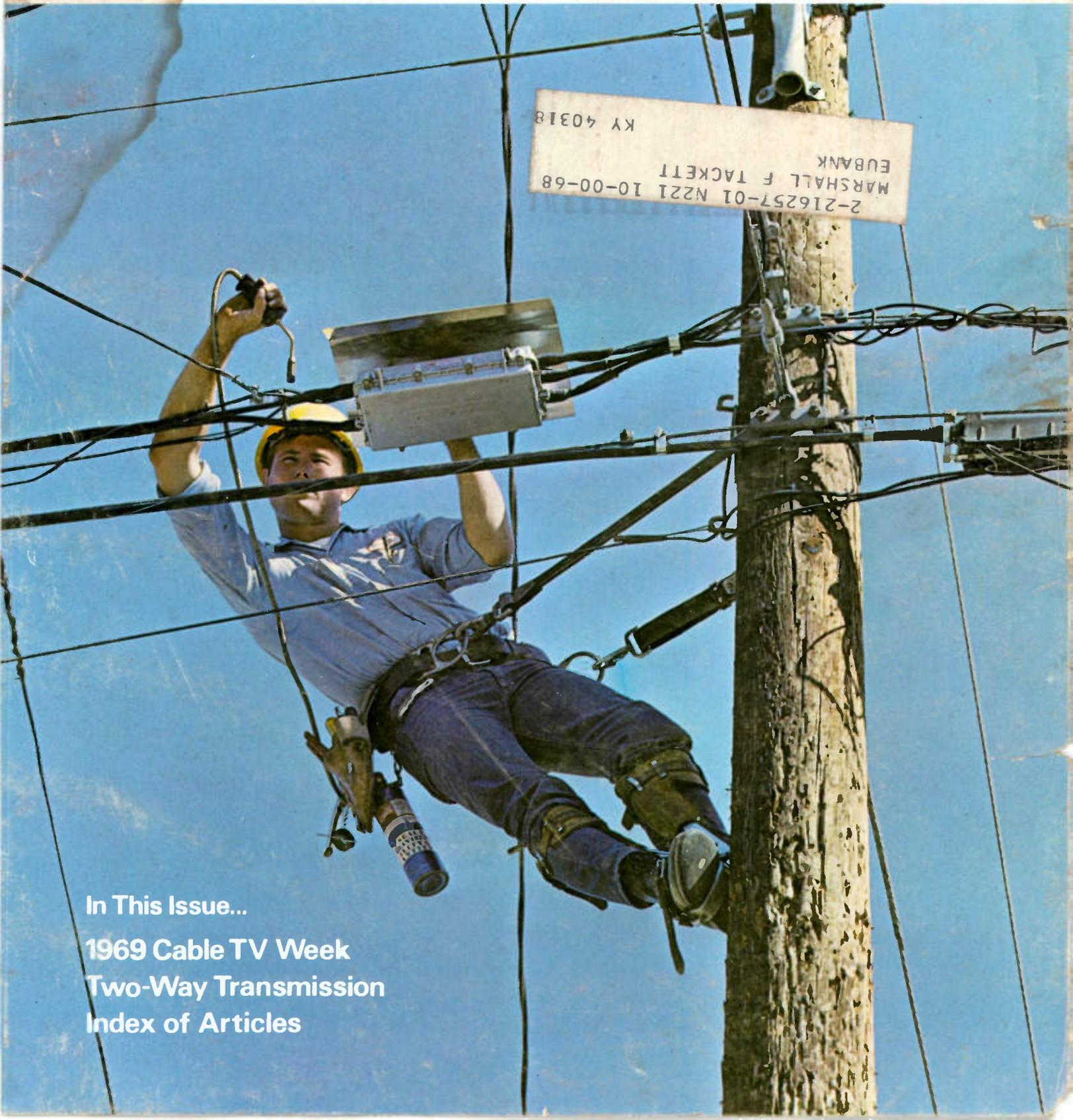


TV Communications

The Professional Journal of Cable Television



In This Issue...

1969 Cable TV Week
Two-Way Transmission
Index of Articles

Now ready for immediate head-end improvement



The Solid-State Channel Commander II™

The same truck that delivers new Channel Commander II units for your head-end also brings reliability, convenience, and subscriber-pleasing performance never before obtainable. Reliability because all circuits are solid-state versions of Jerrold's proved designs. Convenience because modular construction insures simple maintenance.

Each Channel Commander II can be supplied to process and control any single VHF input channel, and deliver it on any standard or special VHF channel. Closed AGC loops to input and output insure that video and sound output levels are strictly controlled for superb picture/sound quality at the output of the head-end.

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- Fast-acting IF AGC is keyed to horizontal sync reference
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- Modular construction, including self-contained completely regulated power supply
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says: J. D. Burge
Executive Vice President
Pala Mesa Cablevision, Inc.

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INCORPORATED



September 24, 1968

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400 Ninth Street
Hoboken, New Jersey

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I would like to take this opportunity to commend your company and organization. The Fallbrook System, built with "futura 12", is now complete and is working perfectly. Your local representative, deserves a special thanks as he has done a fine job in seeing to it that our every need was satisfied. The minor problems experienced initially were immediately attended to by your personnel.

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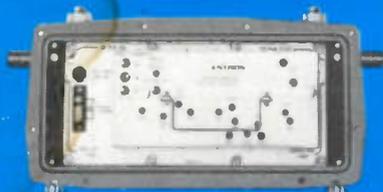


A Solid State **ENTRON** Line



Combination Trunkline Bridging Amplifier RB-6T

Up to four outputs. Operating level of bridging module is 35 dbmv on each of four outputs.



Trunkline Amplifier R-6T

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Weatherproof. Provides diplexing 30 Vac or dc capability to cable power remotely located amplifiers.



VHF Preamp P-1

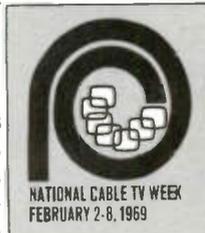
Low-noise antenna preamp, all-solid-state, temperature-compensated cable-powered. Gain is 33 db, low band; 26 db, high band.

The Most Respected Name in CATV

IN THIS ISSUE

Cable Week's Coming Again

The third observance of National Cable TV Week is at hand, and judging from the success of the last two years' promotions and the efforts of NCTA in preparation of this year's promotion, it promises to do a lot for CATV—both locally and on a national basis. A look at what's in store for the industry and a profile of one of last year's successful promotions begins on page 42.



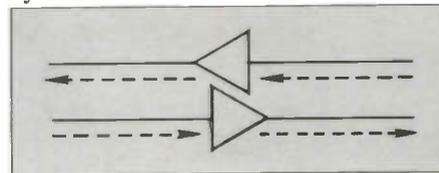
CATV and ETV—Best Friends

The need of cable television systems for additional programming material, and the desire of educational television stations to increase the size of audiences have fostered a healthy case of mutual dependence. For a look at some of the ways ETV'ers and CATV'ers are working together in Pennsylvania, see the article authored by Penn State educator J. David Truby beginning on page 46.



Two-way Transmission

Bi-directional transmission may greatly facilitate the expansion of CATV systems into new services. For an over-



view of the various systems which can be used for two-way, see the article beginning on page 90.

Our Cover: Rain or shine, Concord TV Cable is prepared. The unique sun shield, built by chief engineer Ron Cotten, covers all strand-mounted amplifiers in the system and reduces ambient operating temperature in the case by 8°. Securing a Sigma Industries heat shrink is Coop Cotten, technician for the rapidly-growing Concord, California system.

TV Communications

The Professional Journal of Cable Television

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The TVC Viewpoint

EDITORIAL



Stanley M. Searle
Editor

Winds of Change

There is no mistaking the winds of change that blow across the cable television industry today. The world of CATV is engulfed by eddying currents spawned by torandic revolution in communications technology and the desires of the public for more and better communications services.

People change, governments change, and inevitably, our great industry must continue to change—as it has from the day of its inception. Thoughtful men recognize that transition is essential in the cable television business as in any other. The only important question is *what forces shall dictate the changes in cable television.*

System owners and those who manufacture the equipment used are understandably apprehensive over the present mode of change—that is arbitrary decree by the seven-man Commission of irregular qualifications. A Commission which favors the broadcast establishment over CATV and other important communications services.

Although financially cable television businesses are dwarfed by the mighty broadcast empires, there is one clear path which can lead to a healthy future for cable television—without an artificially imposed servitude to broadcast interests.

Lincoln described this path a hundred years ago—during a time of turbulent change which threatened our government system.

Public sentiment is everything. With public sentiment nothing can fail; without it nothing can succeed. Consequently, he who molds public opinion goes deeper than he who enacts statutes or pronounces decisions. He makes statutes or decisions possible or impossible to execute.

—Abraham Lincoln

Doesn't that statement point the way for cable television? *Those who pronounce decisions* on CATV are bound in unholy wedlock to vested broadcast interests; that is painfully clear. But who is *he who molds public opinion*? Why, that's you and I! That's every cable operator in the land! That's NCTA and dozens of regional groups.

If Lincoln was right, we can mold *public opinion* in such a way as to make some of the private opinions of the FCC inoperable.

Cable operators and those who supply the industry have reason to be encouraged. But we must look for the obvious ways in which we can mold public opinion—including the opinions of those members of the public who rule over the FCC. Do *your part* individually and in concert with others in the CATV business. We must mold public opinion in favor of an impartial and progressive integration of cable TV into the national communications policy. If we accomplish this, all the broadcaster lobbying in the world will not succeed in thwarting the growth of our great industry.

NCTA in Critical Role

The eyes of the membership of NCTA and the entire cable television industry are now turned to NCTA headquarters in Washington. Never has the organization had such a clear-cut challenge to its effectiveness, and very possibly never again will the results of its national leadership be more open to public judgment. The question is simple: Will the FCC be allowed to override a decision of the U.S. Supreme Court and apply the copyright law to CATV?

This magazine has consistently supported membership in NCTA, and expects to continue to do so. But now is when all those dues and all those votes of confidence are on the line.

The FCC, under the sway of Svengali incarnated as a general counsel, says that new rules must be harsh and strongly biased in favor of total broadcaster domination of the cable TV industry. NCTA disagrees, and will take that disagreement to the courts and to Congress. Every NCTA member not only hopes for but demands a measure of victory.

The FCC, supposedly a regulatory arm of the Congress, has now wiped out any chance for reasonable copyright agreement by handing the copyright holders the trump ace under the table. Congress should be angry—and is. But if CATV just grins and takes it, Congress won't get into what could become a very messy fight. Congress has to be fully informed and stirred to action.

The FCC has, at long last, taken its stand. Now it is up to NCTA to demonstrate the decisive leadership this challenge demands.

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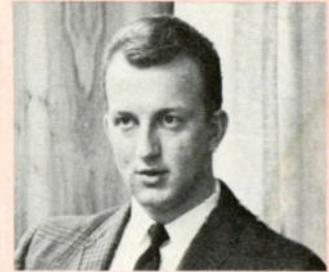
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Perspective

on the news



Robert A. Searle
Executive Editor

Smart money continues to back CATV despite new FCC rulemaking proposals. In fact, stock market reaction to mid-December announcement of revised regulations indicated extreme optimism under the circumstances. The impressive strength of industry stocks, particularly CATV manufacturers', clearly indicates that big money is betting on a healthy long-term outlook for the cable TV business.

Local origination and system ownership receive direct, related attention of the Commission in their proposed rulemaking, raising several new and intriguing questions. The FCC proposes to require cablecasting, while limiting it to one channel (plus automatic services). Advertising may or may not be permitted, the Commission states--further research and experimentation will follow on that subject before any final decision. One channel cablecasting limitation is coupled in FCC thinking with leasing of channel services to outside concerns for any number of uses. This structuring of CATV operations as program originators and common carriers will, if eventually adopted, bring up another batch of regulatory wrinkles for the Commission to iron out.

CATV ownership limitations, as outlined by the FCC, would prohibit common ownership of a cable system and a television station within the Grade B contour of that station. In addition, multiple ownership of systems would be directly limited, based on a three-element formula: number of communities served; number of subscribers served; concentration of holdings in geographical area. No word at this time on what the actual numbers in the formula would be. Another possible consideration suggested is further limitation on number of system holdings based on total media holdings: possible, but not likely. It is this concern over concentrated control of programming that is behind proposal to limit CATV originations to one channel.

Telecommunications Task Force report, which would have attracted tremendous interest among cable operators under normal circumstances, has been buried under the concern over the newly proposed CATV rules. The report is highly favorable to CATV, and states its case with remarkable clarity. It should not be surprising to anyone in the cable TV business that this unbiased and apparently imaginative panel was impressed with both the success of CATV to date and the potential of coaxial distribution in years to come. What is surprising to many, members of Congress included, is that the FCC has moved toward broad policy decisions on CATV with little regard for the findings of the President's Task Force.



debut :

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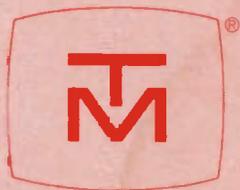
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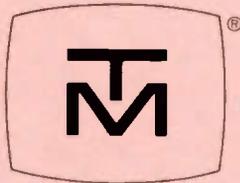


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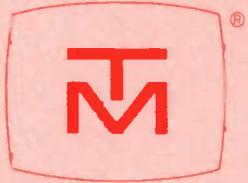
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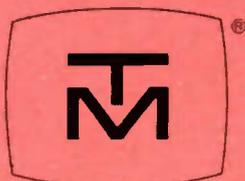
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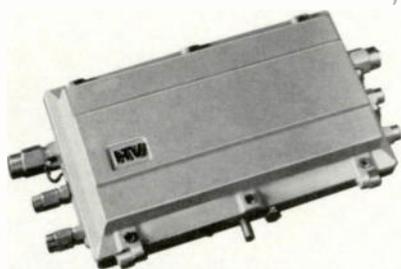
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Management Guidelines

Patrick T. Pogue



**Good Management
Of System Acquisitions**

Today mergers and acquisitions are a concern of many top executives in the cable television industry. The tax aspects have been extensively studied and effective financial techniques for handling them are well known to management. But the problems of managing an acquisition after it has taken place have received relatively little attention.

This neglect is curious, because the evidence is growing that many acquisitions turn sour precisely because management problems are mishandled. Most commonly in such cases, the acquirers neglect to set sound operating objectives for their acquisitions. Some, in fact, set no real operating objectives at all.

Successful acquirers, on the other hand, are always careful to explore what can and cannot be done with an acquisition candidate. Before an acquisition, they carefully appraise the potential return based on detailed subscriber growth estimates, staff-reduction estimates, assessments of planned changes, percentage of saturation, and need for up-dating of equipment.

The post-acquisition period places unusual demands on the leadership abilities of top management in the acquiring company. To build a group of cen-

trally controlled and coordinated cable systems, or to turn around a losing system, demands a sizable investment of top executive time, energy and resolution.

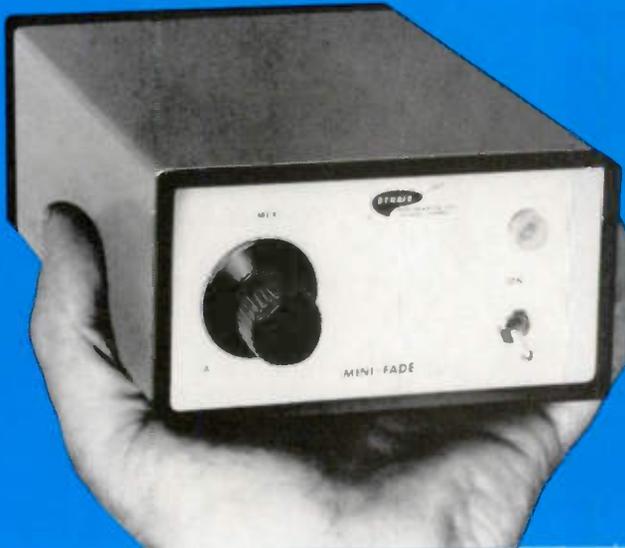
How far corporate operating policies on rates, advertising, system expansion and the like, should be imposed on an acquisition depends on the degree of similarity between the systems involved in the merger. But, most successful acquirers do impose broad, basic corporate policies on such areas as personnel and public relations, and establish immediate controls backed by meaningful control reports, over cash, inventories and major capital expenditures.

What, then, really makes the difference between a profitable and an unprofitable acquisition? To begin with, of course, sound appraisal of the system being considered for acquisition is absolutely essential. But after that, there are ways of avoiding the worst mistakes that have most commonly plagued inexperienced acquirers. Successful acquirers achieve the operating benefits they aim for by essentially applying to the acquired system, the basic management concepts of setting objectives, planning, organizing, control and executive leadership that they routinely use in other situations.



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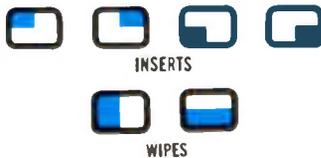
Just \$220 starts you on your way



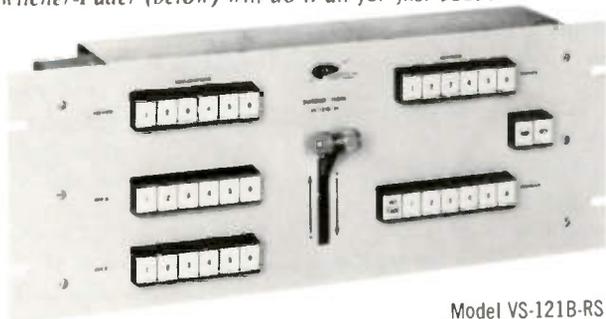
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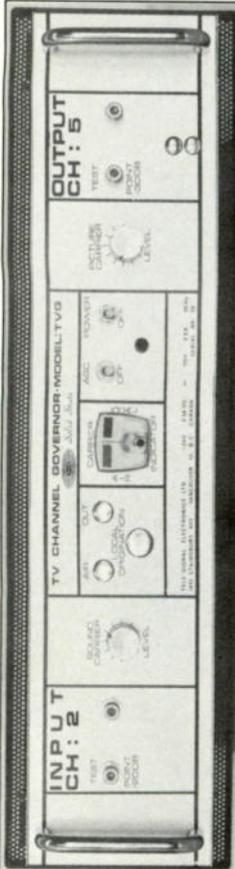
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FINANCIAL REPORTS

Ameco, Inc. reports per share earnings, the company's first profits in some time, of \$.01 for the quarter ending September 30, 1968. This compares with per share losses of \$.04 for the same period last year. Earnings figures are based on a net income of \$15,252 and a net loss of \$46,308 for the two periods respectively.

Cohu Electronics, Inc. reports per share earnings of \$.10 for the quarter ending September 30, 1968. This compares with per share earnings of \$.09 for the same period last year. Earnings figures are based on net incomes of \$147,780 and \$120,568 for the two periods.

Copperweld Steel Co. reports per share earnings of \$.19 for the quarter ending September 30, 1968. This compares with per share earnings of \$.11 for the same period last year. Earnings figures are based on net incomes of \$455,869 and \$278,246 for the two periods respectively.

Famous Players Canadian reports per share earnings of \$.81 for the quarter ending September 30, 1968. This compares with per share earnings of \$.61 for the same period last year. Earnings figures are based on net incomes of \$1,405,931 and \$1,069,024 for the two periods respectively. Revenues were \$13,991,766 for 1968

Maclean-Hunter, Ltd. reports per share earnings of \$.05 for the quarter ending September 30, 1968. This compares with per share earnings of \$.14 for the same period last year. Earnings figures are based on net profits of \$230,000 and \$571,000 for the two periods respectively. Also reported were figures for the 9-month period ending September 30, 1968. Per share earnings for this period were given as \$.31 as compared with \$.55 for the same period last year.

North American Communications Corp. reports per share earnings of \$.45 for the 9-month period ending September 30, 1968. This compares with per share earnings of \$.35 for the same period last year. Earnings figures are based on net incomes of \$712,000 and \$527,000 for the two periods respectively.

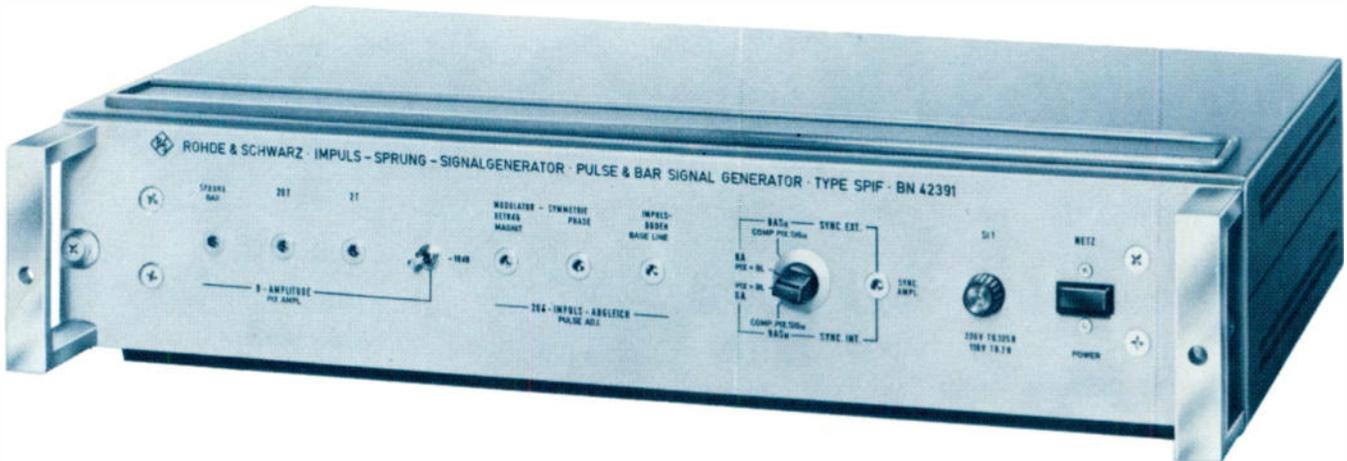
Reeves Broadcasting reports per share earnings of \$.27 for the 9-month period ending September 30, 1968. This compares with per share earnings of \$.27 for the same period last year. Earnings figures are based on net incomes of \$570,200 and \$551,100 for the two periods.

Scientific-Atlanta, Inc. reports per share earnings of \$.07 for the quarter ending September 30, 1968. This compares with per share earnings of \$.07 for the same period last year. Earnings figures are based on net incomes of \$59,416 and \$53,175 for the two periods respectively.

TelePrompTer Corp. reports per share earnings of \$.89 for the 9-month period ending September 30, 1968. This compares with per share earnings of \$.77 for the same period last year. Earnings figures are based on net earnings of \$888,259 and \$678,787 for the two periods respectively. Revenues were \$5,299,317 for 1968 and \$4,958,437 for 1967. Irving B. Kahn, president and board chairman of TelePrompTer, announced record high earnings and revenues for the nine-month fiscal period ended September 30.

Vikoa, Inc. reports per share earnings of \$.16 for the quarter ending September 30, 1968. This compares with per share earnings of \$.13 for the same period last year. Earnings figures are based on net incomes of \$231,930 and \$180,926 for the two periods respectively. Sales were \$4,302,044 for 1968 and \$3,867,645 for 1967. 

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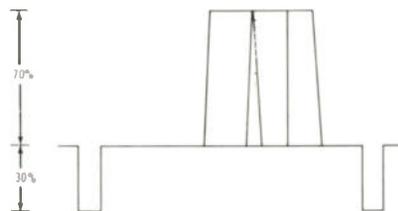
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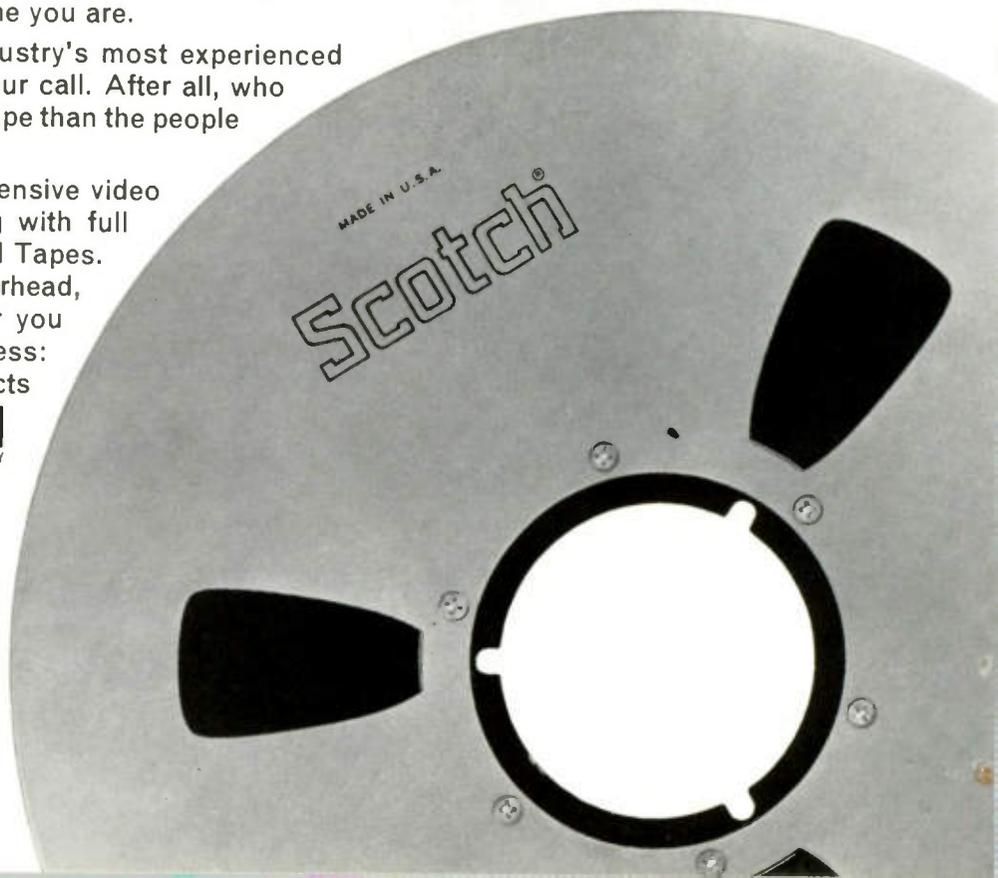
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FCC UNVEILS NEW CATV REGULATIONS

On Friday, December 13, the Federal Communications Commission took the wraps off its new CATV regulatory policy. In the Notice of Proposed Rule-making and Notice of Inquiry, the section capturing most immediate attention was that devoted to importation of distant signals. The new proposed rules divide CATV systems into three categories:

1. Major Market Systems. Systems operating in a community within a 35-mile radius of the main post office of a top-100 market may carry only local signals. Distant signals may be imported only with the retransmission consent of the originating station(s) and the permission of the FCC.

2. Minor Market Systems. Systems operating outside the top-100 markets but within 35 miles of the central post office of a city containing a TV station may carry all local signals. In addition, operators may import distant signals if necessary to round out coverage of three full-time network stations, one independent and an ETV. No special permission is needed to fill this quota. If distant signals other than those necessary for the quota are desired, the operator must obtain the retransmission permission of the originating station and the permission of the FCC.

3. Other Markets. Systems operating in all other markets (that is, outside any 35-mile zone) are unrestricted in distant signal importation. They may not, however, "leapfrog."

In effect, the Commission made the major market rules immediately operative. Pending adoption of the proposed rules, all current top-100 market petitions were frozen, with permission granted for systems which comply with the new rules to file applications. The FCC warned that, if adopted, the rules will apply to all service commencing after December 20, 1968; service before that date is "grandfathered." Also, the rules change the Second Report and Order only in the specific areas mentioned; all other provisions of the Second Report, including carriage and nonduplication, remain in force.

By requiring distant station permission for signal importation, the FCC would effectively make CATV subject to copyright liability--circumventing the Supreme Court decision of last June which held cable television not liable under Copyright laws.

COMPULSORY LOCAL ORIGINATION, OTHER RULES PROPOSED

Other aspects of the proposed rulemaking dealt with equally grave concerns. The FCC not only encouraged local origination, but proposed to make it obligatory excepting only the smallest systems, for economic reasons. No definite proposals for commercial origination were put forth although the possible need for advertising support was recognized. Origination other than automatic services (time/weather, etc.) would be limited by FCC rules to one channel; other open

Late News (Continued)

channels would be made available to outside parties by CATV operators acting as common carriers.

Other proposed rules would prohibit cross-ownership of broadcast and CATV facilities in the same market--and limit multiple ownership of CATV systems as well. While no concrete formula was advanced for the latter restriction, it would take into account number of systems, number of subscribers, and geographic concentration of an MSO's cable interests.

The Notice of Inquiry asks for comments from all interested parties on "the possibility of a multi-purpose local CATV communications system, and of national interconnection of such systems." The inquiry is directed to a wide range of questions including relationships of CATV, common carriers and others; the necessity or desirability of a single communications cable into the home; the feasibility of CATV-provided two-way communication; satellite tie-ins; and division of regulatory functions.

COMMISSION ALSO UNLEASHES PAY-TV

Along with the FCC Notice of Proposed Rulemaking which startled CATV operators another also startled legislators who were under the impression that pay-TV was still under wraps. The Commission unveiled a controversial plan to authorize national over-the-air subscription television. Either a UHF or VHF station may offer pay-TV if it is in a market served by at least 5 commercial TV stations, including itself. Programming is restricted to exclude motion pictures between 2 and 10 years old as well as locally aired sports programs--both blows to any subscription operation. Commented Joseph S. Wright, chairman of Zenith Radio Corp., "Only the American people, by making a free choice in an open market, can ultimately decide the future of STV. American TV viewers have now been given their rightful chance to decide."

NYC APPROVES EXPANDED ORIGINATION

After much political maneuvering and several delays, the New York City Board of Estimate has given Manhattan Cable TV permission to expand its origination efforts. The decision was not surprising, coming as it did on the heels of the FCC's encouragement of origination. The Board approved origination of "public service programming on a one-year experimental basis. And the definition of public service is a broad one, reportedly excluding only pure entertainment such as some first-run movies. The move was seen as a victory for New York cable systems, especially Manhattan Cable TV which has been pressing the Board for permission to carry cultural films, live concerts of the American Symphony and live coverage of college basketball. Manhattan Cable president Charles Dolan expressed his satisfaction over the decision and confirmed his company's plans to "originate the kind of programs that we feel will make television viewing more interesting and more rewarding."

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FCC Delegates 214 Application Authority to Common Carrier Bureau

In disposing of one Section 214 case, the FCC did as was predicted and authorized the Commission staff to routinely dispose of most similar telephone company filings for CATV service. The procedural designation will make for swift and uncluttered processing and should break loose the almost stagnant telco construction field.

The specific action was certifying Southern Bell Telephone and Telegraph Co. to build, continue operating and extend CATV channel facilities it furnishes to Rome Cable TV Co., Inc., a non-affiliate of Bell's in Rome, Ga. Although the authorization covers existing facilities and expansion, any other service will require separate certification. Southern Bell furnishes ten video channels to the Rome system, nine off-the-air signals, all of which provide at least a Grade B signal, and one weather channel.

"The application," the FCC announcement said, "was for an existing head-end facility with equipment for ten video and no FM channels, 21.7 miles of existing feeder cable, 71.9 miles of existing distribution cable, 24.7 miles of planned feeder cable and 116.2 miles of planned distribution cable. The service started October 28, 1967. Estimated costs of the existing and planned facilities are \$303,000 and \$455,940 respectively. The city manager of Rome has written urging completion of the CATV system to satisfy complaints from portions of the city not yet receiving service."

More important than this individual action, however, was the Commission ruling that the Common Carrier Bureau can process the Section 214 cases. The CATV industry has long been worried

about telco arrogance in picking and choosing CATV customers and insistence on dominating the relationship through pole attachment agreements. Last June, after an effectively argued case by NCTA and others, the Commission ruled that in the future telcos would have to apply for certification, filing copies of the pole attachment agreements with the FCC. While it was a necessary regulation, it did have the effect of making telcos shy away from CATV construction out of distaste for the involvements of filing with the Commission, and therefore new construction slowed

dramatically. Last week's ruling should speed things up again.

"Since the Commission decision on Section 214 certification last June," the FCC announcement noted, "about 64 telephone company applications to build and offer CATV facilities have been filed. Of these, 48 are unopposed. Under existing authority delegated by the Commission to the chief of the Common Carrier Bureau, he may act on Section 214 applications when the estimated construction or purchase cost is less than \$2,000,000. All the CATV service applications so far involve less than this amount. The Commission instructed the Common Carrier chief to proceed on these." Chief of the Bureau is Bernard Strassburg.

The Commission action was by Chairman Rosel H. Hyde and Commissioners Robert E. Lee and Kenneth A. Cox. Commissioner James Wadsworth was absent, and Commissioner Robert T. Bartley abstained from voting. Commissioner H. Rex Lee, as a newcomer, did not participate, and Commissioner Nicholas Johnson dissented.

Hope for Copyright Compromise; Sen. McClellan Prods Negotiators

Twenty-one interested parties are scheduled to meet on Capitol Hill this month to hammer out some

agreement on new copyright legislation. Senator John McClellan (D.-Ark.) invited parties to the Washington conclave when negotiations broke down between cable operators and their broadcast/copyright holder opponents.

McClellan, who heads the Senate Copyright Subcommittee, directed his staff to cooperate with the Copyright Office in drafting three versions of possible copyright legislation; the three versions were mailed to the various parties; and at the summit meeting, all comments on the three bills will be heard.

NCTA has been willing to compromise with a bill providing a compulsory license fee (a reasonable rate to be based on gross returns) to be paid by all systems; full liability for distant signals in the top 15 markets; the compulsory license fee and eventual full liability



Senator John McClellan

CBS Head Honored at Reception



Dr. Frank Stanton (left), president of the Columbia Broadcasting System is introduced to J. Ray Peters (right), president of the Canadian Association of Broadcasters, by Fred Welsh Antenna Systems subscriber sales manager Stan McKelvie. The MSO's Vancouver Cablevision, in which CBS has an ownership interest, hosted a reception for 125 broadcast, finance and industrial leaders to meet Dr. Stanton.

for the remainder of the top 40 markets. Under the NCTA plan, fees would be paid to a central disbursing office, not to individual copyright holders.

NCTA is not willing, under any circumstances, to accept a proposal which shackles origination, and therein lies one of the bones of bitter contention.

California Hosts Hundreds At Impressive Meeting

"Impressive" was undoubtedly the most fitting word for the California Community Television Association meeting in San Diego. Well over 800 operators, manufacturers and visitors met in the plush Del Coronado Hotel to hear major speakers and to attend management and technical sessions.

Featured speakers included FCC's CATV Task Force head, Sol Schildhouse (see separate story), and California Congressman Lionel Van Deerlin, a member of the House Commerce Committee. The

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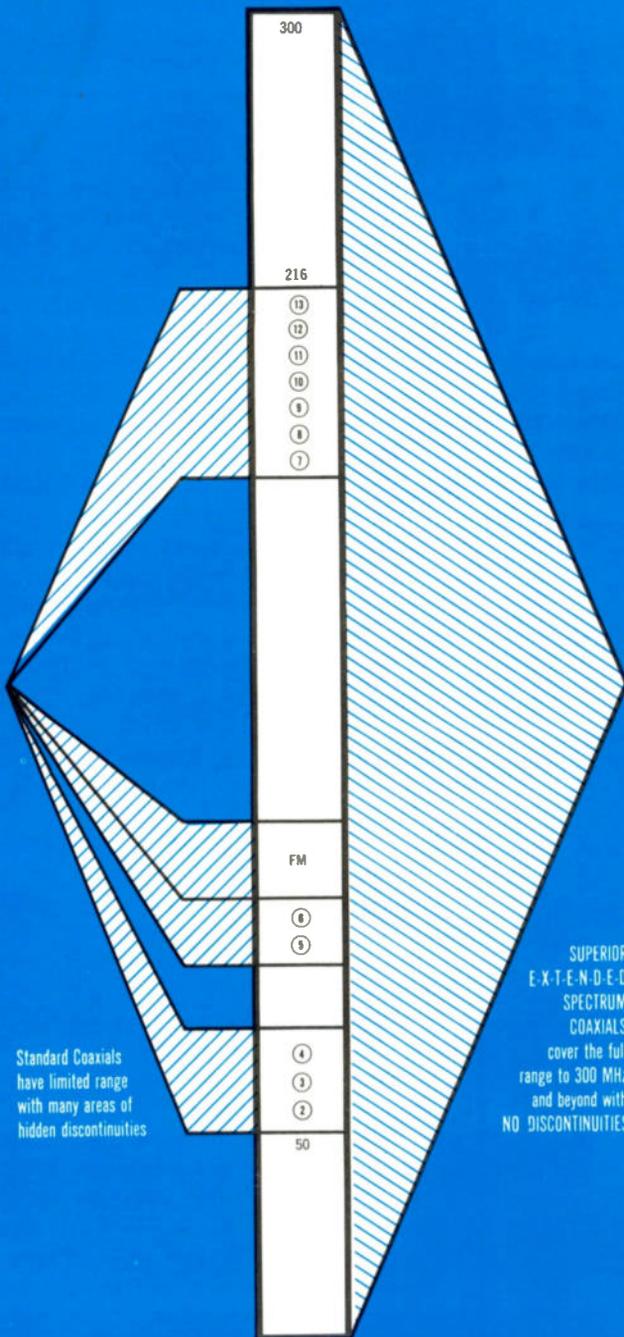
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congressman had kind words for cablemen and harsh words for the FCC's position on UHF and delaying workable cable TV regulations. He dwelt on technological advances and called for a "modern communications code" which serves the public and communications industry. Van Deerlin said he plans to introduce a CATV regulatory measure in the House next session.

Panel discussions ranged over the full spectrum of legal, management, and technical problems facing operators. Well-known communications attorneys served on lively panels discussing copyright, telco relations and FCC regulation. Robert Cahill, right-hand man to FCC Chairman Hyde, one of the non-CATV'ers participating, emphasized the complexity of the Commission's job in determining policy questions, although he refused to depart from his prepared speech to answer the challenges of his fellow-panelists and audience members.

Nearly 50 manufacturers and suppliers were on hand with exhibits.

Initial Decision Rules Out Ads, Distant Signals for Cleveland CATV

A disappointing initial decision has been handed down in Cleveland by FCC Hearing Examiner Forest L. McClenning who has turned down requests by three CATV operators to import distant signals.

McClenning went even further and absolutely ruled out carriage of advertising on cable origination channels. He said CATV would be competing for advertising revenue with UHF stations which the Commission is pledged to protect.

But he did encourage local origination. He noted that each of the three CATV operators plans one channel for time, weather and news wire service, and that one of them wants to originate local programming of a public affairs nature and none will engage in pay television. "It is concluded," McClenning said, "in view of the nature of the program originations proposed and the Commission's policy of encouraging additional outlets for community self-expression . . . that no restric-

tions, except against the sale of commercial time, should be placed upon the local originations" of the three firms.

The companies, who can appeal the initial decision to the full Commission, are Telerama, Inc., and the Independent Lorain Cable TV Inc.

McClenning said that it "must be concluded that grant of the waivers here sought would adversely affect the development of UHF television stations in the Cleveland area to a degree that would make it contrary to the public interest and the petitions should be denied in each instance. . . . In reaching this conclusion all CATV activities in the market reflected in the findings of fact have been weighed together with the proposals of petitioners. Such activity is present in virtually the entire market. There is no reason to believe that the recently activated UHF stations and the proposals for additional stations in the Cleveland area will not experience the same audience and economic achievement difficulties general to such stations in intermixed VHF-UHF television markets and the record is barren of any evidence to the contrary. Given protection, however, from the audience fragmentation potential of CATV systems through importation of distant signals, there is also no reason to believe that such stations will not ultimately achieve a viable service in a market the size of the Cleveland area and thereby provide to the public a wide multiplicity of program choices."

McClenning denied that inability to import distant signals would harm the cable systems. The high-quality, reliable signal provided by CATV together with the capability of providing all area signals to all subscribers "should provide sufficient incentive to subscribers for both the instant and other Cleveland area CATV systems to achieve wide public acceptance," he said. "Coincidentally," McClenning concluded, "they would also be providing assistance to the developing UHF stations through extension of their circulation."

Mayor Petitioned for CATV



The mayor of Sudbury, Ontario (left) checks over a 22,000-name petition for CATV in that city. A committee of volunteers gathered the signatures from citizens for three months.

State Sales Tax Concerns Colorado Cable Operators

Alan Harmon, association president, presided over the third annual meeting of the Colorado CATV Association held recently in Colorado Springs. About 40 cablemen gathered to elect new officers and to check on new developments in legislation, tax and telephone company relations.

Ralph Clark headlined the morning session with a special report on the current battle against the levying of state sales tax on cable TV subscriber charges. The association based its position on the interstate as opposed to intrastate nature of cable television.

Clark stated that after initial meetings and correspondence between CATV representatives and state revenue bureau personnel, the bureau seemed inclined to agree that present tax rules are not applicable to CATV charges. The next likely move, he noted, will be a rule-making action on the part of the bureau. And he concluded that the outlook, although still uncertain,



Ralph Clark reports good news to operators on Colorado sales tax threat during state association meeting. Seated are Bill Brazeal (left) and Alan Harmon. The presentation was videotaped for distribution to interested systems in that state.

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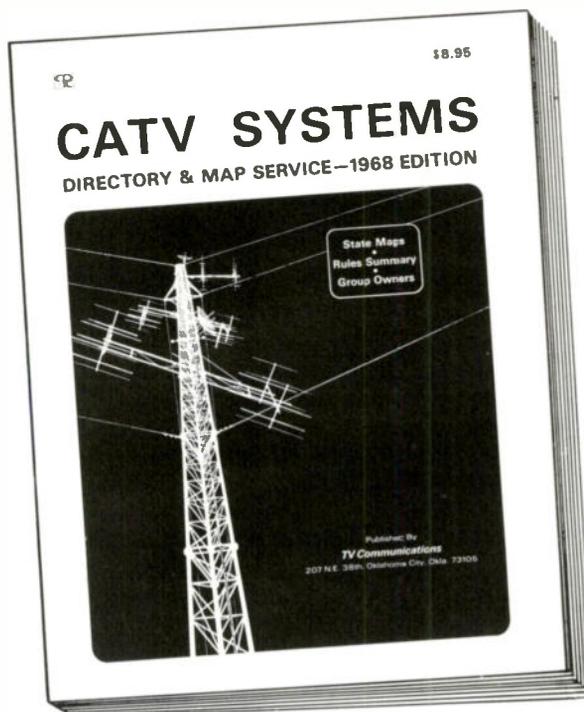
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is not as dark for cable operators as it originally appeared.

The meeting concluded with election of new officers: president, John Morrissey of Durango; vice president, Tom Worster of Grand Junction; secretary-treasurer, Bill Brazeal, Denver. New directors are: Phil Tunks, Boulder; Alan Harmon, and Glenn Jones, Denver.

Cablemen Asked to Watch For Stolen Equipment

Ernest D. Nelligan, Jr., chief engineer for County TV Cable, San Carlos, Calif., reports that the firm's head-end building was robbed on November 4. According to Nelligan, the thief is thought to be someone well acquainted with CATV, and perhaps with County Cable's operation since only equipment which was not in use at the time was stolen.

Operators have been requested by County Cable to watch for the following stolen equipment if they are approached with a "bargain":

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 FD-30 7F Coaxial Switch (Jerrold-2305)
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 Senior Volt Ohmism WV98C (RCA-132805)
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 Preamplifier (406A-FM) (Jerrold)
 CCV-6-2 COM Channel Commander
 Eleven CCV-2 Output Modules (Jerrold)
 Replacement tubes (RCA)

Calendar

January 9-11. The Rocky Mountain CATV Association will hold its winter meeting at the Ramada Inn, Phoenix.

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

February 8. The Dempsey Hotel in Macon will be the site of the Georgia CATV association's annual meeting.

March 30-April 2. The Southern CATV Association will meet at the Monteleone Hotel, New Orleans, La.

March 23-26. The annual convention of the National Association of Broadcasters will be staged at the Shoreham and Sheraton-Park Hotels, Washington, D.C.

April 16-18. The Texas CATV Association will hold its annual meeting in the Marriott, Dallas.

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

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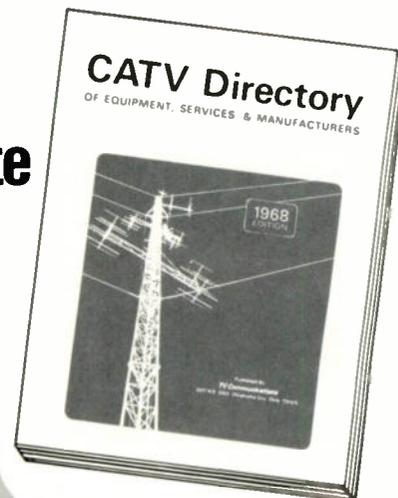
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Schildhouse Suggests Government Aid for UHF

In a major speech before the California CATV Association, Sol Schildhouse, chief of the FCC's CATV Task Force, suggested that broadcasters and cablecasters close ranks in a mutual effort to promote UHF television development, possibly with direct federal aid.

"Since government has already decided that everybody must buy capability to receive UHF," Schild-

house said, alluding to the all-channel law, "it is not difficult to argue for the proposition that it is up to government to insure that capability finds some use. And government help in aid of programs that serve declared national purpose are anything but freakish."

Of special significance in light of some proposals, particularly from broadcasters, that harsh distant-signal rules should be adopted was this statement by the CATV Task Force chief: "I have watched the

machinery of the Second Report and Order run down, and participated in the debates over how to make it work better. Although I'm not at all overcheerful about prospects for the next phase of regulation, I suppose there's something to be said for anything new, even if it only reduces chaos to common confusion."

Schildhouse outlined his thoughts on revising CATV regulation. After noting his belief that, "A basic, over-the-air television structure must be preserved," he stated that, "At the same time we must come to terms with the proposition that CATV will be a part of the nationwide TV structure. Properly channelled, cable can at least fill in some of what's missing in our television structure—and those things are good reception, more diversity of programming, and the opportunity for low-cost local expression.

As Schildhouse examined the need to develop UHF, he explained that CATV has been put up as the

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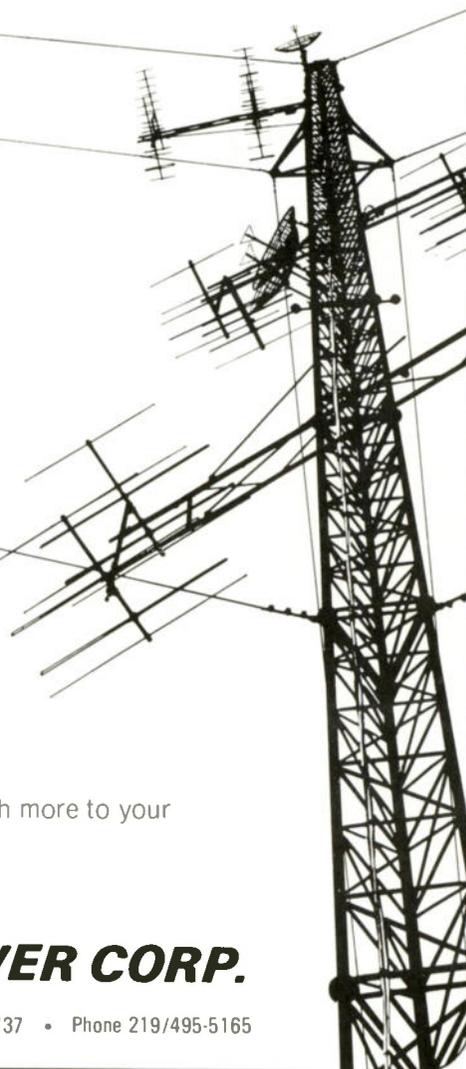
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Sol Schildhouse

natural fall guy for UHF failure, and he said that the situation shouldn't be tolerated.

"Congress and the Commission have already agreed," Schildhouse said, "that a principal ingredient of national communications policy includes the widescale development of UHF broadcasting. Now, so little is known about the likely impact of CATV upon independent UHF that anyone can inject his own prejudices into an appraisal without

running serious risk of being proven wrong any time soon. With UHF expansion now enshrined as a national urgency, it is easy to rationalize a restrictive CATV program when the issue is put in terms of the risk that it might otherwise have adverse impact."

Schildhause went on to point out UHF television's financial problems and lack of full utilization of the UHF allocations, and said that, "What I am talking about is nothing so aimless as trying to alter national purpose at this stage. My view is that it is in the interest of the cable industry to join with UHF and other broadcast forces in a more direct and useful program to encourage and assist the development of new UHF stations in the big and smaller markets."

"The technique for bringing this off is not all that difficult to work out if agreement can be reached that existing programs are not working and don't hold all that much promise. Obviously, government intervention immediately suggests itself. And when you think about other industries that have found incentive in tax concessions, low-cost and insured loans, or even grants in aid, for example, the problem doesn't look all that formidable."

After suggesting that such federal aid programs are possibilities, Schildhause noted: "What I bring to your attention here today is that the cable-UHF circle has got to be broken. I suggest that UHF is faltering and that it can't be blamed on cable. I believe that it is sound national policy to develop UHF in grand and broad style. And I am urging that we all close ranks—cablecaster and broadcaster—behind a program that will assure a real UHF industry. Since government has already decided that everybody must buy capability to receive UHF, it is not difficult to argue for the proposition that it is up to government to insure that capability finds some use. And government help in aid of programs that serve declared national purpose are anything but freakish. When you think of how painfully UHF has emerged and at what cost in money, time, and sheer human effort, you've got to believe that there's a better way."

Commissioners Conduct High-Powered Think-Tank

The Belmont Conference Center between Washington and Baltimore was the site of the recent CATV-oriented intellectual ferment of the seven members of the FCC.

Besides the Commissioners, the center, operated by the Smithsonian Institution, also hosted six "outside experts" who presented ideas on communications and CATV to the FCC members. No proposals were before the Commis-

sion and no direct action resulted, though many of the ideas discussed doubtless will be officially used by the FCC in its necessarily imminent cable decisions.

The six outsiders were Ben Bagdikian of Rand Corp., a well-known critic of the communications media and opponent of concentration of control; Donald A. Dunn of the Stanford Research Institute; Dr. Hyman Goldin, former FCC staffer who is now with the Boston University School of Communications; Professor W. Kenneth Jones

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of the Columbia Law School; Thomas F. Rogers, director of the Office of Urban Technology and Research for the Department of Housing and Urban Development; and Charles L. Schultze, former director of the Bureau of the Budget who is now with the Brookings Institution.

No members of the Commission staff were present at the think-sessions.

ABC Recommends Tough Cable Policies to FCC

The American Broadcasting Company has recommended that the FCC crack down on CATV development with a ban of any distant signals in the top-50 markets under any conditions and a rigid ban of any but the most basic of program origination. The third network also recommended the overhauling of Commission procedures in CATV matters, which certainly is needed, but strangely enough all the streamlining is to the distinct advantage of broadcasters, not cable operators.

In suggesting its severe limitations on CATV, ABC even went so far as to argue that a "distant signal" is one outside the Grade A contour of a station instead of the current Commission standard of Grade B. With the top-50 markets strictly swept clean of distant signals under the ABC plan, the next 50 would allow systems to provide the services of three network television stations and one independent. If that many Grade A stations serve the market, however, no distant signals would be allowed. In smaller markets, distant signals would not be decided on according to a set formula, but by a case-to-case basis.

Program origination, according to the ABC master plan, would be limited appeal fare such as the standard news, time and weather.

Another broadcast-oriented ABC proposal deals with nonduplication rules. Stations now have to notify CATV systems of nonduplication requests. ABC says that most of these requests involve network programs, so ABC wants stations to be allowed simply to inform

Cascade Hosts Student Tour



Cascade hosts a tour of sixteen students from the University of British Columbia. Professor H. C. Wilkinson, dean of the faculty of commerce and business administration, arranged the plant visit for the advanced students to give them the opportunity to see Cascade's production organization in operation. Syd Gomm, Cascade's plant and manufacturing manager, conducted the tour.

System Sales

Cox Cable Communications, Inc., has announced the acquisition of the **Video Corp.** of Ocala, Fla. The system, which reportedly sold for \$1 million of Cox stock, serves 2500 subscribers in Ocala, Fla. Cox officials say that they plan to begin a construction program to expand the present 5-channel system into a 12-channel system.

H&B American Corp. has announced the acquisition of several new systems. William M. Jennings, chairman and president of the firm, reported that his firm has agreed in principle to acquire all of the outstanding capital stock of **Long Island Cablevision** in exchange for common stock of H&B. Long Island Cablevision owns and operates systems in Riverhead, Greenport, Sag Harbor, Southampton, Quoque and Westhampton, N.Y. These systems serve approximately 7,600 subscribers.

H&B also announced that it has

acquired the outstanding capital stock of **Caribou TV, Inc.** from **Reeves Broadcasting Corp.** in exchange for common stock of H&B. Caribou TV serves 3,000 subscribers in Caribou, Fort Fairfield, Loring Air Force Base, and Presque Isle, Maine.

In addition, H&B has acquired the outstanding capital stock of **Leesville Cable Television, Inc.** of Leesville, La. from Stan Socia Corp. Broker for the transaction was Daniels & Associates, Inc. of Denver, Colo. The system serves 2,700 subscribers.

TelePrompter Corp. has recently acquired a newly activated system in Holly Hill, Fla. Irving B. Kahn, chairman and president of TelePrompter, said the system will reach 6,500 homes. He added that TelePrompter acquired the system from previous owners in an exchange of stock.

Vikoa, Inc. has announced the acquisition of **Rockland Cablevision, Inc.** of Haverstraw, N.Y. The system currently serves more than 1,200 subscribers. 

CATV systems of what network they aren't allowed to duplicate. And when Grade A or Grade B signals overlap, instead of dealing with each case separately as is done now, ABC wants the whole problem written off as simply another distant signal situation, with duplicate carriage forbidden.

The 47-page document said that the network was concerned about CATV's impact on broadcasting, primarily UHF, and expressed fear that cable television on a nationwide scale might lead to a pay television system. ABC said the Commission should take this into consideration when drawing up a new set of rules for CATV.

ABC also noted that Commission policies now dealing with cable television are cumbersome. They said that the backlog of waiver requests has created "a staggering administrative burden on the Commission."

CATV'er Turns UHF Tables On San Diego Station

Mission Cable TV, Inc., one of the San Diego-market CATV systems to suffer under the constant harassment of San Diego station KFMB-TV's continual effort in the FCC and the courts to win competitive protection from Los Angeles television signals, is turning the screws the other way.

Mission, a Cox Broadcasting Corp. system and the largest cable operation in the market, asked the FCC to deny the license renewal request of the San Diego television station until a hearing has been held on the VHF station's economic impact on the growth and development of UHF television in the San Diego market. KFMB-TV, licensed to Midwest Television Inc., was instrumental in forcing the FCC decision that restricted CATV in San Diego. Mission bitterly told the FCC in its petition that "if the Commission's powers and processes are appropriately used to foster development of UHF through restraints on CATV—a service undeniably desired by many residents in San Diego—they would also be appropriately used to place restraints and burdens on

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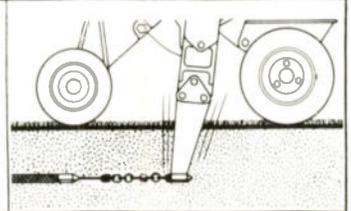
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other aspects of the television industry having an equal, if not even more devastating, impact on the growth and development of UHF. Thus, it is only reasonable and logical to conclude that some financial or other assistance should be furnished by the VHF station in the market urging subsidization of UHF through restraints on CATV service."

Mission also noted that it has offered confidentially to help UHF station KCST in San Diego if the original hearing procedure had been dropped, and was "utterly astounded to be rejected from the outset from even discussing the matter."

Mission offered each UHF station in the market \$150,000 over three years in cash, advertising, programming, etc. In addition, it would pledge not to originate entertainment programming for two years and would give 30 day non-duplication to San Diego outlets. As one observer noted, "Every industry should be as economically underprivileged as UHF, if it can afford to turn down that kind of generosity."

The San Diego case has been a landmark in FCC regulation of CATV, and KFMB-TV has been the catalyst. Mission, in fact, in attacking the license renewal of KFMB-TV, did not file against the other San Diego VHF station,

KOGO-TV, which is also in the California renewal batch.

NRLB Backs CATV System In Employee Dismissal

A National Labor Relations Board trial examiner has backed a West Virginia cable system's firing of a cable installer for failure to meet company standards. Although the Local 968 of the International Brotherhood of Electrical Workers may appeal the case to the full NLRB, the decision by trial examiner Henry L. Jalette is still a significant backing of the system.

Durfee's Television Cable Co., Parkersburg, W. Va., whose president is Charles Erickson, has been a union shop since a June, 1966 labor election. That election provided that company rules had to be posted, and the firm drew them up, noting that they were subject to change. On July 1, 1967, Durfee's added this new rule:

"Any veteran installation man with a year's experience is required to average a minimum of six (6) units, totally completed, in the course of one (1) day."

In another notice, the company said: "All averages these past weeks have exceeded 6 points per man, including new men. The company does not infer that 6 points

per day is a goal, but a minimum."

That notice was grumbled about by the local union, but no formal complaint was filed with the NLRB within the six-month period allowed for union filings. The local complained that the work standard decision by the company was a matter for union-management discussions, and trial examiner Jalette said he would have agreed if the six-month limit hadn't gone by for complaints.

Aside from the rule itself, installer Jack Davis complained that he was laid off because of his union activities. But Jalette noted that he had been clearly notified about not making his six-unit minimum and even given a two-day lay-off penalty before a work cutback caused Durfee's to lay him off anyway.

One of the reasons that the union didn't push the Davis incident, Jalette suggested, was a report that the union representative at a union meeting where Davis complained, told him to "get off his tail and go to work." TVC

TECH PROBLEMS?

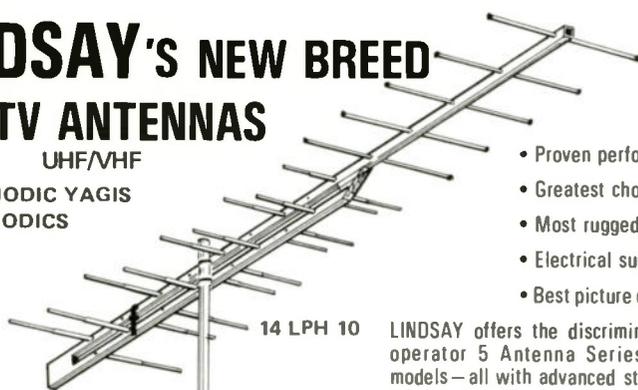
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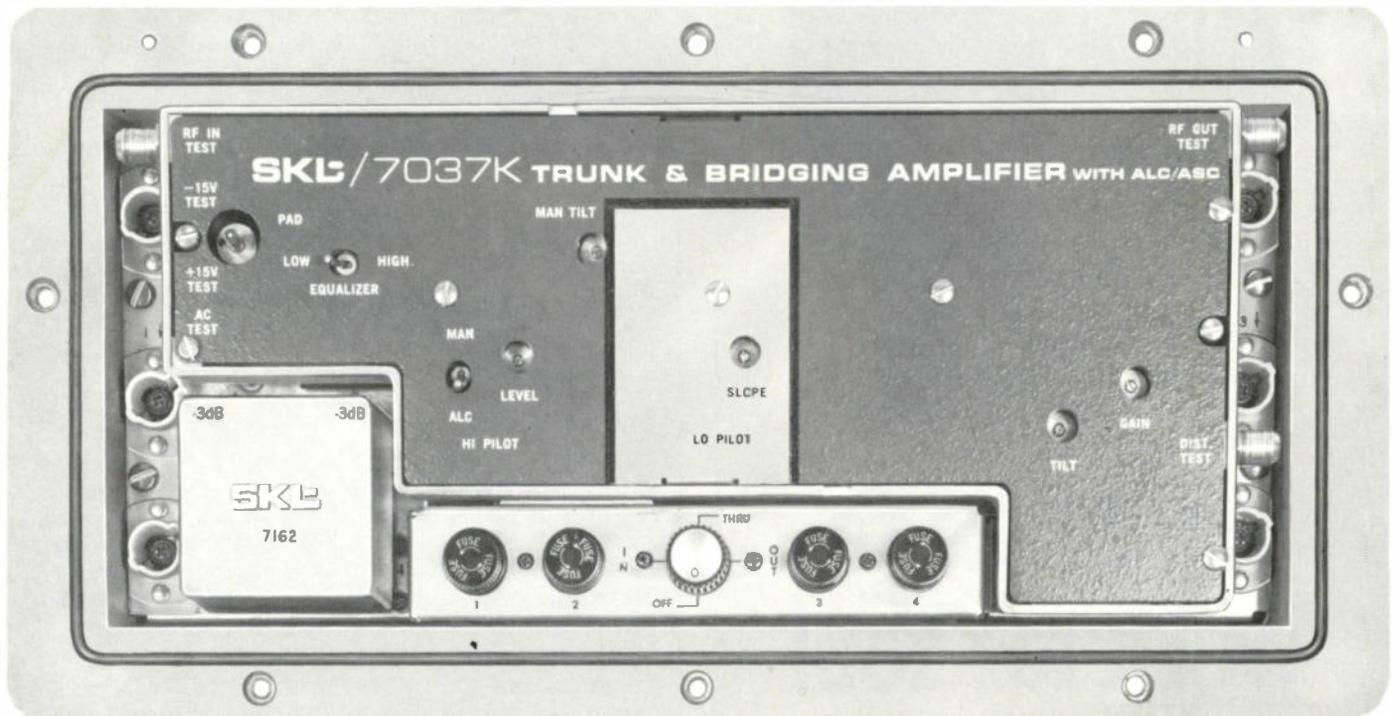
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Construction Reports

Northeastern States

Leominster, Mass., Montachusett Cable, system energized. . . **East Brunswick, N.J.**, Middlesex Cablevision, construction begins soon. . . **Salamanca, N.Y.**, Salamanca TV, rebuild by Jerrold underway. . . **Halifax, Pa.**, Millersburg TV, now making house-drops. . . **Homestead, West Homestead, Whitaker, Munhall and West Mifflin, Pa.**, Dynamic Cablevision, construction underway.

Midwestern States

Hartford City, Ind., Soundvision, construction begins soon. . . **Portland, Ind.**, Soundvision, subscriptions begin soon, 12 channels. . . **South Bend, Mishawaka, St. Joseph County, Ind.**, Valley Cablevision, construction begun. . . **Eagle Grove, Iowa**, TVIQ, construction begins soon, 7 channels. . . **Phillipsburg, Kan.**, Phillipsburg TV, grand opening recently.

Grand Forks, N. Dak., Grand Forks Cable, construction begun, 9 channels. . . **Ada, Ohio**, Reynolds Cable, construction underway. . . **Defiance, Ohio**, Direct Channels, pair of microwave antennas and signal reflectors installed. . . **Wauseon, Ohio**, Direct Channels, new antennas being installed.

Southern States

Fairfield, Ala., Ala. Cable, construction to begin. . . **Helena and West Helena, Ark.**, Cable Service, house-drops. . . **Cocoa Beach, Fla.**, Communicable, rates up \$1.05. . . **Winter Haven, Auburndale, Lake Alfred and Eagle Lake, Fla.**, Universal, local origination added. . . **Aiken, Ga.**, Aiken Cablevision, construction underway. . . **Americus, Ga.**, Cablevision, construction to begin.

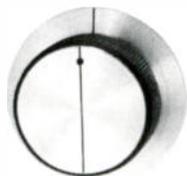
Raleigh, No. Car., Jefferson-Carolina, construction begun. . . **Sanford, No. Car.**, Cablevision, grand opening recently, 6 channels. . . **Shelby, No. Car.**, Shelby Cable, system energized. . . **Athens, Tex.**, Athens TV, system energized. . . **Hamilton, Tex.**, Hamilton TV, channel added. . . **Henderson, Tex.**, Henderson Cable, energized system. . . **Lefore, Tex.**, Lefore Cable, system energized. . . **Lovelland, Tex.**, G'TEC, 2 channels added.

Western Mountain States

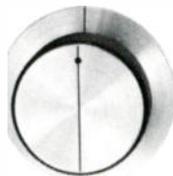
Sierra Vista, Ariz., Sierra Vista Cable, microwave license issued. . . **Alturas, Calif.**, Nor-Cal, \$50,000 rebuild underway. . . **Castro Valley, Calif.**, Televents, construction underway. . . **Rohnert Park, Calif.**, Storer, nearing completion, 12 channels. . . **Marysville, Calif.**, Oroville Comm., cable stringing ahead of schedule. . . **Newport Beach, Calif.**, Cablevision, first phase construction completed. . . **Vacaville, Calif.**, GE, construction begins soon. . . **Westlake Village, Calif.**, Westlake Comm., construction proceeding, 12 channels.

Canadian Systems

Hanover-Walkerton, Ontario, Saugeen Telecable, complete. . . **Picton, Ont.**, Quinte Cablevision, tower installed, house-drops to begin. . . **Richmond Hill, Ont.**, Richmond Hill, system contract to Noram Cable. . . **Whitehorse, Yukon**, Northern TV, rebuild completed, new channel. TVC



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FOCUS

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Systems

Two promotions are announced by Maclean-Hunter Cable TV, Ltd. **A. Ross MacGregor** is now general manager, responsible for the 12 Canadian CATV systems operated by the Toronto-based firm. A native of Toronto, MacGregor is well-known throughout the industry in both Canada and the U.S. **Keith Anderson**, formerly manager of Maclean-Hunter's system in North Bay, Ont., was named to manage Toronto Cable TV, the company's system presently under construction in that city.



Mr. MacGregor



Mr. Anderson

W. Randolph Tucker has been elected vice president of Electronics Capital Corp. (N.Y.). Tucker is chairman of the board of Cypress Communications Corp., a CATV systems company serving some 44,000 subscribers in five states.

Randy Scott is now regional manager of Badger CATV (Abel-Cable). In the past, he has been employed by Rhinelander TV Cable Co., and Abel-Cable of Sparta (Wisc.), subsidiary of Universal Telephone Co., Milwaukee. . . . **Paul Knox** has joined Grand Forks (N. Dakota) Cable TV, Inc., as manager of the system. Prior to joining the Grand Forks company, he managed a cable system in Grand Junction.

Cablevision of Gaffney (S.C.) has promoted **John F. Inman** to system technician. Previous to the promotion, Inman was an installer-technician for Cablevision of Charlotte, N.C.

Talbot Wentworth has been assigned the position of general manager of Vikoa, Inc.'s cable facility at Freehold, N.J. Wentworth joined Vikoa after eight years as manager of the Okonite plant.

John Santen Jr. has been appointed general manager of Triangle Cable Co. Formerly he was president of Local 9415 of the Communications Workers of America.

The appointment of **James Huff** as local TV cable service manager for the Crooksville and Roseville systems has been announced by Ohio Valley Cable Corp. Prior to this assignment, Huff was a technician with Ohio Valley's Marietta system.

Thomas M. Mayers has been appointed manager of the new Bloomington-Normal, Ill., G'TEC Cable TV system of GT&E Communications Inc. Mayers came to GT&E in 1966 as manager of its Angola cable TV system.

Charles C. Bevis has been chosen director of CATV for Pacific and Southern Broadcasting Co., Inc. Bevis came to P&S from Telesis Corporation. Concurrent with the announcement of Bevis' appointment, the company indicated its plans for expansion into the area of CATV.



Mr. Bevis



Mr. Mayers

M. William Adler has been selected executive director of Television Communications Consultants, newly created division of TVC. His responsibilities will include management services, CATV system design, sales promotion and

governmental and public relations. In the past Adler, a pioneer in the industry, has served as CATV consultant to ITT, GE, and several banks and newspapers.

John W. Mole, personnel manager since 1964 for Ross-Martin division of Livingston Oil Co., Tulsa, has been advanced to employee relations manager for the parent company. Mole's new responsibilities will include the company's CATV, oil and gas, and forms services division throughout the U.S.



Mr. Taitt



Mr. Kremer

Selman M. Kremer, a veteran of 20 years in cable television and associated fields, has joined Tele-Prompter Corporation as a corporate executive. Kremer was initially assigned as director of operations for TPT Communications, Inc., master antenna and closed-circuit systems subsidiary at Long Island City. He was director of Advertising and public relations for Jerrold Corporation for ten years.

Suppliers

The appointment of **Robert Taitt** to the position of director-advertising/sales promotion has been announced by Daniel Mezzalingua, president of Craftsman Electronic Products, Inc. Taitt will be responsible for product and corporate promotion through media and sales channels plus the direction of national advertising. Previous to this appointment, Taitt acquired ten years of advertising and sales experience, serving two years with the *Montreal Gazette*, two years agency work, four years with Reader's Digest Association, and two years freelance advertising and photo-journalism.

Duane Crist has been elected vice president of Anaconda Electronics. Crist, who will also be a member of the company's executive committee, has held the position of marketing

manager, CATV, for the past 18 months and will continue to direct the marketing activities of Anacosta.



Mr. Flynn

Mr. Pai

Named vice president of the new CATV division of Aqua Instrument Co., Inc. is S.W. Pai. As a key executive, Pai, who has gained recognition for his work in designing CATV and MATV systems during his years in the industry, will supervise the design, engineering and manufacturing of Aqua's CATV accessories line. Prior to joining Aqua, Pai conducted his own consulting and construction company and was employed in the CATV industry.

Merrill Flynn has been chosen eastern regional sales manager for Cascade Electronics. Merrill comes

to Cascade with 17 years experience in the CATV industry.

SKL has appointed **Stuart K. MacNown** as vice president of engineering. In this new position, MacNown will be responsible for all manufacturing engineering activities. Prior to joining SKL in 1966, MacNown was associated with Rediffusion, Inc., Montreal. SKL also announced the appointment of **Dr. Jacob Shekel** as vice president of research and development for the firm.

advertising sales programs, plus corporate public relations and promotion.



Mr. Titsch

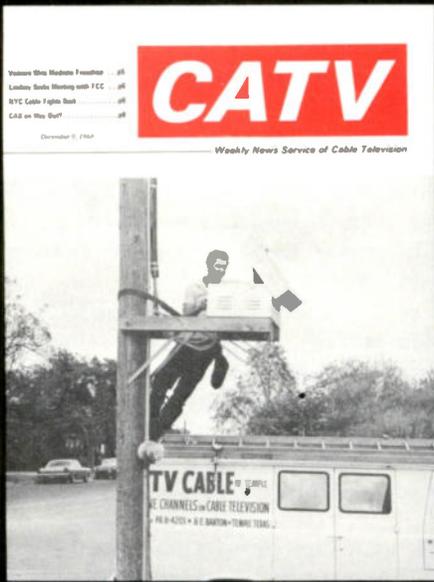
Miss Gales

Professional

Robert Titsch, formerly assistant sales manager for Communications Publishing Corporation, has been appointed advertising sales manager, it has been announced by R. Wayne Wilson, director of advertising for the company. Titsch assumes full responsibility for the management of advertising sales for all publications and NCTI. **Miss Sandra Gales** has joined the company as advertising promotion coordinator. Her primary duties will include the planning and creation of promotional efforts for all

New officers elected at the recent Colorado CATV Association meeting were: president, **John Morrissey** of Durango, and vice president, **Tom Worster** of Grand Junction. Reelected as secretary-treasurer was **Bill Brazeal**, Denver. New directors chosen were **Phil Tunks**, Boulder; **Alan Harmon** and **Glenn Jones**.

The Mississippi CATV Association has elected the following officers: **Dan Boyd**, president; **Tom Dichiara**, vice president; and **Howard Barnett**, secretary-treasurer. Selected as directors were **Robert Hunt**, **J. Wolfe**, **Joe Moritz** and **Joe Hicks**. 



CATV
Weekly News Service of Cable Television

December 9, 1968

Features This Month's Frontiers — pp. 14
Lashley Sinks Mating with FCC — pp. 16
NYC Cable Fights Back — pp. 18
CAT on the Surf — pp. 20

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 should be a part of the action. Read **CATV Weekly** regularly. You owe it to yourself . . . \$33 brings you complete coverage of this important year, and does it week, after week, after week.

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National Cable TV Week: "Opportunity That Knocks Twice"

In the past three years, National Cable TV Week has developed into the NCTA's most effective public relations and promotional tool. Here's an introduction to this year's package. Take advantage of it in your operation.

John Morrissey might very well stand in for the prototype of a typical operator of a typical small CATV system. An industry pioneer who is a former director of the National Cable Television Association and current president of the Colorado CATV Association, John is president and manager of a 14-year-old, 1,850-member system serving Durango, Colorado. Among other things he's learned in an eventful career is the habit of taking a pencil and doing some pretty close figuring on his promotional endeavors.

That's exactly what Morrissey did after taking a substantial flyer on National Cable TV Week in 1968. His figures added up to a convincing argument for the effectiveness of this annual event that the industry will celebrate for the third time this coming February 2-8.

Although his system is a mature one and about 70 percent saturated, Morrissey decided to try a special 12-page Cable TV Week advertising supplement, in cooperation with local stores and set dealers. Thanks to the dealer participation, the supplement cost Cable TV of Durango only \$320. The results included some excellent publicity, a closer relationship with the merchants and a total of \$2,783 in new connection and service fees projected over a 12-month period — a net after expenses of \$2,463.

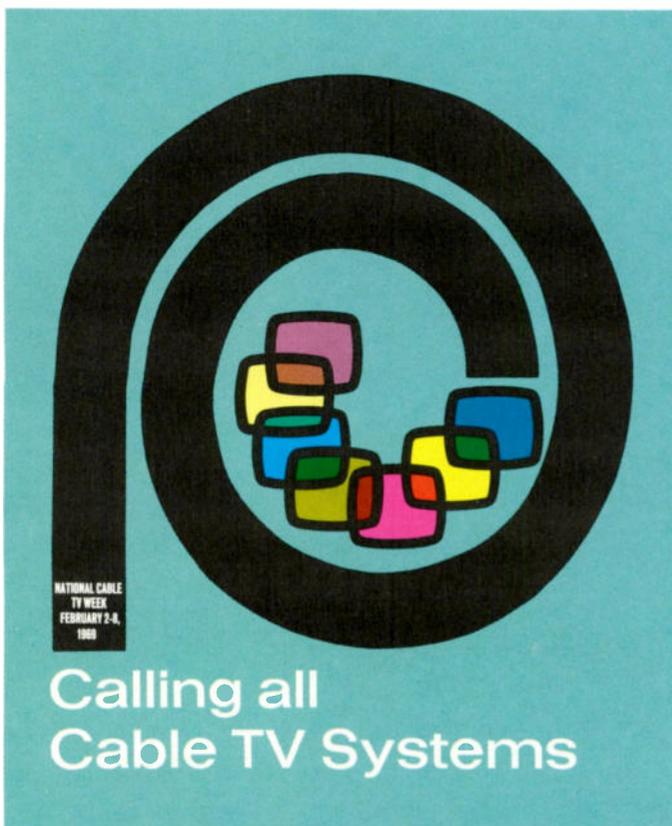
Over and over again, the Durango story has been repeated during the two years that NCTA has sponsored Cable TV Week. Strangely enough, however, the promotional identification of this new addition to the cable TV calendar has been somewhat more than its originators bargained for.

"Two years ago," recalls a former member of NCTA's Public Relations Committee, "Irving Kahn, then the chairman of the committee proposed this event as a nationwide public relations undertaking. We weren't blind certainly to the local promotional opportunities, but we considered that only the come-on, the bait to get more systems to participate in an all-industry effort."

Although pleased with the promotional success of Cable TV Week, NCTA has placed added emphasis on other aspects of the event this year with an "opportunity that knocks twice" theme.

"We found from our surveys after the '67 and '68 Weeks, and from other feedback," says NCTA Public Relations Director John Druckenbrod, "that some systems were not participating because they felt they were too highly saturated, or that this type of new subscriber promotion didn't fit into their schedules.

"Starting with our presentation at the Convention in Boston last summer, we've been trying to sell these



The above symbol will be used in conjunction with the "Opportunity Knocks Twice" theme to promote cable TV during National Cable TV Week, February 2-8.

operators the idea that they owe it to themselves to use the opportunity to develop reservoirs of community goodwill and owe it to their industry to make this a real national effort, whether or not they use it as a pitch for new subscribers."

In order to achieve the all-industry goal, NCTA sends out its annual Cable TV Week promotion and publicity kit to non-members as well as members. Another move toward broader participation has been a restructuring of the Cable TV Week committee to include representatives of state and regional associations.

"The Associations can promote Cable TV Week on a state or regional basis very effectively," Druckenbrod explains. "Also, we hope individual operators will be inclined to do more if they have someone close at home to encourage them and advise them."

The NCTA kit again contains most of the goodies of former years — news releases, background stories, radio and TV spots, promotional aids and suggestions and a dummy newspaper supplement and ad layouts. Two differences are: (1) more stress on the use of cable-casting facilities as a Cable TV Week tool, and (2) greater flexibility in advertising materials.

To achieve the latter, NCTA has included a selection of various-sized mats of the National Cable TV Week symbol and the NCTA logo, along with layout suggestions for both hard-sell connection special ads and a more institutional approach. It's a "do it yourself" kit that enables each operator to tailor his promotion to his own taste.

Nationally, NCTA is planning an annual Washington VIP event similar to last year's industry film premiere during Cable TV Week. With the new Congress just getting well under way, NCTA's Legislative Committee will carry the ball on a reception honoring Capitol Hill and FCC personalities.

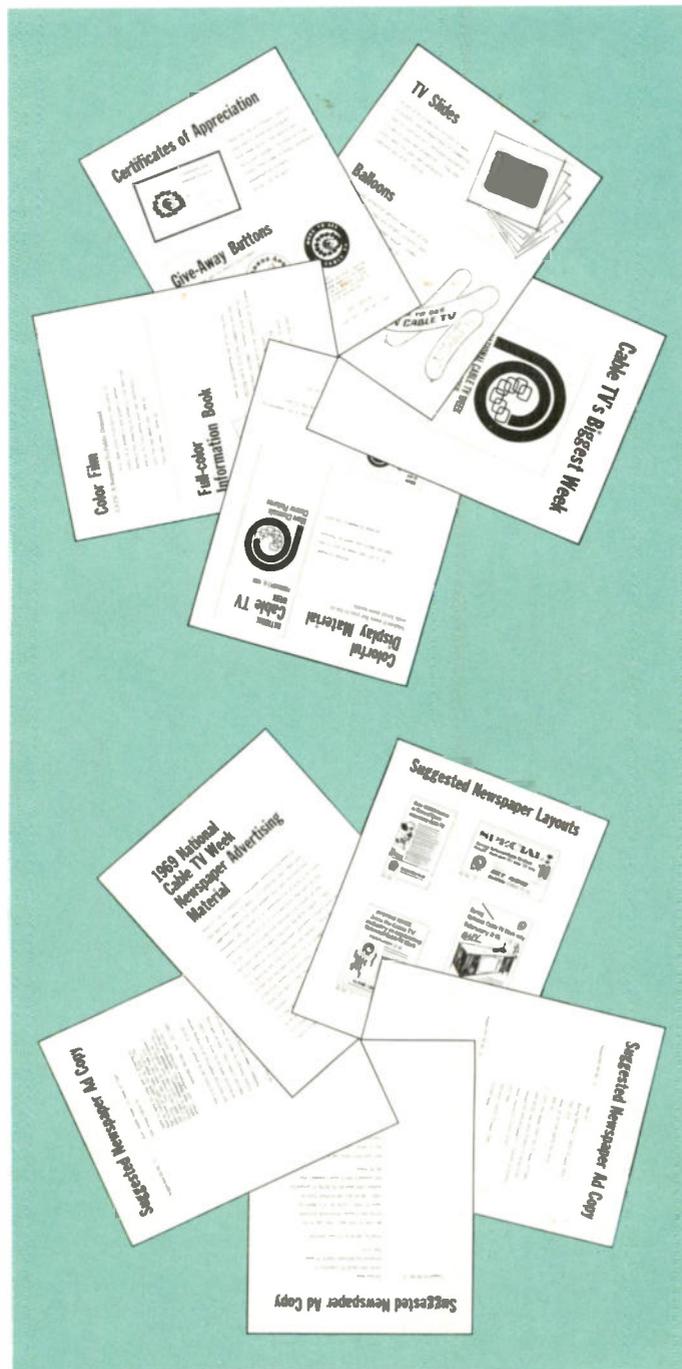
Similar events will be encouraged at the state level as the industry girds for a new onslaught of public utility control bills.

The great bulk of Cable TV Week action, however, will take place at the local system level. Resourceful CATV operators have turned up with literally dozens of ways to make Cable TV Week work for them. A few of the more popular, as cited by NCTA staff members, include: (1) Proclamation of Cable TV Week by the local mayor or other top official; (2) Open houses or receptions; (3) Tie-ins with television set dealers and other merchants for advertising and in-store promotions; (4) Use of pretty girls or costumed characters to give away buttons, balloons and other gimcracks as well as more substantial prizes — radios, TV sets, free cable service — to a fortunate few. (5) "Miss Cable TV" contests, with a coronation ball, cable channel interviews and other trimmings thrown in; (6) Special advertising supplements or inserts; (7) Speaking engagements for managers and other personnel before school assemblies, service and women's clubs and civic organizations; (8) Guessing contests, drawings, telephone games; (9) Tie-ins with schools, 4-H clubs or Scouts for essay, speech, poster or art competitions which can be covered on cable channels; (10) Certificates of Appreciation to local or area officials who have contributed to the progress of CATV; (11) A search and suitable rewards for "oldest" subscribers (in point of time on the cable) or

a "typical" CATV family; (12) Tie-ins or contributions to civic or charitable causes, support of educational TV and other worthy enterprises.

"The list could go on and on," says John Druckenbrod, "but the point is this. The cable TV industry doesn't have the financial resources of some of its rivals. We just couldn't realistically hope to finance a real all-out national Cable TV Week effort. But we do have one very significant resource, and that's the enthusiasm and ingenuity of our own CATV operators.

"Each one can do himself a lot of good by taking proper cognizance of Cable TV Week in his own community, and he can do the industry a lot of good by contributing his bit to the overall observance, which becomes pretty impressive on a cumulative basis." TVC



Here are some of the materials in the NCTA promo kit, which are available to all Association members.

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Educational Television: Growing As CATV Grows

The growth and service potential of educational television hinge in large measure on the cable television industry. Many leaders in ETV recognize that without CATV, their audience would be smaller and their efforts to build a better-educated American public would be significantly limited.

By J. David Truby
Associate Professor
University of Pennsylvania

Amid the bickering and furor of today's communications scene, two segments of the telecommunication industry are happily "holding hands," secure in the knowledge that they belong to each other. As we prepare to enter the seventh decade of the Twentieth Century, Community Antenna Television and Educational Television have found each other.

Writing in the *New York Times*,

Ralph Lee Smith noted that "cable TV does have the theoretical potential to turn the American living room into a cultural, educational, or data center."

Some educational broadcasters are happily proclaiming that this potential is fulfilled, citing the rapidly growing number of cases in which CATV and ETV are engaged in mutual handholding. Actually, the union of the two was

suggested more than ten years ago by communication-education expert C. R. Carpenter, as he discussed public service and educational uses for cable television.

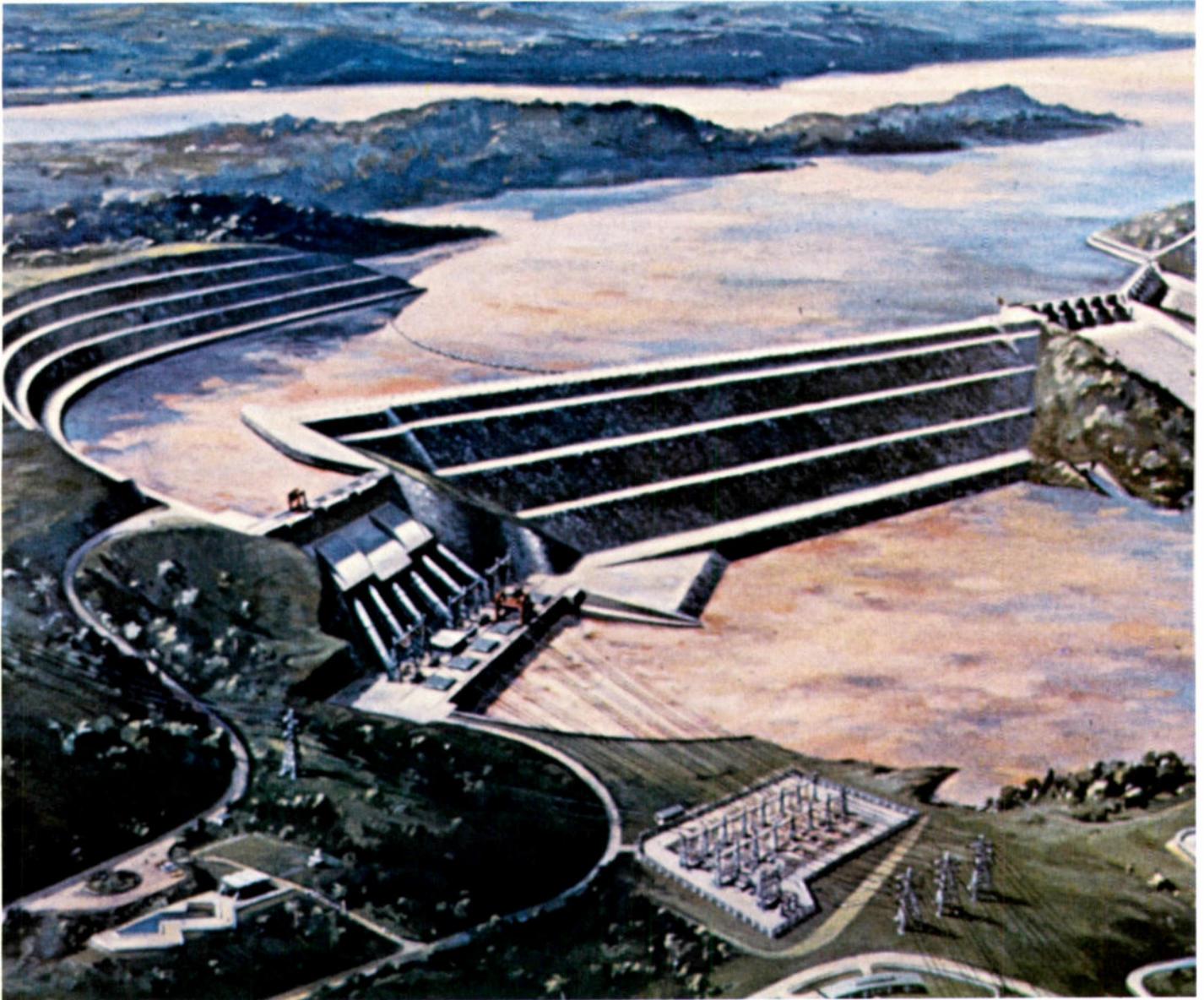
In the past ten years it is obvious that the educational telecaster has indeed found a friend in the CATV industry. On the other hand, the cablecasters have found interesting new material for their expanding and hungry electronic medium.

Roy Danish, director of TIO, addressed the Speech Association of America at their annual convention, and stressed the need for ETV's improvement. "There is much to be done by all of us to improve television and teaching. We must take advantage of every opportunity that comes our way," he said.

Following this principle, many ETV stations now devote a significant portion of their broadcast day to community service and educational enrichment, programming material that is different from the usual in-service or instructional role associated with educational television. This new programming emphasis has become more effective through the expansion of coverage area by CATV. It is now common practice for local CATV systems to aid school districts and educational institutions by installing cable outlets and providing origination



"Who cares about culture?" was a five part series by WQED-TV to examine the growth of culture in current society. The programs were enormously successful, and mail came in from a wide range of people located great distances from Pittsburgh . . . proof of CATV's pulling power. (photo courtesy of WQED-TV)



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equipment, as well as by carrying the signals of the local ETV station.

At Pennsylvania State University, for example, the spirit of cooperation between the educational people and the cable system people has resulted in the campus being wired for cable reception, a most meaningful event in this isolated, mountain-surrounded locale. Another example of mutually beneficial and close cooperation is the origination setup between the cable system in Corvallis, Oregon and Oregon State University.

In yet another instance, WQED-TV, the educational station in Pittsburgh, serves a three-state area with a splendid program schedule that effectively competes with the area's commercial stations. The station's management knows they have a sizeable and vocal audience, and they are aware that CATV brings the station's signal to many homes that otherwise could not receive the excellent programming.

WPSX-TV, Penn State's station, is unusually active in presenting drama and documentary programming most appropriate to our times. In addition, they originate in-depth social analyses, drawing on the University faculty for expertise and talent.

"We program to serve the needs and desires of the people in our

audience area," is the way Marlowe Froke, WPSX station manager explains the programming philosophy. This programming is carried widely throughout Pennsylvania and into New York by various cable systems. The bonus coverage is well recognized and appreciated by the University.

Another venture that has thrust ETV forward into the popular public eye is the Eastern Educational Network, with its flagship station being WGBH in Boston. Not confined geographically, as its name suggests, the Network has member stations from New York to Los Angeles, Pittsburgh to Denver, and Louisville to San Francisco. Naturally, CATV is a major factor in expanding the area of audience coverage for these network stations that cover the continental United States.

However, ETV's highest national pinnacle to date is the Public Broadcasting Laboratory. The loosely formatted programs have been highly controversial, and the production and presentations have ranged from "terrible" to "outstanding," depending upon which critic you might be exposed to.

According to Fred W. Friendly, the ex-CBS producer who is the Ford Foundation's television consultant, the Foundation spent \$23.7 million in ETV last year, and will continue to support the efforts of

the educational telecasters. However, for the first time last year, "seed" money was available from the federal government, and it is hoped that PBL will soon come under full government support, making it truly public television. CATV may take a big bow for helping the ETV stations bring PBL to more people.

To date, dissemination of public telecasting through PBL has been largely a cooperative effort between CATV and ETV. But it is not enough. "Sure our job is to educate, inform, and enrich, but we've got to have an audience for all those things, which means we have to entertain some too," is the concern of ETV producer Bill Flynn.

On the same theme, social critic and author William Grosch notes that ETV needs more programming like "The French Chef" and that "CATV could be the best thing that has ever happened to the educational broadcasters."

The need for closer cooperation between ETV and CATV was spelled out clearly two years ago in a panel discussion held at The Pennsylvania State University. Moderated by *TV Communications* publisher Stanley M. Searle, the discussion was between Floyd B. Fisher, director of the University's Continuing Education Program; Marlowe Froke, WPSX-TV station manager; and James R. Palmer, cable system owner, manufacturer, and a director of NCTA. Their conclusion was that CATV could be ETV's best friend, and that the grass-roots demand for both CATV and ETV was stronger than many people thought.

The conclusions of these men are supported by the statistics of a National Cable Television Association study, which reported that 73.4 per cent of all ETV signals on the air are carried by CATV systems (1966), while in 1964, only 39.7 per cent were carried. One NCTA official estimated that the figure might now be closer to 90 per cent, or even higher.

Thus, the happy and useful union of Educational Television and Community Antenna Television is progressing very well across the nation.

TVC



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Over 3,500 people registered at the Imperial Valley Cable booth set up at the California mid-winter fair.

State Fair Promotion Effort Gets Results for MSO

By Bill Little, Manager
Imperial Valley Cable Company

In the continual search for new ways to sell cable television, while at the same time improving the system's image and building good public relations, many ideas are tried. The staff of Imperial Valley Cable Company put such an idea into practice early last year. Both the techniques used, and the results obtained, should be of interest to other promotion-minded cable operators.

The occasion for trying the idea was the California Mid-winter Fair, held yearly in Imperial, California. The event is considered a major spectator attraction

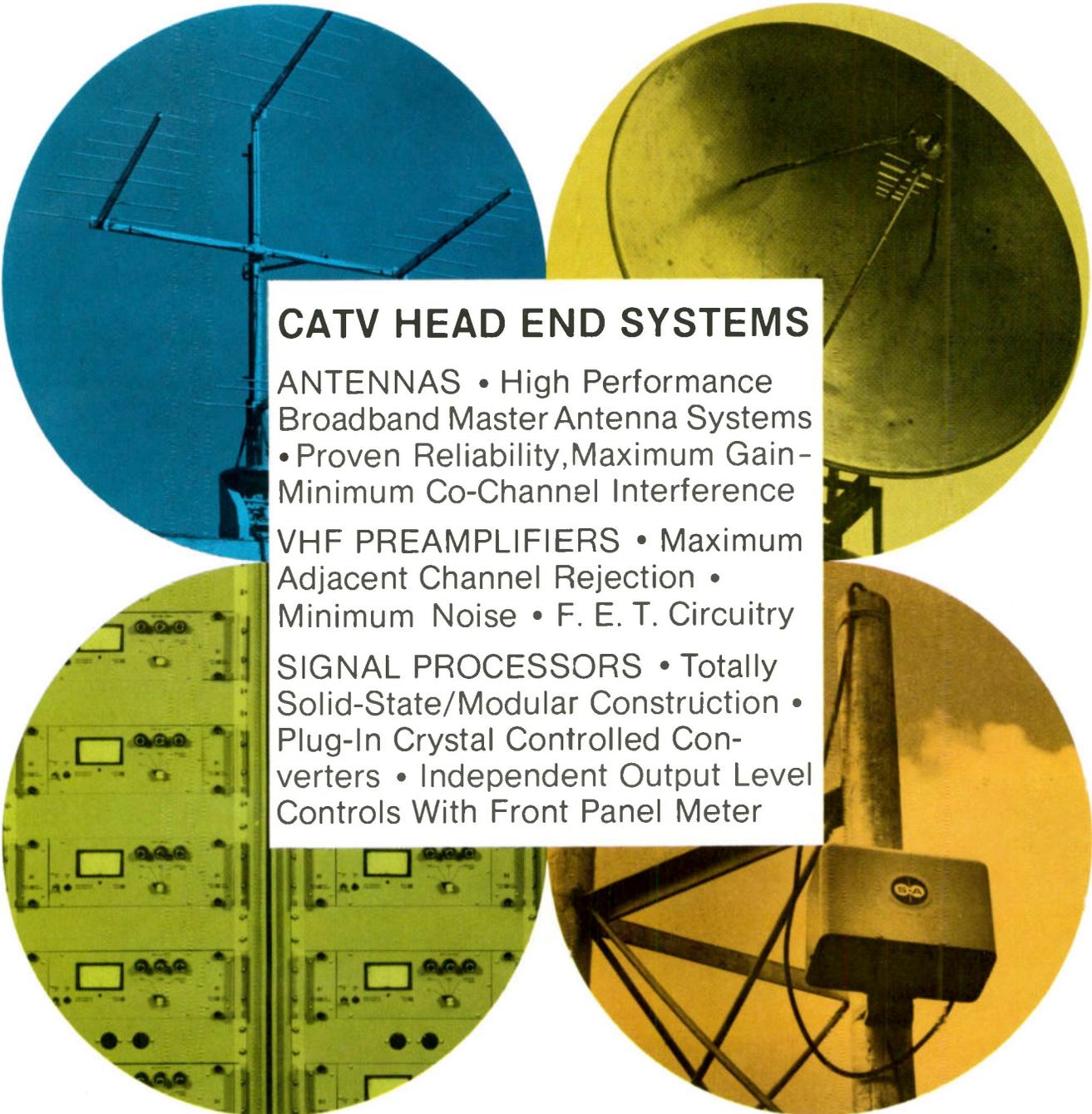
in Southern California and attendance normally exceeds 100,000 people from throughout the state.

Imperial Valley Cable constructed a 14' x 16' booth at the fair and decorated it in bright colors using "Colorful Cable TV" as the theme. Television dealers from each of the five system communities served by the company were invited to display a color television set in the booth.

As an incentive for fair visitors to stop by the booth, Imperial Valley staged a drawing with six-months free cable service going to

a winner in each of the company's systems. As a sales incentive, a "two-for-one fair special" was offered—two months service for the price of one, with payment for the first month to be made in advance.

Each booth visitor was asked to fill in a registration slip, making him eligible for the drawing. Included on the slip were questions asking cable subscribers to comment regarding quality of cable service and asking the non-subscriber to list his reasons for not subscribing. From the answers obtained, the company developed



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competition between media would be provided by a separation of the ownership of television enterprises and CATV systems. The denied applicants all had TV affiliations. The language of the finding said: "The interest of the viewing public is not the same as that of the television station or network. The CATV operator must, of necessity, make a choice of the available signals it sends into the subscriber's home. A CATV unencumbered by a financial interest in a particular television station will be free to select those channels which in its opinion will secure maximum viewing. The interests of the viewing public and the CATV here coincide. However, if the CATV operator has a substantial financial interest in a TV station, he may approach the problem of channel selection with conflicting feelings."

The FCC case (65-688, Docket No. 15415) in which the Federal body declined to rule that joint ownerships should be prohibited per se, and established the policy of individual review of each case, was cited in the Connecticut finding. However the minority opinions were quoted freely, to emphasize their similarity to the Connecticut decision. The Connecticut awards were thus made to "competent independent owners and operators," and applications from inquirers with TV affiliations were denied.

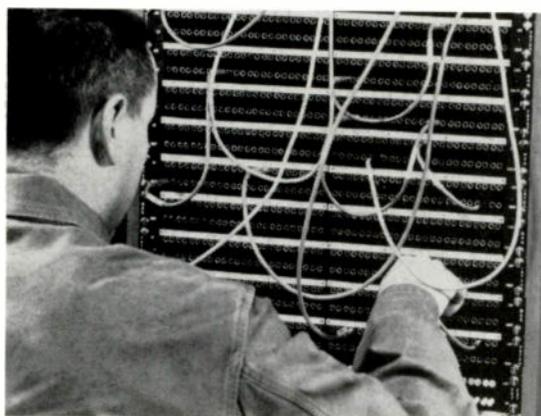
Four of the firms to whom denials were made immediately appealed to the courts, to be joined later by the applicant whose original grant was recalled. For a year, the Connecticut Superior Court consid-

ered the voluminous evidence. In early November, 1968, the court dismissed all five appeals.

Four of the appellants promptly filed a further appeal to the Supreme Court of the State of Connecticut, the last legal refuge within the State. The 16 ready, able and willing, potential CATV operators had to go back to their figurative circling around, not merely for an hour, as happens at the airports, but probably for the better part of another year. Judicial process moves slowly. If, the State Supreme Court says to the CATV'ers: "Come in," then joy will come to the operators and the prospective public viewers alike. An unfavorable decision; and everything goes back to the biblical phrase: "As it was in the beginning."

Meanwhile, Connecticut is ready. The Public Utilities Commission has issued, under its Docket No. 10250, comprehensive guide lines for construction, maintenance and operating standards. This docket also provides for rate regulation, engineering requirements, dissemination of weather forecasts and other services, safety precautions, reports and records, customer relations, accounting procedures and complete construction specifications. While the Commission still receives applications, all processing procedures are suspended until the final court decision.

Will Connecticut ever get widespread CATV? Will the State Supreme Court affirm all that has been done to date? Tune in, as in the soap opera, in 6 or 8 months, or maybe a year and find out. TVC



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Live Remote Cablecasting Boosts System's Image

Tailoring its programs to subscriber interests, Multivision of Dalton, Georgia has achieved success both financially and image-wise by means of live remote cablecasts originated from throughout the city.

*By James Reeves
General Manager
Multivision Northwest, Inc.*

Dalton, Georgia is a city of over 28,000 population, is highly industrial, and anticipates a healthy expansion in the future. Its citizens are sports-minded and deeply involved in local activities.

All of these characteristics were carefully considered by the management of Multivision Northwest, Inc., before the decision to venture into local origination in Dalton was made. The cable system's officials realized that in every city where local origination is tried, the planning involved must center around that particular community. They were deeply aware of the fact

that what works in one city may not work in another.

Multivision's initial local origination effort involved a one-hour program aired during the high-school football season. A live backfeed to the head-end was used, utilizing channel two to keep signal loss at a minimum. At the head-end, the signal was converted to local channel 13. In the Multivision studio, one live camera with zoom lens picked up the announcer and the highschool football coach. Films of the previous game were reviewed, using the camera/shadow box technique. The program was not only a

commercial success, but is credited by system personnel with helping acquire several new subscribers.

With the first step behind them, the Dalton system constructed a one-mile backfeed from the high-school to their studio. Since a 1/2-inch aluminum line was used, the signal did not require amplification between the school and studio. Input points were permanently installed in the gymnasium and the auditorium. Splitter/mixers were used to blend the two possible inputs, so no switching was necessary. The initial live/remote cablecast was transmitted over the setup



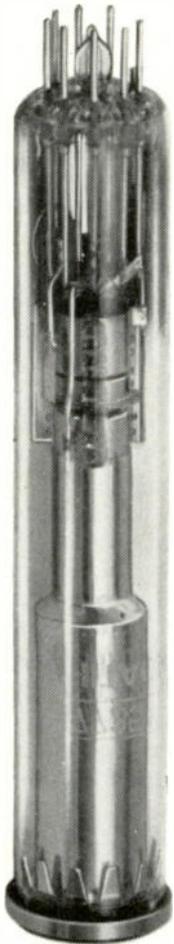
Many of Multivision's programs originate from the Dalton, Georgia recreation center. Here, studio manager Ron Arnold interviews junior citizens at poolside. The studio van is shown in the background.



Chief Technician Gerald Bowman operates the remote camera atop the Dalton recreation center building.

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the week before Christmas. The event carried was the annual Christmas concert of the highschool chorus, and the cablecast was fully sponsored by a local men's store, as a public service.

Multivision next obtained permission to carry the entire slate of home basketball games as well as the regional tournament in the spring. Coverage was provided by one portable zoom camera and one full-court fixed camera. A spotter/color man and the announcer handled the audio portion of the cablecast. Commercials were produced live, using camera cards and simple props. At regional tournament time, however, the sheer number of spot ads dictated the use of video tape.

Moving on in the public service field, the cable system laid plans to give live coverage to the high-school graduation. By the time the event occurred, special effects equipment had been added which effected improvement in the quality of the show. As is traditional in Dalton, many more people showed up for the event than could be seated, but this time the overflow could return home to view the graduation on cable TV. Three fixed cameras and one moveable zoom camera were used by the system, with two men handling the entire program.

Having now jumped into local origination with both feet, the system moved to overcome some problems which had cropped up. In its original cablecasting efforts, all equipment was carried in a station wagon which required almost four hours of set-up time. The station wagon was replaced by a van and special cabinetry was constructed which was portable and could be removed when it became necessary to originate programs from an area where the van could not go. In the van, a remote modulator (channel 2), audio board, video switcher/special effects generators, sync generator, and all the various cords and miscellaneous material was carried. Two helpful devices were added: a built-in 5000 BTU conditioner to keep the controller from broiling inside the van, and an intercom which was multiplexed over the backfeed cable to

the studio. At the studio end, the system set up a simple B+ relay which could be used to cut off or on either the local channel 2 modulator or the remote channel 2 studio amplifier. A demodulator was also used so that any remote broadcast could be videotaped, independent of what was going to the head-end.

The lack of continuity in programming was taken care of by the addition of a full schedule of studio programming consisting largely of radio with pictures. A regular radio board with two turntables was purchased, and approximately 30 hours per week of standard D.J. format is now being originated. This seemingly "dead" style is livened through the use of local guests, interviews, local musical talent and game shows.

With the proven success programs centered about sporting events and local activities, Multivision expanded its remote backfeed cable system to include four local baseball diamonds, the town recreation center swimming pool, gymnasium, tennis courts, and indoor game room. In all, a total of ten locations are equipped for remote programming.

The techniques used by Multivision have changed considerably over the past months. A system official described a recent cablecast (typical of the current format) as follows: "Recently, we cablecast the city softball league tournament from the recreation center. The D. J. at the studio introduced the program and then engaged the remote switch. The screen went into severe co-channel for exactly 1½ seconds and then the ball diamond appeared. We were informed of the difficulty via inter-com and the announcer began, 'Welcome to E. and B. field for more of the city softball tournament coming your way live and direct on Dalton's own channel 13. . . ' We could eliminate the change-over co-channel with another relay, but then it wouldn't look so dramatic."

Multivision system officials happily note that the cooperative attitude of the highschool and recreation center has been all they could hope for and that everyone in Dalton seems interested in helping their city toward its own full-time channel operation. TVC

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CATV Industry Profile: American Electronic Labs, Inc.

The following profile features American Electronic Laboratories, Inc., one of the CATV manufacturing concerns "on the move." AEL's extensive experience in the design and manufacture of various electronic components has prepared the company for a bright and growing future.

From a beginning in a building loft in downtown Philadelphia in 1950, American Electronic Laboratories Inc. has grown to occupy close to a half-million square feet of space and now employs over 1500 people. The company, active for the last three years in the CATV industry, is headquartered in Colmar, Pennsylvania. Additional manufacturing and engineering facilities are located in Montgomeryville, Pa., Fort Monmouth, N.J., Springfield, Va., Mountain View, Calif., and Bene Baraa, Israel.

The AEL engineering staff, which consists of over 250 professionals, includes men specializing in such varied fields as solid-state, microcircuitry, mathematics, physics, antennas, chemistry, communica-

tions, biomedical electronics, and systems design and analysis.

The AEL manufacturing subsidiary, Electromagnetic Technology Corp., is located less than five miles from corporate headquarters in Montgomeryville, Pa. Long conditioned to the stringent requirements of the military, the manufacturing group cites as its goal the same quality control and manufacturing techniques in commercial equipment production.

The diversification of the engineering group is complemented by the in-house support facilities. A precision aluminum foundry is part of the AEL family, along with a completely equipped environmental testing laboratory. A computer, a plastics laboratory and a paint and

plating shop add to the capabilities of the company.

The company was founded by Dr. Leon Riebman, president and director of engineering, and Conrad J. Fowler, executive vice president and chairman of the board. Fowler now directs AEL's marketing and production operations.

Although AEL was heavily involved in Government R&D and production, long-range planning had indicated many areas of commercial diversification. New areas were explored to see with which fields the talents of the engineering staff were compatible. Just such a corporate decision was reached in 1962 when the marketing and engineering management staffs explored the CATV field (by doing the engineer-



AEL staff members meet in the company's conference room. Left to right are Harold Musler, Tony Katona, Irv Faye, Sam Merion, Irv Goldstein and Bob Hayes.



One step in the assembly of thin film microcircuit for Superband amplifier.

ing and design of all the equipment used in the Home Entertainment Co. Pay TV experiment in Southern California during 1962 and 1963). Talent was available in the amplifier design, solid-state, miniaturization, reliability and production know-how. Thus the "integrated diversification" philosophy once more brought a new entity to the CATV equipment field, the AEL "Colorvue" line.

Samuel M. Merion, vice president, marketing played an important and active part in reaching the final decision to enter the CATV field. His faith in the growth of the CATV industry was one of the major factors in the corporate decision.

Direct responsibility for implementation of the CATV marketing is carried by I.A. Faye, director, commercial marketing, who has had long marketing experience in the CATV and CCTV fields. His staff of CATV marketing engineers are well-versed in industry requirements, having had many years experience in marketing CATV equipment.

Complete corporate support is given to the CATV division. At the recent national CATV convention, the company was represented by Riebman and Fowler, along with Merion and Faye, as well as a large complement of marketing and engineering staff members. Tony Katona and Bob Hayes provide the key sales support in the CATV division. Within a recent four-month period, AEL participated in national and regional meetings in Massachusetts, Texas, Washington, New York, Pennsylvania, California and Florida.

CATV engineering and production management and coordination are the direct responsibilities of Mr. Irv Goldstein, manager CATV operations, who reports to Dr. Riebman. Production and engineering schedules must be met and Goldstein's background in production and engineering management enables him to keep the CATV group "on the go".

Abilities in thin and thick film microcircuitry and mechanical engineering enabled AEL to utilize the modularity technique in the design of amplifiers, splitters, extenders, etc. All units are designed for easy

Over the past 3 years there has been a marked change in the shortage of qualified CATV technicians.

It's much worse.



No one has to remind you that CATV technicians are hard to find—and that really qualified men are harder to find. It takes a thorough search and substantial training to assure the performance you want.

That's where the National Cable Television Institute can help you. NCTI offers complete CATV technical correspondence courses ranging from Installer to Advanced Technician. Your men receive thorough instruction in every phase of CATV—from basic electronic theory to the details of system technical supervision—**without interrupting their jobs**. Every lesson is prepared by well-known CATV technical authorities. Courses are constantly updated to assure state-of-the-art material. And our instructors maintain a personal interest in the progress of every student.

NCTI courses can help improve your system's operation and employee potential through professional training. Make sure your technical personnel perform to their fullest capabilities . . . Write us for information on the full curriculum of NCTI technical courses. Group plans are available, plus several options for individual and individual/employer financing.

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access, with two bolts being required to open or close the housing. Plug-in modules are employed in all units, to enable them to be easily set up or changed and to provide for ease of on-site servicing or module replacement.

The modularity concept, although difficult in design, provides simplicity in operation. The basic Colorvue unit is a waterproof aluminum housing containing a baseplate which is prewired for the function desired. Modules are then plugged in to provide up to four commonly used configurations. Both the CVT (50-220MHz) and the CT (50-270MHz) units employ a suffix to denote the functions of the module employed. The basic configuration (-1) uses only a DC power supply and a trunk amplifier module. This amplifier handles the RF signal and provides a gain listed at 48 dBmV per channel with -57dB cross modulation and 5dB block tilt.

The second configuration (-1A) adds an automatic gain control module to the basic amplifier. This unit monitors the incoming signal (pilot carrier) and adjusts the amplification of the trunk amplifier to provide a stable output.

A distribution amplifier module is added to the basic package to produce the (1-B) which will drive up to four feeder lines as well as the main cable.

The complete unit (1-AB) is a Colorvue station with DC power supply, trunk amplifier, AGC and four feeder line amplifiers.

The support of the AEL environmental laboratory enabled CATV engineers to thoroughly investigate the reason for poor signal fidelity caused by extremes in environmental temperatures, particularly high ambients. As a result of this investigation, design innovations were incorporated in the Colorvue line said to result in maximum heat dissipation in the trunk line amplifiers. Problems of moisture and radiation were also studied.

The AEL engineering capability in communication equipment has enabled them to design and produce the "Superband" line. This equipment, said to have the broadest bandwidth in the industry, covers the range from 50 to 270MHz, thus providing for immediate requirements as well as future expansion to a greater number of channels.

The complete Superband line includes trunk line, bridging, extender and line terminating amplifiers as well as indoor and outdoor couplers, multi taps, matching transformers, receptacles, cable terminators, and power supplies.

The requirement of local origination has also not been overlooked at AEL. They recently introduced the "Telemobile," a complete, portable TV studio. The Telemobile includes a control console with built-in special effects facilities, 2 zoom lens equipped viewfinder cameras, and a video tape recorder. A television film chain projector is included in the package, along with all necessary accessories such as cable, microphones, boom, head-

sets, etc. The new complete local origination package, called a breakthrough in systems priced under \$15,000, enables the CATV operator to originate local programs, record sports and public functions on location, and provide a complete community service.

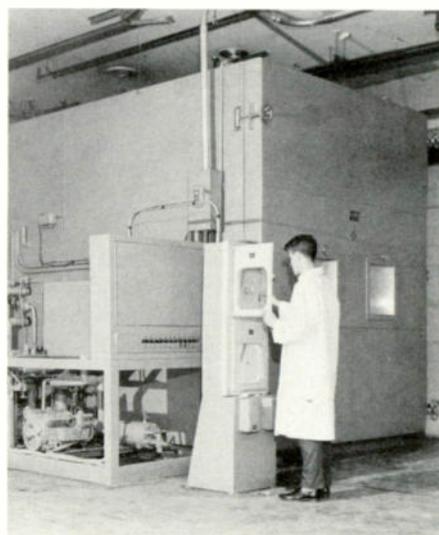
Turnkey has also not been neglected by AEL in an effort to provide the complete CATV package. Long noted for its accomplishments in military "full systems responsibility," the company has applied this technology to the turnkey operation. The turnkey responsibility ranges from preliminary aerial surveys through to equipment and line installation and final system checkout. Support to the turnkey operation is provided by an AEL subsidiary, the AEL Service Corporation, for installation of line cable, poles and ancillary equipment. The Service Corporation also provides engineering and field service personnel and facilities through its centers scattered throughout the United States.

As a result of the "integrated diversification" philosophy, the CATV Division has grown rapidly to the point where the AEL Colorvue Superband line has received wide acceptance and AEL is acknowledged to be one of the leaders in the CATV industry.

Dr. Rieberman recently stated that "if you want to be a leader, you must lead. Therefore, we intend to research tomorrow's requirements today." This philosophy represents a company "on the go". TVC

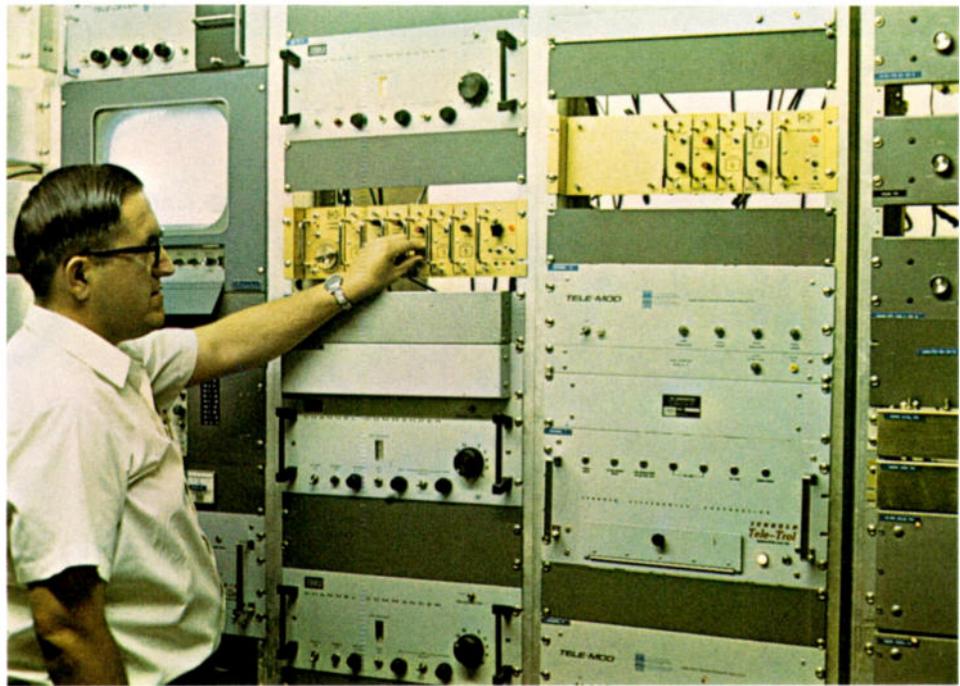


Sam Merion, Marketing Manager and Conrad J. Fowler, Chairman of the Board meet to discuss marketing plans.



The firm's environmental chamber is used to evaluate amplifier performance.

We're slowly taking over.



See those beautiful gold-faced CAS control units? Not *too* many there . . . yet. But everyday more system operators are being won over to the new CAS CC-213 CHANNEL CONTROL. Why? Because the CC-213 combines the total economy, convenience and versatility you want in one solid-state unit.

Versatility is right. The CC-213 functions as a:

■ **Heterodyne Signal Processor**

■ **Complete Origination Modulator**

when switched from OFF AIR to ORIGINATE condition either automatically when the station goes off the air, by remote control or manually.

■ **Duplication Channel Processor**

when switched to ORIGINATE condition for microwave feed, or by use of an external tuner (ET-213) for OFF AIR duplication switching.

■ **Remotely Operated Alert System**

when switched remotely to ORIGINATE condition through CAS telephone system (REAS-12) for telephone audio announcements and antenna site video feed.

Now add the total adaptability of completely modular design. The basic unit is assembled for your system's *exact* require-

ments. If you ever need to change a module, there's no need to pull the entire unit off the rack. Just remove the old module and slide in a replacement. And these compact solid-state modules are *easy* to pull, inspect, and replace.

One more thing—we've worked the bugs out on *our* drawing board. The CC-213 is ready to fit right in to your system with flawless solid-state performance. Isn't it time to consider CC-213's for your head-end? You'll experience the dependability and quality of performance only CAS offers. Please write us . . . we'll send you complete specifications by return mail.

CHECK THESE OUTSTANDING FEATURES:

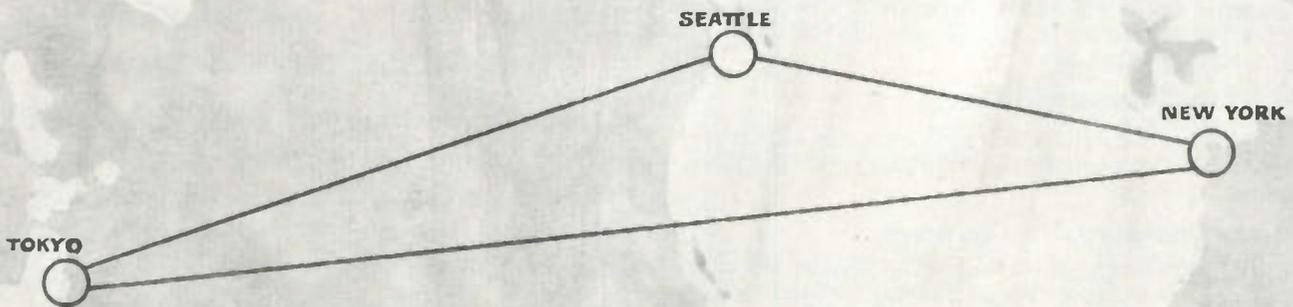
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- all band adjacent operation • simple 19" rack mounting
- solid-state modular construction • regulated power supply • compatible with similar tube equipment • passes full color • operates on 117 vac, + 30 vdc or remote power source • front panel controls and test points • easily removed modules.

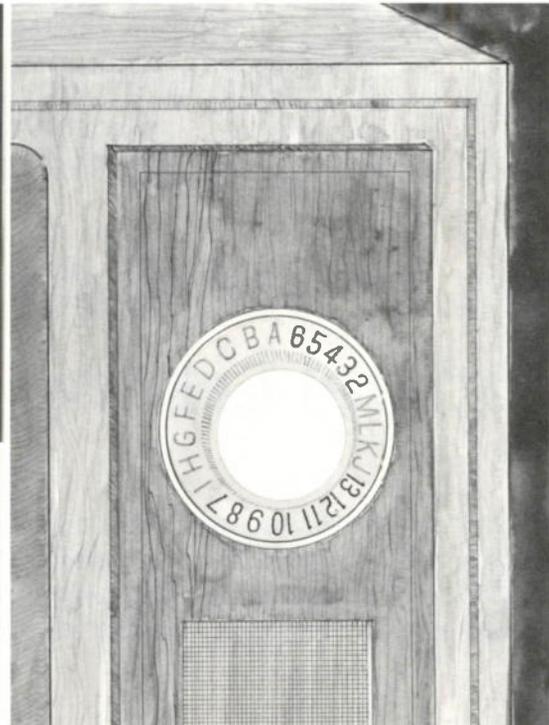
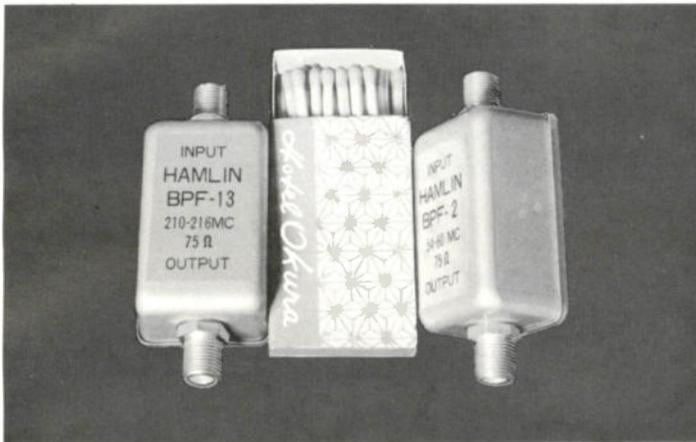
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November 12, 1968

Mr. Philip Hamlin, President
The Hamlin Corp.
605-15th Avenue East
Seattle, Washington 98102

Dear Mr. Hamlin:

The enclosed inspection slip accompanied a converter which was received from your company from Japan.

When our installer, Mr. Frank Henry, unpacked the above converter he was quite surprised to find a wedding band in the package. He is interested in returning this ring to its rightful owner.

We are, therefore, sending the ring to you under separate cover.

Very truly yours,
TelePrompter Manhattan CATV Corp.
Sol Yager
Sol A. Yager
Chief Engineer

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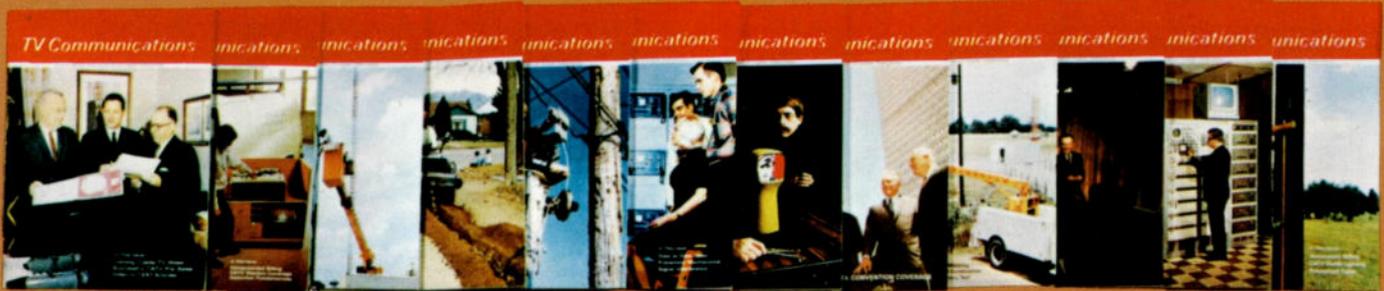
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INSPECTED BY H H

Who said New Yorkers "don't care!" Thanks to Frank Henry, Sol Yager, and the Staff of TelePrompter, Mr. Hirai, Chief Project Engineer, Hamlin Convertors . . . has a very "worldly" Wedding Ring!



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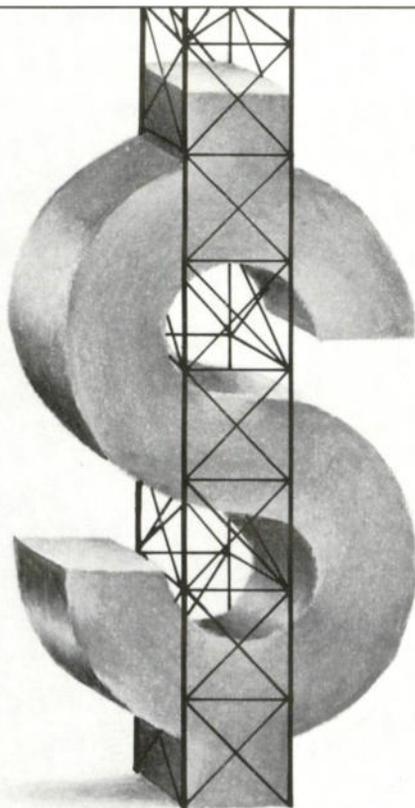
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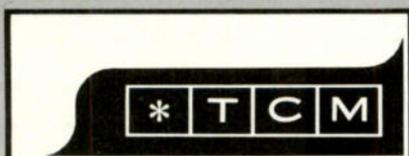
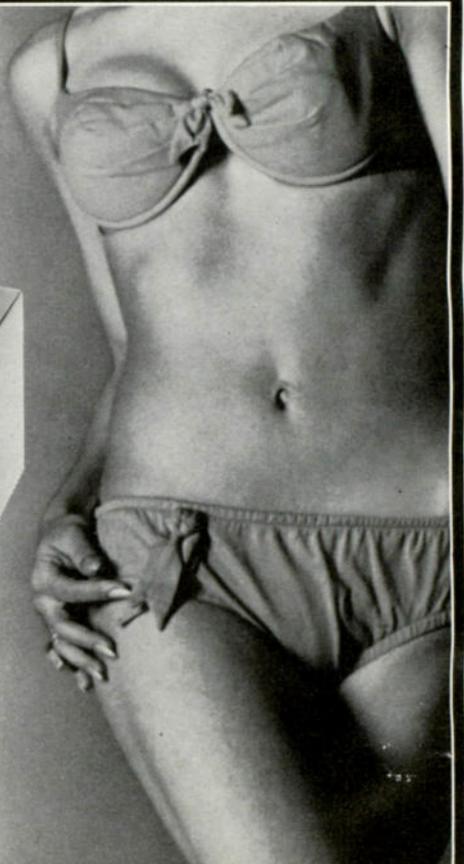
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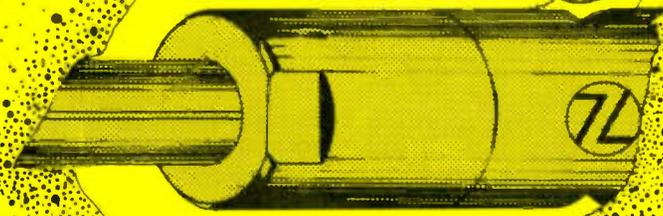
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NCTA Convention Photo Edition: Special souvenir edition published separately in August with complete photo coverage of Boston convention.

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January 1969

TV Communications

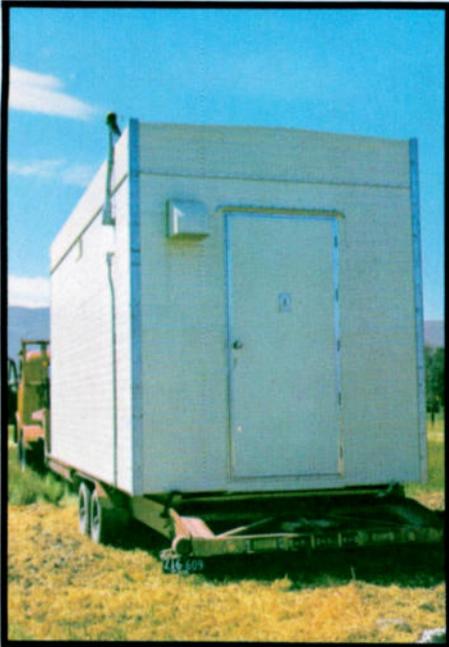
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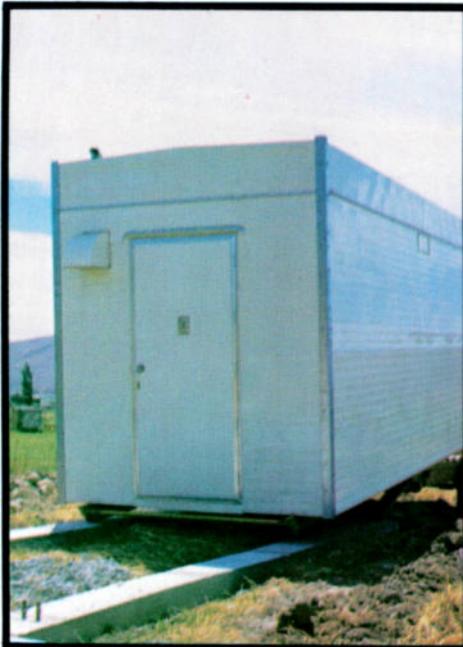
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Troubleshooting Tech Problems • Studio Lighting • Bi-directional Transmission

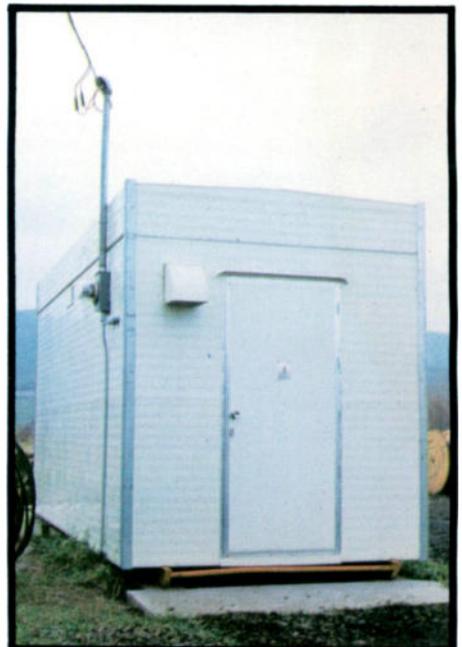
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Part Two

Basic Lighting Techniques For CATV Programming

Proper lighting is a prime consideration for the production of a first-quality cablecast. It requires careful selection of the correct lighting system and fixtures and the skill to use them well.

*By Kenneth M. Palius
and Thomas R. Myers*

A television studio lighting control and electrical distribution system includes power distribution, lighting support and connection, and control systems which permit the intensity of the lights to be varied from a remote location.

The systems proposed offer a simple approach to equipment selection. More sophisticated systems and equipment are available for installations requiring greater control and adjustment.

Since the need for free camera movement dictates that the studio floor be as clear as possible, television lighting systems are usually hung overhead on a grid.

A grid system is usually constructed of pipes which are hung from the ceiling at a height of 10 feet or more and spaced to provide even distribution of lighting fixtures over the studio floor. Lighting fixtures are

mounted on the grid pipes at a usual 45° angle with C-clamps. Power is brought directly to the grid and terminates in a series of connector strips placed at selected intervals along the grid.

For installations with very high ceilings, it may be desirable to use a counterweighted grid which permits raising and lowering the lighting fixtures. This is useful where frequent changes of large numbers of fixtures are contemplated. Experience has shown, however, that a fixed grid is adequate to meet everyday production requirements.

Power Distribution

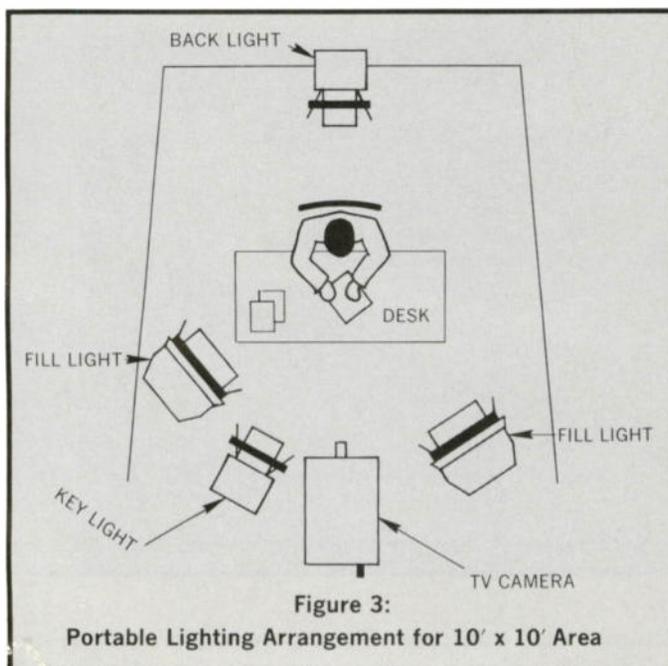
The power distribution equipment used to bring power to individual lights or groups of lights in the studio are connector strips (also called "plugging strips"). These are electrical distribution fixtures of specified lengths with pigtails extending from them. Each pigtail consists of approximately three feet of flexible power cord with a female connector on the end. Each circuit is brought back through the connector strips to a termination point, and then continued into the patch panel where it can be attached to a dimmer.

A modification of the connector strip is available for wall mounting and is called a "wall box." It provides an electrical outlet near floor level. These "wall box" circuits are terminated at the patch panel in the same way as the circuits from the connector strips.

Twenty-amp circuits are adequate for most of the lighting in the recommended studio layouts. Since cyclorama lights are usually controlled in groups, 50-amp outlets are provided for these lights.

To eliminate the inconvenience of using connector adapters, the same type of electrical connector should be used throughout the studio. Three-pin connectors are used exclusively in the recommended systems.

It is often desirable to move individual lights up



and down. For these instances, adjustable fixture hangers and pantographs are included in the systems proposals. These are easy-to-use mounting devices which are simply placed between the fixture and grid pipe. Each hanger has its own C-clamp and the fixture is attached to the bottom of the hanger.

Load Patching

Normally, it is not economically feasible to provide a dimmer for each outlet in the studio. A substantially smaller number of dimmers than outlets in the studio will satisfactorily meet typical production requirements. It becomes necessary under these conditions to provide some means for connecting a group of circuits to individual dimmers. The most satisfactory method for doing this is the use of a load patch panel.

The load patch panel provides a single location at which it is possible to interconnect the load circuits in arrangements which meet the requirements established by the program director.

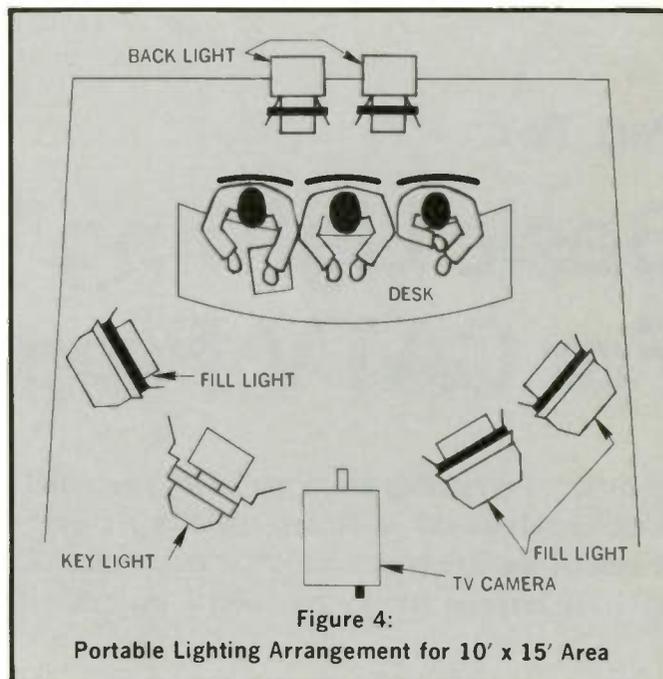


Figure 4:
Portable Lighting Arrangement for 10' x 15' Area

Table I:

Lighting Requirements for 10' x 10' Portable Studio

Quantity	Description
Back & Key Light	
2	1000W focusing "back" or "accent" lights
2	4-leaf barndoors
2	spun glass frames
2	extended holders
2	adjustable stands, extra high
3	1000W, 3200°K, 150 hr. "quartz" lamps
2	extension cables, 25 ft.
Fill/Base Light	
2	Multi-broad 1000W focusing broad
2	spun glass frames
2	4-leaf barndoors
3	1000W, 3200°K, 500 hr. "quartz" lamps
2	adjustable stands, extra high with casters
2	extension cables, 25 ft.
2	gaffer grips with 3/8 in. stud
2	light outlet and control boxes with two receptacles, 2 switches, and 25 ft. cable with parallel blade U-ground input plug
1	carrying case for light heads and accessories
1	carrying case for stands and cables
Dimmer Control Option	
2	1000W capacity portable electronic dimmers with parallel blade U-ground input and output plugs

NOTE: Total connected load of arrangement: 34 Amps @ 120V, AC DC

Table II:

Lighting Requirements for 10' x 15' Portable Studio

Quantity	Description
Back & Key Light	
2	1000W focusing "back" or "accent" lights
2	4-leaf barndoors
2	spun glass frames
2	extended holders
3	1000W, 3200°K, 150 hr. "quartz" lamps
2	adjustable stands extra high with casters
2	extension cables, 25 ft.
1	1000W focusing "key" light
1	4-leaf barndoors
1	spun glass frame
2	1000W, 3200°K, 150 hr. "quartz" lamps, frosted
1	adjustable stand, extra high with casters
1	extension cable, 25 ft.
Fill/Base Light	
3	multi-broad 1000W focusing broad
3	spun glass frames
2	4-leaf barndoors
1	adjustable stand, low w/casters
2	adjustable stands, extra high with casters
4	1000W, 3200°K, 500 hr. "quartz" lamps
3	extension cables, 25 ft.
Distribution Equipment	
3	light outlet and control boxes with 2 receptacles, 2 switches and 25 ft. cable with parallel blade U-ground input plug
1	carrying case for lights and accessories
1	carrying case for lights and accessories
Dimmer Control Option	
3	1000W capacity portable electronic dimmers w/parallel blade U-ground input and output plugs

NOTE: Total connected load of arrangement: 50 Amps @ 120V, AC DC

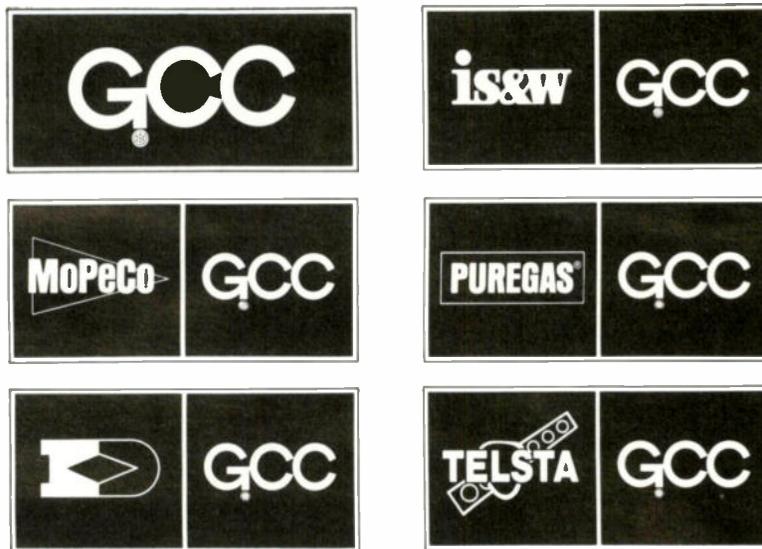
Dimming Equipment

Dimming equipment permits changing the level of light to balance the lighting effects in a scene. Further, it becomes possible to make lighting changes during a performance to supplement the actions of the performers, to affect the mood of the scene, and to change the visual emphasis.

The dimming system consists of two major elements, the dimmer rack and the control center. The

dimmer rack contains dimmer modules (which are solid-state electronic devices permitting the control

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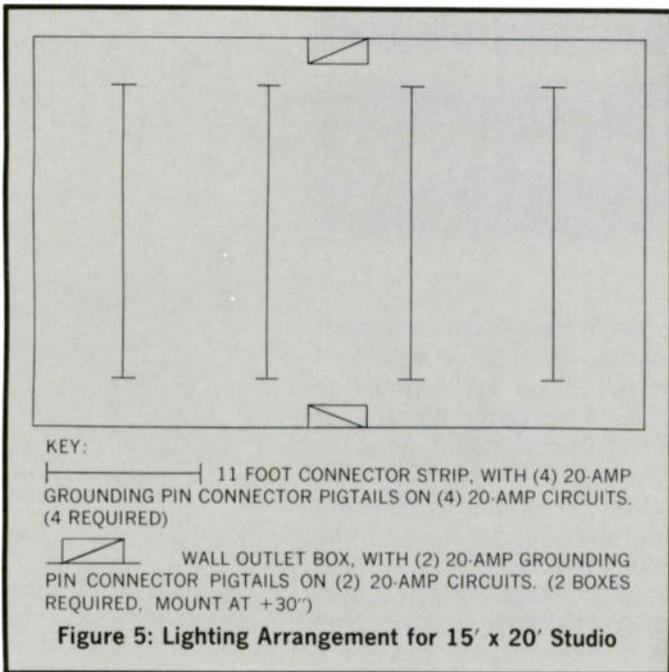
of large amounts of power with low-voltage control signals), input power connections, main circuit breaker, distribution system for bringing the input power to the various modules, and dimmer output terminations. From these terminations, the dimmer outputs are brought to the jack fields in the load patch panel.

The control center is the "lighting console" from which all lights in the studio are operated. Because low-voltage control signals are used, the control center may be placed at any convenient location in the studio.

Electronic dimmer modules are suitable for everyday service virtually without maintenance. The main power control devices on all dimming equipment recommended are silicon-controlled rectifiers.

The dimmer module contains the power control devices, a circuit breaker, and provisions for electrically filtering the output of the dimmer to eliminate radio frequency interference.

Non-dim controls are provided in the systems recommended to handle loads for which on/off control only is required. At the control center, the non-dim may be available either as an on/off switch or with switching which permits mastering groups of non-dims. The non-dim contactor is a mercury relay which is placed in the dimmer rack and terminates in the patch panel in the same way as the dimmer circuits.



Systems Descriptions

The portable lighting arrangement for a 10' x 10' area (Figure 2) is designed to provide illumination for a one-man interview setup or a small office area. It is designed so that one man can do the lighting equipment setup and then operate the camera, if necessary. It will provide a minimum level of 400 footcandles.

The portable lighting arrangement for a 10' x 15' area (Figure 3) is designed to provide illumination for

**Table III:
Lighting Requirements for 15' x 20' Studio**

Quantity	Description
Fill/Base Light	
4	multi-broad 1000W focusing broad
4	4-leaf barndoors
4	spun glass frames
4	1000W, 3200 K, 500 hr. "quartz" lamps
2	adjustable hangers
2	extension cables, 12 ft.
1	2000W soft lite, low profile
1	spun glass frame
2	1000W, 3200 K, 500 hr. "quartz" lamps
Back and Key Light	
6	1000W focusing "back" or "accent" lights
6	4-leaf barndoors
3	extended holders
3	spun glass frames
6	1000W, 3200 K, 150 hr. "quartz" lamps
3	adjustable hangers
3	extension cables, 12 ft.
Effects and Set Light	
2	1000W "set" or "fill" lights
2	extended holders
2	4-leaf barndoors
2	spun glass frames
2	1000W, 3200 K, 500 hr. "quartz" lamps
Special Equipment	
1	roll 4 ft. x 15 ft. spun glass diffusion
2	gaffer grips with 3/8 in. stud
2	3-way mounting bracket
2	adjustable stands, extra high with casters
2	extension cables, 25 ft.
Distribution Equipment	
4	batten & plugging strip assembly 11 ft. long with 4-20 Amp. pigtails (each fitted for 11 ft. long 1 1/2 in. schedule 40 pipe)
4	ceiling junction boxes for inter-connection between plugging strip terminal box and ceiling feed
2	wall outlet box with 2-20 Amp pigtails
Control Equipment (Option A)	
1	circuit breaker panel with 20-20 Amp circuit breakers for switch control of all studio circuits
Control Equipment (Option B)	
Solid State Dimming System	
1	dimmer rack containing 3-3KW dimmers, 2-3KW non-dim circuits and 1-40 Amp 3 pole manually operated circuit breaker including load patching facility with 20-20 Amp hanging load cords and circuit breakers, and 15 jacks
1	remote control panel with 3 linear controllers, 1 master controller and 2 non-dim circuit control switches, 25 ft. remote control cable and connector

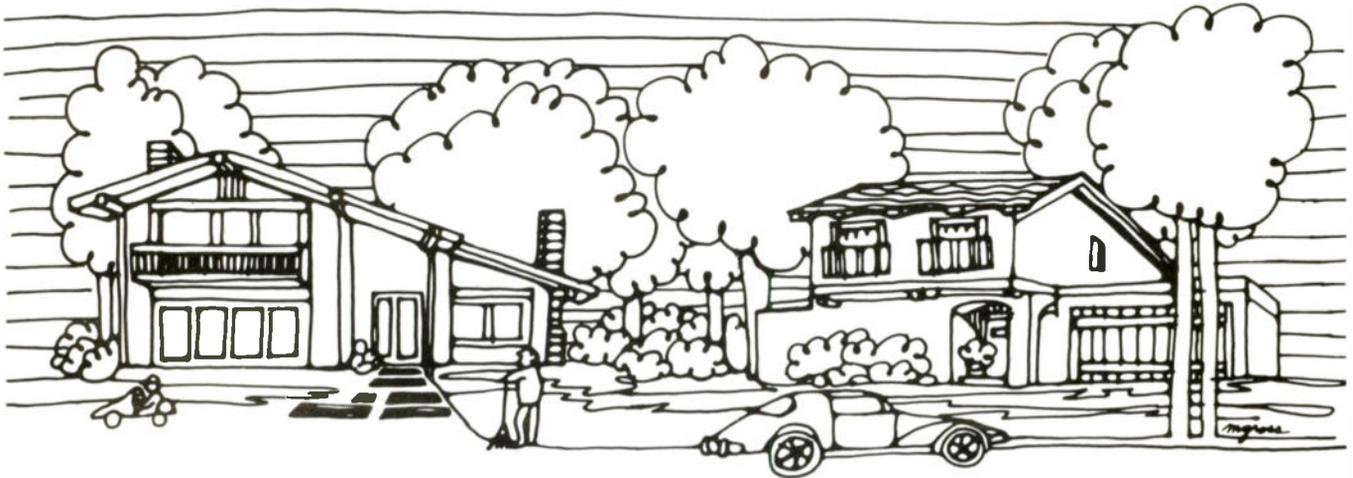
NOTE: Total connected load: 117 Amps @ 120, AC/DC

a multiple interview situation involving as many as three people. It is designed so that one man can do the complete setup and establish a 400-footcandle level of illumination.

The 15' x 20' studio (Figure 4) will permit the simplest forms of cablecasting production to be presented. One set area may be accommodated in this area. Three separate set areas may be accommodated in the 20' x 25' studio (Figure 5).

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If you are installing a new CATV system or extending an old one, remember the Valencia story. NABCAT was pioneering the first new dual cable concept. And they chose Plastoid. Find out all the reasons why.

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Trouble Shooting

your technical problems



By Archer S. Taylor

QUESTION: *I have had some discussion on the merits of matching transformers, and there seems to be two schools of thought of whether they should be isolated or not. Your opinion on same would be appreciated.*

Another controversy is going on between a couple of us as to grounding the drops, it seems that in most cases telco requires same?

ANSWER: I am not aware of a school of thought opposed to AC/DC isolation in set matching transformers.

The current revised edition of the National Electrical Code, published September, 1968 specifies grounding the outer conductor of house drops at the point of entry. The NEC is generally enforced through municipal authorities, and compliance is usually one of the obscure terms of CATV franchise documents and telephone agreements.

QUESTION: *Underground cable and component failure are fast becoming a major CATV "Headache". Short of the shovel, what do you recommend as being adequate, test equipment and method of its use, in locating and correcting such problems?*

ANSWER: The two useful techniques for cable fault location are: (1) TDR, the method which bounces a pulse from a cable discontinuity and measures the delay time for the pulse to go out and back; and (2) some form of metal locator, the best of which utilize an induction loop probe above ground to detect an audio frequency signal applied to the cable sheath. Jerrold is now marketing an English made fault finder using the TDR principle, and Hewlett-Packard has a good induction type fault locator. Both have their place; neither is entirely satisfactory alone. Both are easily portable. Be prepared to part with close to \$1,000 each, however. After you find the trouble, there is no way to avoid digging, unless you were smart enough to provide a manhole or pull-box right where the fault is located, or conduit good enough to allow pulling cable.

QUESTION: *What is the best way to convert, in mid-system, channel 3 to channel 7 and 90 m/h FM to channel 3 and provide 60 dB outputs on all channels from 3 to 7?*

ANSWER: The only equipment I know of at this time which could be used to provide close to 60 dBmV output level on a number of channels at mid-system would be some type of single channel band-pass amplifier. One possibility would be strip amplifiers; another would be modified heterodyne signal processors, one of which could also provide the required conversion of channel 3. A custom up-converter would be required to convert the FM radio channel to TV channel 3. This is a special problem requiring careful study and design, details of which would be beyond the scope of the simple answer possible in this column.

QUESTION: *What is the maximum number of feet that 30 volts 12 amps of AC power can be fed over 4930 cable and arrive with enough voltage to satisfactorily operate a transistor amplifier? What are the symptoms of an amplifier that is underpowered?*

ANSWER: There is no general answer to your question. The voltage delivered to any amplifier may be calculated, using Ohm's Law and the specific facts of a particular layout. Different types of amplifiers have different current and minimum voltage requirements, usually stated in specification sheets. Loop resistance of coaxial cable is specified by the manufacturer in technical data sheets.

The most common symptom of under-voltage is hum bars on the receivers served by the starved amplifier. Sometimes the hum is so severe as to also cause tearing of the picture.

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

Relating NCTA Equipment Specs To CATV System Design

CATV equipment performance specifications for amplifier distortion and noise level have been determined by the NCTA Standards Committee. Careful application of these criteria can help you evaluate the operating characteristics of your system.

*By G. C. Kleykamp
Director Marketing/Engineering
Ameco, Incorporated*

Industry standardization, particularly with respect to CATV system component specification, has been desired by most CATV system operators for some time. Two important standards which relate to amplifier characteristics have been prepared by NCTA—and others are to be added later. The first is a standard on CATV amplifier distortion characteristics and the second is on noise level in cable systems.

After lengthy study, the NCTA Standards Committee decided that a standard for amplifier "output capability" was impractical. It was determined that specification of output levels for a single amplifier at -57 dB combined distortion can lead to significantly incorrect interpretation in practical CATV system application. In other words, many amplifiers "derate" on a two-for-one basis within a reasonable range of their recommended operating level, but the cross-modulation may not decrease 2 dB for each 1 dB reduction of output level at 15 to 20 dB above the normal operating level.

The Committee determined that the concept of "output capability" appeared to be obsolete and that the NCTA Standard should, therefore, describe methods for measuring and specifying amplifier distortion under conditions as close as practicable to actual recommended operating practices.

Two forms of distortion are recognized by the NCTA Standards Committee as "acting to limit the useful output of a CATV amplifier." These two forms of distortion are cross-modulation and spurious signals. Both ratios are to be specified at recommended operating level and tilt.

Cross-modulation is measured with all visual carriers synchronously modulated with a symmetrical 15.75 kHz square wave and a C.W. reference signal of equal amplitude on the desired channel. It is necessary to use test equipment capable of measuring about 90 dB down in order to test individual amplifiers at recommended operating level. Each channel is measured, and the worst case is the ratio to be specified for the amplifier. This cross-modulation testing method results in approximately 6 dB worse conditions than are actually expe-

rienced on an operating system due to the non-synchronous nature of the various channel signals.

The use of sine wave modulation, 15.75 kHz pulse modulation, 15% r.f. carrier reference, etc., will result in cross-modulation ratios which will differ from that obtained by the NCTA method. Cross-modulation measurement using only two channels has also been advocated, but the results are not considered as accurate or reliable as the NCTA method inasmuch as it involves a calculated deration for more than two channels based upon amplifier theory.

The amplifier distortion ratio also includes a specified spurious signal ratio. This is defined as . . . "the ratio of the amplitude of the strongest spurious signal, within the limits of 1 MHz below and 4.2 MHz above the visual carrier frequency to the amplitude of that visual carrier."

A spectrum analyzer having a high order of selectivity is required to detect and measure the spurious signals inasmuch as most spurious signals will fall very close to the carrier frequencies. In performing the measurement, considerable care is necessary to eliminate any spurious signals from the test signal source. Bell Telephone Laboratories has included a procedure for measuring 3rd order beat products in their amplifier specifications KS-19925. The procedure requires considerable test equipment including three modulators (channels 9, 11 and 13) and a sensitive wave analyzer for measurement.

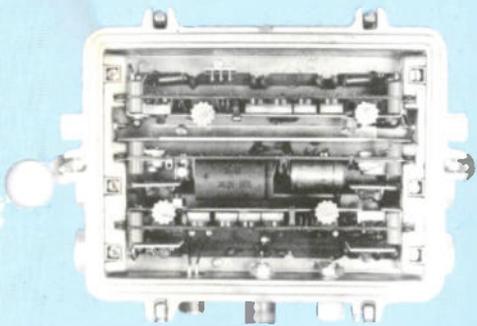
The NCTA Standard on "Noise Level in Cable Systems" specifies methods for measuring system noise levels in head-ends, amplifier cascades, etc., and the calibration necessary for accurate noise level measurement. The basic method involves the establishment of a "standard" amplifier (one of known noise figure and gain) and the use of this "standard" to determine the characteristics of the signal level meter used for the system noise level measurements.

The reason for this rather elaborate calibration procedure is that signal level meters do not accurately indicate noise levels directly. This is due to two characteristics of signal level meters:

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1969

PRODUCT DIRECTORY

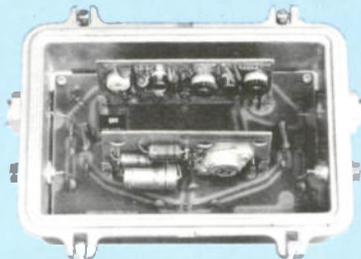


CETA•2/22
CEBA•2/19
CEBA•2/27
CETC•2/22
CETD•2/35

Universal housing and interchangeable plug-in modules function as high-quality Trunk Amplifier, high-gain Bridger Amplifier, low-gain Bridger Amplifier, Trunk Combination amplifier or Terminal Distribution amplifier. Housings accommodate any 5/8"-24 connectors with or without seizing of center conductor. Glass-epoxy circuit boards slip into guide slots in cast aluminum heat sinks. Trunk amplifiers feature Temperature Level Control (TLC) which senses ambient temperature and adjusts gain to compensate for changes in cable attenuation. High-efficiency "switching mode" power supply module extends cable-powering range. Warranted two full years against defects in materials and workmanship.

CETA•2/22

Bandwidth (flat within $\pm 1/2$ dB) † 50 - 250 MHz
 50-220 MHz
 Maximum gain 25dB
 Gain control range (Ch. 13) 6dB tilt comp.
 Slope control range (Ch. 2) 5dB
 Input pad range 0-3dB
 Maximum output* 40dBmV
 Noise figure 10dB
 Return loss in/out 18/15dB
 Test points -20dB \pm 1dB
 Powering 22-32 VAC

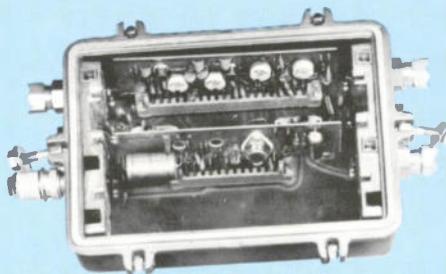


CELE•1/20 E.B.

Line extender in the compact 8" x 6" housing. Now available with the bandwidth extended to 250 MHz, internal center conductor seizing, and a range of plug-in input pads. This amplifier has a gain of 20dB and may be aligned for any combination of cable and flat loss from 20dB cable down to 0dB cable 12dB flat.

Bandwidth (flat within $\pm 1/2$ dB) 50-250 MHz
 Maximum gain 20dB
 Gain control range (Ch. 13) 4dB tilt comp.
 Slope control range (Ch. 2) 6dB
 Input pad range 0-3-6dB
 Maximum output* +41dBmV
 Noise figure 13dB
 Return loss in/out 16/10dB
 Test points -20dB
 Powering at 22-30 VAC 200mA

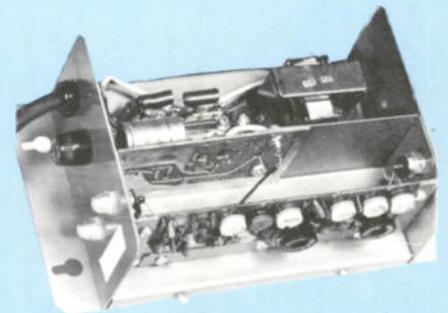
Also available in pedestal configuration.



CELA•2/22

22dB line amplifier, suited to both trunk and feeder applications. Features modular construction, full wave power supply and Cascade Temperature Level Control. Housing accommodates 5/8" x 24 connectors with or without seizing of center conductor. The CELA 2/22 DT version includes a third module feeding four directional tap outlets in the base. A plug-in pad provides for adjustment of tap levels. The CELA 2/22 P is the basic amplifier in a smaller housing with input and output connectors at the same end, and can be mounted in pedestal housings with inside diameters down to 6 1/2".

Bandwidth (flat within $\pm 1/2$ dB) † 50 - 250 MHz
 50-220 MHz
 Maximum gain 25dB
 Gain control range (Ch. 13) 6dB tilt comp.
 Slope control range (Ch. 2) 5dB
 Input pad range 0-3-6dB
 Maximum output* +42dBmV
 Noise figure 10dB
 Return loss in/out 16/12dB
 Test points -20dB
 Powering at 22-30 VAC 230-250mA



CEDA•2/40 EB

The CEDA-2/40 EB is a flexible, versatile, solid state, replacement for tube and other older amplifiers. Developed to satisfy a requirement that cable loss could be exchanged for flat loss capabilities, the CEDA-2/40 EB is not only recommended for apartment house, hotel and similar applications, but has found a very useful place on the CATV equipment test bench as a post amplifier. Mains powered employing silicon transistors in a high-quality four-stage amplifier.

Bandwidth 40-240 MHz
 Maximum gain { 41dB (flat)
 30dB (cable)
 Gain control range 10dB tilt comp. or flat
 Maximum output* +43dBmV
 Noise figure 9dB
 Return loss in/out 18/13dB
 Test points -20dB
 Powering at 117V 11.7w

CEDA•3/35 E.B.

The CEDA 3/35 E.B. Distribution Amplifier is in an all-weather cast alloy housing, coated with highly resistant polyurethane. Cable powered, the CEDA 3/35 E.B. features extended bandwidth and outstanding alignment capabilities. CEDA 3/35 E.B. is available with mains powering (optional extra). Ideally suited to unusual system requirements.

Bandwidth (flat within $\pm 1/2$ dB) 40-250 MHz
 Maximum gain { 38dB (flat)
 30dB (cable)
 Gain control range 10dB tilt comp. or flat
 Maximum output* 43dBmV
 Noise figure 9dB
 Return loss in/out 18/13dB
 Test points -20dB
 Powering at 22-30 VAC 270-300mA

Also available in pedestal configuration.

*With 12 channel input, synchronously modulated, maximum output is the level at which cross modulation on the worst channel is -57dB.

† Available early in 1969.



CAT-3/5

A line powered active tap used in situations where the line level is low and needs boosting at tap points. This compact unit provides moderate gain (or loss) at feeder tapoff, and provides amplified signal to four outputs.

Bandwidth (flat within ± 1 dB)	50-220 MHz
Maximum gain	7dB
Gain control range (Ch. 13)	17dB
Slope control range (Ch. 2)	3dB
Input pad range	16dB
Maximum output*	25dBmV
Return loss in/out	16dB
Peak power requirements	100mA, 28Vrms (sinusoidal) 3.5W 30mA, 20Vrms (sinusoidal) 0.9W
Isolation between taps (Ch. 13)	15dB
Return loss, taps	16dB



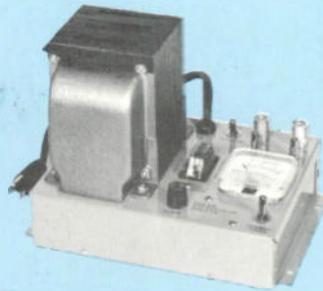
CELX-1/15

Low-cost line extender features 2-stage circuit and full-wave power supply on glass-epoxy board.

Bandwidth (flat within ± 1 dB)	50-220 MHz
Maximum gain	18dB
Gain control range	8dB
Slope control range	5dB
Maximum output*	+30dBmV
Noise figure	12dB
Return loss in/out	16/10dB
Powering at 20-28 VAC	80-100mA

Also available in pedestal configuration.

*With 12 channel input, synchronously modulated, maximum output is the level at which cross modulation on the worst channel is -57 dB.



CEPS-3

A heavy-duty 30-volt AC power supply which provides surge and overload protection for itself and for the system which it powers. A fuse, self-resetting thermal breaker, neon transient suppressor and self-healing Thyrite lightning suppressor afford protection to both primary and secondary circuit. Output current is read on the built-in ammeter. Primary circuit includes RF filtering and double-pole switch. 5- and 10-amp models are offered. Available with or without housing.

Input: 117 volts nominal, 60 Hz.

Output: CEPS-3/5—30 VAC, 5A.

CEPS-3/10—30 VAC, 10A.

Meter: 0-10 amp, push to read.

Insertion loss: .25dB max., 50-252 MHz.

Return loss: 25dB, 50-252 MHz.



CEPI-2

The CEPI-2 is a unit used to insert power into a cable at any convenient point without any degradation of the signal. Has a very low insertion loss and high return loss and can be used to send power in either direction or both directions if desired (60-250 MHz).

Thru Loss
.25dB (max.)

Return Loss
20dB (min.)

CEDC-2

For insertion in trunk and feeder lines where an unequal split is needed. These units have High Return Loss and Directivity to prevent degradation of signal from ghosting. (50-250 MHz)

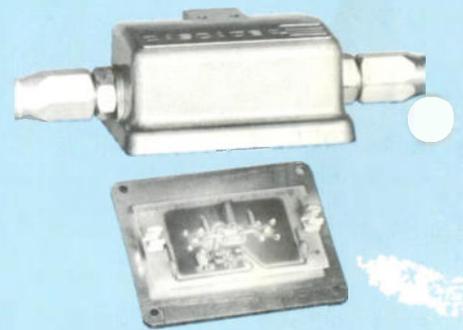
Value (dB)	Insertion Loss (dB)	Directivity	Return Loss In, Out & Tap
8 \pm 1	1.5 (max.)	17 (min.)	20 (min.)
12 \pm 1	1 (max.)	17 (min.)	20 (min.)

CELS-2

The CELS-2 is a line splitter which provides an equal output to two trunk or feeder lines. Input and Output return losses and Tap to Tap isolation are high to prevent ghosting.

Maximum Insertion Loss	Tap to Tap Isolation	Return Loss In	Return Loss Out
35dB	20dB (min.)	18 (min.)	20 (min.)

Also available in pedestal configuration.



CEDT-3

There are several different types of plug-ins in this directional tap set. These are the two output and four output directional tap modules and a no-output pretap module. These modules are also available with internally terminated through lines for use at the end of a distribution line and eliminates the need for an external terminator.

The directional tap modules have high return loss, high directivity and high tap to tap isolation.

Specifications for the CEDT-3 with four, two or no customer tap-offs, with or without terminated through line are given below. (All values are given in dB.) (50-250 MHz).

Value	Insertion Loss	Tap to Tap Isolation	Directivity	Return Loss In	Return Loss Out
12 \pm 1	2.5	17	20	18	18
16 \pm 1.5	1.5	17	18	20	20
20 \pm 1.5	1.0	17	18	20	20
24 \pm 1.5	1	17	15	20	20
28 \pm 1	.75	20	15	20	20
32 \pm 1	.75	30	10	20	20
No Tap	Nominal 1	N/A	N/A	20	20

CEDW-1



Wallplate coupler features high isolation and directivity, and accurate impedance match to eliminate ghosts and beats in multiple dwellings. Maximum peak to valley response deviation over 40-250 MHz bandwidth is .50dB. Circuitry is on etched glass-epoxy board, mounted on plastic outlet cover. Tap values from 8 to 28dB (± 1 dB) are available.

Model	Tap Slope (max)	Loss (max)	Return Loss Line	Return Loss Tap	Directivity (min)
CEDW-1/8	.5dB	1dB	20	12	14dB
CEDW-1/12	.5dB	.5dB	22	16	18dB
CEDW-1/16	.5dB	.5dB	22	18	18dB
CEDW-1/20	1dB	.5dB	22	18	16dB
CEDW-1/24	1dB	.5dB	22	20	16dB
CEDW-1/28	1dB	.5dB	22	20	16dB

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January 1969

(1) The effective bandwidth, being in the order of 300 to 600 kHz, is generally much less than 4 MHz. Inasmuch as the noise power is proportional to bandwidth, the meter will generally indicate a low reading. This error will vary from meter to meter—even though the meters are of the same type and made by the same manufacturer. For example, a meter having a bandwidth of 600 kHz reads low by 8.2 dB ($10 \log 4/0.6 = 8.24$) and a meter having a bandwidth of 300 kHz reads low by 11.25 dB.

(2) The signal level meter detector is generally designed to indicate the sync peak value rather than the rms level of the noise. This results in the meter reading higher than it should. Also, as the detector is generally more efficient at higher signal levels, the meter will usually read higher at full scale than at the -10 dB point.

The bandwidth correction generally has greater effect than the detector correction, so the correction factor is usually +3 to +5 dB, with the exact amount determined by the position of the needle on the meter scale. Although the exact correction factor must be determined in each case by calibration, typical values are as shown in Table I.

NEEDLE POSITION ON SCALE	INDICATED LEVEL (dBmV)	CORRECTION FACTOR (dB)
+10	-20	+3.6
+5	-25	+3.9
0	-30	+4.3
-5	-35	+5.4
-10	-40	+6.4

The cable television system is considered as consisting of sub-systems as follows:

- (1.) Antenna site signal processing and control center, or head-end system,
- (2.) Transportation system, consisting of the transmission line from the antenna site to the distribution system, or hub, and
- (3.) Distribution system, consisting of:
 - (a) Trunk lines, and
 - (b) Feeder lines

Other parameters which affect the quality of the signals, but which are not a part of the cable television system, include the television studio and transmission equipment as well as the subscriber's television receiver. Although this may seem obvious, it should not be overlooked as many customer complaints—and quite a few system operator complaints as well—are a result of such things as a transmitter "glitch," poor video tape of camera output, inadequate receiver adjacent channel rejection and overload characteristics.

The head-end system is, perhaps, the most critical of the various sub-systems inasmuch as the performance here affects the entire system. Signal-to-noise ratio, spurious signal ratio, color distortion (differential gain and differential phase), output level control and cross-modulation are parameters which require close atten-

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tion. Relating the various equipment or electronic component specifications to an overall head-end system performance requires complete information with respect to the equipment specifications as well as how they are combined and operated.

Although most system operators do not have the test equipment required for measuring color degradation, cross-modulation, or spurious signal ratio, they can calculate the effect of ideally combined units to estimate the performance of the complete head-end system. The signal-to-noise ratio of a head-end system may be calculated from the equation:

$$S/N = L_o \cdot (N_1 + F + G)$$

where L_o is the actual output level of the amplifier or active device

N_1 is the thermal noise input level (-59 dBmV at 70° F)

F is the amplifier noise figure

G is the operating gain of the amplifier

All quantities in the equation are expressed in decibels.

For an Ameco Channeleer Solid-State Heterodyne Signal Processor the following example illustrates the method:

$$L_o = +54 \text{ dBmV}$$

$$N_1 = -59 \text{ dBmV}$$

$$F = 7 \text{ dB}$$

$$G = 54 \text{ dB (assumes a 0 dBmV input level)}$$

$$S/N = +54 - (-59 + 7 + 54) = 54 - 2 = 52 \text{ dB}$$

The actual output S/N ratio will be less, as the degradation of the television transmission has not been considered above.

Where the S/N ratio of the received signal (or head-end system input) can be determined or estimated it can be considered as a separate system in tandem with the head-end system. In combining two system S/N ratios the difference between the two ratios in dB is used to determine the reduction effected in the lower of the two ratios. Table II may be used to determine the dB quantity to be deducted from the lower of the two S/N ratios.

DIFFERENCE (dB)	dB TO BE DEDUCTED
0 to 1.5	3
1.5 to 2.5	2.5
2.5 to 4	2
4 to 6.5	1.5
6.5	1
9	0.5
10	0.4
OVER 15	0 to 0.2

For example, if it is determined that the off-the-air signal received has a 52 dB S/N ratio and the head-end system has a 52 dB S/N ratio, the difference is 0 dB and the dB to be deducted as shown in Table II is 3 dB. This would result in a 52 minus 3, or 49 dB S/N ratio at the output of the head-end system.

Similar calculations may then be made for the trans-

portation system, trunk system and distribution system—combining these system S/N ratios in the same manner to determine the S/N ratio at the subscriber's TV set. For cascaded amplifier systems with similar amplifiers—i.e., amplifiers having the same noise figure, operating level and gain—the following formula is used:

$$S/N = L_o \cdot (N_1 + F + G) \cdot 10 \log_{10} n$$

Where n = number of amplifiers in cascade and all other variables are as defined above. An article by J.E. Hickman, (*TV Communications*, October, 1968) contains a complete explanation of this method. Copies of the article, entitled "Relating Equipment Specifications to System Specifications in CATV System Design" are available from Ameco, Inc.

In that article, a system's cross-modulation ratio is given by the following equation:

$$CM_s = CM_r + 2(L_o - L_r) + 20 \log_{10} n$$

where CM is the cross-modulation ratio at the recommended output level

L_o is the actual output level

L_r is the recommended output level

n is the number of cascaded amplifiers

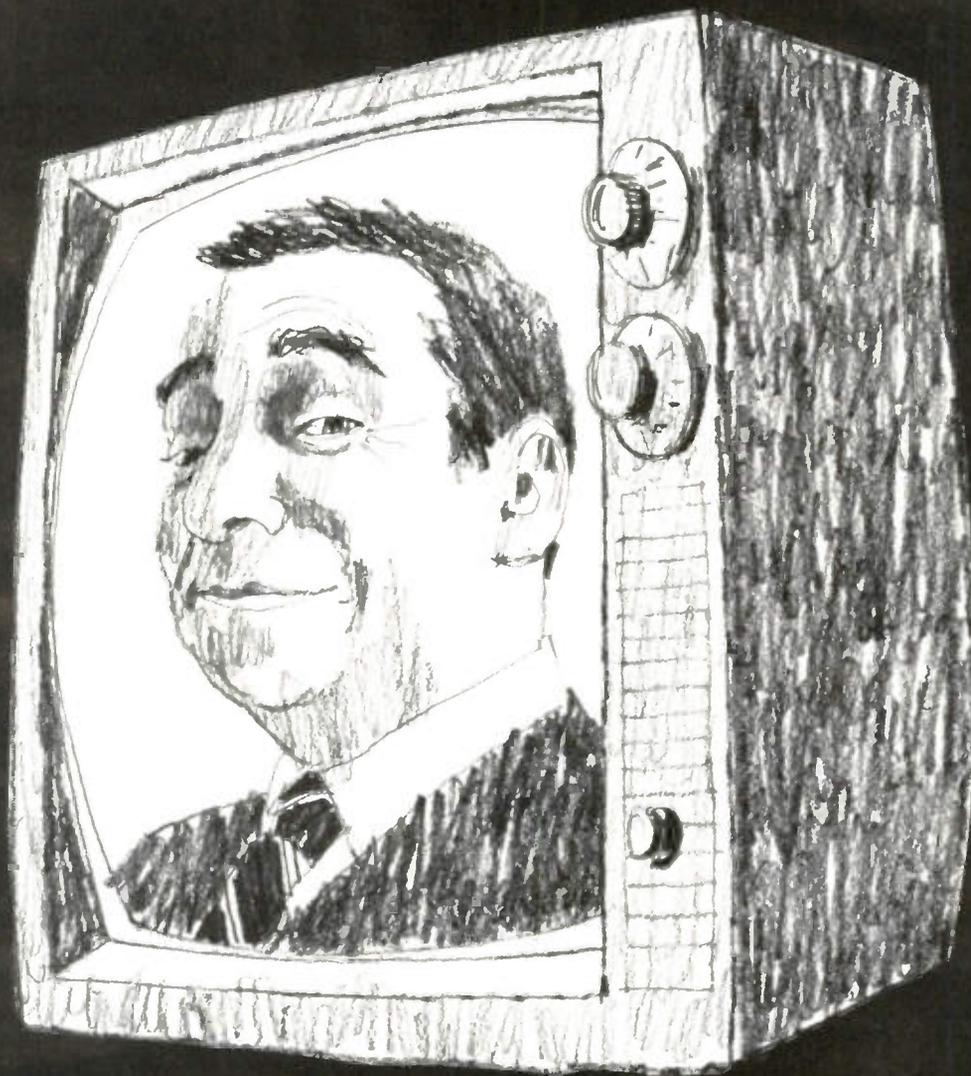
All quantities are expressed in decibels.

As cross-modulation products add on a voltage basis, combining two system's ratios requires a different table from that used for the S/N ratios above. Table III may be used for determining the degradation of the lower of two cross-modulation ratios when two systems are combined.

DIFFERENCE (dB)	dB TO BE DEDUCTED
0	6.0
1	5.5
2	5.1
3	4.7
4	4.3
5	3.9
10	2.4
15	1.4
20	0.8
25	0.5

The NCTA Standards Committee has provided a basis for amplifier specifications with respect to noise and cross-modulation, which may be conveniently related to system performance. It should, however, be emphasized that the amplifier specifications must be known for recommended operating levels and gain, and that the amplifier behaves in accordance with a square law cross-modulation characteristic in the anticipated operating range. Any unusual variation of the amplifier's noise figure with change of gain must also be considered—particularly in the case of automatic gain control amplifiers. However, with reasonable precaution in the calculations, and with the use of amplifier specifications as described above, the CATV system operating characteristics can be determined to the degree of accuracy required in most cases. (TV)

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Bi-directional Transmission For CATV Installations

The inherently wide bandwidth capability of coaxial cable systems has led industry planners to consider the possibilities of two-way transmission. The following is a discussion of some of the problems of and methods for bi-directional transmission.

*By Daniel Lieberman
Staff Consultant, Vikoa, Inc.*

The trend of CATV system amplifiers into higher channel capacity has permitted these systems to more fully utilize the inherently wide bandwidth capability of coaxial cable systems. This has led to the anticipated use of the CATV system for transmission of information other than that of televised programming.

The CATV system utilizing this concept becomes a wideband communications link providing a multitude of communications services operating at fixed fees to subscribers or on a leased basis to communications users. The search for channels to fill already vacant frequency space in the cable system for the newly developed extended channel amplifiers would no longer pose problems, since the request of new communication links for data transmission would probably by itself fill these vacant channels. The anticipated revenues from a performing system would greatly add to existing revenues.

Figure 1 describes the simple basis of a bi-directional transmission system. Channels of one type are originated at one end of the system, and received at the other end, while other channels are originated at the latter end and received at the former. Although the channels contain different information, channel characteristics in one direction can be similar to channel characteristics in the other

direction, i.e., they can either be of the same frequency, can share common amplifiers or can totally share a common transmission medium.

Factors which could limit the potential of a particular system must be analyzed in order to evaluate the merits of a bi-directional system. Some of these factors are:

(a) Cross-talk—Signals of channels transmitted in one direction can couple to signals of channels being transmitted in the other direction, thereby providing disturbing signals to the latter channels.

(b) Singing—If cross-talk occurs so that the cross-talked signal returns to its original transmission path, a condition called "singing" can occur. In this condition, the channel can interfere with itself by either distorting its own signal information or by providing unwarranted effects, such as ghosting, etc. to its own transmission.

(c) Echo—If discontinuity arises in the transmission medium or improper terminations are used, signal reflections can occur. These reflections then appear in the opposing signal path and can result in conditions similar to that which result from "singing" or cross-talk.

(d) Reduced Spectrum Utilization—Some bi-directional transmission schemes can retain full use of available spectrum. In other words,

channels in one direction can be of the same frequency as channels in the opposing direction. In most schemes, however, the total available bandwidth must be divided between the two directions of transmission. The extent of this reduction in spectrum utilization must be weighed against advantages, such as cost reduction, which result from the particular scheme.

Design of a bi-directional system requires particular attention to the factors described above. It is important that these factors maintain conditions to levels which do not serve to degrade quality transmission.

Bi-directional transmission is not easily achieved without additional costs. These costs are either financial when additions to existing plant are required or occur as penalties resulting in compromise of system design objectives. Trade-offs between additional costs and specification compromises become necessary when a communications system is readapted for bi-directional transmission. Therefore, requirements of the bi-directional system for achieving specific design objectives must be carefully defined before a particular method can be examined.

The design objectives of a 2-way system utilizing the CATV plant are essentially to:

(a) Provide some 2-way communication between certain subscribers of the system.

(b) Allow program origination at points remote from the head-end.

(c) Permit correspondence between trunk points and the CATV head-end.

In accomplishing these objectives, the bi-directional system is required to:

(a) Maintain the minimum acceptable specifications for distortion, cross-modulation, signal-to-noise ratio, interference, echo effects, etc. on all communication channels including those of television.

(b) Prevent excessive cross-talk or "singing" between the separate path directions of the systems.

(c) Permit access to the system at any point of the trunk line.

(d) Not decrease appreciably the number of channels which the system could normally handle according to its bandwidth limitation.

(e) Not degrade appreciably the reliability of the communications network.

(f) Not be prohibitive in cost.

Several bi-directional transmission methods are available which can meet these requirements. These methods will be examined in detail, and their advantages and limitations discussed.

Multiplexing

Multiplexing of channels, for separating them in a manner so that these channels do not interfere with each other, can be accomplished by physical separation (space-division multiplexing), by time separation (time-division multiplexing) or by separate frequency allocation (frequency-division multiplexing). A good example of the latter is the interleaving of color information upon the normal television black-and-white channel.

(a) Space-Division Multiplexing—This arrangement is shown in Figure 2. Each transmission direction has its own cables and amplifiers so that transmission isolation between opposing directions is almost totally achieved. The extent of this isolation depends upon the radiation and leakage characteristics of the physically separated system and the distance between the systems. Extremely low cross-talk can thus be achieved by this method. In addition, "singing" is minimized, and echo effects do not appear on oppos-

ing transmission paths.

This type of scheme thus minimizes the problems of a bi-directional system. It also allows the separate paths to contain the same frequency allocations, thereby maximizing use of total available spectrum capacity. It also can allow for full-duplex communication between subscribers.

From a technical stand-point, space-division multiplexing is the most desirable method. Its limitations are those of size and cost. Since no sharing of common facilities occurs in this arrangement, the cost of the system and additions to its cable plant when adapted to bi-directional use become double that of a one-way system.

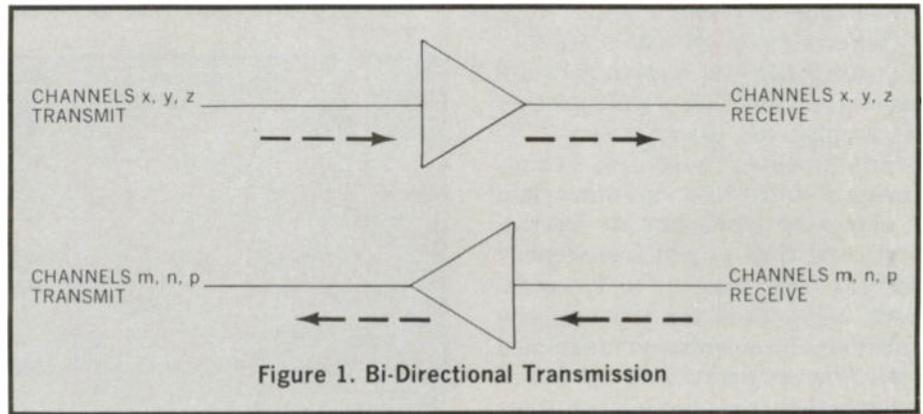


Figure 1. Bi-Directional Transmission

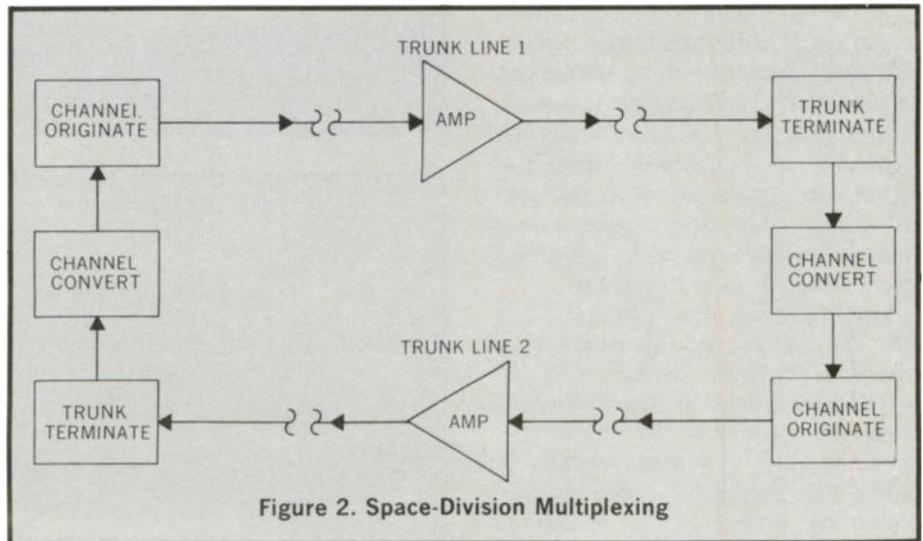


Figure 2. Space-Division Multiplexing

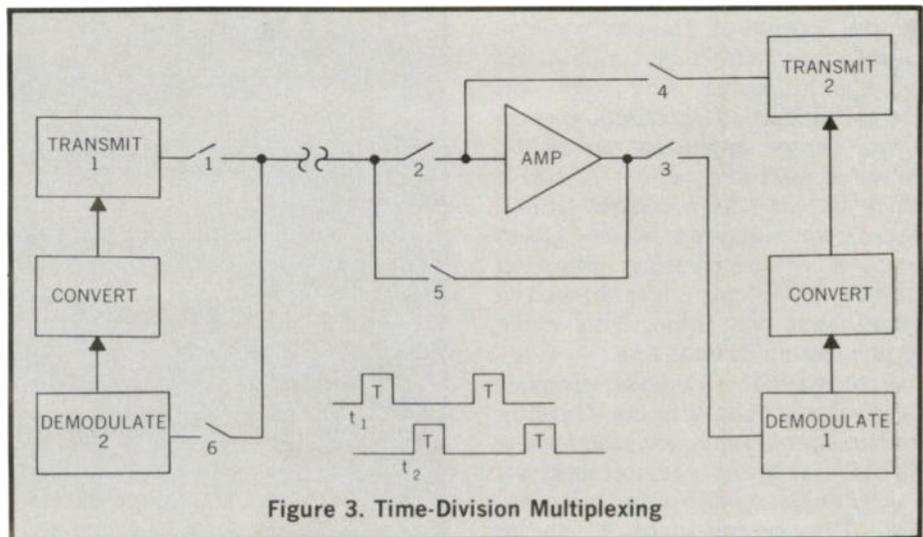


Figure 3. Time-Division Multiplexing

(b) Time-Division Multiplexing— This arrangement, which is essentially a sampled data modulation process, is shown in Figure 3. Although it is a theoretically possible system, its use at the high frequencies of the cable system is limited by present state-of-the-art techniques of time sampling. It is described here only as a hypothetical case of its application to bi-directional cable systems.

Referring to Figure 3, at time t , transmitting and receiving equipment of one direction of transmission is sampled for period interval T . Transmission, therefore, occurs during a stated interval from origin 1, along the trunk line to destination 1. At time t , which is slightly delayed from time $t + T$, equipment being used for the opposite direction of transmission is sampled for a different period interval T . The result is that transmission can occur in two directions in common facilities, with these transmissions occurring at different times. Crosstalk and "singing" can be somewhat prevented if the sampling intervals do not overlap. However, echo effects are still common since the signal can appear as a delayed signal whose time appearance could then coincide with the sampling interval of its new direction.

Time-division multiplexing thus has the advantage of permitting common facilities to be used for both directions of transmission. However, for use at VHF frequencies such a system would require: (1) Sampling rates in the order of about $1gHz$ which is beyond the present state of the art; (2) Trunk amplifiers operating at the sampling frequency since signals are effectively modulated by the sampling frequency; (3) Demodulation of the sampled spectrum before operation on it by terminal equipments; (4) A stable clock to serve as a central timing source for sampling pulses; (5) A method of distributing sampling pulses correctly synchronized throughout the cable. This could require an additional line.

From the above considerations, it is obvious that a time-division multiplexer scheme, adapted for use at VHF, is only of academic interest.

(c) Frequency-Division Multiplexing— This arrangement is similar

to a split-band amplifier. It maintains the same cable plant without requiring additions to it. This results in reduction of available channels in one direction since the same frequency allocations cannot be used in both directions. Some additional trunk equipment becomes necessary in this arrangement. There are several means of implementing this method.

Figure 4 describes one of these

means. In this scheme channels in direction 1 occupy a frequency band different than that of channels in direction 2. At the inputs and outputs of each amplifier diplex filters serve as directional devices to steer signals in the directions shown in Figure 4. Signals in direction 1, which occupy frequency band 1 are blocked by filters 2A and 2B, but are permitted to pass through filter 1A, and be amplified. This band is

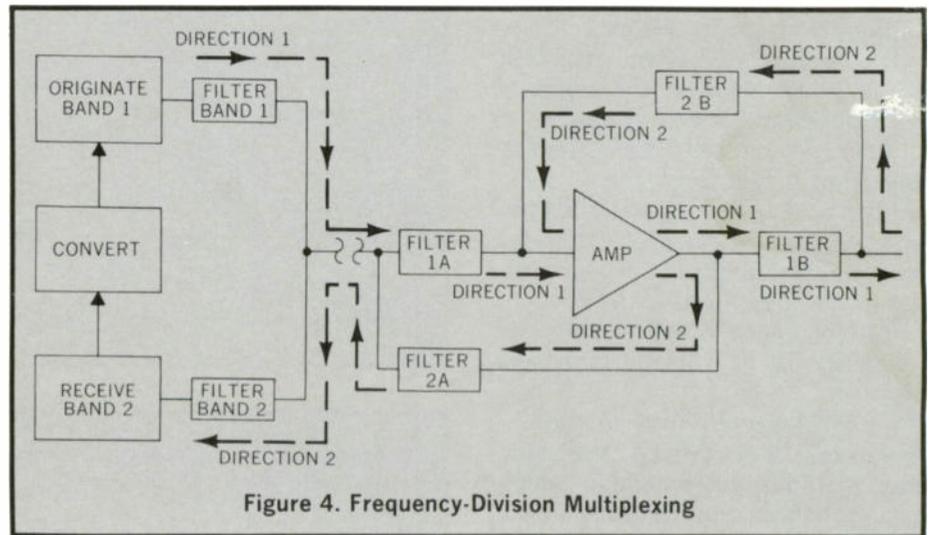


Figure 4. Frequency-Division Multiplexing

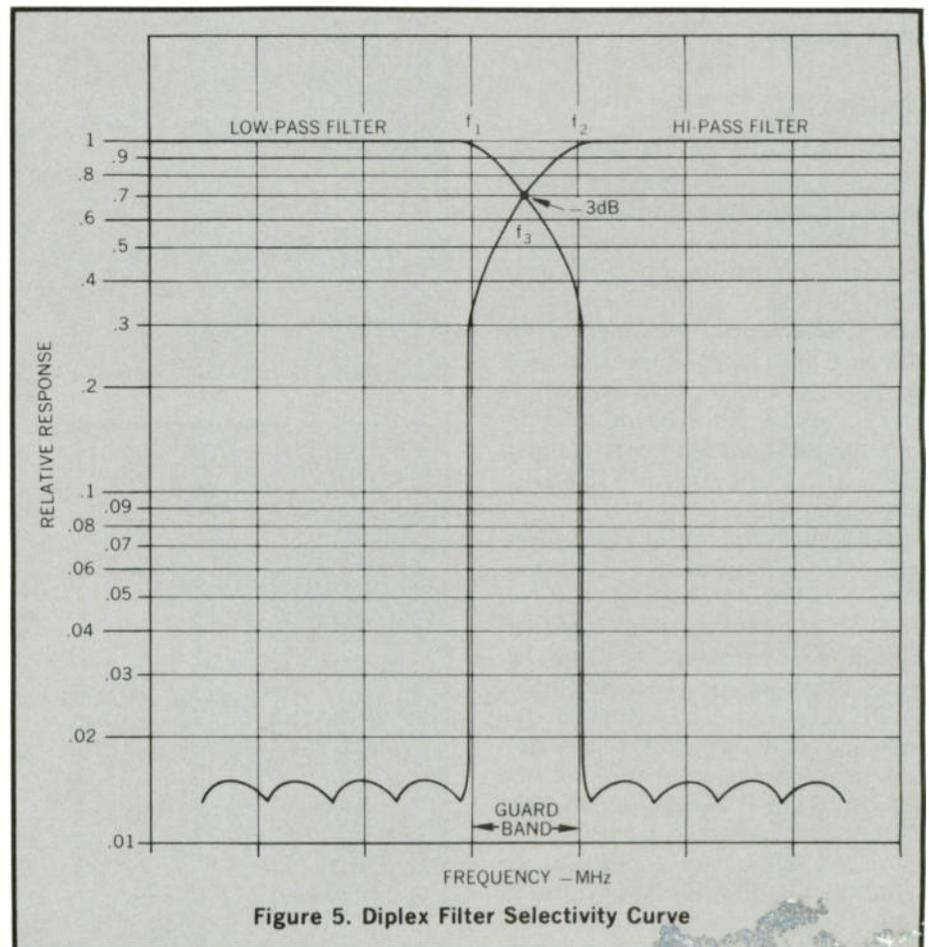


Figure 5. Diplex Filter Selectivity Curve

then blocked again at the output of the amplifier by filter 2A, but is permitted to pass through filter 1B to continue down the line, since filter 2B again blocks signals which occupy frequency band 1.

Channels coming in direction 2, which occupy frequency band 2, are blocked by filter 1B, but are allowed to pass thru filter 2B to the input of the amplifier. Filter 1A blocks this band of channels from continuing down the line. After being amplified these channels are again blocked by filter 1B, are allowed to pass thru filter 2A, and since they are blocked by filter 1A, are steered so that they continue after having been amplified in direction 2, down the line.

Therefore, at the expense of the addition of highly selective filters, which need not be too expensive and which are highly reliable, one common amplifier is used for amplifying signals in both directions. This amplifier can be one designed specifically for extended channel use.

In order to ensure that a "singing" condition where the amplifier out-

put signals are returned thru some feedback path to the input, does not occur, sharp skirt selectivity of the diplex filters is required. This type of "singing" condition could lead to either regeneration, resulting in amplifier oscillation, or for the case of TV signals in a "ghosting" problem. A typical diplex filter selectivity curve is shown in Figure 5. The filter consists of a low pass section which passes band 1 and is flat to frequency f_1 , and a high pass section which passes band 2 and is flat from frequency f_2 to a higher frequency. An unused guard band of several megahertz separates the filter sections. The required adjacent band rejection for a diplex filter used for separation of TV signals can be derived from the sum of the following:

required signal	
/ghost ratio	= 40 dB (industry
at TV sets	accepted value)
amplifier gain	= n dB
derating factor	
due to m cascaded amplifiers	= 10 log m dB
Total	= [40 + n + 10 log m] dB

For assuring that "ghosting" does not occur in TV transmission, a typical CATV system of 35 amplifiers, with 22 dB of cable spacing, would require about 77 dB rejection by the diplex filter, for those signals for which the amplifier has 22 dB gain, and which are the required to be rejected out-of-band signals for the particular filter. For frequency bands very close to each other, this amount of selectivity could be a tremendous problem to achieve. If the skirt selectivity requirements are accomplished, additional problems for channels at the edge of the bands could result, since sharp filter skirt selectivity results in envelope delay distortion.

This envelope delay distortion could prove harmful to the fidelity of TV color transmission, or greatly increase the error rate of data transmissions if either of these transmissions were located at the band edges.

Another means of accomplishing frequency division multiplexing is through the use of hybrids. The hybrid is a useful tool for achieving

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isolation between signals of opposing directions. Its use in a bi-directional system is shown in Figure 6. In this example, the signal from direction 1 can only be directed thru amplifier 1, since amplifier 2 appears to this signal in the reverse direction. Likewise, the signal from direction 2 can only be directed thru amplifier 2, since amplifier 1 appears to this signal in its reverse direction. Isolation between the output of amplifier 2 and input of amplifier 2 and between output of amplifier 2 and input of amplifier 1 depends upon the isolation characteristics of the hybrid.

In order to ensure that any feedback signal to amplifier 1 is suppressed sufficiently below the desired signal, necessitates that the isolation of both hybrids in the feedback path be equal to the sum of:

required signal /ghost ratio at TV sets	= 40dB
amplifier 1 gain	= 22dB (assumed)
amplifier 2 gain	= 22dB (assumed)
derating factor for 35 cascaded amplifiers	= 15dB
Total	= 99dB

Each hybrid must then provide 50 dB of isolation in order to prevent "ghosting". This amount of isolation for broadband hybrid couplers operating in the VHF region could be beyond the present state-of-the-art of such devices. If the isolation specification could be achieved, the hybrid scheme would allow for frequency-division multiplexing without the use of duplex filters. If the

hybrid isolation is not sufficient, some combination of hybrid coupling and duplex filtering could be used to achieve the required overall isolation.

One disadvantage in the use of hybrids is the minimum of 3 dB loss which results from their use. This results in a degradation in noise figure and of output capability of the system equal to the hybrid loss.

Frequency-division multiplexing is a very valid scheme for bi-directional transmission in CATV systems. It essentially trades the complete use of available spectrum and increased, but tolerable effects of cross-talk, "singing" and echo for decreased cost, when compared to space-division multiplexing.

Hybrid Repeaters

If it is required that full spectrum utilization be available in both directions, then the directional amplifiers shown in Figure 6 must both operate at the same frequencies. Hybrid requirements become more severe than that previously described, where hybrid isolation and frequency-division multiplexing were used together. In this case, the hybrids must be capable of isolating the output of one amplifier from the input of the other so that co-channel interference is reduced sufficiently. The ratio between the desired signal and the interfering signal, which is at a close frequency, should be at least 55 dB. Since the output of one amplifier is at a much higher level than the input of the other, according to the gain of the amplifier, the

isolation problem becomes even more critical.

desired signal /interfering ratio	= 55dB
amplifier gain	= 22dB (assumed)
derating factor for 35 cascaded amplifiers	= 15dB
Total	= 92dB

This type of isolation is well beyond the present state-of-the-art of broadband VHF hybrids of low loss. However, if it could be achieved, then a bi-directional system could be mechanized which uses common cable plant (but not common amplifiers) and still maintains total available spectrum for use in each direction. Hybrid disadvantage of thru loss, as described previously, would still result in degradation of system noise figure and output capability.

Closed-loop System

This arrangement is shown in Figure 7. It is not truly a bi-directional system but can serve the same purpose. It is a compromise arrangement which combines some features of space-division multiplexing, and those of frequency-division multiplexing. It utilizes all of the existing equipment and cable plant, and adds at a convenient position, additional cable and amplifiers which allow for return of the system to the head-end. It could yield a cost saving when compared to the space-division system. This is especially true in urban areas where the run to the head-end is never too great a distance.

This arrangement allows insertion of new channels thru directional couplers at many convenient tap points in the system instead of at one basic location. It is, however, required that these inserted channels be at different frequencies than those which are derived from the head-end. If these channels are returned to the head-end, they must be translated to unused frequencies for complete transmission throughout the cable system so that problems of regeneration and ghosting do not occur. Therefore, available spectrum is compromised. The advantage is that directional isolation is no longer a problem, since

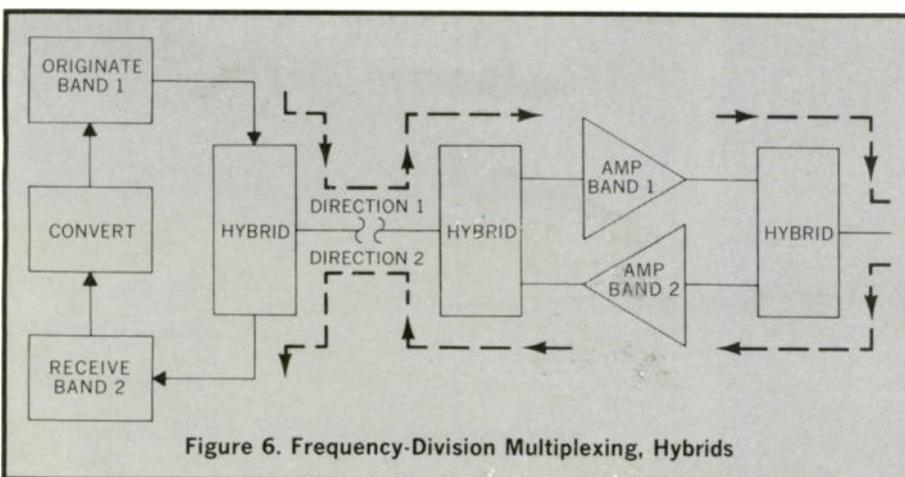
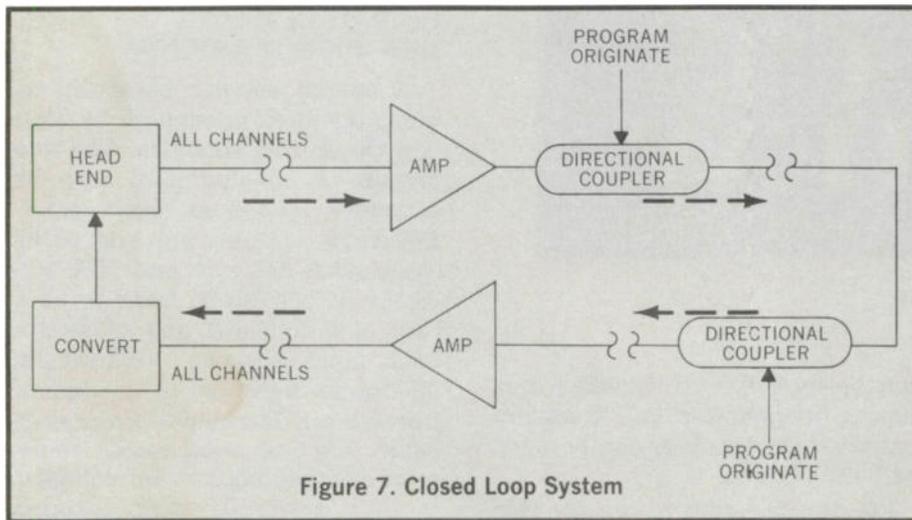


Figure 6. Frequency-Division Multiplexing, Hybrids



transmission is essentially in one direction, which is around a closed loop. Therefore, crosstalk, "singing," and echo are not inherent problems of this system.

If the very last amplifier of one of the trunk lines is returned to the head-end, communication between any two points on that trunk line becomes possible. The trunk then becomes a frequency-separated, 2-way communication system. Programs can also be originated at

any point on the trunk line and be redistributed, after frequency translation at the head-end, to any point in the system.

The closed-loop system has definite advantages, especially in an urban environment. These advantages can be summarized as the following: (a) Does not require additional equipments for directional isolation; (b) Permits simple 2-way communication on one trunk line; (c) Permits program origination at

many points in the system.

Its principal disadvantages are: (a) Requirement of additional cable plant for return of trunk to head-end; (b) Requirement of separate frequency allocations for the line inserted channels.

Bi-directional transmission can greatly facilitate the expansion of CATV systems into newer services. It can also permit program origination at points in the system, other than that of the head-end; thereby, allowing for greater flexibility in origination of available channels in new extended bandwidth amplifiers.

The most optimum means of achieving the bi-directional system must consider both the economic and technical factors associated with the implementation of such a system. It is safe to state that superior technical characteristics can only be achieved at approximately double the present system costs. However, a more than adequately performing system can, thru some of the methods described previously, be achieved at moderate additions to existing systems. TVC

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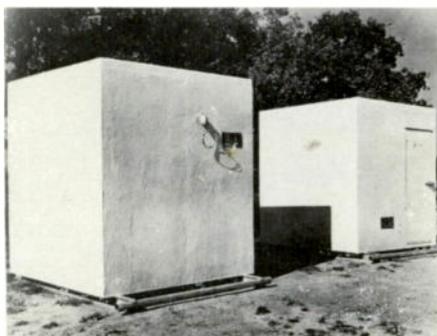
U.S. Patent, 3,226,476

PRODUCT REVIEW

NEW COMPONENTS FOR CABLE TELEVISION SYSTEMS

PORTABLE BUILDINGS NEW FROM RUF-NEK

A line of portable buildings for the communications and microwave industry is being built by the Ruf-Nek Building Company of Aubrey, Texas. The "ruf-nek" buildings are portable, skid mounted, modular buildings, factory custom assembled according to customer requirements. They are designed to house communications and microwave relay equipment at remote installations require minimum maintenance. The buildings are of sandwich wall construction with styrofoam bonded between layers of interior and exterior plywood within a structural framework. The exterior plywood is covered with a 1/8-inch layer of fiberglass. Each building is assembled and built on a two-foot modular increment. The most requested size made is eight feet wide by ten feet long. Buildings have been custom assembled wider than eight feet and up to 22 feet long. The roof is designed to withstand heavy snow loads and supplementary roof bracing is available to hold microwave dish reflectors. Added components



are available for each custom-assembled building. They include air conditioning, exterior lighting, electrical outlets and lighting units, partitions, toilet and plumbing facilities, battery cabinets, louvers and exhaust fans. Company colors

may be applied to the building during its fiberglassing and company emblems and numbers can be built into the exterior walls.

For further information on this new product contact Allied Tower Company, P. O. Box 331, South Houston, Texas 77587.

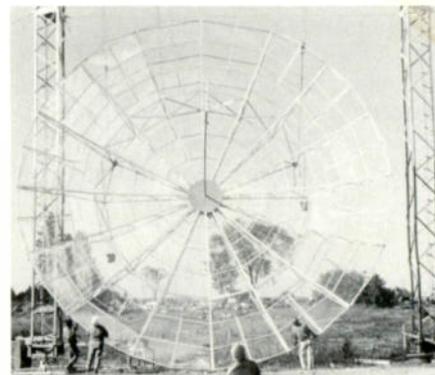
THICK-WALL TUBING SHRINKS TO 1/3 SIZE

A new thick wall heat-shrinkable tubing with self-sealing properties and a 300% shrink ratio is being offered by American Pamcor Inc. When exposed to 250°F the tubing is designed to contract to 1/3 its original inside diameter (a .400" tube contracts to .150") and be stable from -65°C to +130°C. The thick wall of this tubing is said to be highly resistant to cracking when applied over irregular configurations and provide an added measure of abrasion resistance and strain relief. This tubing is available with a factory-applied sealant that remains flexible and seals against pressures of 25 psi to provide a moisture and waterproof junction, according to the manufacturer. As well as tubing diameters from .400" to 3.000", this new material is available in molded products as end caps, two, three, four, and six-legged boots, and aperture seals all having the same physical and electrical properties. Any of these configurations can seal over lead, conduit, and standard plastic and elastomeric materials. The material itself is non-hygroscopic and is said to resist fungus and weathering. With a dielectric strength of 450 volts per mil (ASTM D149) the tubing is engineered to be used as an insulating material up to 600 vac.

For further information on this new product contact American Pamcor Inc., Box 1776, Paoli, Pennsylvania 19301, Ph. (717) 564-0101.

HOSKEN DEVELOPS NEW 40-FOOT ANTENNA

A 40-foot circular parabolic antenna has been introduced by Hosken Cable TV Antennas. The new antenna is all-aluminum with an expanded aluminum mesh screen. Electronic features are said to include: 25.6 dB gain and 55% efficiency at 200 MHz; front to back ratio of 35 to 50 dB, and adjustable focal point antenna designed for maximum rejection of co-channel interference. Mechanical features include: 100-mph wind rated; aluminum one-inch mesh screen; complete factory assembly with antenna shipped in segments designed for fast assembling at site; any-height mounting on "H" frame towers; circular reflector for sharp horizontal and vertical beam angles; and true parabola with maximum error one-half inch.



For further information on this new product contact Hosken Cable TV Antennas Ltd., 335 Frankcom Street, Ajax, Ontario, Canada, Ph. (416) 942-1232.

AMPHENOL SWITCH FOR DUAL-CHANNEL SYSTEMS

A coaxial switch designed to provide superior performance in dual-channel CATV systems has been developed by the Amphenol RF Division of The Bunker-Ramo Corporation. The new switch mounts on the rear of the subscriber's television set with the

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pressure sensitive adhesive panel provided; or it may be mounted with screws on a nearby wall. It is connected between the dual-cable lead-in and the antenna terminals of the set and enables the subscriber to switch between two sets of 12 CATV channels. Crosstalk specifications for the new unit is said to be -55 dB at 216 MHz; with impedance of 75 ohms. The switch is two and a half inches across by one inch deep by an inch and a half in height, including connectors. Price of the No. 300-10100 switch is \$4.25 in quantities of 5000.

For further information on this new product contact Amphenol RF Division 33 East Franklin Street, Danbury, Conn.

ENTRON PRODUCES UHF-VHF CONVERTER

The Model C-200 (antenna mounted) and the Model C-200R (head-end rack mounted) all-solid-state UHF to VHF converters have been introduced by Entron. The units are said to feature lowest noise figure, high signal sensitivity, high rejection to unwanted signals,



and reliability. Circuitry includes a low noise Schottky barrier diode mixer, low noise silicon transistor post amplifier, and a selective three pole UHF input filter. The power supply incorporates derated components and tantalum filter capacitors. Low output return loss insures negligible reflections even with a poorly terminated output line.

For further information on these new products contact Entron, Inc., 2141 Industrial Parkway, Silver Spring, Maryland 20904.

AUTOMATIC CONTROL UNIT FOR SONY'S VIDEOCODER

A new automatic control unit, Model EVR-210-A, said to provide a complete automatic play and re-

wind capability for Sony's video tape recorder, Model EV-210R, is now available from Sony Corporation. In addition to its remote control capability, the EVR-210-A may also be attached directly to the front



panel of the Videocorder. The new control unit is designed to permit users to select an isolated portion of the video tape for automatic, continuous viewing. The unit is adaptable to, and interchangeable with Sony's Models EVR-200 and EVR-210 remote control panels; it can also be installed on the EV-200R Videocorder. The EVR-210-A lists for \$295; the unit plus installation in standard Model EV-210 is \$625.

For further information on this new product contact Sony Corporation of America, VTR Division, 47-47 Van Dam Street, Long Island City, New York 11101, Phone (212) 361-8600.

TELEMATION INTRODUCES WAVEFORM SAMPLING UNITS

TeleMation is producing a unit which allows simultaneous display of both video waveform and picture information on conventional video monitors, viewfinders and receivers. The TMV-529 waveform sampler develops a video waveform through a line-by-line sampling technique. As many as ten separate waveforms may be displayed at the edge of the kinescope raster. The unit is supplied with overlays to accommodate various picture tube sizes. Four lines on the overlay indicate sync level, pedestal level, black level and peak whites. Phase and amplitude adjustments are provided to allow for variations in raster size.

For further information on this new product contact TeleMation, Inc., 2275 S.W. Temple, Salt Lake City, Utah 84115, Phone (801) 486-7564.

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Products Literature

The availability of a new catalog which includes information on dri-transfer lettering, numerals, words, symbols and special applications has been announced by Russell Industries, Inc., 96 Station Plaza, Lynbrook, N.Y. 11563.

General Cable Corp. has published two new cable TV brochures entitled: "Coaxial Cables for Cable TV" and "CATV Cable for Buried Plant." They include detailed information about trunk, distribution and drop cables for the Cable TV industry. Write: 730 Third Avenue, New York, N.Y. 10017.

The 2600 series Video Multiplexer, designed to eliminate the need of additional monitoring equipment by expanding the capabilities of existing wave-form oscilloscopes and video monitors, is described in detail in a data sheet from Cohu Electronics, Inc., Box 623, San Diego, California

An eight-page brochure providing general information and specifications of Ampex audio recorders and accessories is available from Ampex Corp., 401 Broadway, Redwood City, California 94063.

A new 36-page catalog that lists nine major wire product groups and related products has just been released and is now available from Garrett Electronics and Cable Corp., 770 Park Avenue, Huntington, L.I., N.Y. 11745.

A series of advanced seminars for design engineers, R&D managers, project managers, and long-range and product planners are described in a 32-page booklet available from Technology Forecasting Institute, Inc., 150 Fifth Ave., N.Y., N.Y. 10011.

Vikoa has published a 98-page catalog relating to wire, cable, CCTV, CATV, ETV and miscellaneous lines of equipment necessary to the communications industry. Copies are available from Vikoa, 400 Ninth St., Hoboken, N.J. 07030.

The model 22-1187 a-c power supply for CATV systems is the subject of a new bulletin from Sola Electric Division. The units are for use on-line and feature a constant-voltage transformer. Bulletins are available by writing, 1717 Busse Rd., Elk Grove Village, Ill. 60007.

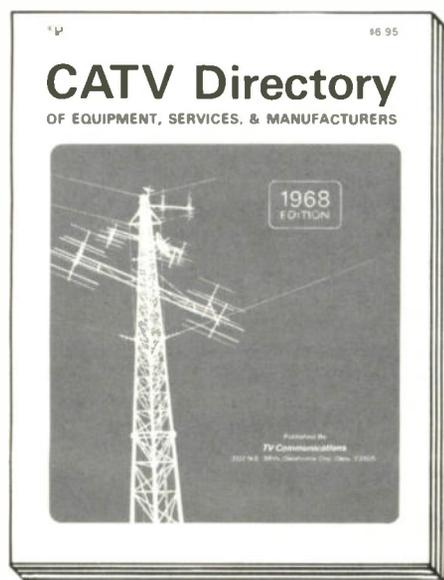
Bulletin TV-10, 4-pages, introducing a new line of CATV cable and listing descriptions and specifications has been published by Whitney Blake Company, New Haven, Connecticut 06514.

An up-dated version of "1001 Ways to Use Closed-Circuit Television", a 10-page, 2-color brochure, may be obtained from Fairchild Space and Defense Systems, 30 Park Place, Paramus, New Jersey 07652.

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This new directory lists over 3,000 CATV products and services offered by 887 CATV manufacturers, suppliers and professional firms.

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International Video Corp.	57,58	R. H. Tyler Co.	95
International Wire and Cable	51	Video Instrument Corp.	35
Jerrold Electronics Corp.	C-2	Vikoa, Inc.	3,104

THE CATV CLASSIFIEDS

TV Communications Reply Address: 207 N.E. 38th, Okla. City, Okla. 73105
 Rate for classifieds is 25 cents per word for advertising obviously of a non-commercial nature. Add \$1.00 for Box Number and reply service, per issue. Advance payment is required; minimum order is \$10.00. Classified rate to commercial advertisers is \$30.00 per column inch (2 1/4" col.). Deadline for all classifieds is 1st of preceding month.

MANAGER-TECHNICIAN

Preferably with first class license, needed for small system; salary, with commissions, open. In mild climate, N.M. Send resume (in confidence) to TV Communications, Dept. T19-3.

EXPERIENCED FOREMAN AND LINEMEN

Needed for all phases of CATV Construction. Send written resume to Stan Socia Corporation, 217 West Houston, Tyler, Texas 75701. Phone 214/593-0911.

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Growing New England MSO needs CATV Technician who wants to settle in top four season resort area. Great opportunity for advancement, possible partnership, excellent working conditions, other benefits. Give full resume and past earnings in first letter to TV Communications, Dept. T19-2.

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Growing system in New York State needs an alert individual capable of supervising present staff of ten. Must have prior sales experience, plus installation and maintenance background. Please include salary requirements with resume. Reply TV Communications, Dept. T19-5.

W-A-N-T-E-D

BY LARGE EXPANDING CATV MULTIPLE OWNER

SYSTEM MANAGERS

REGIONAL MANAGERS

TECHNICIANS

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CATV SYSTEMS
 (POTENTIAL 5,000 AND UP)

BOUGHT FOR QUALITY STOCK
 IN GROWTH COMPANY
 AND/OR CASH

SEND ANSWERS TO
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 Just fill out the coupon below and mail with your check to TV Communications.
 Do it today for quick, effective results.

I'd like to reach the entire CATV market with the following classified message
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Please assign a reply box (\$1 chg. per issue) This ad is to run _____ month(s). Payment enclosed for _____ words at 25c per word (\$10 min.) per month.

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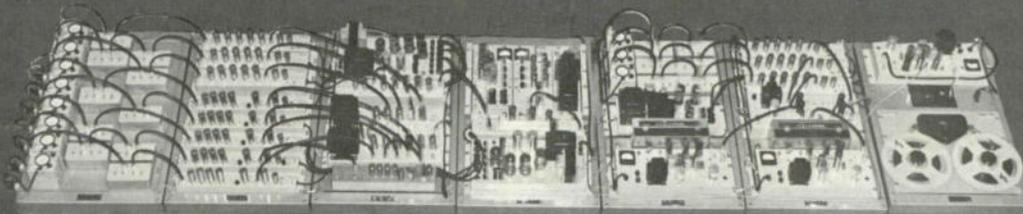
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Atlantic Research Corporation
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 1812 K Street N.W.
 Washington, D.C. 20006
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 803/779-4585

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Davco is a CATV pioneer. An outstanding innovator in CATV custom-designed components, assemblies, and system engineering. And masterful in the art of producing dependable, functionally designed head-ends. This demands experience. The type of experience Davco has, and the professional ability Davco personnel use in applying their knowledge.

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For low-band and all-band requirements, Davco can custom design a dependable head-end for your system. Profit from Davco's experience . . . Write today. Post Office Drawer 861, Batesville, Arkansas 72501; or call 501/793-3816 for any additional details.

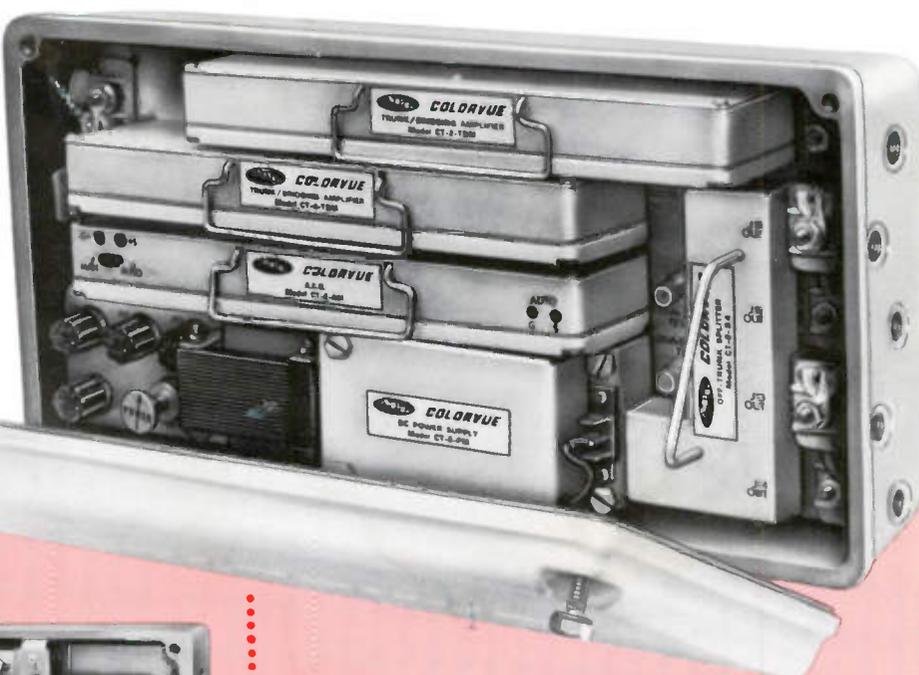
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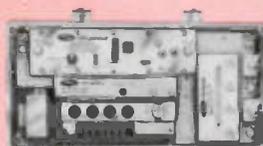
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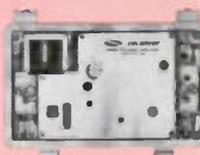
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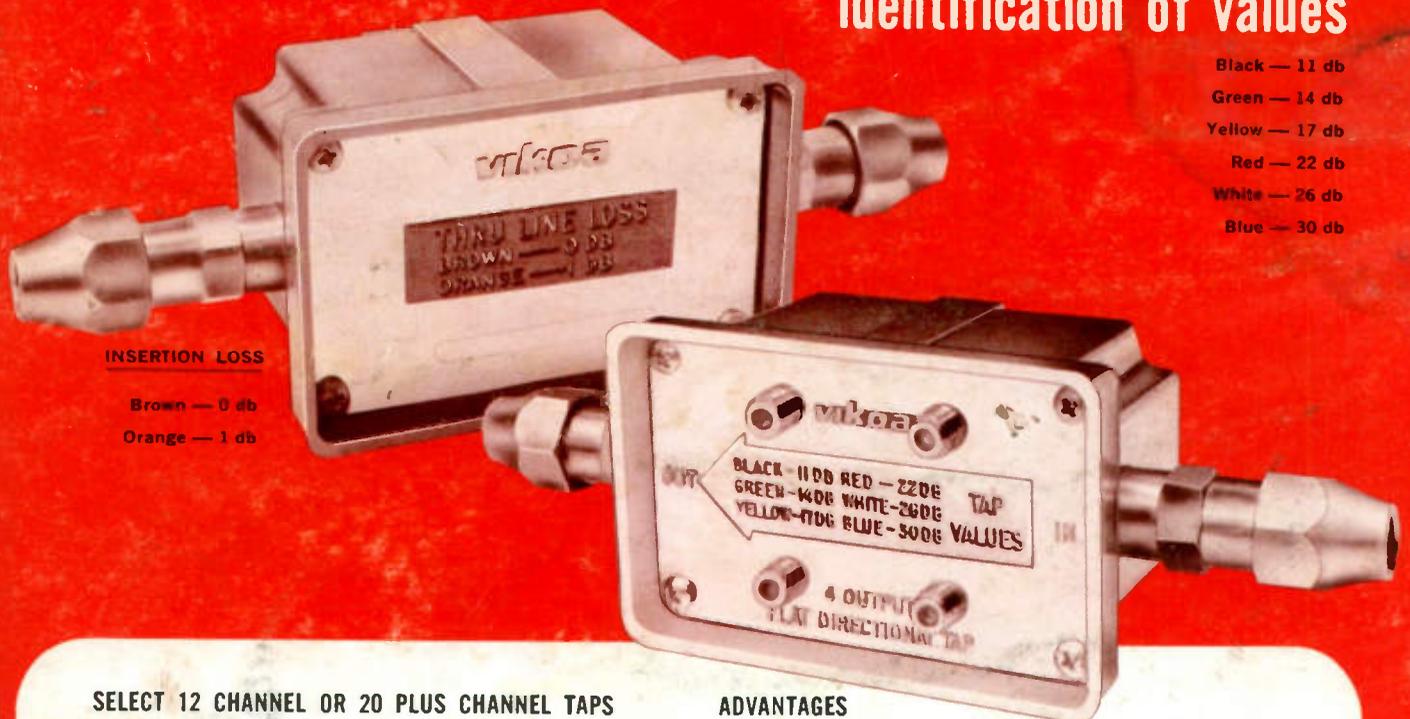
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VIKOA

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Black — 11 db
Green — 14 db
Yellow — 17 db
Red — 22 db
White — 26 db
Blue — 30 db

INSERTION LOSS

Brown — 0 db
Orange — 1 db

SELECT 12 CHANNEL OR 20 PLUS CHANNEL TAPS

The model 5510 Flattap is a flat directional tap combined with a four-way hybrid splitter. An industry standard directional tap, with foolproof modular plate construction is now available from VIKOA'S research and development.

Only the desired signal coming from the amplifiers is selected by the tap and reflections from the tap lines are blocked by over 30 db to the "out line."

The right number of ports and the right type of chassis fittings — all moderately priced for new construction, system modernization, and line extensions are available to you when you purchase VIKOA'S MODULAR DIRECTIONAL TAP with printed circuit.

All models permit up to 8 amperes AC or DC power feed-thru with taps isolated. Vik-O-Process plated to prevent all corrosion problems.

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- STANDARD 50-220 MHz OR WIDE BAND 50-300 MHz COVERAGE
- RUGGED ZINC CAST HOUSING. LIGHT WEIGHT, FOR STRAND, POLE OR PEDESTAL MOUNTING
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- ALL ATTENUATION AND RETURN LOSS CHARACTERISTICS WITHIN 1 db TO INSURE UNIFORM PERFORMANCE
- BUILT IN LEAKPROOF SHIELDING TO PREVENT INTERFERENCE
- INTERCHANGEABLE 1, 2, 3 AND 4 OUTLET PLATES FOR MAXIMUM SERVICE FLEXIBILITY

SPECIFICATIONS

Tap Coupling (\pm 1 db)	11, 14, 17, 22, 26, 30 db
Insertion Loss	3.5, 1.8, 0.9, 0.4, 0.3, 0.2 db
Tap to Tap Isolation any 2 taps	20 db minimum
Tap to Tap Output Isolation	26 db minimum
Tap Match	1.25 (19 db)
Input Match	1.22:1 (20 db return loss)
Output Match	1.22:1 (20 db return loss)



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