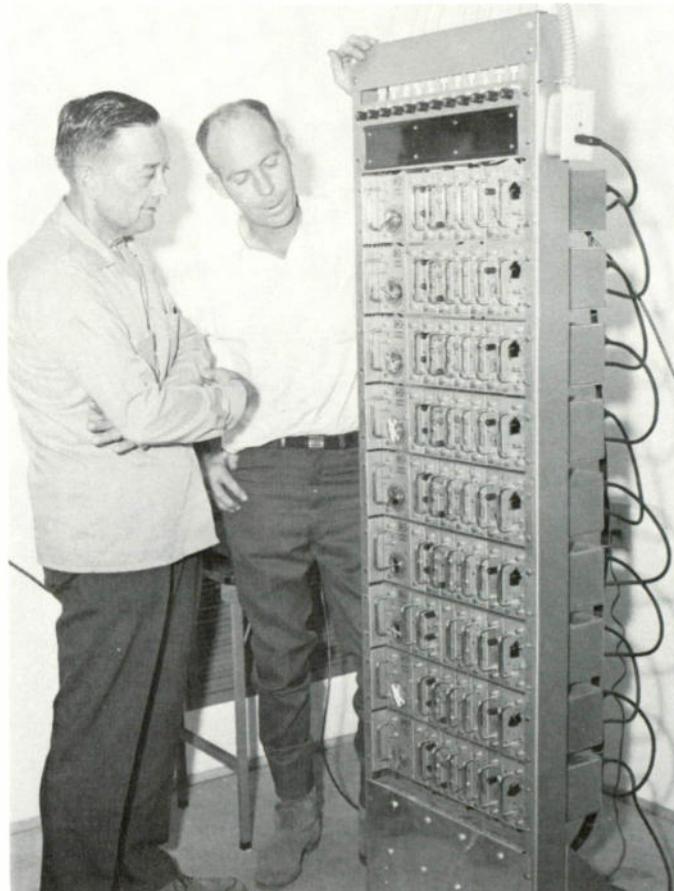
Nine modular circuit boards (including options) make up the complete Channel Control, and plug into a 19" module chassis. All modules are interchangeable with like units of other Channel Controls, with the exception of the modules which determine the specific channel.

The CAS TVM-213 TV Modulator is an all-transistorized head-end device which provides for two complete TV modulators, with associated sound modulators, in a single 19" rack mounted frame. Both are powered from a common power supply.

When the TVM-213 is ordered as a single unit, a plate covers the unused portion. This single unit is made up of four modules plus the power supply. The first module generates a 41.25 MHz FM sound carrier which allows external audio to be injected onto the audio portion of the channel. The sound module incorporates a 45.75 MHz crystal video modulator and a vestigial side band filter.

The output of the Video IF and the sound IF modules are all fed into a common line leading to the crystal oscillator output and converted to the desired output channel. This output signal is fed through a band pass filter to attenuate all frequencies but those in the desired channel. After this filtering, the signal is further amplified prior to reaching the RF output jack.

In those cases where the source of program information is a microwave link, a VCS-4.5 Video Clamp and Sound Module are used in place of the SFM-44 module. In this case, the composite video and 4.5 MHz audio FM sub-carrier from microwave receiver are fed to this module where they are



CAS Channel Control receivers feature frequency stability. The units are designed for future adaptability.

separated. The video is fed to the adjacent TVM-44 module where it generates a modulated Video IF. The audio portion is converted to the sound IF frequency in the VCS-4.5 module. The outputs of these two modules are then mixed and fed to the up-converter.

Controls and test points are accessible on the front panel of each unit. Each module plugs into a mother circuit board on the back of the chassis, which features strip line coaxial interconnection of all modules.

Entron's Head-end Equipment Line

Entron's head-end philosophy has been to seek the best signal possible with the least possible signal processing. The use of several relatively inexpensive single channel strip amplifiers and strip converters will result in a lower dollar outlay for head-end equipment. Furthermore, strip amplifiers are easy to align and maintain. Entron's head-end strips utilize tubes guaranteed for 10,000 hours; not off-the-shelf tubes which may or may not perform over a long period.

A typical Entron head-end will include one or more of the units described below. Single channel high VHF amplification is provided by a model APH-D. Circuitry includes ALC and the unit will provide up to 60 dB gain. The model AP-F is a highly reliable FM band amplifier providing 40 dB gain. The low VHF channels are individually amplified by a model APL-

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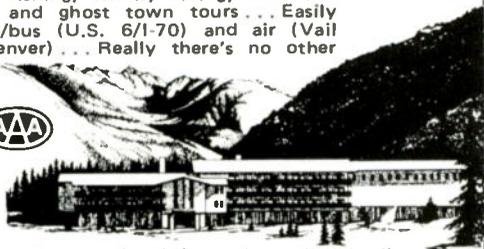
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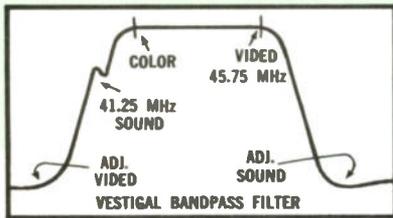
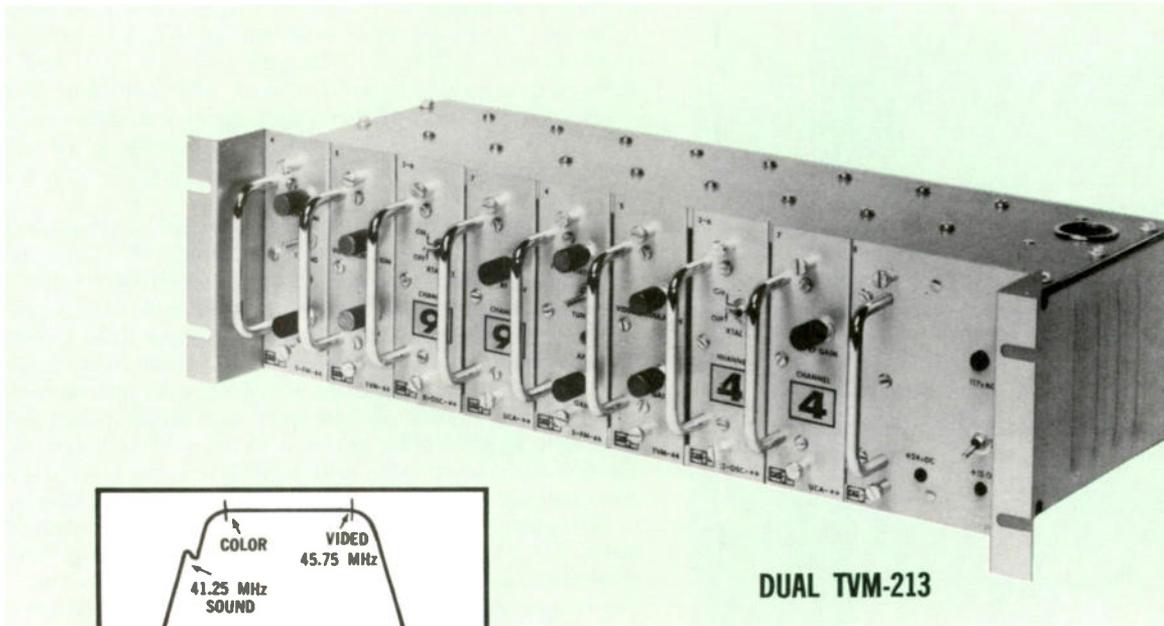
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The TVM-213 is available in a choice of single or dual channel models. The Single TVM-213 may be purchased and modules added later to convert it to a dual channel unit. A plate covers the unused module spaces of the Single TVM-213.

The CAS Dual TVM-213 consists of two



complete channel modulators operated from a common power supply and will fit a standard 19-inch rack.

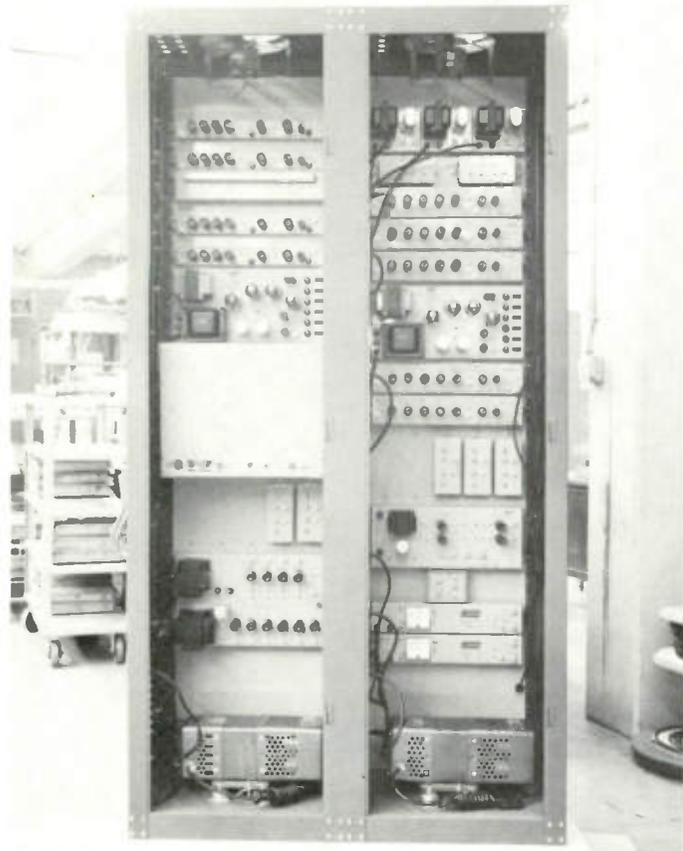
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D which also includes ALC. Gain of this unit is 60 dB maximum.

Signal conversion from high to low VHF is handled by Entron's model CHL-D. This unit includes ALC and automatic sound-carrier level. The unit will maintain constant output within ± 0.5 dB for input signal variations of up to ± 10.0 dB. Gain is 60 dB. For conversion from low to high VHF, Entron offers the model CLH converter. The gain of this unit is 0 dB.

Single channel FM multiplex stereo and monaural signals are fed to CATV systems through a model FMT modulator. This unit is factory aligned to any specified channel. The maximum output is 46 dBmV; stereo channel separation 35 dB.

The model DBR tunable filter can remove both higher and lower adjacent channels, if required. Typical adjustment provides two 40 dB reject bands, 3.5 MHz wide, one on each side of a channel. It may also be used as a single notch filter to provide a 25 dB 6 MHz notch, a 75 dB 1 MHz notch, or a 90 dB 600 KHz notch. The model HQT tunable filter is for improving edge-of-band response of broadband amplifiers.

Automatic level control and automatic slope control for the entire CATV system is accomplished by utilizing Entron's dual pilot carrier concept. The company markets two pilot carrier generators: a 73.5 MHz pilot carrier generator and a 225 MHz pilot carrier generator. The 73.5 MHz generator interleaves the control signal with the channel 5 signal during the horizontal blanking interval. Should channel 5 leave the air, a special circuit automatically switches in a CW pilot carrier of the proper amplitude.

The output of the strip amplifiers and the pilot carrier generators is mixed electronically and fed directly into the trunkline cable. Gain through the mixer is 6 dB for each TV channel and 2 dB for the FM band.

Power for an Entron head-end is provided by a model PSR-3 regulated power supply. This unit includes six output recep-

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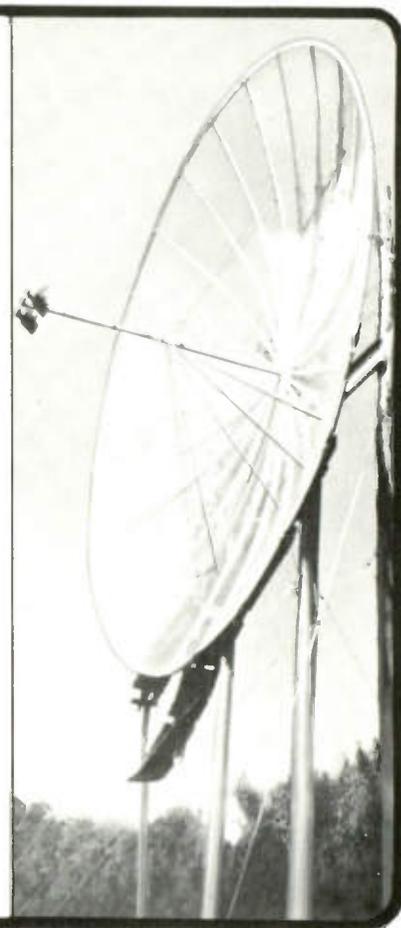
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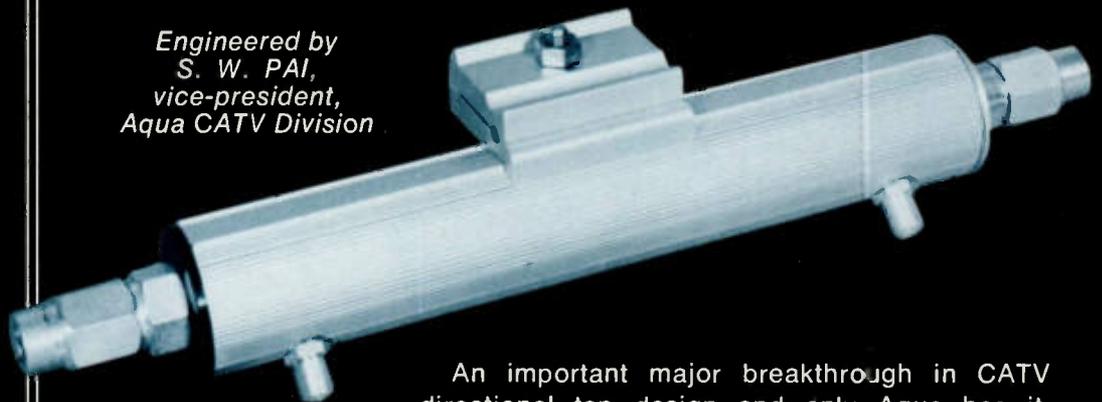
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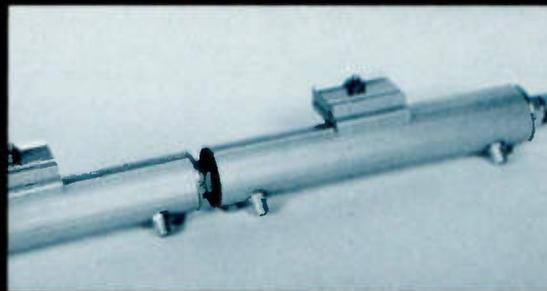
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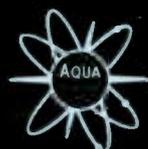


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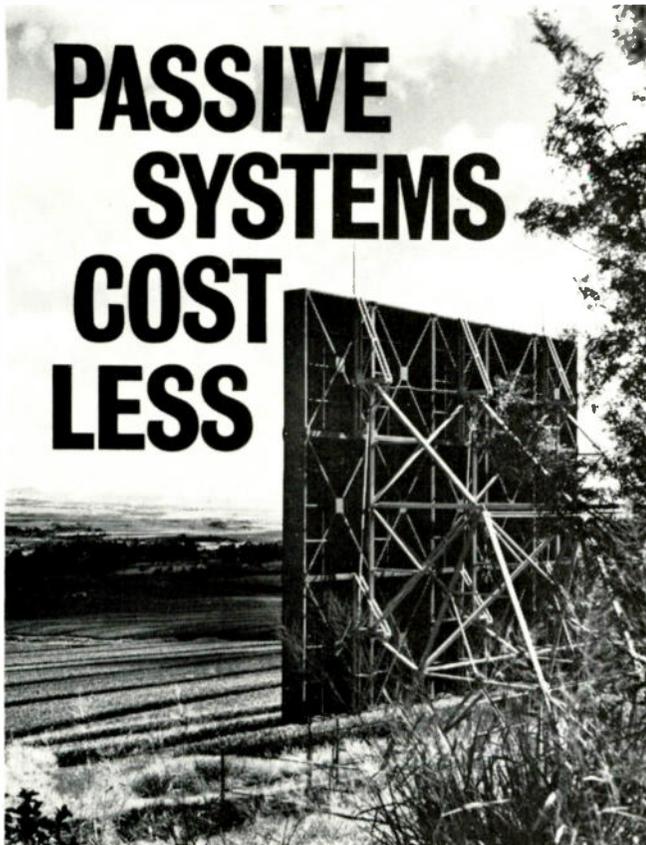
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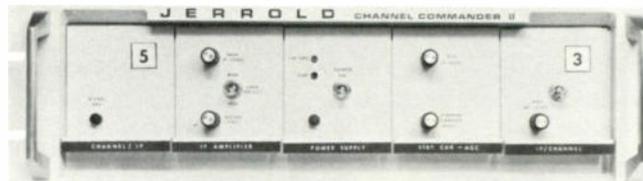
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Jerrold Electronics' Channel Commander II

The Jerrold Channel Commander II is a completely solid-state, modularized head-end unit which processes and controls any single VHF input channel (2 thru 13) and delivers it as any standard VHF channel (including the original input channel) or as any special VHF channel.

Among the features provided by this unit are: one-hundred percent crystal-controlled oscillators in both input and output modules to insure complete stability; a fast-acting IF AGC (50 dB dynamic range) keyed to horizontal sync reference; circuitry which insures that spurious beats are down at least 60 dB for standard VHF TV channels at recommended output; audio or video over-ride connection facility on rear panel; completely modular construction; and all solid-state circuitry.

This particular unit comprises five active modules: Channel/IF Converter, IF Amplifier, Power Supply, Standby Carrier and AGC, and IF/Channel Converter. Each of these modules plugs into the front panel of the chassis. A passive module (an IF Band Pass Filter network) is incorporated in the unit. The modular construction of the unit makes it possible to change either the input or the output channel by simply replacing either the Channel/IF module (input) or the IF/Channel module (output) depending upon whether it is de-



Jerrold's Channel Commander II is solid-state and modularized. It features crystal-controlled oscillators in input and output modules and fast-acting IF AGC.

sired to change the input or the output. In any case, only one module need be replaced to change the function of the unit. This greatly reduces the number of spare modules needed for proper head-end maintenance.

The channel control unit has only one input and one output except that provision is made for an alternate input to the IF Band Pass Filter module from a program control device in case programming is necessary to prevent duplication of programs in accordance with FCC regulations. The operator need only set the desired levels of video and audio with a field strength meter to be in operation. The equipment mounts on a standard 19" rack and takes up 5 1/4" of vertical rack space.

The closed-loop post-converter VHF AGC circuit in the IF/Channel converter provides perfect control of the output level of this module. A single control permits simultaneous adjustment of video and sound output levels in either direction without affecting the relationship between the levels.

In on-channel conversions (i.e. channel 2 input, channel 2 output) the IF/Channel oscillator is switched out of the circuit so that only the Channel/IF oscillator is used for both conversions. This insures that co-channel interference cannot be generated internally.

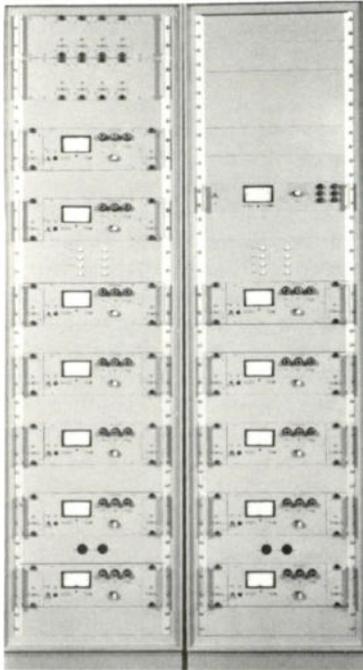
When a station goes off the air, a time delay device is automatically energized which triggers a crystal-controlled oscillator to provide a replacement carrier after 20 seconds. A warning light indicates that the station is off-the-air. Rear panel terminals provide convenient connection points for video

or audio over-ride modulation of standby carrier or selection of other signal replacement or operating modes.

A self-contained, load regulated, current-limited (+ 20 V at 0.4 amps.) supply powers all modules.

Scientific-Atlanta's Model 6100 Signal Processor

The Model 6100 Signal Processor is a totally solid-state head-end receiver featuring completely enclosed modular construction. It is designed to receive any VHF channel, down-convert and amplify the signal in high gain AGC'd intermediate-frequency amplifiers, then up-convert to the same or any other VHF channel (including mid-band) for distribution. The heterodyne unit features all silicon transistors.



All-silicon transistors are featured in Scientific-Atlanta's heterodyne signal processor. The Model 6100 is solid-state and of modular construction.

The input and output converters are accessible from the front panel, making it possible to change the input or output channel, or both, simply by replacing the respective converters. The input converter utilizes a low-noise Field-Effect Transistor RF Amplifier featuring excellent spurious response rejection and low cross-modulation distortion. Delayed AGC is employed for improved noise-figure performance at low signal input levels, and superior linearity at strong signal levels. The local oscillator is crystal-controlled to provide stable frequency control, independent of environmental changes. Video and sound signals are separated in the converter output, allowing separate AGC circuitry to be employed in the video and sound IF amplifiers. These separately derived AGC circuits reduce the effects of selective fading and facilitate the independent control of video and sound signal levels in the system.

The video IF signal enters its IF amplifier through a special band-pass filter circuit with traps to give high rejection of adjacent channel picture and sound carriers, and color sub-carrier. The first three stages of the five stage IF amplifier are gain controlled by an undelayed AGC voltage. The output of the fourth stage is lightly coupled into an AGC amplifier where it is amplified and peak detected. The resulting signal is amplified in a special "noise inverter" circuit which prevents any impulse type noise from appearing at the output. This

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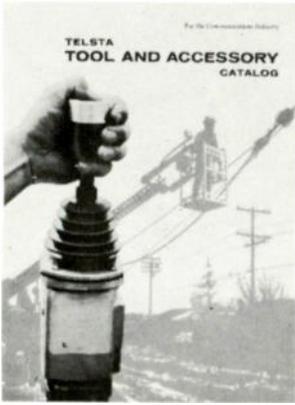
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noise-free video signal is again peak detected to obtain a DC voltage proportional to the syn-tip level of the television signal. This DC voltage is amplified and used to AGC the video IF amplifier. A portion is delayed and used to AGC the input converter RF amplifier. The gain of the fifth stage can be manually set with the Video Output Level Control on the front panel of the unit. The dynamic range of the signal processor does not depend on the setting of the Video Output Level Control.

The sound IF amplifier receives its signal from a high-Q sound trap in the input converter. It is a four-stage, transformer-coupled amplifier utilizing an undelayed AGC voltage to control the first two forward AGC transistor stages.

The substitution carrier circuitry samples the video AGC voltage to determine the status of the received signal. In the event that the received video signal is lost, the substitution carrier replaces the video IF signal.

After IF amplification, the video and sound signals are recombined in a toroid network. The combined signal is sampled at this point by the output level monitor, a built-in field-strength meter.

The RF amplifier circuitry is tuned to either the video or sound portion of the combined IF signal by means of a front panel selector switch. A third switch position injects the substitution carrier in lieu of the received video signal. The selected signal is detected and the resultant DC voltage is amplified and used to drive the Output Level Meter.

The output converter transforms the combined IF signal to the desired VHF output channel. The local oscillator is crystal controlled. For on-channel conversion, one local oscillator is used for both the input and output converters, preventing any possible beat interference. A final RF amplifier provides output circuits for two 75 ohm loads which are back-matched to permit loop-through mixing of non-adjacent channel signal processors.

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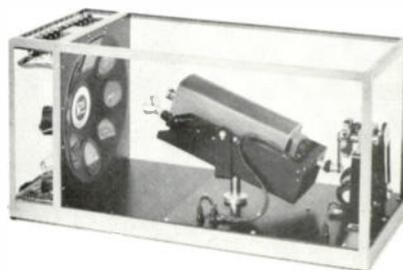


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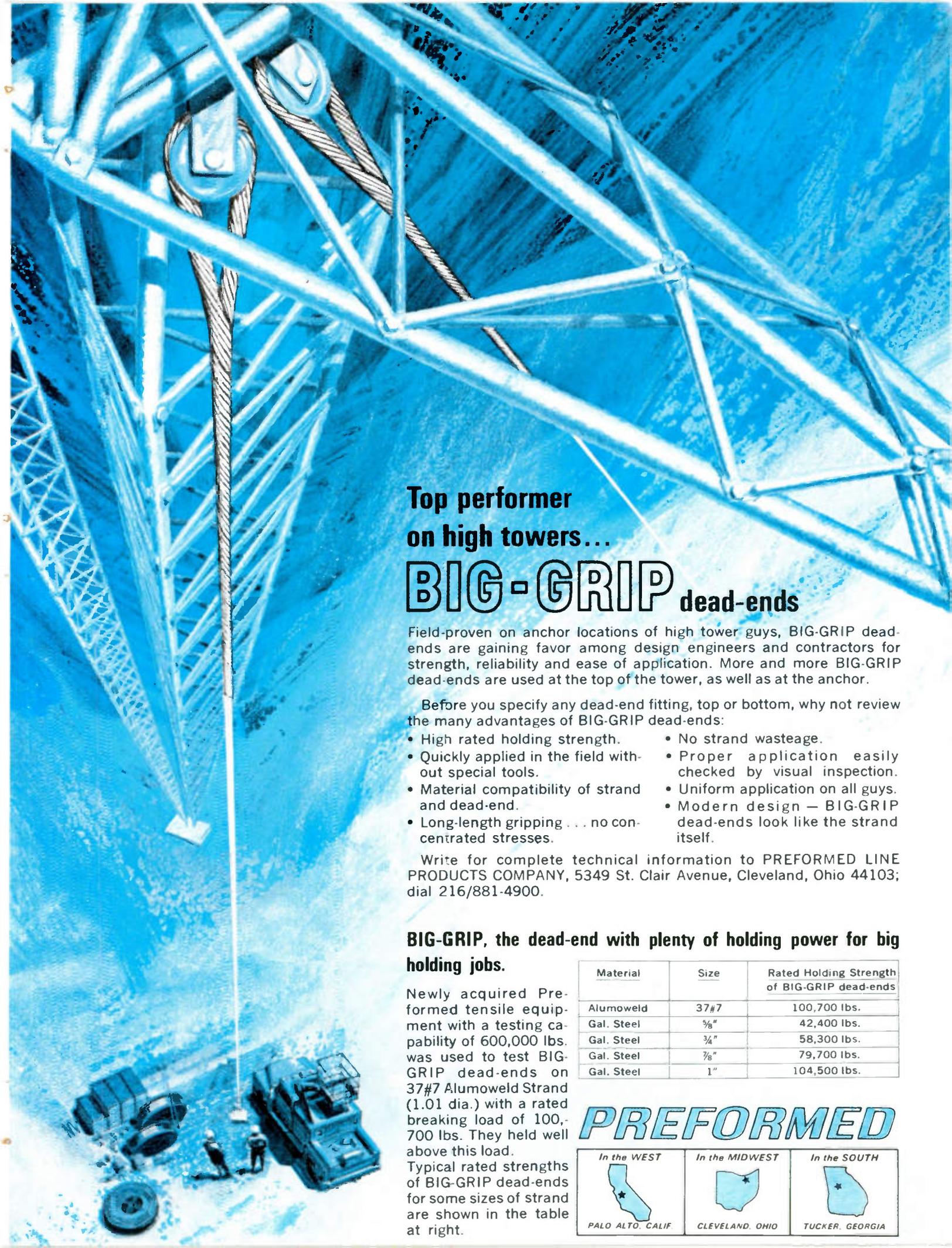
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Material	Size	Rated Holding Strength of BIG-GRIP dead-ends
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Signal Reception Using Parabolic Antennas

Remarkable results have been obtained with the parabolic antenna in the communications world. Basic concepts regarding the use of this device for cable TV signal reception are given below.

By Albert K. Fowler
R. F. Systems, Inc.

The use of parabolic antennas for receiving and transmitting applications, particularly in microwave and other point-to-point applications, is certainly a well-appreciated fact. Also, the accepted use of parabolas and other reflector type antennas for radar and for other communications applications is readily known to most informed people in our electronics industry. Most of us are also familiar, if not knowledgeable, concerning the use of parabolic antennas for use by the military in long-range communications.

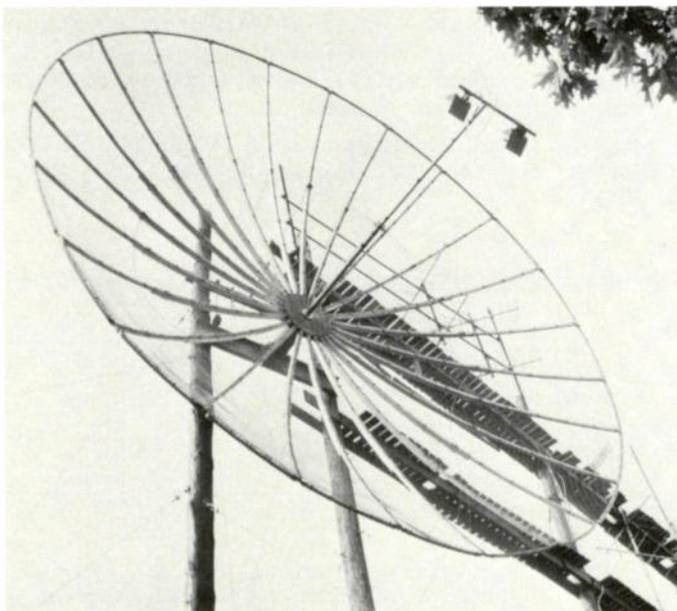
In view of the successful use of the parabolic antenna in virtually all applications, it is a matter of considerable interest to determine the reasons why more parabolic antennas are not used in CATV. Aside from the problem of mechanically supporting this type of structure, there appears to be no basis at all for not using such an

antenna in places where it would obviously do a better job. The writer has satisfied himself that the parabola cannot only be successfully utilized, but indeed may be the *only* type of antenna that can perform satisfactorily in certain applications.

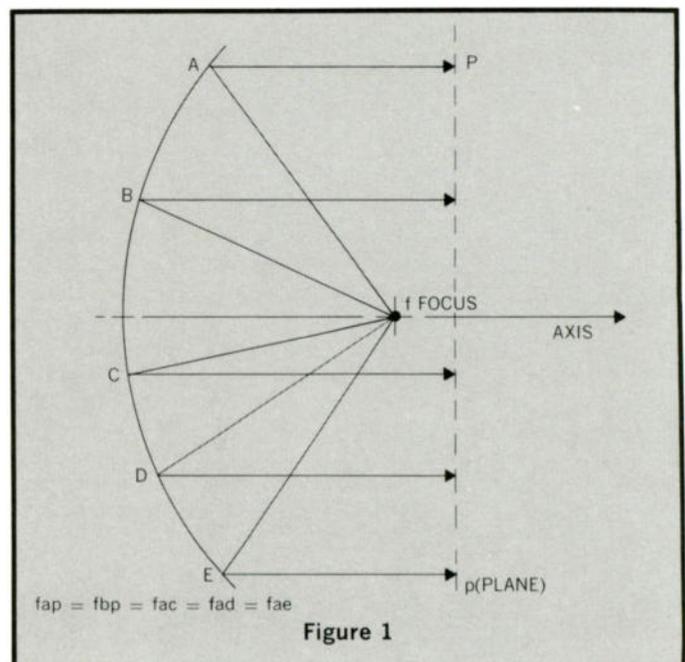
Before getting too deeply into the definite ways of making use of the parabola in TV systems, let us explore from a basic point of view what it can do and cannot do.

First of all, the parabola may be used as a collector of waves. The parabola, by virtue of its geometric properties, concentrates all the rays in a plane wave at the focus of the parabola. (Figure 1.)

It is seen that no matter what direction a ray takes, the distance from the focus to a plane perpendicular to the paraboloid's axis is equal. Rays in a plane wave are



RF Systems 30-foot parabola at Athol, Mass. receives two signals from Boston, 50 miles away, and yields a gain of 34.5 dB.



accordingly focused perfectly. The surface of the parabola is mathematically defined by the equation shown in Figure 2.

The parabola must have a surface that will reflect the waves. (They may not be allowed to leak through to any substantial degree.)

For light rays we would, of course, require a solid surface. For electromagnetic waves, various porous reflecting surfaces may be used up to a limit. In general, mesh or porous surfaces may be used up to 5000 mc and even higher with carefully controlled surfaces.

In the TV ranges of frequencies open mesh surfaces and wires oriented horizontally may be used. The selection of sizes and spacings is a matter of selection by the antenna engineer. However, it is recommended here that one should not reduce the spacing to less than a tenth of the wavelength when the wire size is at least 1/100 of a wavelength. A spacing of $\lambda/16$ is to be preferred when the wire size is $\lambda/100$.

Surface Tolerance

The surface accuracy of the paraboloid has an effect on the side lobes and gain of the antenna.

In general, these tolerances are only a problem in antennas operating in much higher frequency bands and a tolerance of $\lambda/16$ is entirely adequate and will have negligible effect. This means, of course, that tolerances in the VHF bands can be very liberal while in UHF bands considerably tighter. The tolerance at Channel 13 for example is 3.5 inches, while that at Channel 87 is 7/8 inch.

Type of Feed

The feed should be designed for the particular geometry of the reflector used. Yagis, dipole feeds with reflectors or corner reflectors, can be used. The feed should be designed by an antenna engineer unless someone has had prior experience. The beam characteristics of the feed are what are important, not its gain. The design is a separate topic and will not be taken up here. The feed, of course, is ideally located at the focus of the reflector. For a yagi, the fed element of the feed would be placed at the focus as this coincides with the phase center of the feed.

Frequency Limitations

While it is desirable that the aperture of the paraboloid be large compared to the feed size, there is no definite limitation. It would seem obvious that the larger the feed became with respect to the aperture, the larger would be the blocking effect of the feed. This is true. Now the antenna theory is based on the assumption that a point source is located at the focus of the paraboloid and for ideal performance the phase error is zero. With a point source located at the focus, there is no phase error due to the current from the source. As the source becomes larger physically, the currents on the elements will appear displaced from the focus. The result will be to produce a linear phase error across the aperture that will result in some distortion of the beam

and filling in of the nulls as shown in Figure 3.

The filling in of nulls and broadening of the beam does not mean that the antenna is unuseable. There will be a drop in gain, of course. Whether or not to use the parabola if the aperture is, say, two times the size of the fed element is more of an economic consideration and it may be dependent on other considerations.

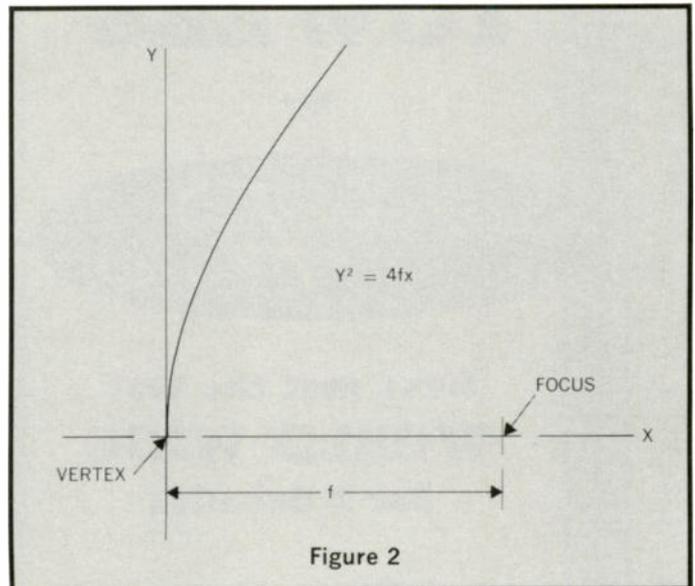


Figure 2

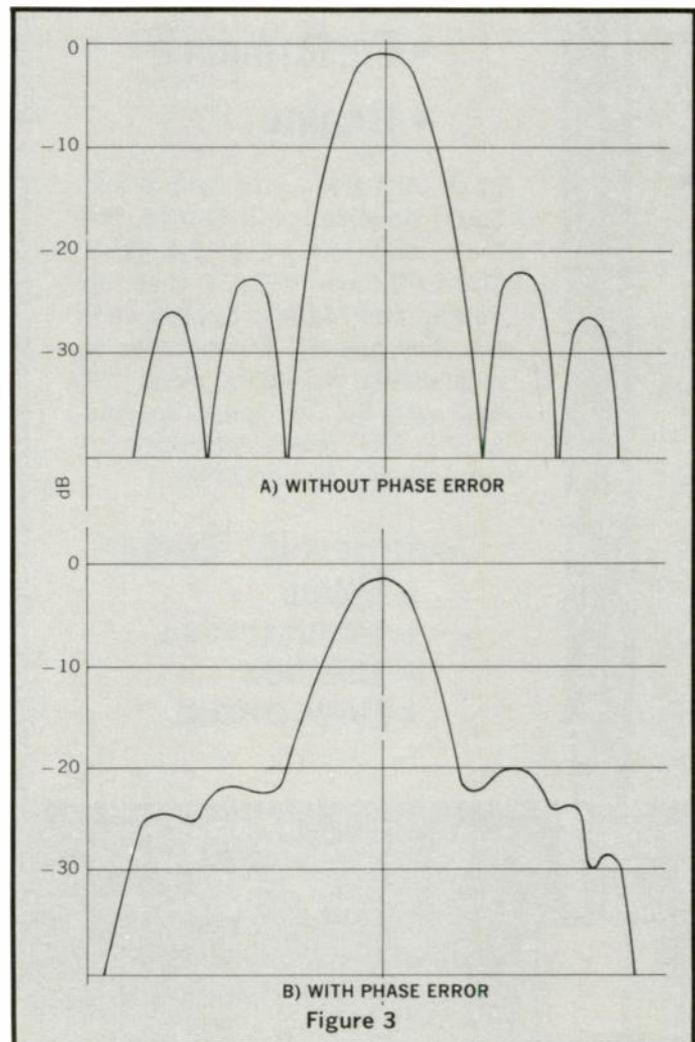


Figure 3

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Various authors have stated limits on the aperture size related to wavelength which are presumably based on certain assumptions or rules of thumb which are inaccurate and cannot be applied in specific cases. This is borne out by antenna pattern data measured on R F Systems, Inc. test range at Cohasset, Massachusetts as shown in Figure 4.

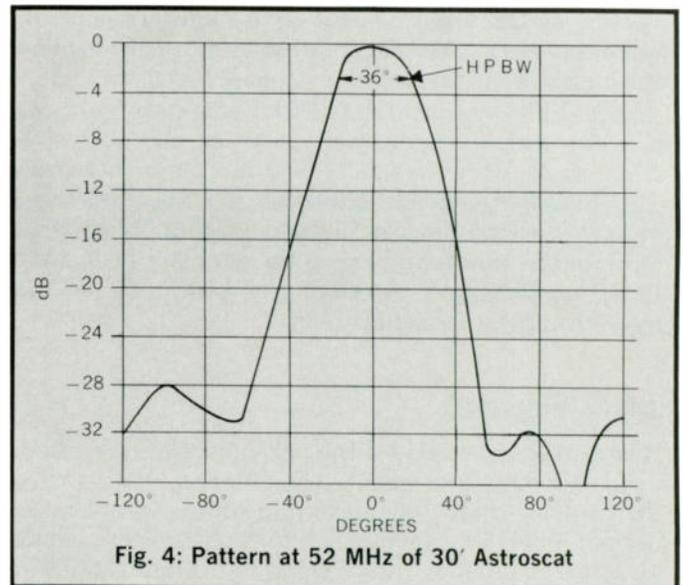


Fig. 4: Pattern at 52 MHz of 30' Astroscat

Accordingly, the selection of a parabolic antenna for a given application even at low frequencies should be made by an antenna engineer or systems designer taking into consideration all the specific problems involved.

Mechanical Considerations

Many functional and performance characteristics are based on the mechanical design of the paraboloid. It is not the purpose of this article to go into these, except to cover the following two broad points as related to electrical performance:

- (1) The unit should be designed to meet allowable deflections and wind loads with a minimum performance degradation under *operating* conditions.
- (2) Due consideration must be given to the reliability aspects as well as the anticipated life of the equipment, which involves materials, their strength and their chemical characteristics.

Tower Loading of Parabolas

One of the objections to the use of a paraboloid has been the wind loading factor as transferred to the tower. Certainly, there is not much question that for low gain antennas, a yagi or combination of yagis, in general, will result in less tower loading. For the higher gain antennas which we are mostly concerned with, this is not necessarily the case. In some situations the loading for the parabola may be less, because, as will be shown later, the paraboloid can pick a multiplicity of channels from a single dish and from different directions merely by adding a feed.

Another important consideration is the fact that it

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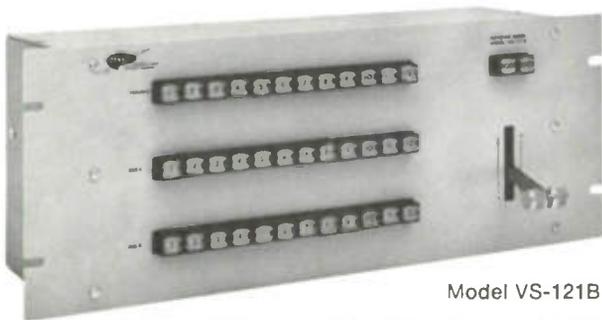


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is possible to design a system with towers of less height because of the large gain margin available from the parabola. Lower height towers result in savings beyond the cost of the basic tower such as cable length, attachments, servicing and installation time.

Installation on Towers

There is some feeling that the installation of a parabola may be more difficult than the installation of an array. Actually, this could possibly be true in comparing the installation of a yagi or pair of yagis with a dish. However, it is definitely not true when comparing a large array with a parabola. The parabola has a well-defined outline without protrusions and it is less likely to catch on guy lines while being raised. Actually, it appears that there are no significant additional problems related to mounting such an antenna.

Other Advantages of the Parabola

Tower effects on performance are absent with the parabolas. The tower will not interfere with performance as it does in the case of tower mounted yagis or on other type arrays.

The feed element is tailored to the parabola's geometry, and with proper feed design, side lobes and beam characteristics can be controlled.

Since a high percentage of energy is radiated, the level of radiation in undesired directions is extremely low, thus assuring excellent front-to-back ratios and minimizing undesired signal reception.

Considerable flexibility is available. The parabola can be used for any channel by a simple feed change, thus resulting in a considerable potential saving if the channel pick-up requirements are modified in the future.

One of the more attractive advantages of the parabola or other types of reflective antennas is the ability to generate separate beams by utilizing the same reflector. This is done by using separate feeds in the same reflector. This is discussed in some detail later in this article.

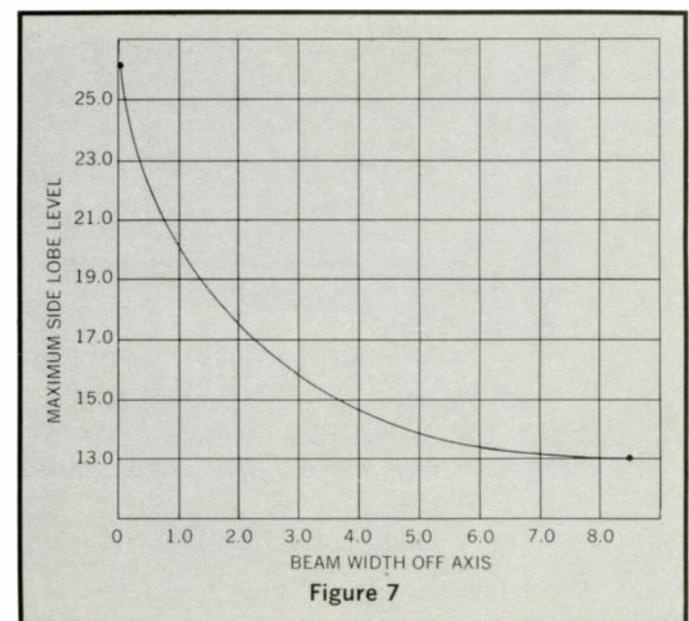
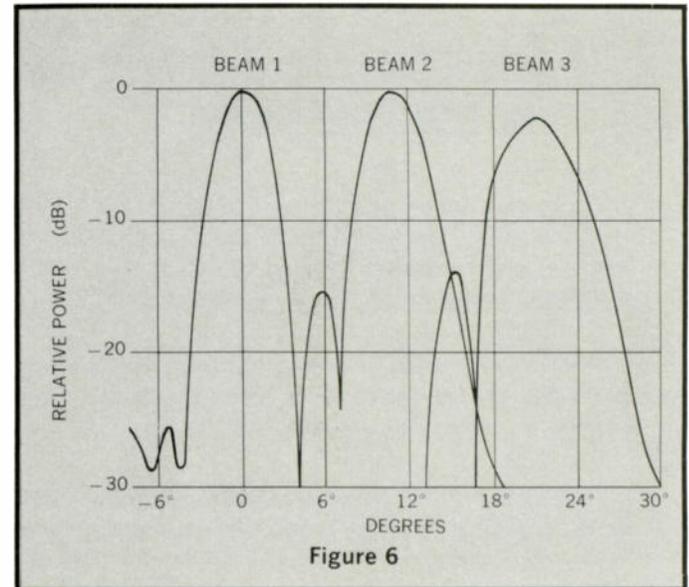
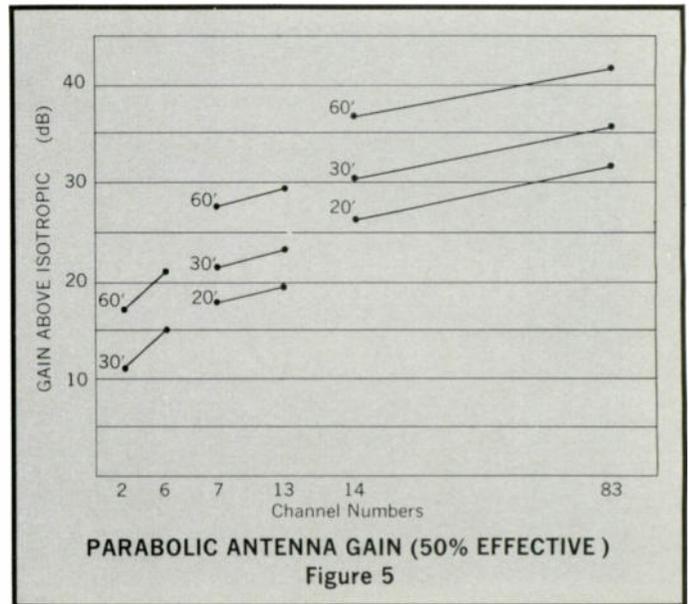
One of the most impressive of the characteristics which can be achieved is high gain, particularly as the frequency of operation is increased. Figure 5 shows gains achievable using a 20', 30', 45', and 60' parabola.

Equally impressive is the ability to obtain high discrimination to unwanted signals because of the narrow beam-widths attainable.

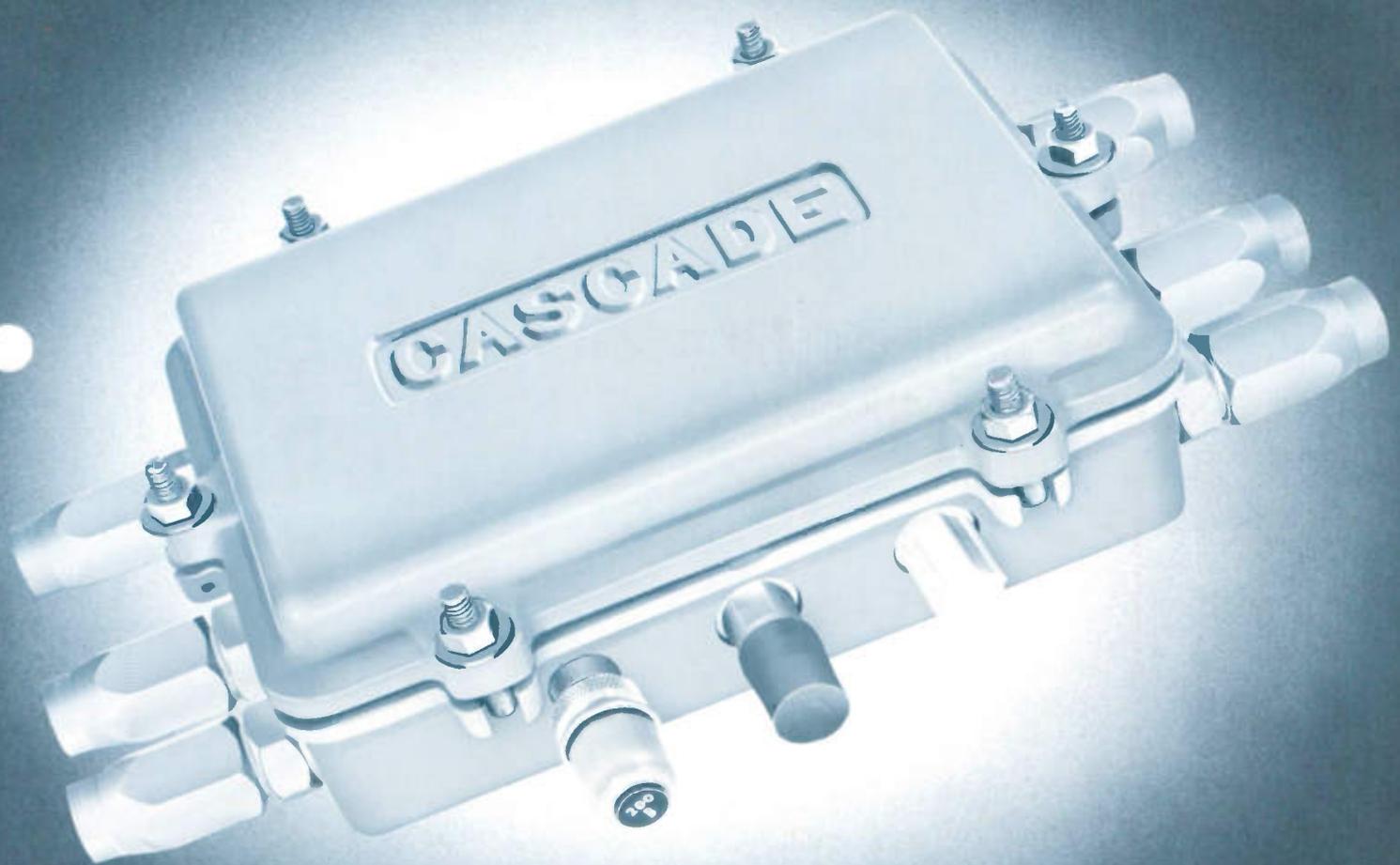
Multiple Pick-Up

Several channels can be picked up from a single parabola by use of multiple feeds (one for each channel). The range of angles over which these signals can be picked up is quite large.

Kelleher² has shown results of placing feeds off axis in a paraboloidal reflector. Figure 6 is reproduced from the referenced report. The data presented and extracted from the Kelleher data has been verified by the author in test results conducted over a wide band of frequencies in various size antenna reflectors. It can be seen from these curves that: (1) As the feed is moved off axis,



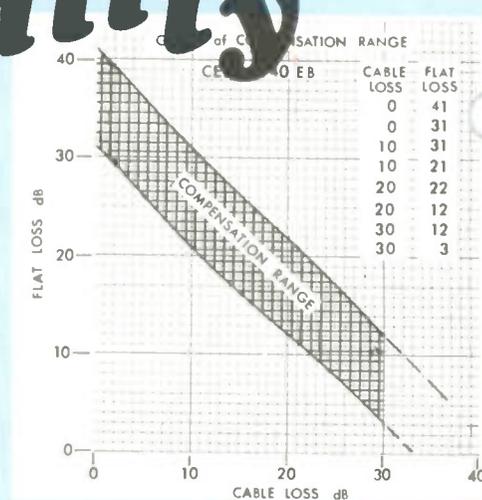
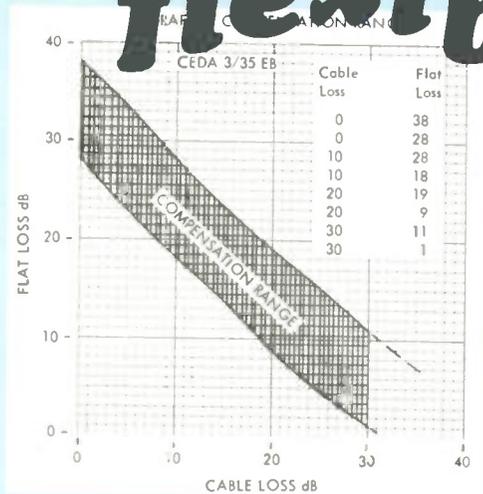
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Alignment capability ⁽²⁾		
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maximum cable loss	30 db	30 db
Frequency response (± 0.5 db)	40-250 MHz	40-240 MHz
Recommended input level Ch 13		+10 dbmv
Input return loss	18 db	18 db
Output return loss ⁽³⁾	13 db	13 db
Ambient temperature range	-20 to 55° C	0° - 50° C
Power requirement	300 mA at 30V 270 mA at 22 V	11.7 W from 117 V 60 c supply
Distortion Characteristics		
Cross modulation. Output level for -57 db cross modulation 12 channel synchronous sync. at Ch 13	+43 dbm V	+43 dbmv
Maximum noise figure	9 db	9 db
Physical		
Dimensions (overall)	Trunk Housing	(8.5 x 5 x 3) inches
Connector fittings. Input/Output	Optional	F 61
Connector fittings. Monitor points	F 61	F 61

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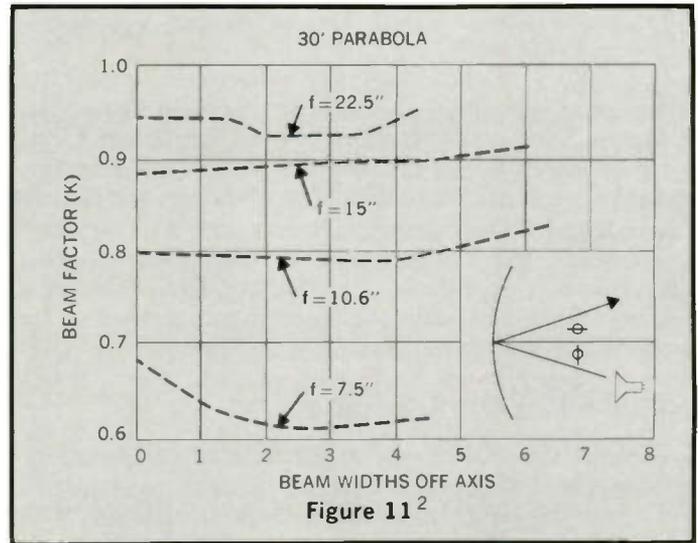
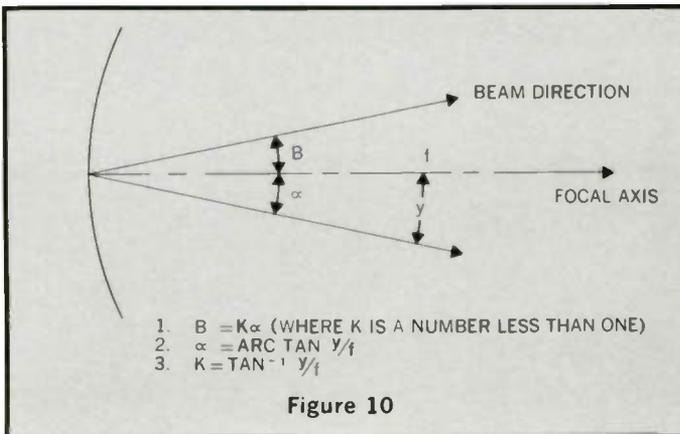
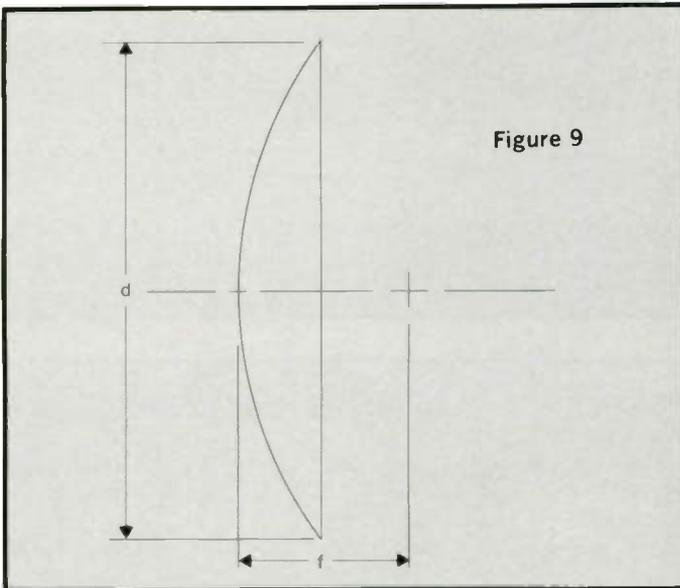
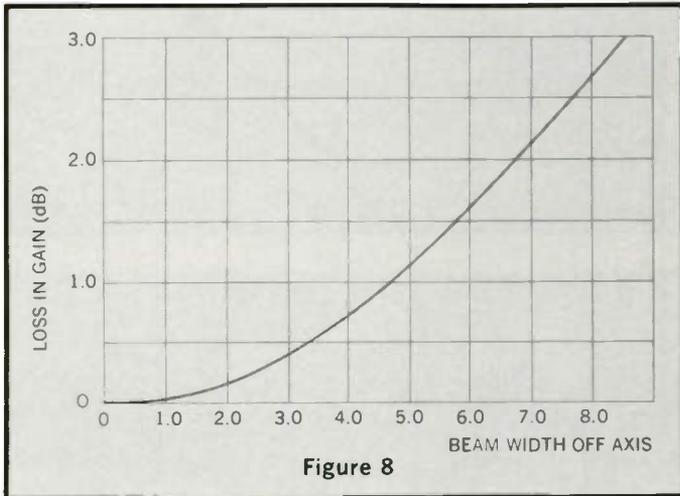
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the resulting main beam from the paraboloid retains virtually the same shape for a surprisingly wide range of displacement. (2) The main variation in the overall beam is in the near inside lobe, (the side lobe toward the main axis of the reflector). (3) The drop in gain is very slight for as much as 3 beamwidths off axis. (4) Even for wide displacements, the loss in gain is relatively low. Curves extracted from the Kelleher data have been prepared. Figure 7 presents the maximum side



lobe characteristics vs. beamwidths off axis, and Figure 8 presents the gain loss vs. beamwidths off axis.

Determining Beam Deflections

One would expect that the beam would deflect in direct proportion to its displacement from the axis as it does in a mirror. However, it is found that the beam deflects a smaller angle than the angle of displacement of the feed (see Figure 10).

In Figure 10, K is referred to as the beam deviation factor and has been shown³ to be a function of the edge

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illumination characteristic and the f/d of the paraboloid. (See Figure 9.)

Data for a 30-inch diameter reflector is presented in the above reference and is reproduced in Figure 11. It is seen that although there is some variation in the beam deviation factor as the feed is moved off axis, this variation is minor in nature. The data is replotted in Figure 12 with the beam deviation factor as a function of f/d ratio. For most commonly used focal lengths, the factor K is approximately 0.85, and since this is not critical, K equals 0.85 is a good number to use for average conditions.

Multiple Pick-Up Application

Perhaps the most likely application of the parabolic antennas to CATV is in the pickup of multiple channels. For example, let us consider a theoretical case. It is desired to pick up Channel 10 at a bearing of 48 degrees, Channel 24 at a bearing of 28 degrees and Channel 56 at a bearing of 52 degrees. (See Figure 13.) Since the UHF channels will have a narrower beamwidth and the beam locations must be as close as possible to their required direction, we will start by bisecting the angle between the two UHF stations. The angular difference is 24 degrees so the required beam displacement is 12 degrees, and because of the effect of the beam deviation factor, we must displace the feed $12/.85$ equals 14 degrees. This is a physical displacement and $f \tan 14$ degrees equals 144 inches. Displacement equals $144 \tan 14$ degrees equals 36 inches.

The feeds will then be placed in the dish as shown in Figure 14. The Channel 10 antenna will be 8 degrees off axis and accordingly will be displaced a distance: y equals $144 \tan 8/.85$, equals $144 (.166)$, equals 24". The beam positions and their relative sizes are as indicated in Figure 15. Table I indicates beamwidth and gain characteristics of the system.

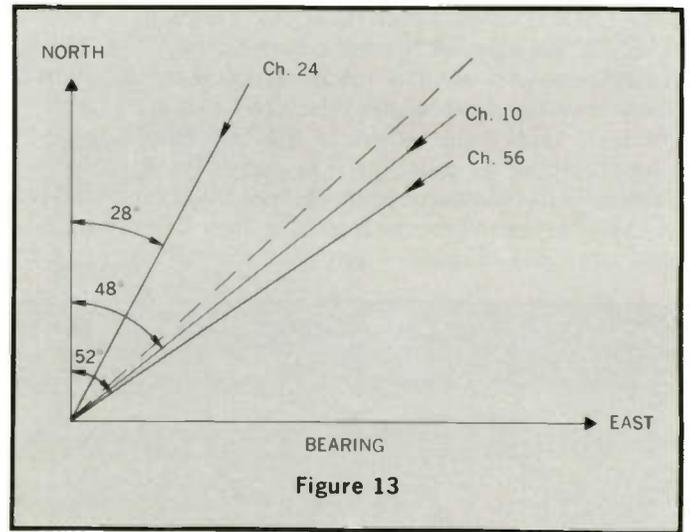
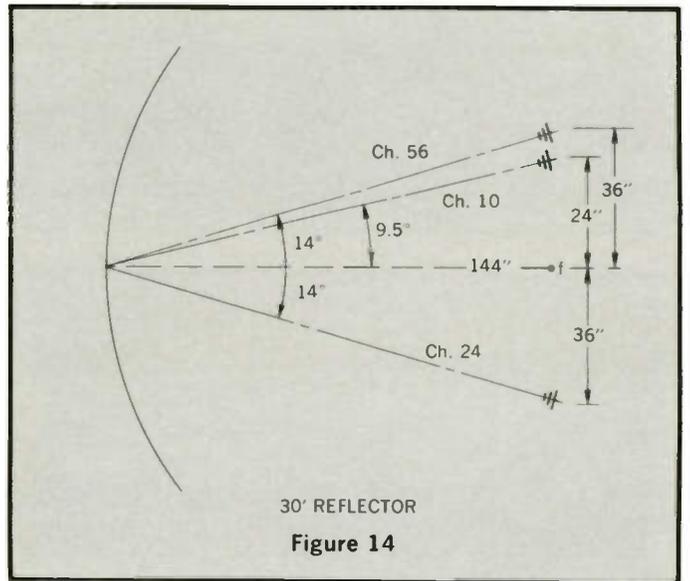


Figure 13



30" REFLECTOR
Figure 14

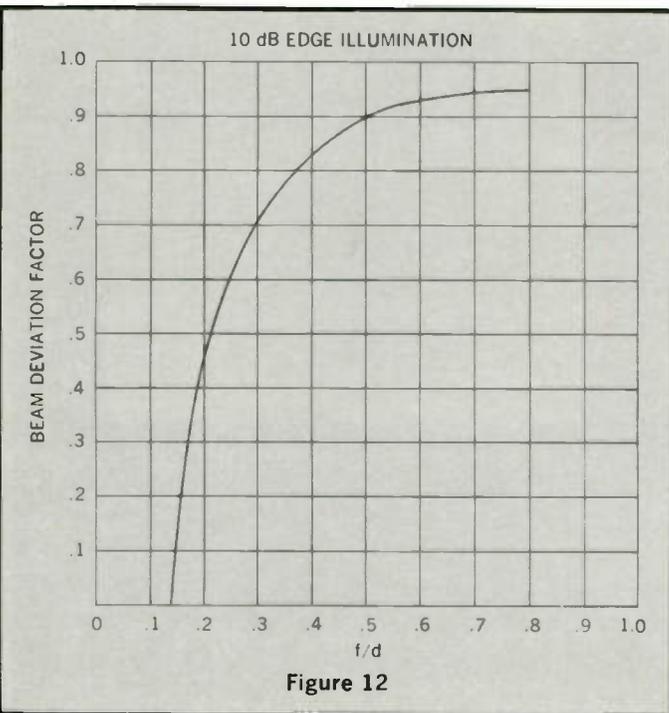


Figure 12

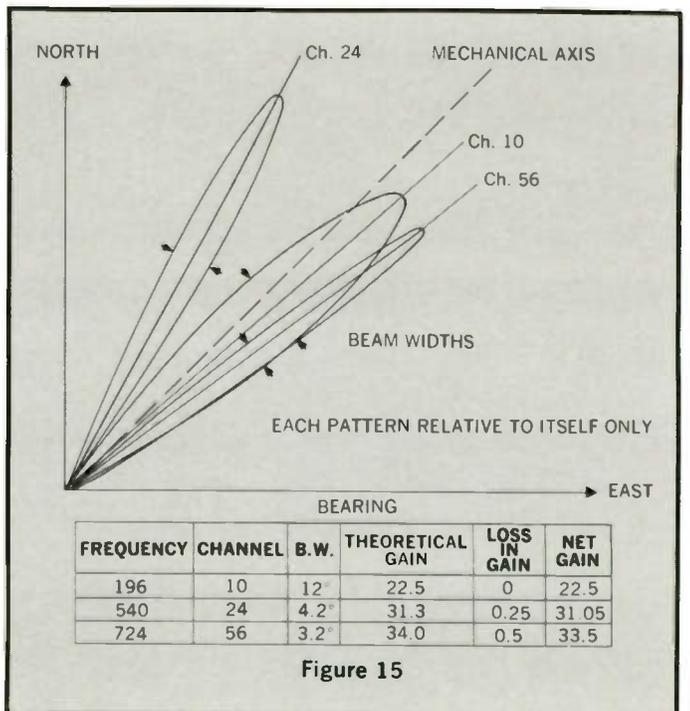


Figure 15

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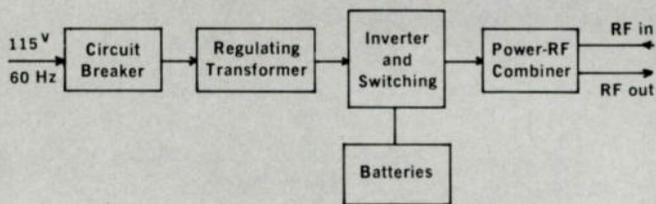
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Co-Channel Interference Reduction Application

Another area of application of the parabola, by no means common, but nevertheless practical, is in the obtaining of cancellation of undesired signals. For example, suppose it is desired to pick up a signal of Channel 30 from a bearing of 50 degrees and to reject a signal of Channel 30 coming in at an angle of 52 degrees.

The beamwidth from a 30-foot parabola is 4 degrees and gain is 32 dB. The paraboloid with a properly focused feed will inherently have a null in its pattern that will occur at an angle related to power distribution of the energy over the aperture. (See P. 195, Vol. 12 Rad Lab.)⁴To a first approximation this value will be $\psi = \sin^{-1} 1.63^{-1} \lambda/D = 5.5$ degrees.

Accordingly, we can see that by placing a single feed in the reflector and by pointing the reflector in the

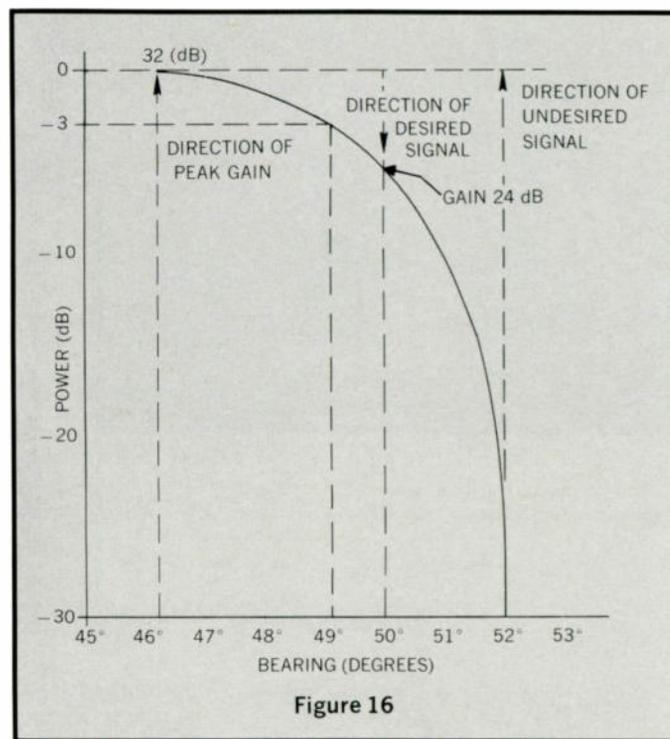


Figure 16

proper direction, a null can be placed in the direction of the undesired signal. The beam is shown in Figure 16.

Theoretically the null depth can be infinite. From a practical viewpoint -40 dB should be readily attainable. Therefore, we see that the co-channel isolation in this case for two signals 2 degrees apart of the same transmitted power will be -32 dB. Obviously, a better angular distance will give us a better rejection. (7C)

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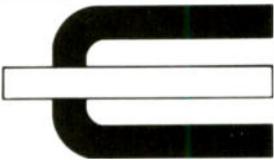


Dick Yearick



Mason Hamilton

Both Dick and Mason have been solid anchor men in CASCADE'S greatly expanding sales and service operation. They are leaving us to devote full time to their own fast growing company, Television Distributors, Inc. We just want to say "Thanks fellows for doing such a good job ... and Good Luck in your new venture".

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In the next issue we'll announce the two top flight professionals who will be taking over from Dick and Mason

21-Channel Research Head-End Installed by Manufacturer

A new multi-purpose signal processing system has been installed recently at Vikoa, Inc.'s Hoboken manufacturing facilities. The head-end equipment is capable of 21-channel operation, and serves as a functional test and demonstration system.

By R. L. Cowart
Staff Consultant
Vikoa, Inc.

A new "21" channel test head-end has been installed at Vikoa. It is designed primarily to fulfill the needs for three major areas of investigation. First, to provide test signals for development and compliance testing of various types of head-end equipment. Second, to provide maximum flexibility as a test head-end which will be used to drive sections of cascaded amplifiers. Sixty "21" channel Vikoa Futura ampli-

fiers are presently being installed on the roof of the Vikoa administration building as a test cascade. The test head-end will provide all "21" channel signals to this test cascade. In this fashion, actual operating conditions will be established for "21" channel test amplifiers. The third use is the ability to create virtually an exact duplicate of a customer's channel carriage so that transmission characteristics and system specifica-

tions can be experimentally confirmed.

The head-end as conceived is arranged so that full monitoring can be accomplished on each channel or spectrum segment, i.e., low-band, mid-band, and high-band, prior to ultimate combination. This way, distortion sources can rapidly be discovered by comparison of input vs. output. Since full control of these sources is available, instant comparison can be

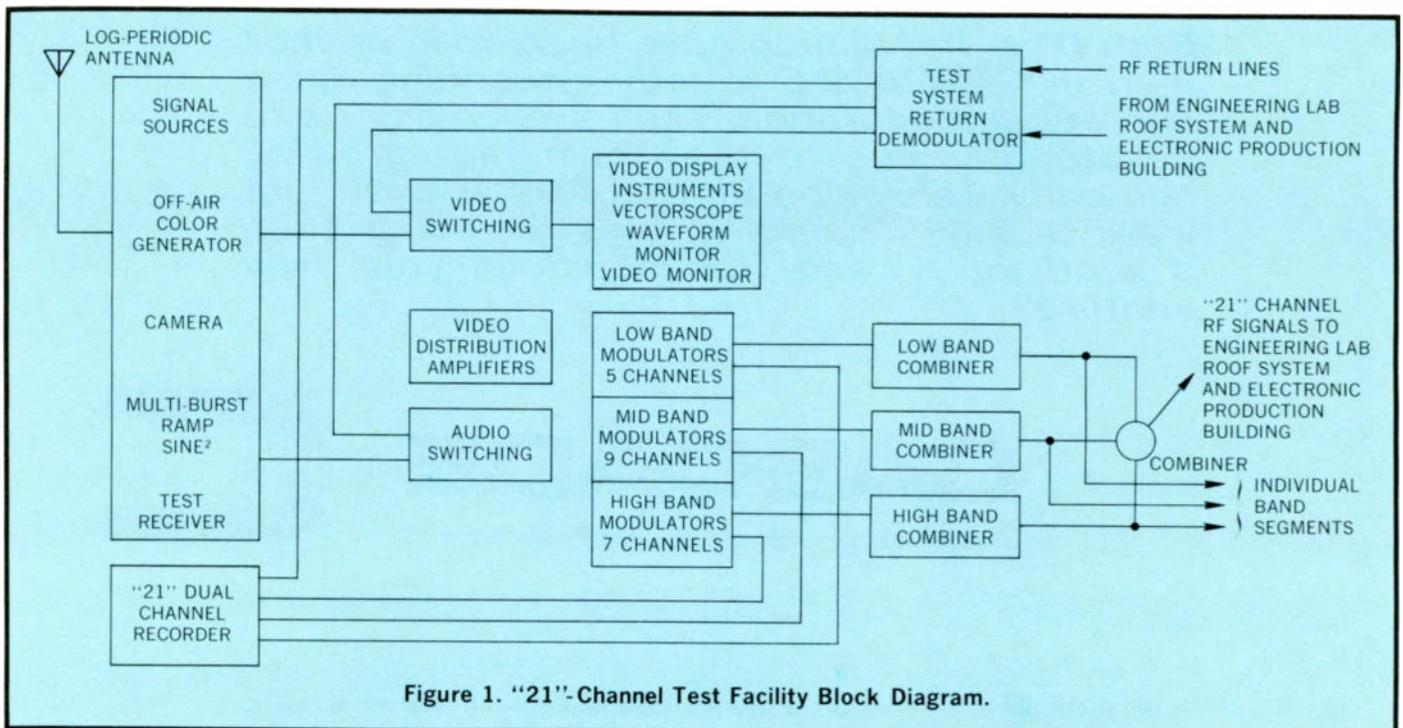
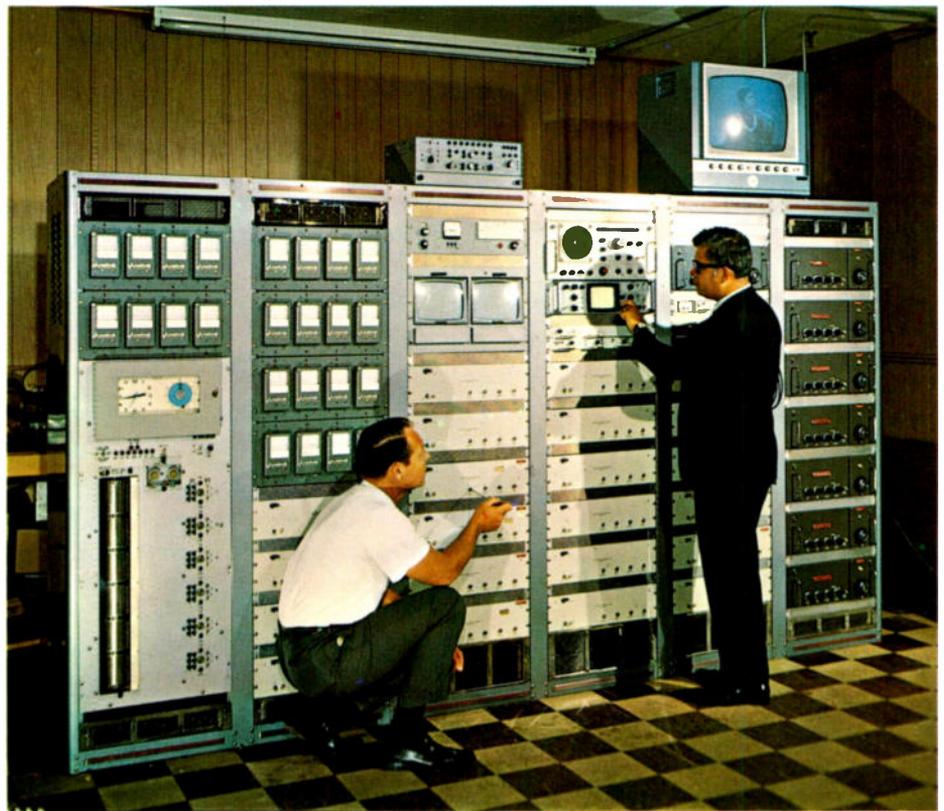


Figure 1. "21"-Channel Test Facility Block Diagram.

made for any channel or segment of the spectrum through any test amplifier or system cascade. Monitoring of each channel's input and output signals is available as well as an analysis of the return signal through the test cascade. A broadcast quality color bar generator is included in the head-end main frame which is available to modulate any or all of the "21" channels. Video switching is incorporated to accommodate other test signals, e.g., Telmet (video) test signals which are similar to broadcast VIT signals. Since the equipment is basically at base band, various other conditions can be simulated. (e.g., the classic argument of what difference in output capability exists with different numbers of channels synchronously modulated can be evaluated since all video inputs to the modulators can be driven from a common source.) Various combinations of synchronous and non-synchronous modulation can be programmed into the head-end. Optimum cascade operational levels can be compared to theoretical calculations.

The basic configuration used in the "21" channel head-end shown in Figure 1, consists of demodulation and remodulation equipment. This permits all test information to be at base band (video). A Telmet generator, off-the-air signals, and standard color test signals are available as built-in information sources. Channels 2, 13, and mid-band channels A and I are all modulated with the same test signals in the basic configuration. This permits easy and rapid monitoring of performance at the four key frequencies in both "12" and "21" channel transmission equipment.

In addition to the switching flexibility, dual-channel strip chart recorders are installed to allow continuous monitoring of the level of each output channel and each return channel signal from the test cascade. Thus, an excellent record of ALC (automatic level control) and ATC (automatic tilt control) can be obtained. This allows various AGC modes to be employed to determine the effectiveness of each mode in typical



Author Bob Cowart (kneeling) and Mike Rodriguez, Director of Engineering at Vikoa adjust one of the 21 Dynair signal processing units used in the test system.

system segments. Among those being tested are: composite AGC, the oldest and most common method of CATV level control; dual composite, by which certain selected portions of the transmission spectra are sampled and used to provide both gain and tilt actions; single pilot carrier systems, which control gain only; and dual pilot systems, which simultaneously control gain and tilt. Each different AGC method can be tested in any cascade segment up to sixty amplifiers and performance evaluated.

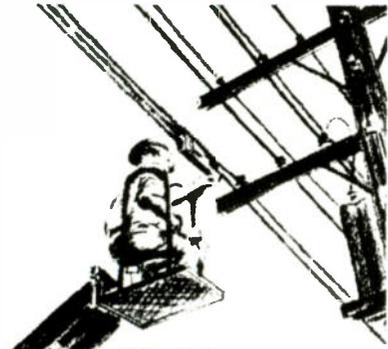
The test head-end provides twelve channel composite signals, mid-band signals only, and combined mid-band and conventional "12" channel or "21" channel system which are utilized throughout the Vikoa engineering laboratory for various test facilities, i.e., multiple and simultaneous test operations. The test signals from the head-end are delivered to the Vikoa electronics building via a coaxial cable intertie which allows for the transmission to and the reception of signals between the two buildings at different locations.

The rack contains sufficient

built-in instrumentation to allow measurement of differential gain, differential phase and frequency response by means of multi-burst and other types of modulation, to determine the characteristics of a processing device or transmission system section. Color burst level and phase relationships can be made with a broadcast quality color generator, displayed on a Tektronix Vectorscope as well as off-the-air examination through demodulators which can be examined by a Hewlett-Packard Model 191 TV wave form monitor.

The future of CATV processing equipment will differ from present day equipment due to the greater requirements for larger CATV systems. Today, many possibilities are available in the form of video clean-up. These devices are presently in use by broadcasters and consist of processing amplifiers and sync stabilizers by means of which various forms of low frequency distortion are removed from the video signals. With the building blocks provided in Vikoa's test head-end, all future improvements can be incorporated and evaluated.

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Trouble Shooting

your technical problems



By Archer S. Taylor

QUESTION: *Is it an acceptable procedure to tap out of the end of a feeder line into a two-way splitter in order to serve two house drops beyond the end of the feeder line? Does this procedure provide proper termination?*

ANSWER: There is some controversy on this point. However, I believe that if the drop cables are at least 6 dB in length, and if the next tap back on the feeder is directional, the mismatch will not be excessive, even if one or both drops are unterminated in the house. A better arrangement would be to use a four-way splitter. In any case, it is important that all unused outputs be terminated. There have been reports that this scheme allows the 15.75 kHz receiver sweep signal to feed back from one customer to another. I suspect that this may be caused by a particularly "hot" set and is not a general reason for not using terminating splitters.

QUESTION: *What is the best method of providing true 60 cycle AC to operate sweep equipment, when you have to sweep a solid-state system and must use an auxiliary power source, such as a generator or an inverter?*

ANSWER: The best way will be to use battery-operated solid-state test equipment when it becomes available. Auxiliary power supplies are not phase-locked to the supply source, and sometimes suffer from unstable voltage, and harmonic waveforms. The important point is to select a reasonably well-regulated power source which is capable of supplying the test equipment load without excessive voltage fluctuations with load changes, and with adequately suppressed transient "noise" or other distortions producing "glitches" on the viewing screens, or unsteady meter readings. The problem of synchronizing the oscilloscope time-base to the sweep generator is best solved by using a voltage sample from the cable power to drive or trigger the oscilloscope time-base, with the sweep generator also controlled by line power. Several manufacturers supply a phase shifter to bring the oscilloscope display into proper phase with the sweep generator.

Since no significant power is required to drive or trigger the time-base, the 60 Hz signal can be obtained from clips or probes on the power supply in the amplifier, using voltage test points if provided.

Readers are invited to submit technical questions for solution in this column. Send questions to: "Trouble Shooting," TV Communications, 207 N. E. 38, Oklahoma City, Oklahoma 73105.

TVC

LINDSAY introduces A NEW BREED of CATV ANTENNAS

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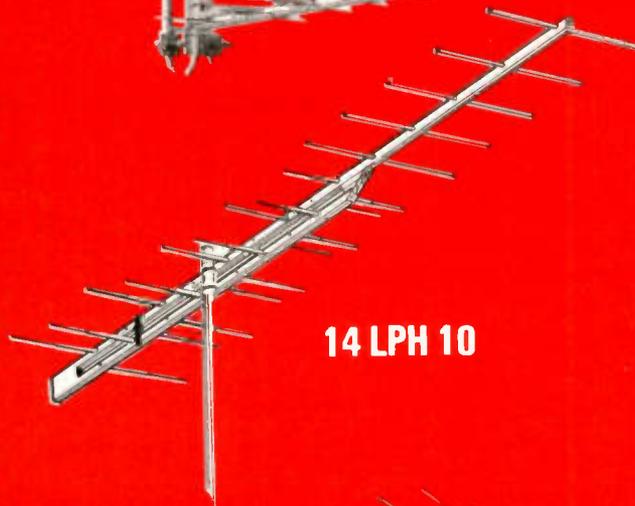
Extra heavy duty construction gives long-term reliability. Dual booms are used to give rigidity with less weight and wind resistance. Elements are vibration dampened and strengthened in stress areas. Hardware parts are generously massive in size. The U-bolt takes up to 2-3/8" OD masting (larger on request). Gold-Alodized finish — optional.

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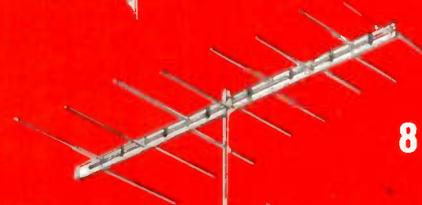
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Using Photography in Signal Quality Analysis

Photography can be used effectively to evaluate cable TV picture quality. The following applications of the photographic art can be used to aid you in the pursuit of product excellence.

*By Peter S. Carr
Home Telephone Company
Ridgway, Pennsylvania*

The technique of taking photographs of a cathode ray tube is one that has not found extensive application in the cable industry. However, its use offers a unique method for technical evaluation of the many phases of signal processing and distribution and provides permanent records for comparison and reporting.

One application of video image photography concerns the evaluation of subscriber picture quality. The objective is to compare video quality between the off-the-air signal and the cable, as viewed from the average subscriber's set. Figure one is an off-the-air picture of average quality and shows moderate snow and fine co-channel lines. Its prime worth, however, is as a contrast level reference. Figure two is a photograph of the opening sequence of an "I Spy" program as provided by cable. It offers maximum contrast content for comparison with Figure one. It is evident that, while the cable picture is free of such

defects as co-channel snow, interference and cross-mod, it has less contrast content than its antenna-received counterpart. The photograph comprising Figure three is also of a cable-received picture.

In scrutinizing Figure one a faint ghost which is most noticeable at the announcer's head can be seen. A study of Figure three shows no such noticeable ghost but a definite smear in the lettering. It must be noted that the cable signal was taken from the end of a seven-amplifier cascade and that the antenna signal originated from a station some one-hundred twenty miles distant.

In using photographs for comparative evaluation, all factors must be held as constant as possible. In this example, room lighting, TV set controls, and camera positioning were identical throughout the shooting sequence. Therefore the only variables were the actual contrast levels present at the receiver. Had

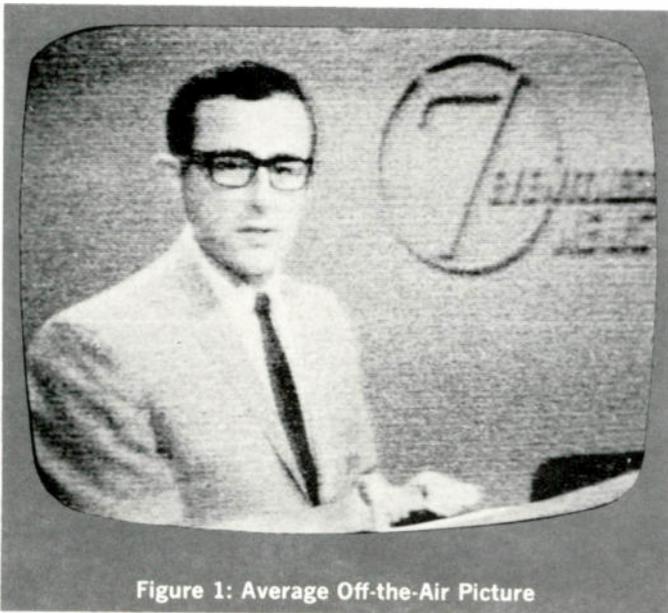


Figure 1: Average Off-the-Air Picture

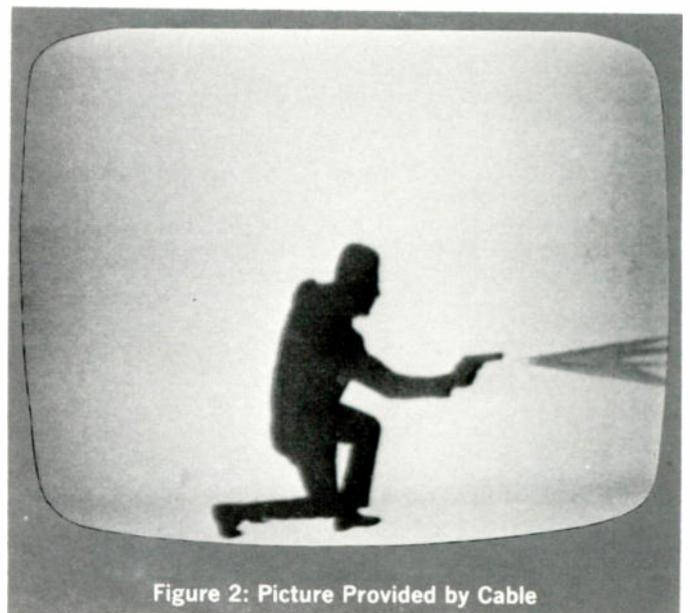


Figure 2: Picture Provided by Cable

the cable carried the channel seven signal shown in Figure one, a more precise comparison could be made by using shots of the same program.

By far the best photos are those of station test patterns. Normally the last several minutes of the pattern's broadcast make the best photographs, since the station technicians are completing final adjustments and the high quality of the pattern lends itself to close examination. A large-screen set will make

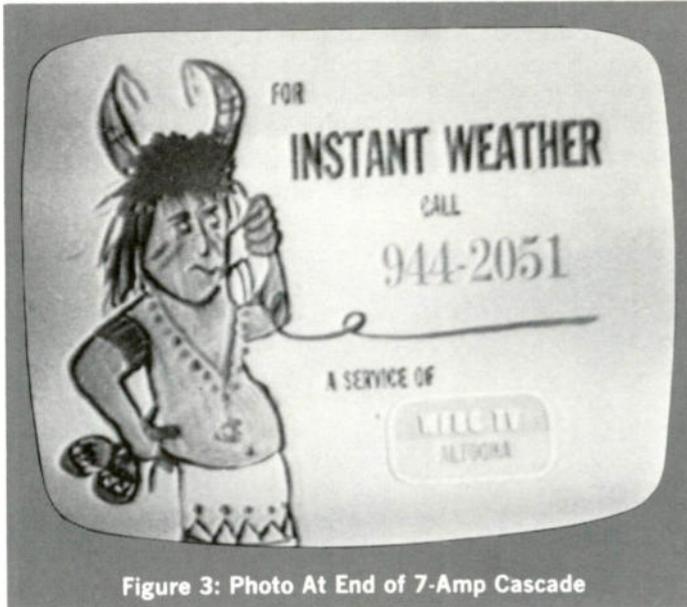


Figure 3: Photo At End of 7-Amp Cascade

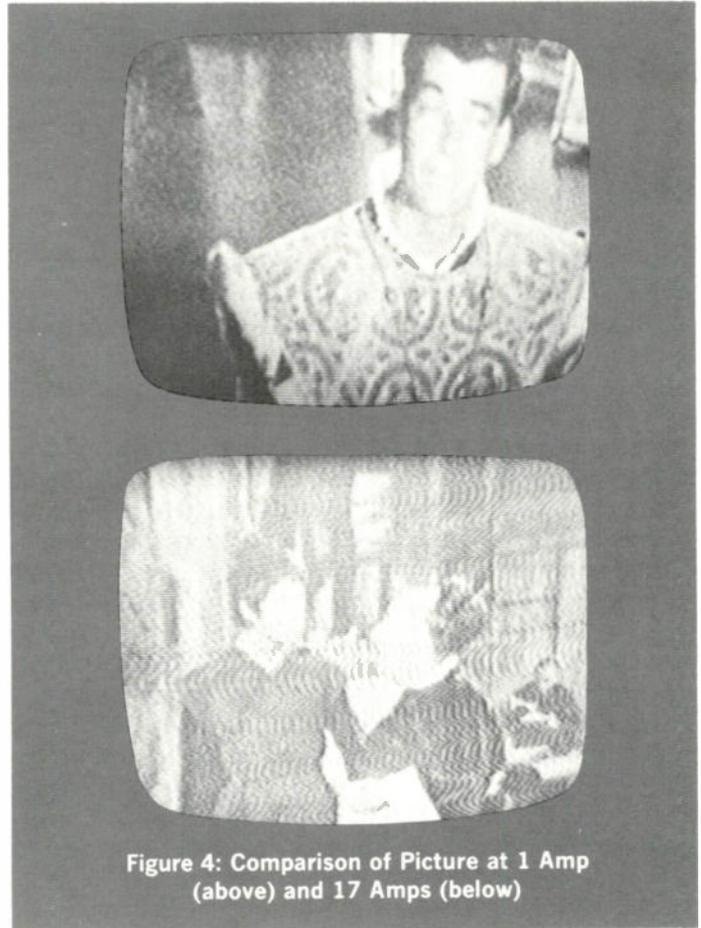


Figure 4: Comparison of Picture at 1 Amp (above) and 17 Amps (below)

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small defects more noticeable than a portable and will also make the camera setup easier. The shots presented here were taken from a twenty-one inch set and the snow and co-channel interference stand out clearly in Figure one.

To check the total reproduction quality of the system plant, a test-pattern shot should be taken at the head-end and one at a subscriber set at the end of the longest cascade. This must be done with the same camera-to-screen distance, the same size screen, and similar TV sets to be most effective. By making the system plant between the two receivers the only variable, it is easy to show the total degrading effect of the plant on the video.

Another use of photography is in extended antenna site evaluation. In this case, we are looking for a pattern of periodic ghosting interference and serious fades which may not show up in a short-time survey. To be sure that the raw signals at a proposed site are of consistently high quality, a series of time-interval photos can be used. A camera that can be tripped and the frame changed by electrical or electromechanical means is necessary equipment. The camera can be activated by a programmed timer such as the Torks timer and should be tripod-mounted in front of an instrument array consisting of a clock, field strength meter and TV set. The clock will show the proper sequence of the photos, while the meter will give actual signal level normally compensated for by receiver AGC. The TV screen video will, in addition to show-

ing serious fades, give a check on interference and ghosting, both of which may show a cycling pattern throughout the test period.

As can be seen from the photos, it is possible to make an almost line-by-line examination of the video in search of defects. By knowing the size of picture tube and its reproduction on film, it is possible to establish a scale reference for calculation of ghost offset.

Our first attempts in video image photography were made with a Polaroid Swinger camera. The camera itself is quite adequate, but standard shutter speed required is such that only one-third of the screen image is photographed. However, by using slower shutter speed ($\frac{1}{30}$ -second), a full-screen photograph can be obtained. Because of the extended exposure time, a tripod-mounted camera should be used.

We have discussed only photos taken from TV

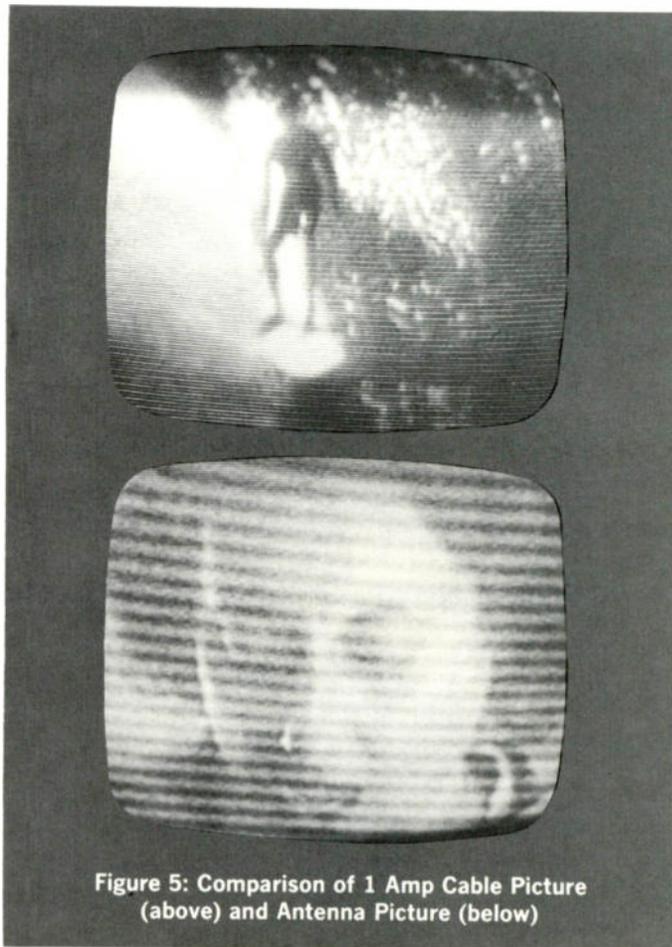


Figure 5: Comparison of 1 Amp Cable Picture (above) and Antenna Picture (below)

screens. It is equally feasible to photograph the traces from an oscilloscope. A common test facility is a field strength meter feeding detected video to a scope. Here again, photos of the resulting trace will give permanent records of picture components.

As the equipment used in our business becomes more complex, we must keep pace through the use of more refined techniques for measurement and adjustment of its performance. Photography can be usefully applied to our needs and offers another tool to aid us in the continuing pursuit of product excellence. TVC

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Construction Reports

Butler, Ala., Anco, construction at the tower begun; system completed middle of month . . . **Lake Village, Ark.**, Southern Video, expansion program complete; two video channels, 12 FM added . . . **Escondido, Calif.**, Escondido Cable, \$500,000 system contract to Jerrold; 100-mile plant operational by spring, 12 channels . . . **Holtville, Calif.**, Imperial Valley, rebuilding completed, trunk and feeder lines replaced . . . **Kern County, Calif.**, Kern Cable, new parabolic antenna installed, nine 1-1/2-ton towers . . . **Twenty-nine Palms, Calif.**, Elbac Cable, system going underground.

North Port, Fla., Gulf Coast Teleception, tower installed, system operational in near future . . .

Centralia, Ill., Sullivan Cablevision, grand opening recently, system complete; ready to make house-drops . . . **East Dubuque, Ill.**, Dubuque TV-FM, started expansion program construction, add 500 subscribers . . . **Mitchell and Orleans, Ind.**, Mitchell, tower erected; construction to begin soon, six channels plus time/weather . . . **Manhattan, Kan.**, Manhattan Cable, rebuilding nearing completion, broadband amplifiers installed, trunk and feeder cable replaced; increase to 10 channels.

Pittsfield, Mass., Pittsfield-Dalton, \$300,000 rebuild program contract to Burnup & Sims, replace 53 miles of plant . . . **Sea Isle City, New Jersey**, Garden State, system construction begun . . . **Deming, N.M.**, Sun Cable, adding 4 L.A. channels . . . **Lackawanna, New York**, Lackawanna Cablevision, construction begun, some house-drops made.

Wilmington, N.C., Entron, 135 miles of cable to be replaced, 50 miles of new plant added . . . **Cambridge, Ohio**, TV Cable System, will add 4 new channels to present 5 . . . **Loudonville, Ohio**, Ashland County, construction begun; will offer 6 channels . . . **Derry, Pa.**, Highland Video, system energized . . . **DuBois, Pa.**, Alto Video, undertaking \$100,000 expansion, will more than double.

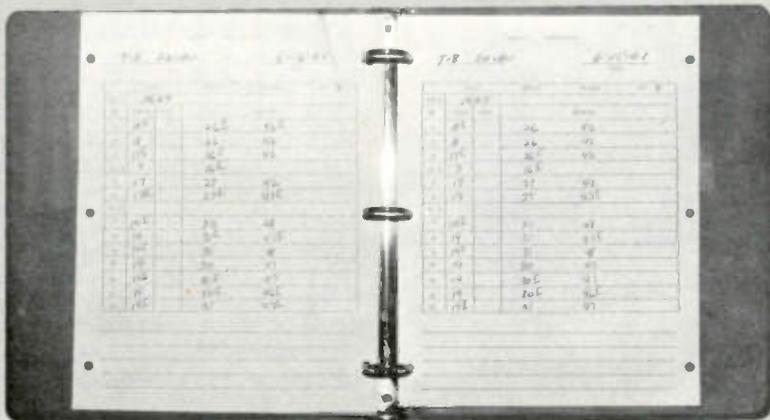
NCTI

CATV Tech Tip...

By Art Voiles, Chief Technician
Lawton (Oklahoma) Cablevision

Maintaining Equipment Performance Records

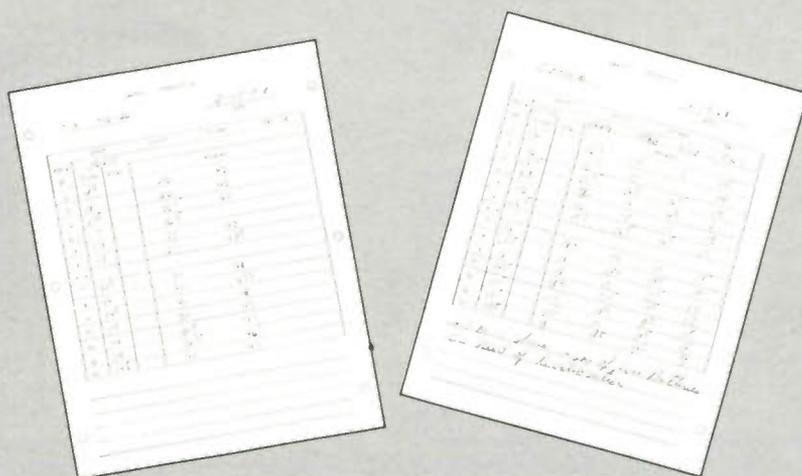
EQUIPMENT PERFORMANCE LOGBOOK



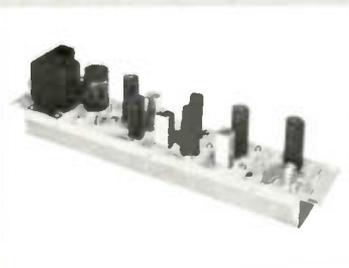
Yesterday's log is placed on the left side, for easy comparison of levels. Today's log is recorded on the right.

The keeping of regular records of system plant and equipment performance is an essential part of maintaining quality system performance. By doing so, the CATV Technician is able to discover slight degradations in amplifier and test equipment performance. The following log is used by Lawton (Oklahoma) Cablevision for weekly head-end readings, trunk, bridger and line extender readings. It is also used for a daily calibration record of all field strength meters, a practice which has prevented many trouble calls, by informing the technician when a particular meter needs calibration or is in need of batteries.

Log forms are punched on both sides for use in a three-ring binder. By so doing, the technician is able to remove the previous day's records and place it on the left for easy comparison with the current day's readings. This practice is also used when setting trunk and bridger levels, and allows the technician to see the last output readings without turning back the page. Samples of records kept by Lawton Cablevision are shown below.



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For further information on these products contact Allegheny Business Systems, P.O. Box 296, Indianola, Pennsylvania 15051. Phone (412) 767-5337.

TAPECASTER PRODUCES NEW CARTRIDGE MACHINE

Tapecaster TCM has announced its new all silicon, solid state, Series 700 continuous loop, tape cartridge machines. The units are said to exceed NAB standards and offer high systems flexibility in the recording and reproduction of audio and digital information. In addition to the information tracks on the tape, an auxiliary track is provided for the control and sequenc-

ing of the unit itself, other tape machines, slide projectors, lights, displays, or other equipment. The machines are available in reproduce only, record re-



produce, stereo, and delayed programming models.

For further information on this new product contact Tapecaster TCM, Box 662, Rockville, Maryland 20851. Phone (301) 942-6666.

BAND PASS ANTENNA FROM SWAN

Swan Antenna Company has announced the availability of their Swan Band Pass antenna. The unit features +14 dB forward gain, -30 dB front-to-side, and 20 dB down +3% above or below desired channel. UHF traps are available to be used between UHF antenna and converter to prevent frequency interference.

For further information on this new product, contact Swan Antenna Co., 646 N. Union St., P.O. Box 1122, Stockton, Calif. 95201. Phone (209) 464-9897.

SMITH RELEASES NEW SURE CLOSURES

A new series of Sure closures for encapsulation of buried wire and cable splices is available from The Smith Co. Division of Preformed Line Products Company. Sure closures are designed to provide full resin encapsulation of all conductors and joints thus reducing maintenance. Open cell foam liner is said to create uniform thickness of resin around all components of the splice. Other features include shield connectors and heavy braid conductor to provide shield current carrying capacity bond, by-pass tube for optional

use on pressurized cable systems, and sealant ring to reduce dependence on resin-polyethylene adhesion and provide permanent flexible seal around cable sheath. Sure closures are available in four sizes and each size fits a wide range of straight or branch splices (either new or repair work). No tools are required during installation.

For further information on this new product contact Smith Co. Division, Preformed Line Products Company, P.O. Box 91129, Cleveland, Ohio 44101. Phone (216) 621-0648.

IMPROVED MOUNT FROM ROTA-LOCK

New antenna mounts for cable television which lock pipe at right angles are being produced by Upright Scaffolds. Standard pipe is locked at right angles to form antenna mounts using the new Rota-Lock which consists of a loop and saddle. Its open loop wraps around the pipe at any point desired without taking the loop over the end of the pipe. The lock is designed to be installed in 15 seconds by tightening a single screw. Any adjustments are made by loosening the screw. Eight thousand pounds of grip is produced to form a strong, rigid mount.

For further information on this new product contact Upright Scaffolds, 1013 Pardee Street, Berkeley, California 94710. Phone (415) 843-0770.

BERKEY-COLORTRAN DEVELOPS MAXI-BRUTE "6"

Berkey-ColorTran, Inc. has announced the introduction of the Maxi-Brute "6" which is designed to outperform a standard 10K in light output and area coverage and draw less than 50 amps. Operating directly from 120 volts, AC/DC, the light accepts a fam-



ily of 1000 watt, PAR 64 "quartz" lamps with color temperatures of 3200°K and 3400°K. PAR 64 "quartz" lamps are also available with dichroic coated lenses producing a color temperature of 5500°K. The Maxi-Brute "6" can be stand mounted or C-clamp sup-

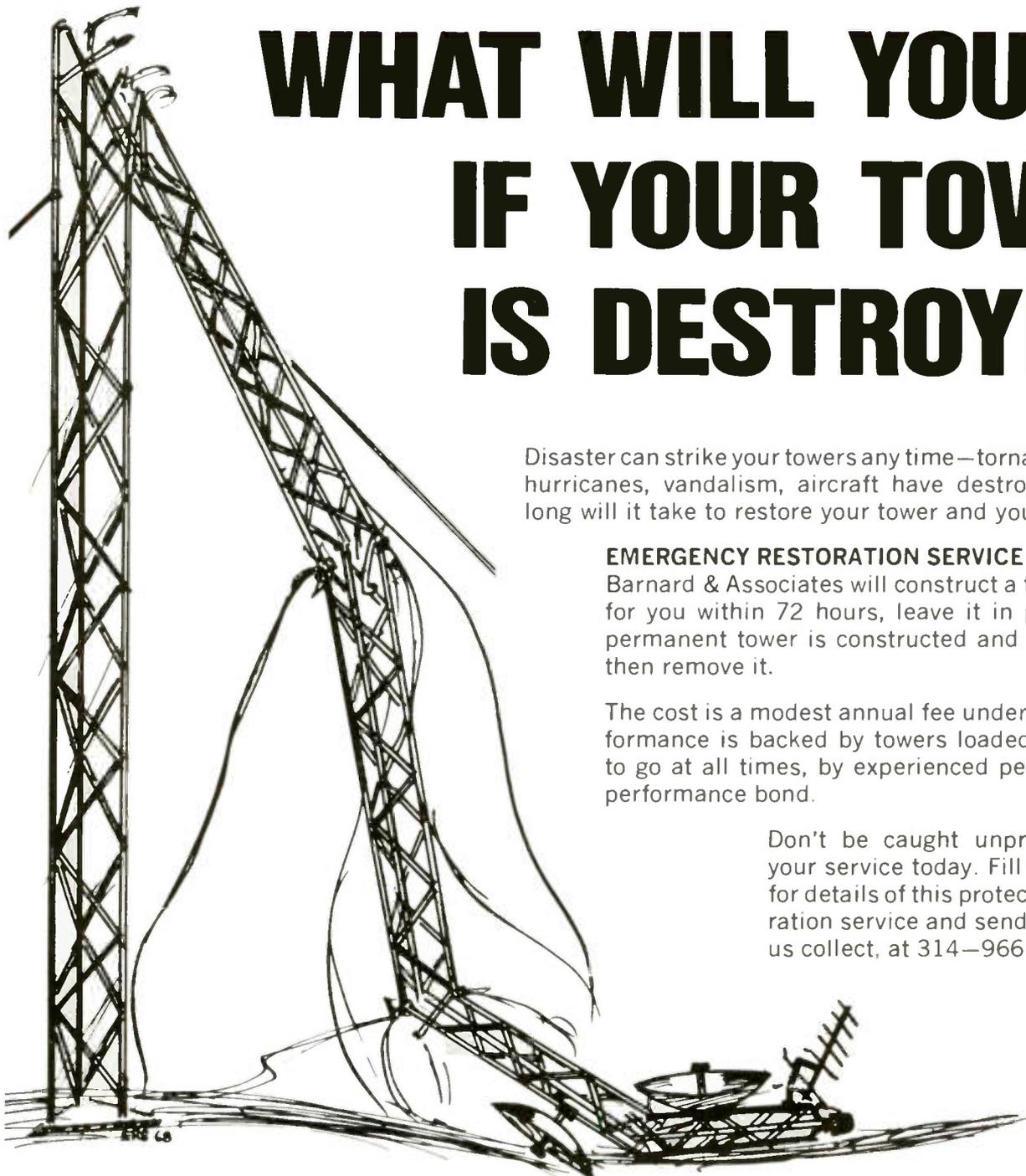


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ported. Weighing 42 lbs. (including lamps), the fixture is 19" H x 34" W x 7 3/4" D and is priced at \$198. Accessories include four leaf light shields, dichroic daylight conversion filters as well as diffusion frames that accommodate spun glass. For further information on this new product contact Berkey-Color-Tran, Inc., 1015 Chestnut Street, Burbank, California 91502. Phone (213) 843-1200.

**"BIG 7" WIRING TOOL
NEW FROM HOLUB**

A new wiring tool that can strip, cut, loop and size wire; cut bolts; crimp terminals and ream conduit is being introduced by Holub Industries, Inc. The "Big-7" is engineered to perform various tasks: to strip or size No. 18 solid or stranded, through No. 6 solid and No. 8 stranded wire; cutting blades will cut all popular aluminum and copper conductors, including UF and Romex cable; unhardened machine screws, Nos. 4-40, 6-32, 8-32, 10-32 and 10-24 can be sized and cut to length; and insulated or plain terminals and connectors from Nos. 22-10 can be crimped. According to the manufacturer, an important feature of the "Big-7" is the manner in which the two halves of the tool are held together. An adjustable bolt is used to maintain correct pres-

sure. A spring holds the tool open and ready for use. When not in use, the tool is held closed with a cam lock. Overall length of tool is 8", weight 7 ozs. The price is under \$5.00.

For further information on this new product contact Holub Industries, Inc., Sycamore, Illinois 60178.

**COMPACT CAMERA
OFFERED BY RAYTHEON**

Raytheon Company has recently introduced a new low cost, transistorized, viewfinder television camera. The Ray-



theon 705 camera features an enclosed integral zoom lens, a nine-inch viewfinder, rear-mounted controls and automatic adjustment for changes in room brightness. No equipment other than the camera is said to be necessary for

full operation from any 60 Hz, 110-volt line. The 35-pound 705 camera is designed for convenient transport and set up for location shots. The controls are engineered for operation by inexperienced persons.

For further information on this new product contact Raytheon Learning Systems Company, 285 Columbus Avenue, Boston, Massachusetts 02116. Phone (617) 862-6600.

**NEW "SWIVEL-BLADE"
CABLE STRIPPER**

Ideal Industries, Inc., has announced a new "Swivel-Blade" cable stripper for end or center stripping. The company states that the design of the cable stripper permits fast and accurate stripping of most types of common electrical cable. The cable is inserted in the stripping guide, the tool rotated for a circular cut, and then pulled along the cable for an axial cut. The "swivel-blade" automatically turns to the same direction in which the tool is moved. This is said to eliminate re-positioning of tool to perform separate "ringing" and slitting operations. The stripper can be used on coaxial and power cables.

For further information on this new product contact Ideal Industries, Sycamore, Illinois 60178. Phone (815) 895-5181.

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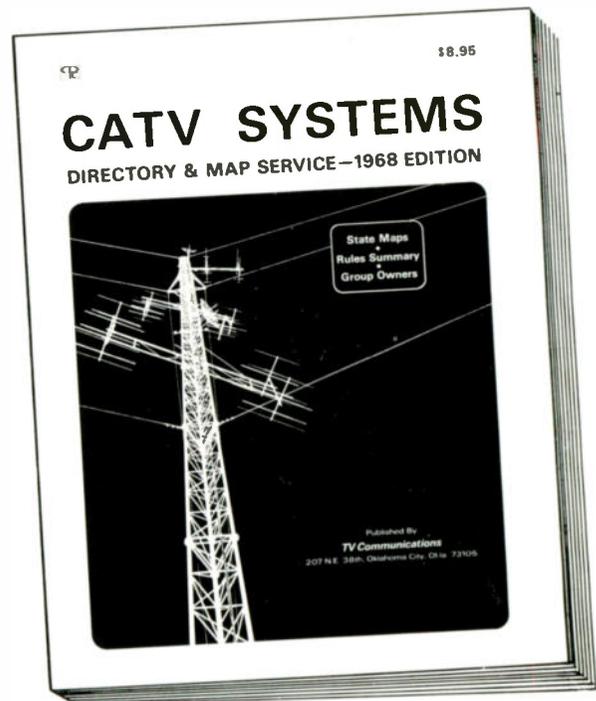
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Products Literature

A 42-page how-to-do-it guide for television videotape production, fully illustrated, may be obtained from 3M Company, Magnetic Products Division, 3M Center, St. Paul, Minnesota 55101.

Recommendations on cables and connectors to provide the most satisfactory interconnections for the more commonly encountered installations in monochrome TV systems are included in a four-page technical data sheet produced by Cohu Electronics, Inc., Box 623, San Diego, California 92112.

A 16-page **Master TV antenna equipment catalog** including numerous new items has been published by JFD Electronics Co., Systems Division, 15th Ave. at 62nd St., Brooklyn, N.Y. 11219.

Microflect Co., Inc. has made available a new tower catalog listing standard three and four leg, self-supported towers in eight configurations. Address is 3573 25th Street, S.E., Salem, Oregon 97302.

NEW LAMP FROM PACKAGED LIGHTING SERVICES

Packaged Lighting Services' line of new lighting instruments now includes the "Quartz Daylitter" which utilizes a 5000°K quartz-halogen dichroic sealed beam, medium beam lamp. The device is rated for 650 watts, 120 volts and operates on AC or DC with unrestricted burning positions. At a 15-foot distance, 600 footcandles are said to provide even illumination over a 12' x 8' area. The housing is cast aluminum with rear openings for lamp ejection.

For further information on this new product, contact Packaged Lighting Services, Inc., 36 Woodworth Avenue, Yonkers, N. Y. 10701.

NEW CABLE CLOSURE

New for aerial splices, buried encapsulation, and pressure plugs is the PIC cable closure manufactured by Communications Technology Corp. The closure features a newly developed bullet bond clip and rigid bond bar, requiring only one size bond bar to fit all sizes of cable, which adjusts to various lengths. A provision is also made for local bonding between the strand and a bond bar. Made of ABS plastic, the PIC cable closure is designed to telescope to adjust for various splice

lengths, and provide an opening for pouring compound.

For further information on this new product contact Communications Technology Corporation, 2237 Colby Avenue, Los Angeles, Calif. 90064.

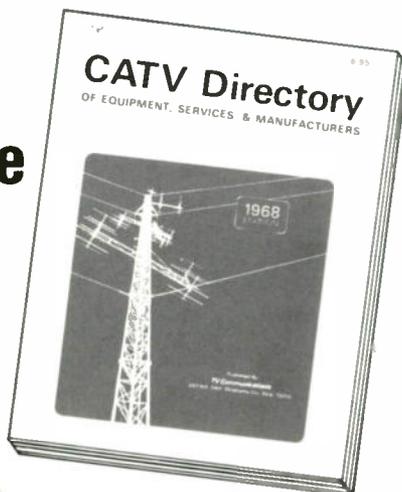
RANDOM ACCESS PROJECTORS RELEASED

The availability of a new series of random access 2 x 2 slide projectors for television chain integration has been announced by Spindler & Sauppe



Inc. The units are designed for use with black and white or color multiplexers or for direct projection onto a television camera tube face. Two models are offered: Model SLS-TV

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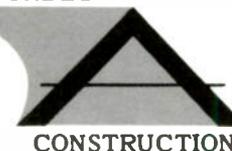
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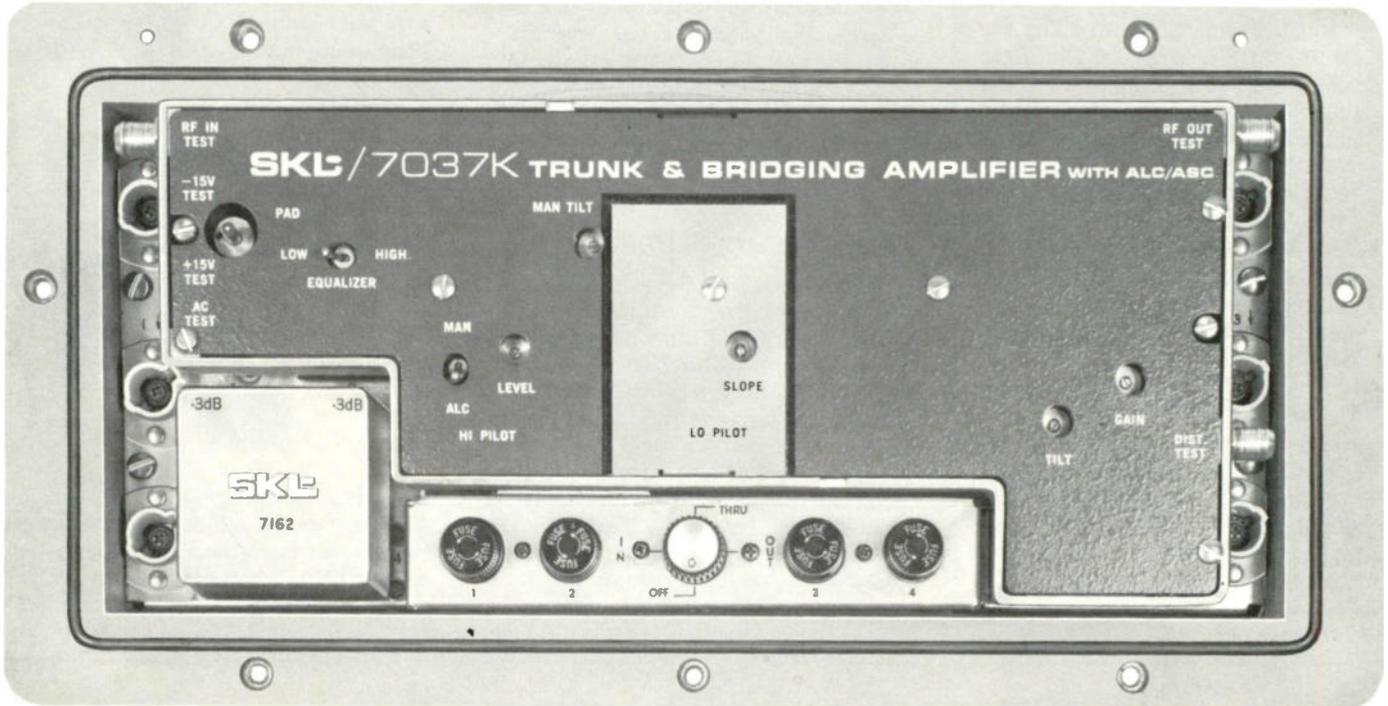
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The SKL/7037K has a minimum full gain of 24 dB and a bandwidth of 50-220 MHz, flat within ± 0.25 dB. Low noise and low cross-modulation permit long cascades.

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Characteristics of Series 7160 Splitters

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7162	2	3.5 dB ea.	20 dB
7163	3	3.5, 6.5, 6.5 dB	20 dB
7164	4	6.5 dB ea.	20 dB

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1. Date of filing: October 1, 1968.
2. Title of publication: TV Communications.
3. Frequency of issue: Monthly.
4. Location of known office of publication (street, city, county, state, zip code): 207 N.E. 38th, Oklahoma City, Oklahoma 73105.
5. Location of the headquarters or general business offices of the publishers (not printers): Same as above.
6. Names and addresses of publisher, editor, and managing editor:
 Publisher (name and address) Communications Publishing, 207 N.E. 38th, Oklahoma City, Oklahoma 73105.
 Editor (name and address) Stanley M. Searle, 12608 St. Andrews Terrace, Oklahoma City, Oklahoma.
 Managing Editor (name and address) Robert A. Searle, 2033 Manchester Drive, Oklahoma City, Oklahoma.
7. Owner (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.)
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8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities (if there are none, so state): None.

9. For completion by nonprofit organizations authorized to mail at special rates (Section 132.122, Postal Manual): Not applicable.
10. Extent and nature of circulation.
 A. Total number of copies printed (net press run): (Average number of copies each issue during preceding 12 months): 6818. (Actual number of copies of single issue published nearest to filing date): 6750.
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 2. Mail subscriptions: (Average number of copies each issue during preceding 12 months): 5564. (Actual number of copies of single issue published nearest to filing date): 5532.
 C. Total paid circulation: (Average number of copies each issue during preceding 12 months): 5564. (Actual number of copies of single issue published nearest to filing date): 5532.
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 G. Total (sum of E & F—should equal net press run shown in A): (Average number of copies each issue during preceding 12 months): 6818. (Actual number of copies of single issue published nearest to filing date): 6750.

I certify that the statements made by me above are correct and complete.
 (Signature of editor, publisher, business manager, or owner)

Patrick T. Pogue

with a 48-slide capacity from a single magazine and Model SLX-TV with a 96-slide capacity from dual magazines. Both models may be operated in either random access or sequential mode. In random access mode, slide change time averages 2½ seconds; in sequential mode the change time is one second.

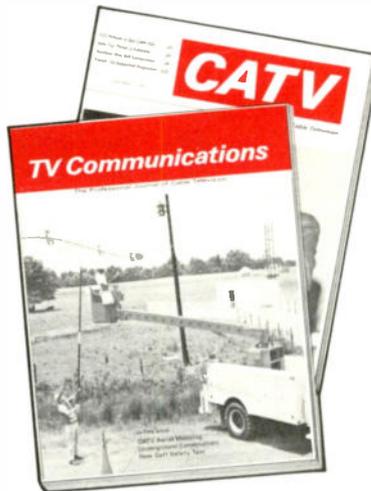
For further information on this new product, contact Spindler & Sauppe Inc., 1329 Grand Central Avenue, Glendale, California 91201.

GOBLE ANNOUNCES SAFETY WARNING BEACON

The availability of a new safety warning beacon, dubbed the Lifesaver, has been announced by Gene W. Goble and Associates, Inc. The red units are designed to meet or exceed SAE (J-596), ICC, federal, state, municipal and local government agency highway requirements for electric highway emergency lanterns. Features of the beacon include 1000-foot visibility, 30-hour life expectancy and non-flammable system. The Lifesaver has an overall length of 7¾" and sells for \$1.98.

For further information on this new product contact Gene W. Goble and Associates, Inc., P.O. Box 1057, 1478 Mission Road, Escondido, California 92025. Phone (714) 746-8741. TVC

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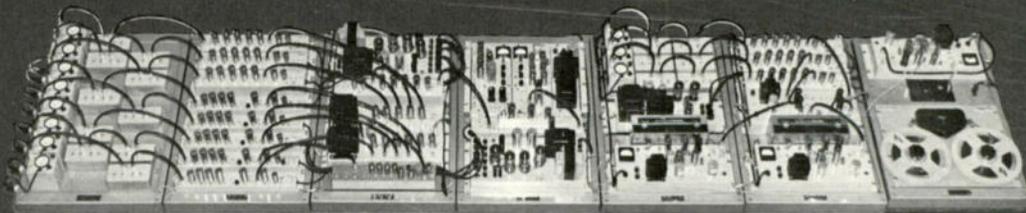
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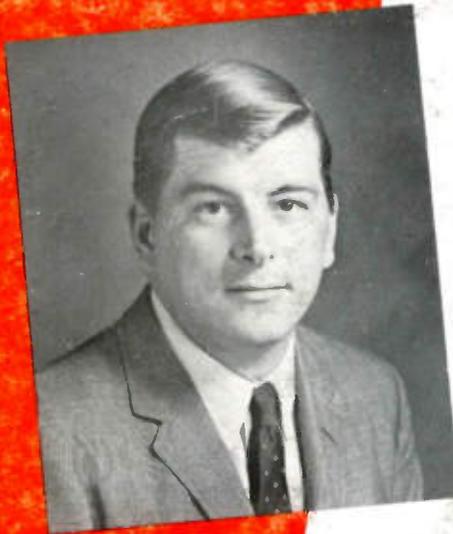


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September 19, 1968

Mr. Robert Baum
Vikoa, Inc.
400 Ninth Avenue
Hoboken, New Jersey

Dear Bob:

I would like to take this opportunity to say how much Vikoa's coaxial cable, Futura series amplifiers, and passive equipment has helped our operations.

I believe that your engineering design and quality to be superior to anything on the market today. The equipment failure rate is negligible and my technicians report specifications are being met with ease.

Your awareness to tight construction deadlines by delivering this equipment have met every construction schedule and we have not had any lost time due to lack of equipment.

We are presently installing your Futura amplifiers, aluminum sheath coaxial cable, directionals, and other passive equipment in over 600 miles of plant in Burlington and Raleigh, North Carolina. The modular design of your amplifiers has enabled us to lower inventories and improve our systems cash flow substantially.

We are now sending our technicians through your training school and have been thoroughly pleased with not only their increased system knowledge, but in depth technical ability to maintain our future systems.

Again, let me personally thank all your organization for intense care, handling, and attentiveness to our system needs.

You are truly the "House that service built" and will continue to grow because of this.

Sincerely yours,

Jefferson Carolina Corporation
Alan Varden
Alan Varden
Director of Engineering

AV:bjc



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Write: Vikoa, Inc., 400 Ninth
Street, Hoboken, N.J. 07030. Or call
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