



August 1968

# *TV Communications*

The Professional Journal of Cable Television



**NCTA CONVENTION COVERAGE**

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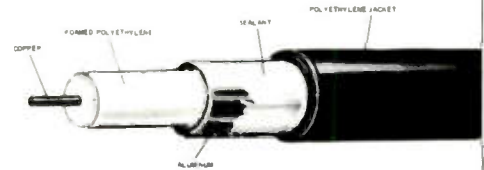
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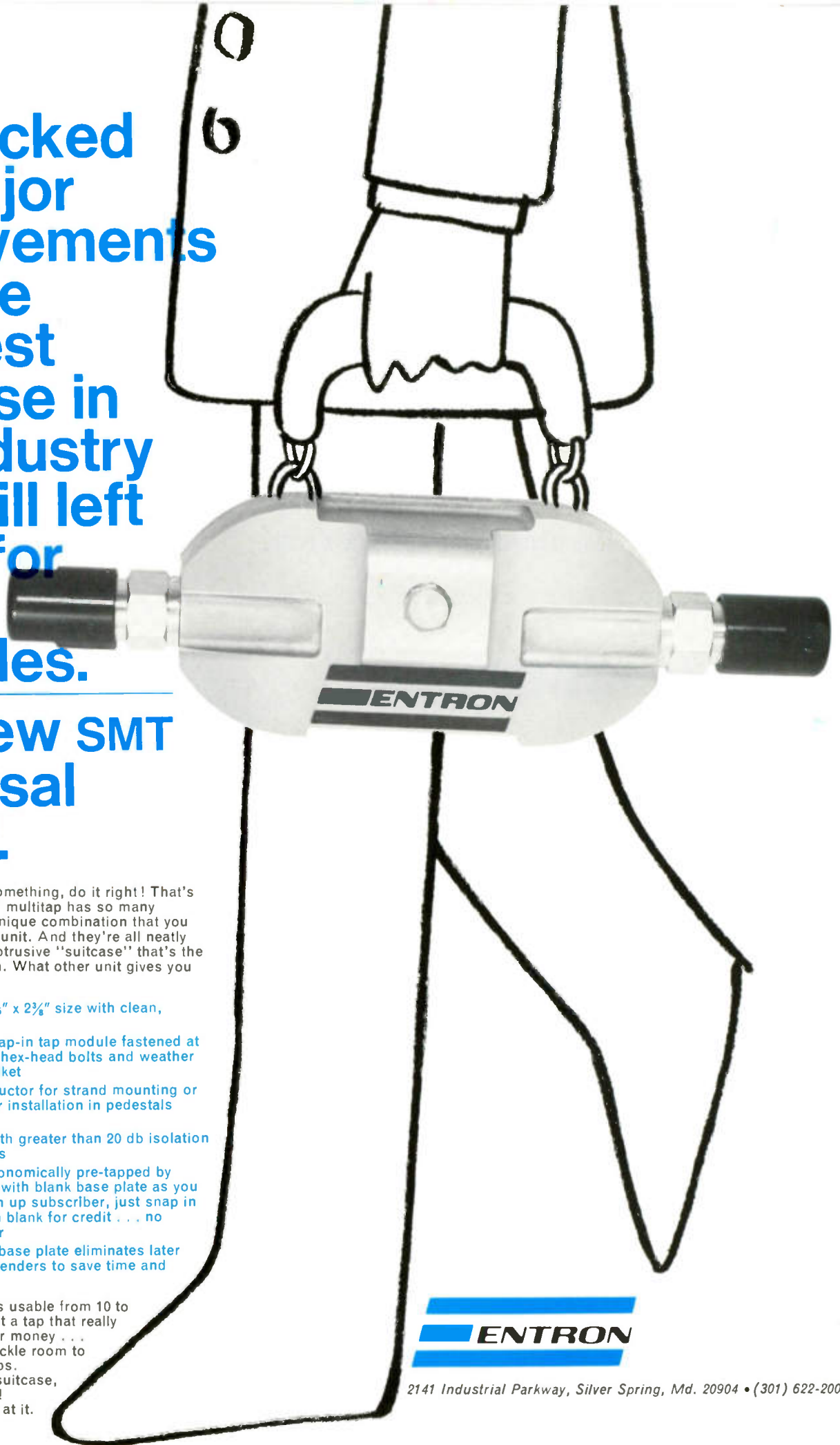
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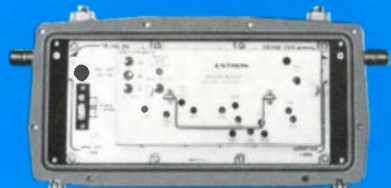
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### Combination Trunkline Bridging Amplifier RB-6T

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### Trunkline Amplifier R-6T

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### VHF Preamp P-1

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## IN THIS ISSUE

### Looking Back at Boston

Much of this issue is devoted to coverage of the 17th Annual NCTA Convention held in Boston last month—coverage intended to be the most comprehensive and meaningful ever. Our Convention Wrap-up, the product of our eighteen-man convention team, is broken into two major sections: General Convention Activities, beginning on page 36; and the Trade Show Product Review, beginning on page 46.

Leading off the general coverage is a summary of the blue ribbon panel discussion on the "Future of Cable TV." The session was moderated by former national chairman Ben Conroy, and featured presentations and discussion by Irving Kahn, Bill Daniels, Al Stern, and Leonard Reinsch.

The convention wrap-up continues with a review of management sessions, including presentations on legal, financial, and promotional aspects of system operation. The election of NCTA officers and Directors, and the presentation of industry awards get attention next, followed by digests of key speeches given by FCC Chairman Rosel Hyde, NCTA President Frederick W. Ford, and Senator Jennings Randolph.

### The Manufacturers' Offering

The second phase of our convention review consists of an engineer's frank appraisal of the new and modified products featured in the exhibits. TVC associate technical editor I. Switzer, a veteran CATV engineer and an outspoken component analyst, is the author of this informative survey of the state-of-the-art as represented in Boston.

### Two Top Tech Papers

Featured in the *CATV Technician Section* this month are Walter Roberts' paper on "Performance Testing of CATV Coax (part I)," and Bob Eldridge's article "CATV Antennas—A Survey of Basic Concepts." The former begins on page 63, the latter on page 74.

**Our Cover:** NCTA's new officers and Association President Frederick W. Ford pose briefly at Boston's Prudential Center. Shown left to right are Secretary Marcus Bartlett, Treasurer Monroe M. Rifkin, Vice-chairman Richard A. Moore, Chairman Robert H. Beisswenger and President Ford. For complete convention coverage turn to page 36.

the most respected name in CATV

# TV Communications

The Professional Journal of Cable Television

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# The TVC Viewpoint

EDITORIAL



## CATV In Technical Bankruptcy?

*Guest Editorial—by I. Switzer*

The recent NCTA Convention presented 40 speakers on a wide range of technical topics of current interest to the cable television industry. Thirty-four of these speakers came from suppliers of equipment and services; only six from the working cable television industry. With such an overwhelming proportion of speakers from the supply side of the industry, speaking primarily to an audience of potential customers, the technical sessions could not help but break down into thinly veiled sales pitches for the speakers' products.

If we assume that the convention management sought out the best-qualified speakers on each topic and could find most of them only among equipment manufacturers and suppliers, we must conclude that the CATV industry is in very bad condition, and ill-equipped to meet its rising technical demands.

This was NCTA's 17th Annual Convention. In these 17 years the cable television industry has grown to serve 3-1/2 million households in 2,500 communities, but apparently is still unable to define, discuss and solve its technical problems without massive support from the equipment manufacturers. If this is a fact of cable television life which does not seem to have changed over the past 17 years, let us now admit our technical bankruptcy and use the annual convention to do something about it.

The Association should take advantage of the convention to organize tutorial sessions to teach industry technicians the best current practices and techniques. Technical sessions should consist of lectures and demonstrations designed to teach, not to sell. A future convention could devote two sessions of three hours each to this kind of discussion—with greater benefit to the cable television industry than the equipment sales pitches which were presented at Boston.

Worthwhile tutorial opportunities exist in the fields of cablecasting, microwave system design, television propagation and cable system design.

It seems obvious that the NCTA convention is not yet ready to be used as a forum for professional discussion of the industry's technical problems. Let us therefore use it as an opportunity to upgrade the technical abilities of the membership.

## NCTA's Loss

One of the hardest-working young executives on the staff of NCTA has resigned to hang out his own CATV consultant's shingle. For the past two years Sam Street has served as Director of Convention and Field Services for the trade association. Already well known as a consultant and advertising expert, Street won the admiration and respect of hundreds of new cable industry acquaintances as he traveled the U.S. for NCTA.

In addition to participating in a host of NCTA, state and regional meetings, Street personally directed local origination seminars and developed the text material for these sessions. Another primary contribution was his new member recruitment effort. Of course, his biggest assignment has been coordinating the annual convention, a job which he handled remarkably well—in the face of personnel shortages in the convention effort.

That Sam Street leaves NCTA with an excellent reputation—and many new friends—is not surprising in view of his past performance. A graduate of Philadelphia College of Art, in advertising, his credentials include ownership of an advertising agency and several years as advertising manager of TeleSystems. In 1964 he formed a consulting firm with Bill Adler and later was instrumental in developing advertising programs for Ameco and Vikoa. An accomplished writer, he contributes regularly to *TV Communications*. His first book, *Advertising for Cable Television* will be published this fall.

Reviewing Sam Street's impressive credits, one can see that this 31-year-old man on the move will be sorely missed by the NCTA staff and by the officers and directors who had come to rely on him.

*Stan Scarle*





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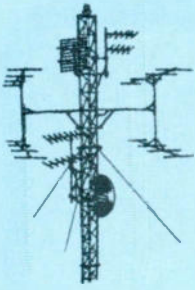
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## CATV Industry PERSPECTIVE

Look for more mergers and multiple system acquisitions. Even the big MSO's realize that additional financial leverage will be required in order to cable the choicest markets. Combining companies is the most obvious first step toward raising equity capital or securing large loans at attractive interest rates. The H & B American-Jack Kent Cooke merger is the first of several similar unions which will take place this year.

NCTA will be showing signs of renewed vigor under the leadership of newly elected Chairman Beisswenger. Members will recognize an esprit de corps among the association office staff, unprecedented in recent years. Reasons for the boost in morale will be more pressure from the Executive Committee, aimed at specific performance and results, plus the encouragement of the copyright decision and the FCC's Section 214 ruling. Some realignments in the administration of the NCTA Washington office can be anticipated, but no major staff changes.

Beisswenger believes strongly in delegation of responsibility--and has called upon all directors for active participation in association direction. But the personal hand of the Jerrold chief executive will be clearly evident in many areas, particularly in the running of the Washington office. Following the extended period of rest and relaxation ordered by his doctors, Beisswenger is now fully active in his company and will be devoting considerable time to personal supervision of NCTA affairs.

A national policy will undoubtedly be formulated with respect to ownership of cable television systems by broadcasters and publishers. The possibility of a mass communications monopoly on a localized basis is not being ignored by the FCC or the Justice Department. Within a year, two years at most, JD will critically examine situations in which the cable system is owned by the local TV broadcaster--who may also own an AM radio station, an FM station, and the local newspaper. Presently developing cable ownership patterns, particularly involving group broadcasters, could be altered by the Federal intervention.

More new faces at the FCC may be forthcoming. Although no Commissioner's term will expire this year (other than Loevinger's), the job opportunities outside the FCC are a tantalizing financial incentive for Commissioners to leave government service. At least two of the present panel have been considered for attractive positions which would involve salaries much higher than those paid by the Federal Communications Commission. A resignation or two during the next few months would not be surprising.

# "the New Look in Profits"



Shown is 1/2" Ameco  
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Ameco Cable. "Chapman" 3/4-inch trunkline cable; "Catskill" 1/2-inch feeder lines; "Camelback" .412 distribution cable, and "Etna" drop cable (available in a multitude of decorator colors) are but a few of the many CATV cables made by Ameco Cable.

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# LETTERS

• I wonder how many of your readers realize that at the Boston Convention, only one of the three Boston UHF stations were available for television viewers in the rooms of the Boston Sheraton? The Sheraton is not connected to any CATV system, it has its own master antenna installation.

Thus, who is hurting UHF? Certainly not CATV which takes every opportunity to provide as many UHF channels, local and distant, as possible. When can we convince the UHF broadcasters to analyze actual market conditions like the Boston Sheraton, where 1000 potential customers are denied the opportunity to watch Boston UHF channels?

Steven I. Biro  
Manager Reception Facilities  
Vikoa Construction Corporation

• You are to be commended on doing an excellent job of covering the entire field of communications and CATV. I originally subscribed to *TV Communica-*

*tions* in July of 1966 and have been an avid reader ever since. So convincing is your presentation that I recently began negotiations for the purchase of a cable system of Goliad, Texas (population 2,500).

Do you have any tear sheets, or other data on the cablecasting activities that seem to be increasing every day on systems? The area of most interest is what type of programming is done . . . the hours involved, arrangements for advertising, and the equipment involved. The Goliad system success will depend on the providing of *local* news and events—that can not be received anywhere else.

Are any back issues of *TV Communications* available for my permanent library files?

The cable industry is to be praised for its activities in the area of providing service to FM broadcasting's cause. KTXN-FM, which is controlled by my family, originally went on the air with 3,000 watts and the intention to serve only 15 miles—because of tremendous interest, coverage of the station was a must for cable systems in Edna; Port Lavaca, and Goliad—we had listeners calling in from areas we did not even place a calculated city grade signal, but received via CATV.

I again commend you, if I can be of service to you by filling in on my FM or

CATV operations, please do not hesitate to let me know.

John J. (Joe) Tibiletti  
Vice-President, KTXN-FM  
Victoria, Texas

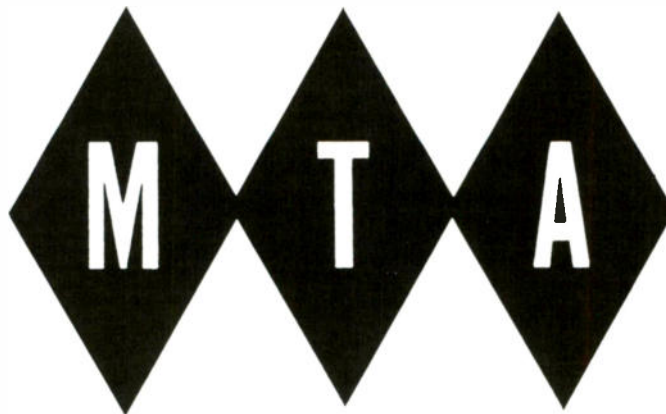
*Joe, welcome to the ranks of cable system operators. The information you requested is on the way to you; we appreciate your interest.*

• I am interested in obtaining a copy of your brochure entitled "CATV System Cash-Flow Projection." I would appreciate your sending me this at your earliest convenience and if there is a charge involved, please let me know. Thank you for your consideration in this matter.

Michael J. Maher  
Credit Analyst  
The Chase Manhattan Bank  
New York, New York

*Thank you, Mr. Maher, for your inquiries on the availability of our Cash-Flow Projection Booklet. Copies of our revised edition of this publication are available at \$1.95 each (with quantity discounts available) from the Circulation Department, TV Communications, 207 N.E. 38th, Oklahoma City, Oklahoma 73105.*

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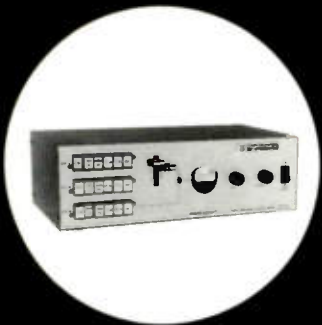
Designed to be the most reliable television camera for CATV



TMC-2100V



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SCREEN  
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FROM AN ELABORATE EIA MULTI-CAMERA OPERATION TO A SIMPLE ONE-CAMERA SYSTEM

# ...the TMC-2100 Vidicon Camera



TMC-2100



TMC 2100 (rear view)

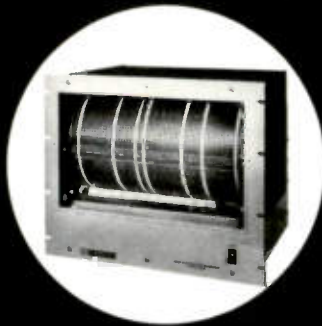
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## CATV MANAGEMENT CORNER

# Your Precious Time

A manager's time is his primary commodity—and his efficiency in getting the most of each minute is a strategic factor in his success. The starting point for effective use of your time is scheduling your activities as completely, and as accurately as possible. Most system managers probably have a workable schedule for long—and medium-range projects and programs, but may tend to "play it by ear" in allotting time for day-to-day activities. Time planning for each day's work can pay big returns to you both in terms of increasing your worth to the system and in terms of conserving time for your family and outside interests. The following are some techniques which constitute the basis for good day-to-day scheduling of your valuable management time:

- (1) Schedule your day around key activities.
- (2) Schedule actions which need attention early in the day.
- (3) Match your activities to your varying energy levels throughout the day.
- (4) Schedule groups of similar, routine jobs in continuous periods of time.
- (5) Allow adequate time for each activity—an inaccurate schedule is a source of frustration.
- (6) Utilize one of the office girls to maintain your calendar and remind you of key appointments and activities.
- (7) Don't get side-tracked onto unscheduled topics during discussions with system personnel or outside business associates.
- (8) Restrain your own impulses to get involved in unscheduled activities. Keep your eye on priority targets.
- (9) Confirm your appointments—both with system personnel and with outside business contacts.
- (10) Remain conscious of your time and how you are spending it.

Of course you can't schedule system outages or visits from irate subscribers—but you can make sure that high priority activities are scheduled first, so that such interruptions postpone only less important work. Chances are that if you plan no more than three or four key tasks for each day, and *get them done before starting anything else*, you will find your job simplified and your time at the office reduced substantially.

Most people operate at their greatest efficiency level from about 9:30 to 11:30 a.m. and from 2:30 to 3:30 p.m. Your best efforts will usually come in the morning, before the press of the day's activities begins to close in on you—thus it again proves advantageous to put the key jobs up front in your daily schedule. Of course the exact hours at which a manager is at his peak remain a personal consideration, and should be checked against these averages for use in planning your time.

Utilizing an outside stimulus to aid you in maintaining a detailed schedule is almost a must for most busy CATV executives. Whether it be a full time personal secretary, or one of the office girls with other major duties is of little consequence. Have her maintain a daily calendar of your appointments and key activities.

These are just the basics of personal time planning for management personnel, but even a fairly casual application of these proven techniques can net you increased output, and a substantial reduction in your overall time expenditure on the job.

NVC



## **BROADCAST "PROTECTION" ON TRIAL**

The Ninth Circuit Court of Appeals recently asked FCC Counsel Henry Geller some pointed questions about the FCC's broad non-duplication rules which protect highly profitable broadcasters from economic injury supposedly caused by CATV--but demand no showing of such injury. Cable attorney Robert D. L'Heureux, representing Port Angeles (Wash.) TeleCable in an appeal from an FCC non-duplication order, told the court the average commercial TV station makes 100-105% return on its capital investments.

"Under such circumstances," L'Heureux said, "it is unreasonably, arbitrary and capricious for the Commission to issue a (non-duplication) rule. . . without proof of the need of such protection. . ." When asked by presiding Justice James R. Browning, Geller admitted the profit figures were correct. The court then asked Geller, "Why should the Commission protect them (broadcasters) without proof of need? Why do you need a general rule that applies across the whole field of broadcasting?" A decision in the case is not expected for some weeks; meanwhile, the FCC order has been stayed by the court, pending the outcome.

## **NCTA FILES AGAINST TELCOS**

Appellate battle has been joined, both before the FCC and in the courts, on the Section 214 issue. Telcos immediately appealed the FCC's ruling that they must obtain certificates of convenience and necessity before building CATV leaseback facilities--and NCTA and others have already replied to those appeals.

The national cable association has asked the FCC to deny telco petitions for a stay of the order. NCTA said the telephone companies were under notice by the Commission that continued construction of leaseback was at their own risk, and therefore "any injury. . . emanates from their own responsibility." The organization has also asked the Court of Appeals in Washington, D. C., for permission to participate in the pending appeal suit there. The court was advised that "affirmance or reversal of the decision will be of critical interest and importance to the CATV industry whose interests can be adequately represented and protected only by NCTA's intervention."

## **CANADA PREPARES TO LICENSE CATV**

The Canadian Radio-Television Commission, recently granted authority over CATV, has launched a study on what they will expect from cable systems now that the systems must obtain licenses from the Commission. Old regulations merely required a technical clearance from the transport department, but when cable operators began microwaving in U.S. signals, Parliament reclassified CATV as broadcast undertakings.

# Late News (Continued)

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## CALM AFTER STORM IN BAY STATE

In an anti-climactic conclusion to a stormy session, the Massachusetts legislature has stalled CATV regulation for another year in that state. All-night debates, intensive lobbying by all factions, and emotion-filled speeches marked the passage of a cable-favored local control bill in the House and defeat of the Consumers' Council bill which would have placed CATV under regulation by the Department of Public Utilities.

The Senate, however, refused to pass any legislation amid charges of "sham," "power struggles," and "fraud." Instead, the legislators called for a study by the Judicial Council to determine the legality and constitutionality of control by the DPU. Governor John A. Volpe signed the resolve during the last hours of the legislative session.

## LOANS, MERGERS MAKE CATV HISTORY

Several large loans and mergers made and in the making are setting new records in CATV financial history. Latest of several big-money announcements were the Chase Manhattan \$10 million loan to Manhattan Cable TV and the H & B American acquisition of Jack Kent Cooke's system network.

Charles Dolan, president of Manhattan Cable TV, called the \$10 million loan "the largest loan ever made to a single system; perhaps the largest in the industry's history." Financing will enable the system to complete underground construction in their franchised area in Manhattan.

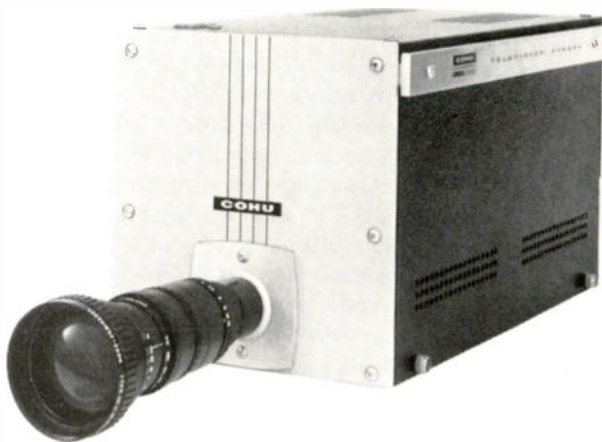
H & B American, already the largest MSO in the industry, has agreed to exchange in the neighborhood of \$35 million in stock for the CATV interests of millionaire-sportsman Jack Kent Cooke. The acquisition increases H & B's systems by 20, bringing the total to 56 operating systems.

## TELCO ACCUSED OF BACK-DOOR TACTICS

California cable operators led the vociferous attack on "back-door" dealings by a Bell System telco in circumventing the FCC's Section 214 ruling. Pacific Telephone and Telegraph, in the face of the Commission's orders to halt construction of all leaseback systems, sent the Common Carrier Bureau a telegram asking for "emergency" permission to construct another section of its Mission Viejo system in California.

The Bureau, by its delegated authority, gave the telco the permission, subject to a warning that it could be changed by "further action" of the Commission. The California Community Television Association, in an official protest to the FCC, said it "is at a loss as to how to proceed in situations where. . . rulings of the Commission with respect to pending dockets are set aside by 'delegated authority.'" It said Pacific's action is in violation of the spirit of the Bell System's request for a stay in the 214 hearing.

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# News SPECTRUM

## Major Federal Decisions Change Course of Cable Television Industry

Within the past two months, CATV operators have witnessed what amounts to a transformation of the entire cable television scene. No less than four far-reaching decisions by adjudicatory bodies at the national level will affect every system in the country.

### Copyright Coup

One of the brightest victories in industry history was the Supreme Court's vindication of a West Virginia system in *Fortnightly v. United Artists Theaters*. In that decision, the Court held that transmission of a broadcast signal by cable is not a "performance" within the meaning of the Copyright Act, and that systems are therefore not liable to copyright holders.

Had the decision gone the other way, the financial back of the cable industry could have been broken by

the burden of past liability. As it stands now, cablemen are coming to the negotiating table with unprecedented strength and confidence.

There is no question that the turn-of-the-century Copyright Act badly needs up-dating—or that any new legislation should consider the position of cable television. To this end, representatives from CATV, broadcasting and copyright holder groups are continuing to meet to work out recommendations for Congress.

We decline the invitation. That job is for Congress."

### "Member of the Family"

The same Court that gave cable its copyright victory also decided the basic issue of whether or not the Federal Communications Commission has the right to regulate the CATV industry. In a unanimous

decision, the Court ruled that the FCC has both the power and the obligation to regulate. This holding, in the words of one Washington attorney, made cable television officially a "member of the FCC family."

While the majority opinion, written by Justice John Harlan, was not entirely without qualification—it restricted the Commission's authority to matters related to its broadcast responsibilities—it left no real doubt of the FCC's position.

And already the industry has seen some indications of what membership in that family means as the FCC immediately proceeded to hand down long-awaited decisions in the Section 214 and San Diego cases.

### Telco Certification

On the heels of the Supreme Court mandate, the FCC issued its answer on the question of Section 214—whether telephone companies constructing lease-back facilities for CATV are obligated to obtain certificates of convenience and necessity from the Commission. And, as was hoped by cable interests—the decision was affirmative.

In the past, pole-use and other service agreements have given telcos in some areas virtual control over who could build a system and when. According to the decision, not only will future arrangements be subject to scrutiny, but cease and desist orders are being issued on facilities begun after October 21, 1966.

The orders allow present lease-back systems to continue to operate pending investigation by the FCC, but prevent further leaseback construction and require the telco to submit an application for certification.

The application for certification must be accompanied by supporting data showing: (1) that the existing system owner is the only franchise holder; (2) that when service was commenced no other application for channel service, pole use, etc. was pending before the carrier; (3) that the cease and desist order will result in the complete deprivation of cable service to subscribers; (4) any other public interest factors warranting relief.



The nine justices of the United States Supreme Court who recently handed down two significant CATV decisions are pictured above. Seated (left to right) are: Associate Justices John M. Harlan, Hugo L. Black, Chief Justice Earl Warren, William O. Douglas and William J. Brennan, Jr. Standing are: Abe Fortas, Potter Stewart, Byron R. White and Thurgood Marshall.

The strong language and get-tough attitude of the Commission indicated quite clearly that cablemen now have a forum for their problems and that any efforts by telcos toward monopoly in CATV will be summarily dealt with.

### Cablecasting in San Diego

The same day 214 was decided, the Commission also handed down its verdict in the San Diego case (the same case which, only weeks earlier, provided the occasion for the Supreme Court's affirmation of FCC jurisdiction over CATV). In very much a parental posture, the FCC gave the cable systems involved carte blanche to originate as many programs as they wish—but added a prohibition against carrying advertising.

The policy considerations involved in the FCC decision were: (1) the desirability of CATV local originations as "outlets for community self-expression and for augmenting the public's choice of programs and types of service"; and (2) the protection of UHF. In the Commission's view, the two considerations compete at least to the extent that if a system sells advertising to finance its local origination, it will reduce the potential advertising revenue which is "critical . . . to the viability of the UHF stations."

The FCC reasoned that, since it has the authority to regulate the use of broadcast signals, and since CATV systems use broadcast signals as a base for program origination, the Commission therefore has the "legal power to condition CATV's use of broadcast signals upon reasonable restrictions" in the public interest.

However, the decision did not propose this restriction for any systems other than those represented in this particular case. "This case," the decision said, "does not afford an adequate vehicle for the formulation of overall policy in this area . . . this would be more appropriately done in a general proceeding in which all interested persons have an opportunity to comment."

In further moves designed to protect UHF in San Diego, the FCC limited the carriage of Los Angeles signals to the Rancho Bernardo and Escondido communities.

TV Communications

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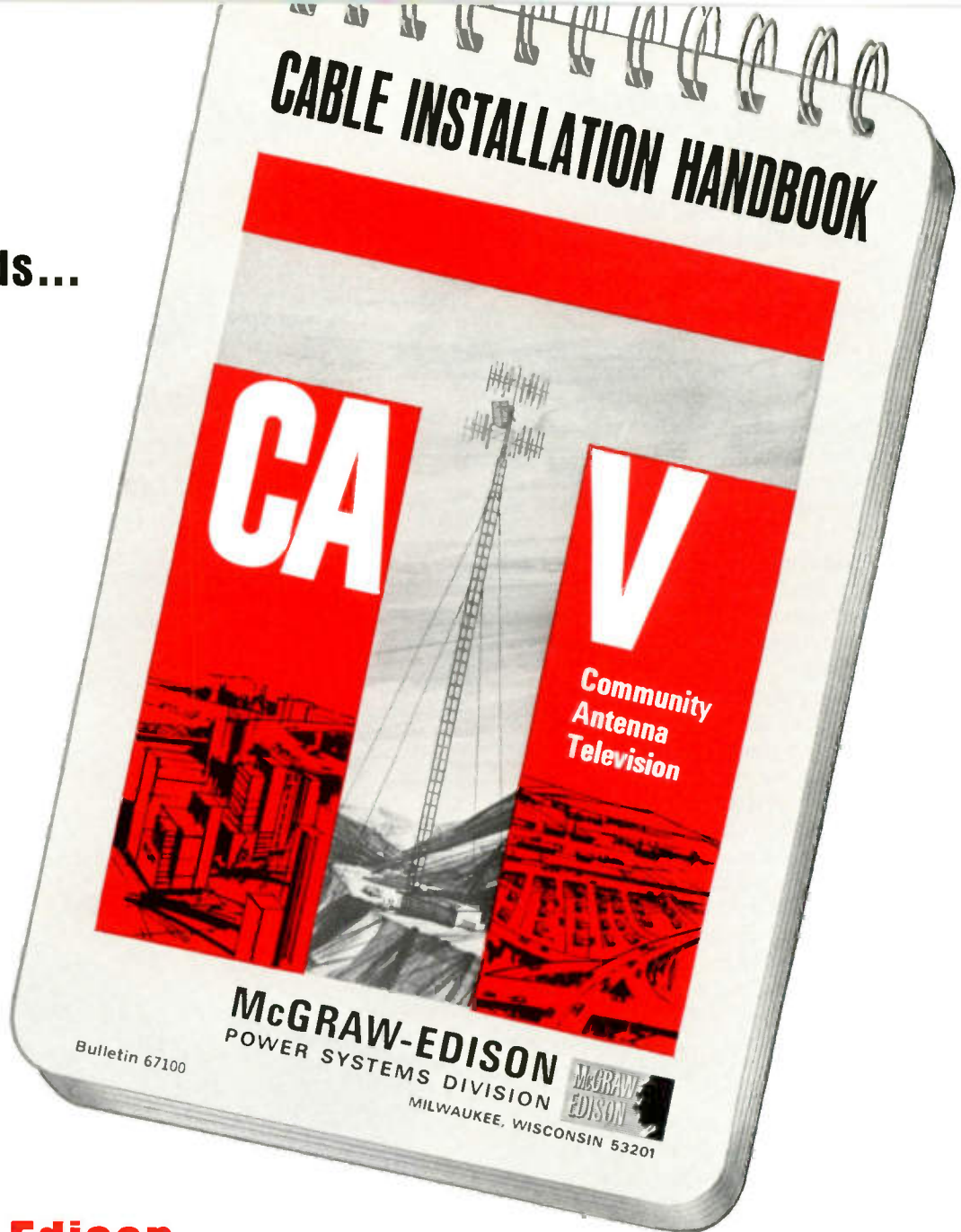
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## Commission Dissenters Point Up Need For CATV Programming Capability

In the forceful dissenting voices issuing from the FCC today, the note is sounding of future television programming truly designed to serve the needs of the public. It is at once a warning to complacent broadcasters and a message of encouragement to CATV operators.

Again and again in the past months, Commissioners Nicholas Johnson and Kenneth A. Cox have written detailed and pointed dis-

sents to broadcast license renewals on the grounds that the licensees have "systematically ignored" substantial, though perhaps minority, segments of their audiences.

Indications are that these members of the Commission are ready and willing to put some sharp teeth into the FCC's public service programming "requirement." And indeed, one of the questions they are asking is whether the Commission should protect top-100 market TV stations from CATV when those stations are not providing adequate community service.

Commissioners Johnson and Cox recently issued a 308-page report based on a study of Oklahoma radio and TV licensees up for renewal. They declared that since the broadcast system, under the mandate of the Communications Act of 1934, was built on "the keystone of local service," that should be a primary concern in license renewal.

The two went on to condemn the renewal process as a "sham" and a "pretense" since "programming deficiencies, even the most flagrant indifference to local service obligations imposed by the Communications Act, raise no eyebrows."

The type of programming of which the Commissioners speak is that which cable systems are so well

equipped to provide and which systems across the country are carrying on their local origination channels. That the FCC is aware of the programming gap and the unique capability of CATV in filling that gap is demonstrated in its recent San Diego decision. There, the majority said "The Commission has already determined that the public interest is served by encouraging CATV systems to act as additional outlets for community self-expression."

### Multiple Ownership To Be Considered Soon At FCC

As concern grows over concentration of news media ownership, the FCC has postponed filing deadlines in their one-market multiple ownership proceedings. The deadline for filing original comments was moved from June 27 to August 1, and the deadline for reply filings from July 8 to August 15.

This is the proceeding looking toward new rules barring ownership of an AM, FM or TV station by anyone owning another type in any one market.

While both the NCTA and the NAB have opposed such a rule, government figures have become increasingly outspoken on the desirability of some regulation in this area. At a recent Federal Bar Association meeting, Senator Philip A. Hart (D-Mich.), Chairman

### Anaconda Executives Change Name, Hold Planning Meeting

Anaconda Astrodata Co. of Anaheim, California, has changed its name to Anaconda Electronics Company.

Eighteen members of the Anaconda Electronics executive group met recently for a planning meeting that lasted four days. CATV's future and the company's opportunities for leadership in that future were the topics.

According to Ed Regan, president, "Anaconda has served notice that it plans to become a major factor in the CATV business." To back up his statement, Regan cited the CATV staff which the company has formed over the past 12 months.

Nine men, all with enviable depth of experience in the cable television industry, have been added to the company's management. One recent addition is Donn G. Nelson, 15-year veteran in the business, who was one of the founders of Cascade Electronics, Ltd. of Vancouver, B.C. Nelson's role at Anaconda is as liaison between customers and all company divisions.

Other management people are: Duane Crist, CATV marketing manager, formerly with Kaiser-Cox CATV Corp.; Vic Tarbutton, formerly with Cascade; R. Bruce Walters, vice president of manufacturing, formerly with Ameco; Gaylord Rogeness, director of research; James Emmick, manager of system engineering and construction; William G. Robinson, Jay Hubbell and Dick Old, sales managers for the southeast, central and northwest U.S., respectively.



Anaconda Electronics president Ed Regan (right) confers with Jay Hubbell (left) and Vic Tarbutton (right) at a recent meeting of the company's CATV staff.

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of the Senate Anti-Trust Subcommittee decried what he called a "cobweb" of ownership and partnership in news media, and warned against monopolistic trends.

At the same meeting FCC Commissioner Kenneth A. Cox spoke of the Commission's concern over the problem particularly in view of increased emphasis on CATV program origination. "The greater the role of the CATV operator in determining the content of the programming he distributes to the public," Cox said, "the greater the likelihood of increased Commission concern about avoiding undue concentration of control over this new type of communication facility."

### NCTI Has New Officers, Forms Guidance Committee

National Cable Television Institute president Patrick T. Pogue has named Edward O. Shotwell to the post of Director of Training and Jerry Laufer to advisory position of chairman of the Curriculum Committee. In addition, a Guidance Committee has been formed for the Institute.

Shotwell will be responsible for the coordination and production of lesson materials for NCTI's home study courses which provide tech-

nical and managerial training for CATV technicians. Laufer, a well-known cable television consultant and vice president of Tele-Vue Services Co., will specifically review all lesson materials in addition to course planning, and will serve as a member of the NCTI executive committee along with Pogue, Stanley M. Searle, and Buford S. Marsh.

Named to the new Guidance Committee, chaired by Laufer, were: Hank Diambra, Clearview of Georgia; Walter Wydrow, American Electronic Laboratories; Mike Rodriquez, Vikoa; and Clay White, Columbia Television, Inc.

Two courses are currently being offered through the school: the CATV Installer/Technician course, and the Chief Technician course.

### Cable Firm Announces Program Plant Expansion

The Jefferson-Carolina Corporation of Greensboro, owner and operator of 15 cable television systems, has announced plans to purchase equipment for seven additional Cable TV Bingo operations from Jack Hampton & Associates of Denver, Colorado.

The announcement was made by George Green, general manager of the corporation.

### Winner Accepts NCTI First Prize



David Winer, (right), TeleCable Corp. of Ellenville (N.Y.) accepts congratulations from NCTI president Patrick T. Pogue at the Convention. Winer, first-prize winner at the NCTI drawing, took home a matched women's and men's set of Tourister luggage.



The firm presently operates three Bingo TV games in their 10 systems now in operation. Five other cable-vision systems are under construc-



*Mitch Roberts, of Jefferson-Carolina's Dunn, N.C., system, is the first "bingo-caster" for the operating systems.*

tion. The operating systems are now serving over 20,000 subscriber, and with the completion of the 5 systems now under construction, the company anticipates serving 750,000 viewers. The completed operation will pass 200,000 homes in 15 cities in North and South Carolina and Georgia.

### Commission Grants 3-Yr. Pay-TV Extension in Conn.

Following heated arguments before the FCC, RKO General's pay-TV experiment in the Hartford, Conn. market has received another three-year extension. The Commission, in granting the extension, brushed aside objections by motion picture theater owners to the RKO operation.

Terms of the extension are identical with those of 1965. The new authority will be for three additional years, or until the FCC reaches a final decision in its long-pending proceedings with respect to authorizing pay-TV on a national scale.

There is still speculation that, on Capitol Hill, the House Commerce Committee might once again approve a resolution asking the FCC to forbear acting on pay-TV for another year.

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RCA-8121  
RCA-8462

100 to 250 W  
RCA-4633  
RCA-8072  
RCA-8122

500 W to 1.0 KW  
RCA-8791

1.0 to 2.5 KW  
RCA-8792

5.0 to 10 KW  
RCA-4628  
RCA-8793

10 to 25 KW  
RCA-8794



HF Vehicular FM  
30-76 mHz

50 to 100 W  
RCA-4631  
(2) RCA-6146B  
RCA-6816  
(2) RCA-6883B  
RCA-6884  
RCA-7843  
RCA-8462

100 to 250 W  
RCA-4637  
RCA-8121

250 to 500 W  
RCA-8122  
RCA-8226



VHF Aircraft AM  
108-144 mHz

10 to 25 W  
RCA-6146B  
RCA-6159B  
RCA-8072  
RCA-8462

25 to 50 W  
RCA-8121  
RCA-8646

50 to 100 W  
RCA-4633  
RCA-4637  
RCA-8072  
RCA-8122  
RCA-8226  
RCA-8462

100 to 250 W  
RCA-7650  
RCA-8121

250 to 500 W  
RCA-7213



VHF Vehicular FM  
148-174 mHz

25 to 50 W  
RCA-6146B  
RCA-6883B

50 to 100 W  
RCA-8072  
RCA-8462

100 to 250 W  
RCA-8121  
RCA-8122

250 to 500 W  
(2) RCA-8121  
(2) RCA-8122



UHF Vehicular FM  
450-470 mHz

50 to 100 W  
RCA-8072  
RCA-8462

100 to 250 W  
RCA-8121  
RCA-8122

250 to 500 W  
RCA-7650



UHF Mobile FM  
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# RCA

## TVC Publishers Honor CATV Pioneer with Title

A framed certificate naming him Honorary Editor of *TV Communications* magazine was recently presented to Jim Davidson at his Batesville, Ark. office. The inscription noted that Davidson was the first advertiser to order space in the inaugural issue of the publication and acknowledged "his continuing support." Stan Searle, co-publisher and editor of *TV Communications*, voiced appreciation of the fact that Davco Electronics Corp. has advertised in 57 consecutive issues of *TVC* since the monthly publication was founded. Davidson is president and principal owner of Davco, which supplies a wide range of cable television equipment, including some items which are manufactured at the Batesville plant. Davidson's holdings also include 12 systems in Arkansas.

In making the presentation, Searle recalled Davidson's early



*Jim Davidson (r.) accepts "Honorary Editor" certificate from Stan Searle.*

endorsement. "When Pat Pogue and I decided to launch a totally new CATV publication, I called Jim Davidson late one evening at his home and told him of our intentions. I don't think we had even decided on a name for the magazine at the time—but Jim mailed a check the next day to pay in advance for a full page in the first issue."

Davidson built the first cable system in Arkansas and one of the first commercial systems in the U.S. In nearly two decades since that time he has participated in the

formation of NCTA, the Southern CATV Association, the Arkansas CATV Association, and other state groups. He has served as president of both the Southern and Arkansas organizations and NCTA director.

## Politics Provides Programs For Service-Minded Systems

In this election year, cable system operators could not possibly ignore such a rich source of cablecasting material as the political scene. Nor, of course, is it all one-sided. As pointed out by many operators, this is an excellent opportunity to bring special interest programs to subscribers while at the same time educating politicians as to what CATV is, how it operates, and how it can benefit the politician in reaching a larger segment of the electorate.

Two examples of such public service cablecasting come from the East and West Coasts. In New York City, Manhattan Cable TV used cable television for the first time in that city for a local political race. Five of six candidates entered in the primary election race for the 17th Congressional district. They participated in a discussion series, "Views from the 17th." The program, designed to inform voters on issues and candidates, was aired each week night from 8:00 to 8:30 p.m.

On the national scene, Bill Little, manager of El Centro, California's Imperial Valley Cable Co., invited the candidates for the presidential primary in that state to appear live on cablevision and present their views.

The offer was received enthusiastically by candidates and viewers alike. Mary McCarthy, daughter of Wisconsin Senator Eugene McCarthy, appeared on behalf of her father in an hour-long question-and-answer panel show. Members of the panel questioning Miss McCarthy included representatives from the press, the local high school, the college faculty and the NAACP. Republican candidate Richard Nixon declined Little's invitation since, he said, he was not actually running in the primary. However, according to Little, Nixon indicated that he would welcome a similar offer during the national election.

## System Sales

Moore Cable TV, serving Corunna, Ont., has been purchased by Huron Cable TV, Ltd. The system presently has approximately 200 subscribers.

Mountain TV, formerly operated by Gary Tubbs of Grant, Colo., has been sold to Jerry Baker of Englewood and Dave Hubble of Littleton, Colo.

The Evening Post Publishing Company has acquired Aiken Cablevision, Inc., Aiken, S.C. and plans to complete system construction within a year.

The Ellensburg (Wash.) Television Cable Corp. has been added to the chain of systems owned and operated by King Videocable Company. The system, which serves about 2,500 subscribers, will be rebuilt soon, according to KVC officials.

Garden State TV Cable Corp. has been sold tentatively by John and Frank Scarpa to International Telephone and Telegraph Co., Inc.

Mid-Continent Telephone Corp. of Elyria, Ohio, has announced acquisition of Direct Channels Associates of New Bethlehem, Pennsylvania. TVC

## NCTA Members Approve Continuing Education Plan

At their annual meeting in Boston, the NCTA membership approved a Board of Director's recommendation for a \$65,000.00-per-year program designed to improve the technical, management and professional skills of CATV personnel.

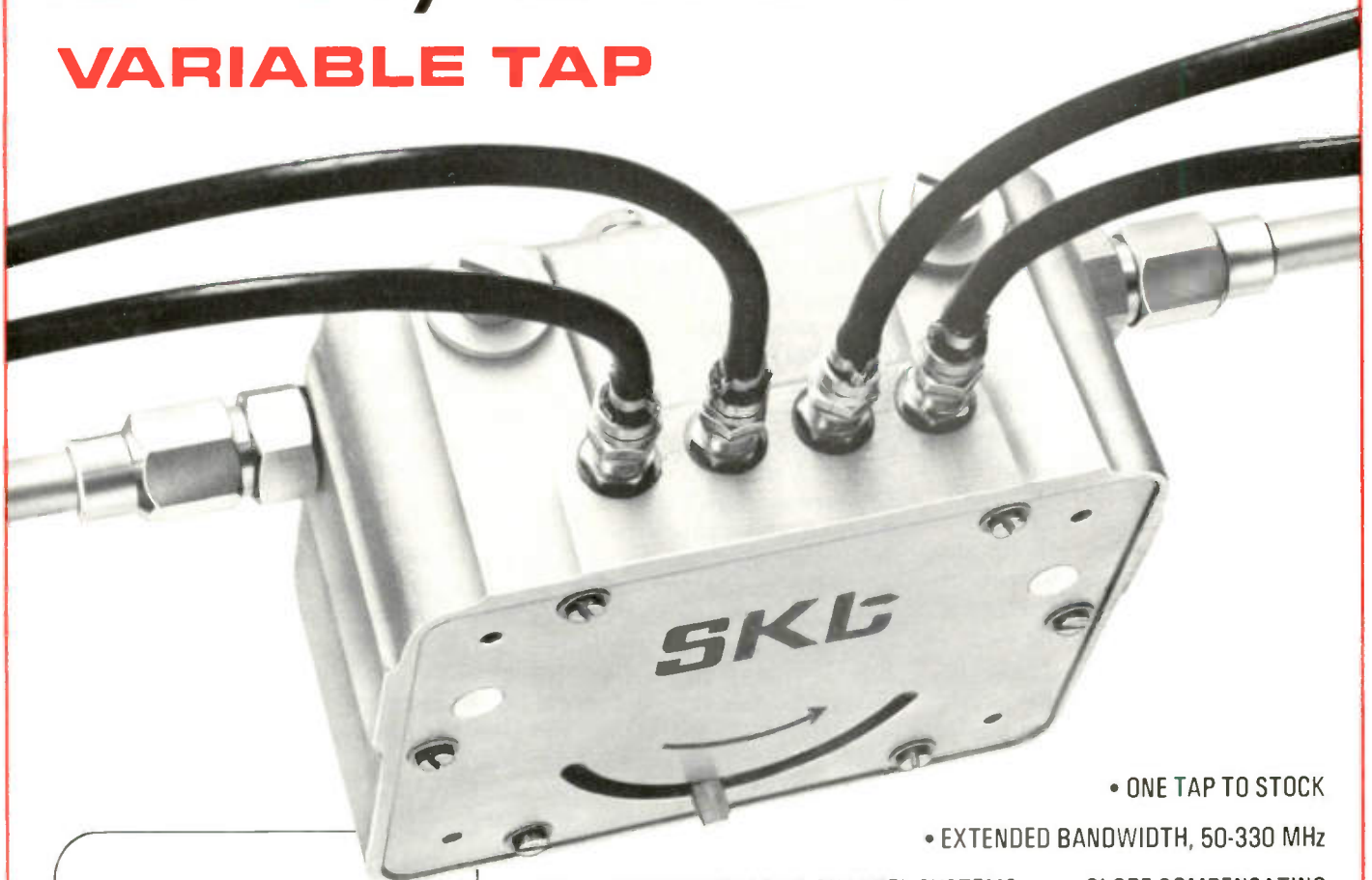
The program will be developed and administered by the Continuing Education Division of Pennsylvania State University, under the guidance of an advisory committee on which NCTA is to be represented.

The approval, according to an NCTA announcement, "climaxes years of intense activity" by James R. Palmer, head of C-Cor Electronics and chairman of the association's Technical and Management Training Committee.

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Center, staffed by a director and other personnel appointed by Penn State, will be responsible for day-to-day management of the project. Instruction will be available at the university campus and through the 115 members of the National University Extension Association. Participation in the program, according to NCTA, will be limited to employees of member companies of the association.

### U.S.—Canada Group Build Cable System in Hawaii

American and Canadian Cable businessmen have joined forces to build a new system in Hawaii. Mililani Cablevision, Inc., which has been formed to provide cable service to the new Mililani Town development, numbers among its principals several executives of Fred Welsh Antenna Systems of Vancouver, British Columbia.

Warren Haight, president of Mililani Cablevision, is also president of the company which is building the town. Every home built, he says, is planned to include two CATV outlets. Subscribers will receive five video channels plus FM and a time/weather service.

## All-Systems Moving Toward Colorful New Look in Cablecasting

The "new look" in cablecasting is the "bright look." As more and more consumers replace their outmoded television sets with "the exciting world of color TV," a correspondingly increasing number of cablecasters are experimenting with color.

At his Boston Convention press conference TeleMation president Lyle Keys noted this trend. "It was surprising to us," he said, "how many *smaller* operators are getting into color. We expected it primarily from the larger systems."

Kudos for the country's first color cablecast go to Coachella Valley Cable TV of Palm Desert, California. Keith Burcham, manager of the cable firm, successfully combined the appeal of color with the appeal of public service programming in taping the quarterly public meeting on industrial development presented by the Riverside County Industrial Development Association. In their first venture into local origination, the system used International Video Corp. cameras and recorders supplied by TeleMation. So enthusiastic was the response that

Burcham reports they are building the nation's first color studio.

The nation's first color cablecast of a sports event was carried by Time-Life's Telesystems, Inc., in Newburgh, N.Y. on the Hightower system. One of the programs, a local "Pony" league baseball game, was taped on a Saturday and shown to Hightower subscribers the following day.

With color an increasingly important factor in cable operations, the NCTA Standards Committee has reported that it has suspended distribution of its original standard specifying the signal strength to be delivered through cable to the subscriber's set. Hubert Schlafly, chairman of the committee, said this standard will be revised and reissued in a form designed to assure optimum performance.

### Seventh FCC Chair Empty; Loevinger Takes Private Post

The seventh chair at the FCC is still vacant following the recent retirement of Lee Loevinger after five years at the Commission. Although he could have continued to serve pending the qualification of his successor, Loevinger chose to move immediately into private life.

He is opening a Washington office for Craig-Hallum, Minneapolis bankers, and two of their subsidiaries, and will also be "of counsel" to Hogan and Hartson, leading Washington communications law firm.

For Hogan and Hartson, Loevinger will concentrate on anti-trust problems rather than communications matters.

### FCC Toughens Attitude On UHF Construction Plans

The FCC has taken a get-tough attitude on non-construction of UHF stations for which construction permits have been granted. The Commission has directed more than half a dozen holders of such permits to notify the Commission of their intentions to proceed or else to undergo hearings looking toward loss of their CPs.

### New Jersey Cable Group Elects Officers



*Pete Lucchin of Alpine Cable Company (second from right), outgoing president of the New Jersey Cable TV Association, congratulates newly elected head, George Cisco of Washington Cable Co. Other officers are vice president Bob McGinty (left) of Atlantic Coast Cable Co. and secretary-treasurer Bill Kennan (right) of General CATV, Inc. All four men serve on the state association board of directors. Installation of officers took place in Boston at the National Convention.*

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## Kaiser Accords CATV Full Division Status

Kaiser CATV Corporation, Oakland, Calif., previously a wholly-owned marketing subsidiary, last week became a major operating division of Kaiser Aerospace & Electronics Corp. The announcement came from Clay P. Bedford, president.

The company reports that a substantial increase in CATV sales for the first five months of 1968 was a factor in combining production and



*Announcement was made at the Boston Convention of Bill Daniels' gift of free TV Communications subscriptions to the television departments of all colleges and universities offering courses in Communications. Daniels makes final arrangements with publishing firm officials Buford Marsh and Patrick T. Pogue.*

marketing efforts into one major division.

The newly created division, headquartered at Phoenix, Ariz., will be responsible for all Kaiser CATV activities, including manufacture and sale of equipment and installation of systems.

Bedford also announced the appointment of Robert W. Behringer as vice president and manager

## Thor Electronics Enters CATV Field

Thor Electronics Corporation, Elizabeth, New Jersey, has recently entered the CATV field. The firm is a long-time wholesale supplier of electronic tubes, transistors, diodes, integrated circuits and cathode ray tubes, made by a large number of well-known manufacturers. Thor Electronics headquarters at 741 Livingston Street, Elizabeth, New Jersey.

## New England Firm Enters CATV Via SKL Acquisition.

An agreement in principle has been reached for the sale of Spencer-Kennedy Laboratories, Inc., of Boston, Mass., and Katahdin Corp. of Carlisle, Mass., to Adams-Russell Co., Inc., of Waltham, Mass. The announcement was made jointly by chief executives of the three companies.

Adams-Russell is a technically

oriented company in electronic components and phased antenna systems for electronic reconnaissance, digital communications and other areas. SKL, in addition to manufacturing, owns either directly or through an affiliate, CATV systems with over 13,000 subscribers. Katahdin has previously held a 51% interest in SKL.

## Calendar

**August 9-10.** The semi-annual meeting of the Rocky Mountain CATV Association will be held at Teton Village, Jackson Hole, Wyoming.

**September 26-28.** New York State Cable Television Association will hold its annual fall meeting at Castle Inn Motel, Olean.

**September 29-October 2.** The fall meeting of the Pacific Northwest CATV Association will be held in Portland, Ore., at the Sheraton-Portland Motor Inn.

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

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

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

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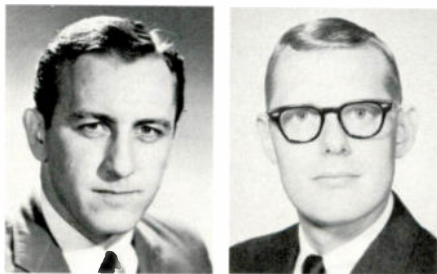
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# FOCUS

## ... On People

### Systems

**John F. Gault** has been appointed president of Continental CATV Corp., a Vikoa subsidiary responsible for the operations of company-owned systems. Gault has been



*Charles A. Bittick      Barrie W. Braden*

executive vice president since joining the company in 1966. He was formerly New England regional manager of TV Communications Corp.

**Edward Lamb** has announced his retirement as president of Lamb Communications, Inc., and the election of a new management team. **Arthur M. Ingram**, former vice president and general manager of the company's Erie, Pa., broadcast station, was elected president; **J. Edward Goff** was named corporate counsel; and **Bertram A. Ramlow** was named assistant treasurer.

**Wayne R. Hauser** has been appointed vice president and general manager of Newport Beach Cablevision, Inc. in Calif. In addition to this system, Hauser will have management responsibilities for all of Foote, Cone & Beldings's systems. He entered CATV in 1962.

Community Cablevision Company, Inc. has promoted **Gene Moon** to the position of general manager. Moon was formerly systems engineer.

**Lyle D. Abbott** has been named marketing director of GT&E Communications, Inc. He will be responsible for the direction and supervision of all marketing functions. Abbott has been with the

General system since 1957. **Charles Bittick**, formerly a marketing analyst for the company, has been appointed manager of G'TEC Cable TV in Macomb, Ill. and **Barrie W. Braden** has been named to manage the Angola, Ind., system.

Mississippi Transmission Company, Inc., has announced the appointment of **James "Eudy" Martin** as general manager for the systems under construction in four Mississippi communities. Martin will be in charge of the make-ready and construction of the systems as well as act as general manager for the entire complex.

**Craig H. Stevenson** is the new assistant manager of Jerrold's Community Operations Division. He was previously consumer product manager of the company's Distributor Sales Division. Jerrold has also named **Robert Oltman** division manager for the company-owned cable systems in six Texas towns. Oltman has been manager of Jerrold's Pontiac (Ill.) TV Cable Co. since 1964. **Wib Benckendorf** will assume Oltman's duties in Pontiac in addition to his present responsibilities as manager of Streator (Ill.) Cable TV. **Bill Young** has been named manager of Valley Cable TV System in Brownsville, Texas.

**Frank Englefield** has been promoted to the recently created



*Wayne R. Hauser      James Martin*

position of manager of Gray Cablevision, Inc., a division of Gray Communications Systems, Inc.

**Ed Pennington** has replaced **Roland Scott** as manager of the Fredonia (Kansas) Cable Television Co. Pennington moves from Casper,

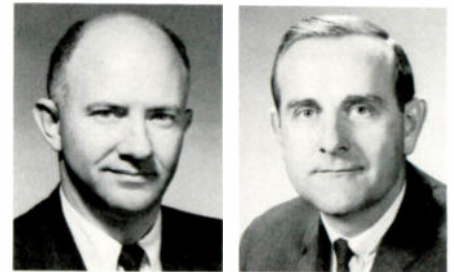
Wyo., where he has been in CATV for several years.

**Jim Mayfield** has been appointed manager of the Burlington (Colo.) TV Cable Service, owned by Dorate. Replacing Mayfield at Clayton (N.M.) TV Cable Service is **John Lord**, who joined the Dorate organization in 1957.

### Suppliers

**John Buchanan**, who had been with Ameco from 1962 to 1965, has been named vice president of marketing and sales.

Entron, Inc., has named **Thomas J. Gee** to the position of supervisor,



*John Buchanan      J. A. Reifenberger*

quality assurance. In his new post, Gee will be responsible for quality control engineering, and test and inspection surveillance. He comes to Entron with more than 15 years' experience in inspection.

Preformed Line Products Co. has named **John A. Reifenberger** district sales manager for the Southeastern U.S. He will be responsible for all markets as well as supervision of several manufacturers' representatives.

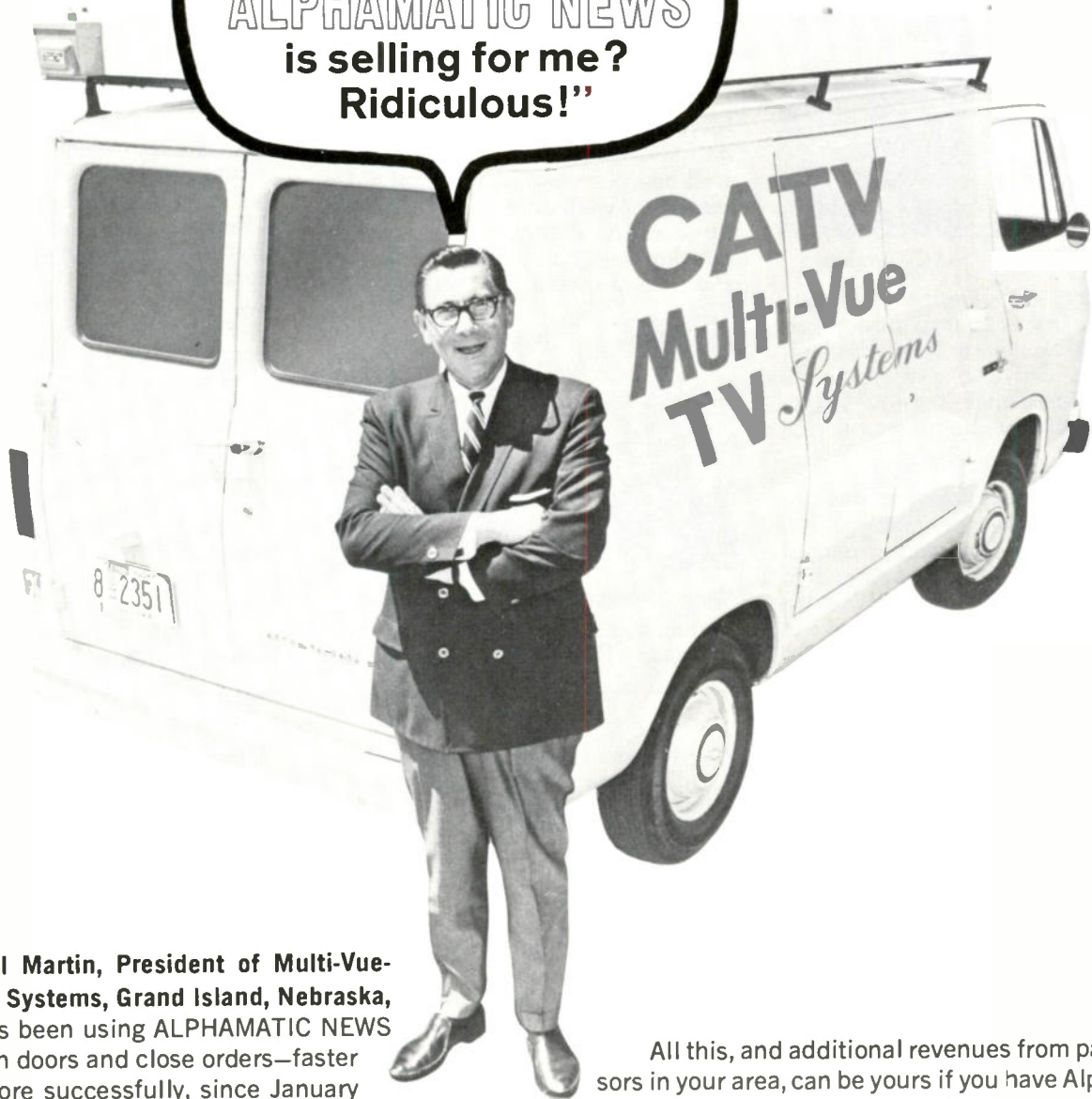
**Robert G. Rosenquist** has been named director of personnel for Shure Brothers, Inc. He has served for the past eight years as corporate personnel director of the Nuclear-Chicago Corp.

**Donn G. Nelson** has moved to Anaconda Electronic Co. in the newly created position of technical coordinator. His responsibilities will include technical and product coordination between CATV customers and all company departments. Nelson has been vice president and general manager of Cascade Electronics, Ltd., a Canadian firm which he helped to found in 1965.

**David E. Karrmann** has been appointed manager of Whitney



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He's got a new business secret that's unbeatable—a CATV channel of Alphamatic News that goes 24 hours a day. And, he gets his news—from around the world to around the corner—as part of his custom designed Alphamatic News package:

United Press International news, 24 hours a day. News, news features, sports, in-depth reports fed direct from the UPI news wire at the same time they come into local radio and television news rooms.

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Blake's Coaxial Cable Division, according to president George A. Hanlon. Karrmann, who has been with the company since 1965, was instrumental in developing the division which manufactures aerial, duct and direct burial CATV cable.



Donn Nelson



J. C. Sparkman

His prior experience includes positions as transmission engineer with Southern New England Telephone Co. and new products manager for Times Wire & Cable. Karrmann is a technical advisor to the NCTA.

The Jerrold Corporation has announced several personnel shifts. **J. C. Sparkman** has been promoted from sales engineer to manager of equipment sales for the Western region. Sparkman joined Jerrold in 1965. Two sales engineers have also

been appointed by the company. **Charles C. Moody** will establish a new Jerrold office in Minneapolis, and **R. Bruce Lane** has been named to serve Missouri and southern Illinois.

C-COR Electronics, Inc. has appointed **Charles R. Durrell** as marketing manager. He has previously served as director of marketing for Rochester Datronics,

Several marketing appointments have been announced by International Video Corp. **John D. Rockwell** has been named national sales manager. **William A. Fink** has been appointed director of market development and product planning. **Paul W. Jantzen** has been named



Robert Rosenquist



Jerry Laufer

manager, sales and service administration. **Frederick J. Haines** has

been appointed manager, applications engineering. **Richard J. Reilly** has been promoted to Western regional sales manager; **Joseph S. Bottali** is the new Eastern regional sales manager; and **Jerry Kraus** have been named district manager for Southern California.

## Professional

National Cable Television Institute president, **Patrick T. Pogue**, has announced the promotion of **Edward O. Shotwell** to the post of director of training. He will be responsible for the coordination and production of lesson materials for the NCTI home study courses. **Jerry A. Laufer** has accepted the advisory post of chairman of the curriculum committee. Laufer, a well-known CATV technical consultant, is vice president of TeleVue Services Company.

**John M. Taff**, an FCC employee since 1949, has been named engineering assistant to FCC Commissioner **Robert T. Bartley**. Taff has been an aid to Commissioner **Lee Loevinger** since 1963. TVC

## Financial Reports

**Ampex Corp.** reports per share earnings of \$.80 for the year ending April 27, 1968. This compares with per share earnings of \$1.09 for the same period last year. Earnings figures are based on net earnings of \$7,665,000 and \$10,326,000 for the two periods respectively. Sales in 1968 were \$233,433,000 and in 1967, \$215,529,000.

**H&B American Corp.** reports per share earnings of \$.21 for the 9 months ending April 30, 1968. This compares with earnings of \$.15 for the same period last year. Earnings figures are based on net incomes of \$609,696 and \$452,616 for the two periods respectively. Sales were \$5,221,50 for 1968 and \$4,484,006 for 1967.

**Mid-Continent Telephone Corp.** reports per share earnings of \$1.14 for the year 1968. This compares

with earnings of \$1.04 for the preceding year. Earnings figures are based on net incomes of \$3,357,562 and \$3,120,844 for the two periods respectively. Operating revenues for 1968 were \$7,460,838 and for 1967, \$6,365,234.

**North American Communications** reports per share earnings of \$.14 for the quarter ending March 31, 1968. This compares with earnings of \$.11 for the same period last year. Earnings figures are based on net incomes of \$223,000 and \$154,000 for the two periods respectively. Operating revenues for the 1968 period were \$1,612,000, and \$1,145,000 for 1967.

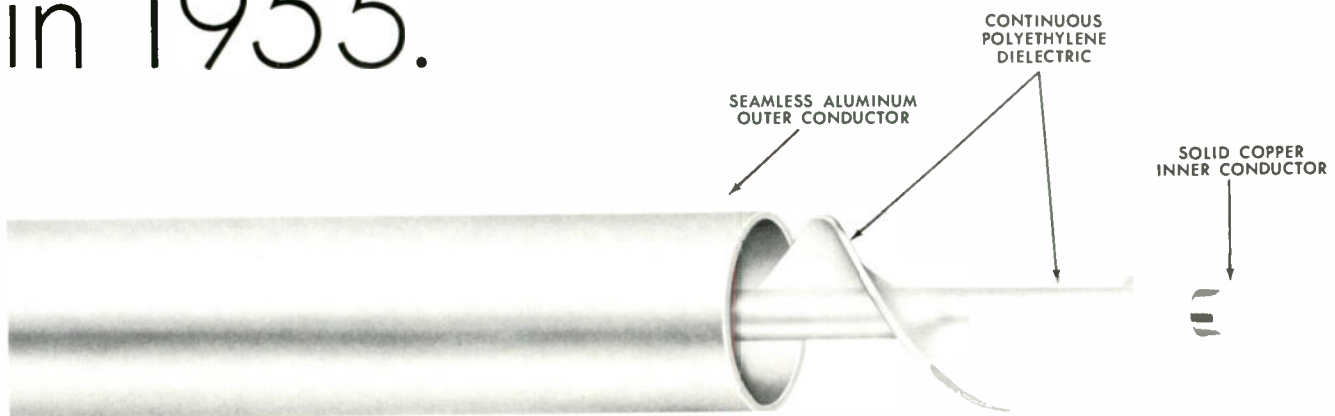
**Scripps-Howard Broadcasting** reports per share earnings of \$1.85 for the year 1967. This compares with earnings of \$1.95 for the same period the previous year. Revenues for the company were \$19,300,000 and \$18,900,000 for the two periods respectively. Besides extensive broadcast interests, the company has a 49% interest in Telerama, Inc., operator of a 4,000-subscriber system in the Cleveland area.

**Southam Press, Ltd.** reports per share earnings of \$2.15 for the year 1967. This compares with earnings of \$2.11 for the previous year. Earnings figures are based on net profits of \$6,455,813 and \$6,327,354 for the two periods respectively. Revenues were \$73,800,000 for 1967 and \$67,600,000 for 1966. Company president, **St. Clair Balfour**, announced the 2% increase in net profit and 9% increase in revenue despite a disappointing fourth quarter. During the past year, the Toronto-based firm has acquired a 50% interest in Greater Winnipeg Cablevision.

**Vikoa, Inc.** president, **Theodore Baum**, has announced that the company has filed a registration statement with the Securities and Exchange Commission covering approximately 200,000 shares of common stock, par value 5½ cents per share. The managing underwriters are **Ladenburg Thalmann & Co.** and **Oppenheimer & Co.** The company plans to use the proceeds for expanding its ownership of CATV systems and for the purchase of new equipment. TVC

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# NCTA Convention Roundup...

## A Summary Of Speeches And Activities

The following special report, along with the Trade Show Review beginning on page 46 and the upcoming Convention Photo Edition of CATV Weekly comprises a comprehensive convention digest, produced by the 18-member TVC staff who covered the show.

### All-Star Panel Gathers Around Cable Television Crystal Ball

As convention-goers were still registering in the hotel lobby, the NCTA's 17th annual show got underway with one of the most important panels of the entire program. Four of the industry's acknowledged leaders, in a panel moderated by Ben Conroy, Jr., in effect keynoted the convention. Speaking on the Future of Cable TV were Irving Kahn, president of TelePrompTer Corp., New York City; Alfred R. Stern, president of

TeleVision Communications Corp., New York City; Bill Daniels, president of Daniels & Associates, Denver; and J. Leonard Reinsch, president of Cox Broadcasting Corp., Atlanta.

In his remarks, Irving Kahn set the theme: "The important questions today are not whether the industry is going to survive, but where it is going, how it is going to get there, and whether some of the *people* now in the industry will survive." To insure the survival of present cable operators and their successful transition to the "new

world," Kahn proposed a BEBA (bring'em back alive) program for cable analagous to the AAA program.

There is no question, said Kahn, that *where* we're going is "home communications centers, data transferral and more local programs and services" keyed by a wired system. And he emphasized that that wired system could and should be the cable operators' system.

He also made some concrete suggestions for a BEBA program. One was concentrated public and



Shown during a special tour of the convention exhibit hall are (left to right) Bill Daniels, FCC Chairman Rosel Hyde, Robert Baum, and Frederick W. Ford. Chairman Hyde keynoted the Monday luncheon at the Boston Show.



Panelists for a management session on local programming are (left to right) Bob Weisberg, Gene Dodge, Greg Liptak, John Brunson, and C. E. Feltner, Jr. Sessions were rated "better than ever" by many conventioners, and were well attended for the most part.

government relations program for all operators. Another was increased cablecasting activity in metropolitan centers as well as smaller communities.

Kahn urged cablemen to "try to find accommodation with the FCC, to break new ground and influence new, forward-looking FCC policies," and also to re-think goals for legislative action. "Anything," he said, "that tends to broaden and modernize the communications ground rules should work to the ultimate benefit of CATV."

Alfred R. Stern, too, spoke of the wired communications system to come. He suggested a name-change from cable television to cable communications to reflect more clearly the "group of services based not only on TV but on other important additions which should be developed for use by our subscribers."

Stern forecast the day when the viewer himself, not the networks, would decide on his own entertainment program and be able to dial it on his set. The "excitement of the future of our industry," he said, lies in taking the "mass' out of mass media."

Outlining the steps necessary to effect this shift, Stern emphasized the program which must be directed to the FCC, the Congress and the President's Task Force. He also stressed the need for a vastly more far-reaching research and development facility for new wire services.

To this end, Stern proposed the organization of an industry company to be known as Cable Communications Development, Inc. The firm, as envisioned by Stern, would work closely with the NCTA, but would be independent, and would "have the responsibility of seeking maximum uses for the cable to benefit all of us."

Stern estimated the cost of forming such a corporation at \$750,000 and pledged his own company to \$50,000 toward that goal. He invited "smaller organizations, individuals, system operators and anyone who is willing to back up his confidence in the future of our business with his money" to contribute funds. (See page 58 for the complete text of Stern's speech.)

J. Leonard Reinsch, in his address, termed 1968 the year of "cable television re-birth." Today, he said, the industry is seeing the realization of a years-old goal—the inclusion of cable in the framework of national communications policy, "a full-fledged member of the communications family."

In discussing recent court decisions, he said, "I believe the fact that our industry has gained equal standing with other electronic media is more important than the fact the FCC regulates us." Reinsch outlined the possibility of a new course of action by the Commission which would achieve the goal of "complete television service."

Bill Daniels anchored the panel and lived up to his reputation as an industry innovator when he announced that his just-completed underground Colorado Springs system had 19 twin pairs of communications wire for expanded services. He also announced that he is going to construct a \$200,000 facility to house computers and related equipment.

Daniels told cable leaders that he is currently holding talks with IBM to discuss ways in which to utilize the expanded communications capability of the Colorado Springs system for computer services.

The bright financial future of cable television was also predicted by Daniels, who said he agreed with estimates of \$1 billion annual revenue by 1978. He noted that the recent court decisions have noticeably spurred financial interest in the industry.

Thus the consensus of the first general session was optimism and enthusiasm, a mood which was to prevail throughout the four-day 17th Annual Convention.

## Focus on Cablecasting

The first management sessions, on Sunday, June 30, dealt with "Cablecasting — Discovering New Horizons." Mort Berfield, communications attorney with Cohen and Berfield of Washington, D.C., outlined for operators the host of legal

and regulatory ramifications of increased cablecasting. "There is clear evidence," he said, "that the shape and form of cablecasting will be greatly influenced by forthcoming... decisions," particularly at the FCC. Berfield observed that with the jurisdiction and copyright issues settled, cablecasting has advanced in importance at the Commission.

Dick Garrett, of ITT Mackay Marine, Clark, N.J., discussed some cable capabilities in the non-video area. Specifically referring to burglar and fire alarm protection, he said, "cable can provide this service in the two large markets that are now untouched: cities under 200,000 and residential areas."

Greg Liptak, of Cleveland Area TV, Lakewood, Ohio, called on cable operators to face and solve the cablecasting problems that are confronting them today. One such problem, he said, is the lack of technical standardization in the industry, a problem which could perhaps be solved through the NCTA Standards Committee. He also touched on the need for hiring better qualified personnel, and for a more extensive exchange of cablecasting ideas, again perhaps through NCTA channels.

The role of cable systems in local education was covered by Ed Drake of GenCoE, Inc., Moab, Utah. He told the audience of his own system's relationships with the local school board. "We share our facilities with local schools," he said, "for films, review courses, commercial basketball and football games, teen discussion programs and record shows. Our goal," he concluded, "is to build a better community through cable television."

James Thurber's "Fables of Our Times" were re-created by Richard Shively, president of Telesis Corp., as he cautioned operators about some of the hazards of instituting cablecasting. In summarizing useful guidelines, he suggested a "happy medium" between doing nothing, like Thurber's bear, and attempting too much, like Thurber's moth. Shively emphasized the value of planning and programming for "multiple minorities," the kind of public service programming that best fits the need of a particular community.

Sunday's second session dealt

with the lively new topic on the cable scene: "Free Film Packages for Cable TV." Moderated by Greg Liptak of Cleveland Area TV, Inc., the panel featured Robert Weisberg of TeleMation Program Services; C. E. Feltner, Jr., of Trans America Film Corp.; Gene Dodge of Modern Talking Picture Service; and John Brunson of Programming Corp., of America.

Within one short hour, operators were informed of the services offered by each panelist's firm and advised on such diverse topics as free films (Gene Dodge); programming for unique interests such as foreign language, children's programs and religious programs (Robert Weisberg); cost considerations (C. E. Feltner); and the importance of "quality programming concept" leading to consistently good programming on cable channels (John Brunson).

## Legal Briefs

Monday's management sessions covered "Cable TV and the Law," including the hottest topics in the legal area. NCTA's general counsel, Bruce Lovett, moderated the first panel of six well-known attorneys who spoke on FCC regulation, PUC, copyright and telephone company relations.

Harry M. Plotkin, of the Washington, D. C. firm of Arent, Fox, Kinter and Kahn led off with a re-examination of FCC regulation and jurisdiction in light of the recent San Diego decision in the Supreme Court. Now that the Court has determined that the FCC does indeed have jurisdiction over the industry, Plotkin said, the next question is, "How should the Commission exercise that jurisdiction?"

The basic approach of the FCC, Plotkin said, must shift from protectionism to public interest. He emphasized the right of the public to receive the fullest possible television service—and noted that this right falls within the area of freedom of speech, an area "carefully and scrupulously" guarded by the Supreme Court.

John Cole, of Cole, Raywid and Zylstra, also spoke of the effects of the FCC's latest move in San Diego. His prediction was that the cable industry's erstwhile enemies, such

as NAB and AMST, will become staunch allies in future confrontations.

On the subject of the 214 decision at the Commission, Cole called it "the first clear demonstration that you are no longer the step-child at the FCC." CATV is far from the favorite child there, he continued, but "at least you are now inside the home." The 214 decision, he said, "heralds a new era of Federal regulation," an era marked by the "paternal instinct" of the Commission toward cable. "The pattern which will develop from this," he concluded, "is in your hands."

E. Stratford Smith, co-counsel for Fortnightly Corp. in the Supreme Court copyright case, spoke on that topic, quoting Supreme Court Justice Potter Stewart's remarks in the case, "The broadcaster procures the program, but CATV falls on the viewer's side. CATV is a well placed antenna and it no more than enhances the viewer's picture."

Smith said that although local origination is a great thing for a cable system, the more a system "acts like a broadcaster" the greater its danger in the copyright area.

On the PUC regulation threat, Washington attorney John D. Matthews said that only two states (Connecticut and Nevada) have held that CATV systems are public utilities. "In both states," he said, "exclusive authority has been given to the state public utility or service commission to regulate CATV systems, select franchise holders, establish rates and the like." He added that other states have either not considered the question or have consistently held over the years that CATV systems are not public utilities. He cited the Supreme Court in California that held that the Public Utilities Code of that state did not have jurisdiction since CATV systems did not come within the definition of a public utility.

Matthews went on to say that the Supreme Court decision in *Southwestern* may have settled the issue by pre-emption, i.e., by giving jurisdiction of CATV to the FCC in such a way as to preclude regulation by the states. While the language in the decision is not absolutely clear, he said, that would seem to be the thrust of the judgment.

Copyright was again the topic as

Walter Schier, of Katz, Moselle and Schier, addressed the audience. Schier emphasized the importance of negotiations between cable people, broadcasters and copyright holders as "a means of providing for the future." He said, "The Fortnightly decision blessed and gave approval to our past and enabled CATV to continue to serve as it has been. The task now remains to negotiate for the opportunity to realize our potential."

Schier took the opportunity to criticize CBS's prosecution of their copyright suit against TelePrompTer. He drew applause from the audience with his advice to the broadcast giant, "I say, put down your gun, CBS—it isn't loaded!"

The final speaker was Lewis Rivlin, of O'Conner, Green, Thomas, Walters and Kelly. Rivlin delved into the complex decision of the FCC on the 214 issue and explained to the operators present how it would and would not affect them.

Immediately following the first panel was a second, also on the law, moderated by Gary Christensen of NCTA. Participating in the panel were: Albert J. Hoban, Regional Director, New England Office of National Labor Relations Board; Robert W. Kopp, Bond Schoeneck and Kink; and Thomas J. Kilday, Assistant Regional Director, U.S. Department of Labor, Wage & Hour and Public Contracts Divisions.

These three panelists outlined for operators the increasingly important areas of labor relations, unions, and fair wage and hour practices. Besides treating the policies underlying governmental regulation in these areas, the three experts also conveyed many practical guidelines for system operators.

## Final Day

Tuesday morning's sessions covered the topics, "The Board Spectrum of CATV" and "Educational Television and CATV." The first was moderated by Sol Schildhause, chief of the FCC's CATV Task Force. Panel members were: S. Jerry Cohen, Staff Director & Chief Counsel of the Senate Subcommittee on Anti-Trust & Monopoly; Dr. Martin H. Seiden, of M. H. Seiden & Associates, Economic

Consultants, Washington, D.C.; and Greg Potvin, counsel to the Select Committee on Small Business, House of Representatives.

This panel discussed some of the upcoming problem areas cablemen will be confronting. They touched on such matters as the economics of the "new CATV," the growth potential of local origination, the forthcoming copyright legislation, and some expected changes in FCC regulation.

The panel on ETV/CATV was moderated by Stanley M. Searle, publisher of *TV Communications* and *CATV Weekly*. He and panelists William G. Harley, President of the National Association of Educational Broadcasters and Robert K. Avery, CATV information coordinator for Pittsburgh's ETV stations, discussed the complementary functions of the two industries.

Harley, in his remarks said, "The two futures are not really separate, but the same," and went on to express his confidence in "cordial and mutually beneficial relations." Avery outlined the close working relationship between stations WQED and WQEX in Pittsburgh and nearby system operators. He echoed Harley's sentiments that ETV and CATV share the responsibility of providing alternate and wider-ranging television service to the American public, and that such an aim can be achieved through cooperation.

Harley mentioned two specific concerns of ETV about CATV: a financial concern about the possible siphoning off of support; and a professional concern about the quality of educational programming being carried on cable channels. But he emphasized that, through discussion and a cooperative attitude on both sides, solutions are being, and will continue to be, worked out.

In the final management session of the convention, the NCTA awarded citations for Cable TV Week promotions; for outstanding programs in public relations, advertising and promotion; and special awards for outstanding contribution through effective promotion.

First-place winners for Cable TV Week were: TelePrompTer of Tuscaloosa (Ala.), Houma (La.) Cablevision, Inc., and Durango (Colo.) Television Network, Inc.

Special awards for outstanding promotion of the industry went to: Daniels and Associates; Pueblo (Colo.) TV Power, Inc.; Theta Cable of California (Los Angeles); and Quincy (Ill.) Cablevision; with the top prize awarded to Town Television of Moab, Utah.

Some of the winners in the advertising, public relations and promotion categories presented their programs briefly at the final session. Among them were: Bill Adler of TeleVision Communications, for the start-up program at Charleston, W. Va.; Mimi Barash of Barash Advertising, for Quincy (Ill.) Cablevision; Mark Weber of Perfect TV, Harrisburg, Pa.; George Sisson of Westerly (R.I.) Cable Television, Inc.; Keith Burcham of Coachella Valley Television, Palm Desert, Calif.; Abe Patlove of Continental CATV, Inc. for Better TV of Zanesville (Ohio); Dom Sansome, Florida TV Cable, Melbourne, Fla.; Bill Little, Imperial Valley Cable Co., El Centro, Calif.; D. A. Purcell, TeleCable Corp. for Beckley (W. Va.); and Sanford M. Freeman of TelePrompTer for Elmira (N.Y.) Video, Inc.

John Druckenbrod, of NCTA, also detailed for operators promotion plans for Cable TV Week, 1969.

## New NCTA Officers

Last minute opposition to the election of Robert H. Beisswenger as NCTA Chairman was the center of attention at the association's annual business meeting—but failed to deny the Jerrold president a healthy margin in the balloting. Placed in nomination from the floor was Ralph L. "Bud" Weir, well known Kansas system operator and former NCTA officer and director. Several members took the floor to comment on the choice of the national chairman, each making it clear that principle—not personalities—was at issue.

Beisswenger, at 51, heads the operations of Jerrold Corp., which in turn has interests in 18 operating systems, in addition to its major manufacturing operations. Joining Jerrold in 1961, Beisswenger has headed the firm since January, 1966. Prior to his election as NCTA's chairman, he served on the association's board of directors,

and chaired the legislative committee during 1967-68.

Other officers for the 1968-69 term were elected by voice vote as nominated by the nominating committee. National Vice Chairman is Richard A. Moore, president of Southwestern Cable Company of San Diego, Calif. Moore served on the NCTA board and its executive committee last year, and has been active in the California operators' association. Elected as Secretary was Marcus Bartlett, vice president in charge of cable television operations for Cox Broadcasting Corp. of Atlanta, Ga. Also a former director of the association, Bartlett has held several committee posts. The new Treasurer is Monroe M. Rifkin, president of Daniels Management Company of Denver, Colo. Rifkin has served on the NCTA board for two years, as well as on the Budget and Audit Committee.

Also elected at the annual business meeting were eleven new directors for the association as follows: William Bresnan, F. Gordon Fuqua, John Gwin, William Hemminger, G. H. Dodson, Amos B. Hostetter, Jr., Fred Lieberman, Robert H. Symons, W. Randolph Tucker, John Walson, and Ralph L. Weir. NCTA associate member firms, meeting earlier in the conven-

tion, elected Superior Continental's Ben Hughes as their representative on the board for this year.

Other business transacted at the members-only general meeting included approval of a record \$1,058,770 budget for the association's operations for the current fiscal year, (up from \$987,859 for last year); approval of bylaw revisions intended to streamline organizational structure and efficiency in the association; and passage of a modification in the dues structure raising associate members' dues and reducing the tariff on system operators as subscribers increase.

### Pioneer Awards Presented:

Among the highlights of the annual NCTA convention banquet was the presentation of CATV Pioneer awards to six new "old-timers" in the industry. Pioneers named in previous years have organized as the CATV Pioneers Club, and now administer the award program. Individuals chosen to receive the awards are selected for service to the entire cable television industry, over a period of at least ten years.

Recipients of the coveted awards this year were Bill Calsam, James Palmer, Raymond V. Schneider,

Donald Spencer, and Ralph "Bud" Weir. Also recognized by the group was Robert D. L'Heureux, well known Washington attorney, and long-time friend of CATV, who was made an honorary Pioneer (his direct involvement in CATV not yet stretching over a decade). Presentation of the plaques to the recipients was made by Stan Searle, co-publisher of *TV Communications*, and originator of the Pioneer Awards.

Following the naming of its new members, the CATV Pioneers Club presented two special awards: one to attorney E. Stratford Smith for his work on the Supreme Court copyright case recently decided in favor of cable interests; the other to NCTA General Counsel Bruce Lovett for his efforts in the 214 case in which the FCC found in favor of the CATV industry arguments.

### Boggs Award Presented:

Fred J. Stevenson, veteran system operator and outstanding industry leader over the years, was honored this year with the Larry Boggs Memorial Award. Making the presentation was last year's recipient, George Barco. Among the specific contributions to the industry noted in the award ceremony were Stevenson's efforts as NCTA's National Chairman, and his acting as administrative head of the association in the absence of a paid president for the group. A charter member of the national group, Stevenson has served many committee posts and two terms as an NCTA director, in addition to taking an active part in forming and supporting the Arkansas and South Central CATV associations.

Also honored at the annual banquet were two outstanding committeemen for the association, Hubert Schlafly and Archer Taylor. The former is chairman of the Standards Committee; the latter chairs the subcommittee on Standards Engineering.

### Jerrold Night:

Another social highlight of the Boston convention was the Jerrold Night banquet and show. Centered around a "Showboat" theme, the



New NCTA National Chairman Robert Beisswenger is shown during press conference the morning following his election. His comments dealt primarily with the mature state and bright future of the cable television industry.





Presentation of the coveted Larry Boggs Award highlighted the Annual NCTA Banquet. Veteran system operator and industry leader Fred Stevenson is shown receiving the award from last year's recipient, George Barco.



The CATV Pioneers Club added six members this year, including Ray Schneider shown receiving his plaque from Stan Searle, originator of the awards. Other new Pioneers were: Bill Calsam, Jim Palmer, Donald Spencer, Bud Weir, and Bob L'Heureux.

gala attracted an overflow crowd, and featured a number of top quality acts on stage. Jerrold CATV chief Jerry Hastings hosted the affair which was noted for its lively pace and variety of entertainment.

### Comments of Sen. Randolph

In the convention's opening speech Sen. Jennings Randolph (D-W. Va.) charged that certain television programs are nothing more than "a gigantic advertisement for sadism and violence." The chairman of the Senate Public Works Committee called on television broadcasters "to elevate rather than to downgrade our standards of value."

Randolph noted that the nation's 2,000 CATV systems, serving some 10 million viewers, are not responsible for originating the TV shows he criticized. But he urged cable operators—and their subscribers—to exert an influence on television producers to curb what he called "an almost unremitting diet of violence on TV."

Randolph, recent co-sponsor of a Senate resolution calling on all communications media to conduct a searching re-examination of their "contributions to the atmosphere of violence" and to suggest possible remedial actions, said many television programs have "served well the aims and interests of a democratic society."

But, he added, "there are literally

scores of programs tuned to the glorification of violence and sadism and debasement of the public weal."

No one expects the television industry to be "an around-the-clock purveyor of happiness and good," the Senator stressed. "But neither do we expect it to be a gigantic advertisement for sadism and violence.

"It is my hope that the events and disclosures of recent months will set in motion the development of a higher sense of social responsibility among those who govern television . . . Meeting this challenge is also a responsibility of cable television."

### Comments of FCC Chairman Rosel H. Hyde

President Ford, Distinguished Guests, Ladies and Gentlemen: The opportunity to address the National Cable Television Association comes at a time which is certain to be recognized as crucial in CATV matters. It is a time for reflection; it is a time for new ideas and a new look. We must now begin to re-examine policy in the light of recent decisions of the Supreme Court relating to regulatory responsibility and copyright considerations. I know that some of us thought the Court would solve our problems one way or another. The Court has, in fact, given assistance in resolving certain issues, but it has left the further development of policy to the Commission, to interested parties, and

to such further attention as Congress may wish to give the matter. There is obviously a challenge and opportunity for regulatory leadership and for industry statesmanship.

Let me review briefly where we now stand. The Supreme Court has sustained Federal Communications Commission jurisdiction to regulate community antenna television systems to the extent necessary for the proper regulation in the public interest of television broadcasting. In doing so the Court noted that CATV systems "promise for the future to provide a national communications system . . ." It found that CATV systems were within the statutory term "communication by wire or radio," that they are engaged in interstate communication, and that Congress intended to place regulatory authority over all such interstate communication in a single agency with broad authority.

A week later the Court held that a CATV system carrying a copyrighted television program is not infringing the copyright because there is no performance within the meaning of the Copyright Act. For the purpose of the 1909 Copyright Act, the Court likened CATV to the home or apartment house antenna rather than to a broadcasting station.

On June 25, we issued our Section 214 decision holding that all common carriers providing service to CATV customers must obtain a

certificate of public necessity and convenience from the Commission.

On June 26, the Commission handed down its decision in the San Diego hearing, finding that increased penetration of the San Diego area with Los Angeles television signals would jeopardize local San Diego UHF television service in a manner not consistent with the public interest. I believe it is a fair description to say that this decision shows a determination to protect local service rather than to hinder the valuable contribution which CATV can make. Thus, it particularly encourages CATV originations (whether local or other types of programs) without commercials.

To assist in the growth and development of CATV, both in the major city and the small isolated hamlet, the Commission in May authorized the full, commercial testing of the Hughes-TelePrompTer in New York City, the largest market, and two other tests will be in rural communities. If successful—and we have every reason to believe that they will be—a new significant avenue of communications will be opened.

These landmark decisions are, I am sure, well-known to all of you here today. They establish a benchmark for the future.

The pioneer years of your industry are now over. Maturity, but not, I hope, middle age, approaches fast. The Commission's own protracted and hesitant attempts to measure its authority have been concluded, and the long-debated validity of the conclusion it reached on that issue has now been definitively settled. Although many of you have disagreed with us on the jurisdictional question, its final resolution should mark for you, as it does for us, the occasion for new thinking and new approaches.

The Commission fully intends to do a great deal of new thinking, and it will seek your help. The promise of communications today is brighter than ever. However, the problems we face are also greater than ever. And they cut across industry lines as never before.

You may think that the critical decisions I have listed are contradictory—that in one instance they

favor CATV and in another they exhibit an anti-CATV policy. However, it is not, and never has been, a case of one policy, pro or anti-CATV. The Commission has only one goal: to achieve the most effective communications' service to best serve this nation's needs. To accomplish this often calls for adjustment of competing industry efforts. The competition is certainly healthy and, hopefully, the accommodation reached is also a healthy one, consistent with our goal. With this as important background, I will comment a little further on our recent actions.

As the Second Report of March, 1966, and our recent San Diego decision make clear, the Commission is concerned about extension of television signals into major markets from outside when there is a measured likelihood that local television service will be lost as a consequence. This is not an anti-CATV policy. It is a policy whose sole purpose is to protect what the Commission believes to be the public's interest. It seems undeniable that there is a public interest in free service and in service to all the people, and that service only to those who can afford it and live in heavily populated areas is not enough. There is also an undeniable base of reason in a public policy concerned with preserving local outlets: that is Congressional policy as well as Commission policy, and I urge you to take account of it in your own thinking and planning. The Commission clearly cannot ignore it.

At the same time we have recognized that CATV has a valuable role to fill. It can provide diversity and gives promise of becoming a substantial alternative program source through origination of its own programs. Our San Diego decision puts no limit on program origination with respect to type of program or its source. It does prohibit commercials in order to prevent the destruction of the advertiser base of support for local UHF service. This decision on origination will provide practical experience as the Commission considers long-range overall policy in this area.

Our TelePrompTer decision may also be helpful in facilitating your

service in the major markets and also in assisting you in performing more fully your traditional, long-established and recognized function of bringing needed additional service to inadequately served areas.

The Commission's recent decision that the furnishing by telephone companies of service for CATV program distribution must be preceded by issuance of a certificate of public necessity and convenience granted under Section 214 of the Communications Act, means that full common carrier regulation will be applicable. This decision, as is the case with the others I have described, is in a real sense the foundation for intensive and broad scale consideration of the entire field of wire service to the homes of America.

The prospects of multi-channel offerings of such varied fare as entertainment, stock reports, news, and instant access to research data and libraries, glitter before us. Although seemingly far out in imagination, we have every confidence in the ability of science to make them a reality. Indeed, the question is not whether science and technology can provide such services, but whether we can use them wisely for the benefit of all. We well know that new technology will not be held back, that no outside force could long delay it. We also know that it raises most difficult social questions. Who will provide these services? Who will carry them? What degree and form of public control is appropriate? Will traditional forms of common carrier regulation serve our purpose? What is the relationship of data processing and communications to our existing institutions and to other new services which use wire communications into the home, the factory or the office? What relationship shall there be in the long run between an expanded use of wire and the use of the radio spectrum? What will be the role of satellites?

The question must be developed a hundredfold, because only through wide-ranging inquiries piercing the outer edges of the known possibilities can we reach adequate answers. Many of these questions of course are being studied now on various fronts, in-



The annual "members only" business meeting at the NCTA show focused on election of officers and modifications of bylaws for the association. Ralph Demgen (back to camera) chaired the session.

cluding the Commission's current proceedings in the CATV area, on satellites for domestic communications and on the interdependence of computers and communications facilities. The President's Task Force on Communications Policy (due to report to the President later this summer) will have significant recommendations as to communications' policy. It sometimes seems that the regulatory side cannot keep pace with technology, let alone range ahead of it. But range ahead of it we must if we are to fulfill our role. . .

We ask you, as we ask every industry and every person concerned, to give us your best thinking in a spirit of enlightened self-interest. We need to know what you want to do, what service you hope to bring to the public, how you see the future for yourselves and for related technologies and related industries. Our task is to create the regulatory climate with due regard for all private interests and paramount regard for the interest of the public for whose protection the Communications Act was enacted. Your task is to push your skills and your service to their limits. We may never achieve complete accord, and perhaps it is in the nature of things that we should not. But with mutual

respect, with candor and with some wisdom, we will strive to make man's reach in this crucial area constantly exceed his grasp.

### Comments of Frederick W. Ford "The Polar Star of CATV"

Last year, at our convention, the title of my address was "Year of Decision for CATV." And it certainly has been—just that—a year of decision. Last year we were beset, castigated, accused and slandered by our opponents. We resolved to fight harder, in the firm belief that our service to the public was demonstratively and indispensably in the public interest. Now, after two important decisions we are a stable industry. *United States, et al. v. Southwestern Cable Co., et al.* and *Fortnightly Corporation v. United Artists Television, Inc.* Our property is secure. Our dreams a reality. Our business a full-fledged member of the mass media complex. Our faith justified. Our reputations vindicated. We have arrived.

We perform these vital functions free of the charge of piracy and relieved of the accusation that we utilize the property of others for our private gain. It also means that we are a business affected with the

"public interest" and in that role we will be regulated by the Federal Communications Commission "not inconsistent with law" in the "public interest, convenience and necessity."

Historically, I think it is clear that the "public interest, convenience or necessity" had great meaning at the time it was adopted as a legislative standard in the Radio Act. Its significance lay in the contract it presented to what had prevailed before. *Private interests were to be subordinated to those of the listening public.* Although accepted as axiomatic today, the fact that licenses could no longer be had for the asking was described in 1927 by Judge Davis as constituting "a revolution in practice." Within this general frame of reference, however, any further refinement of the term had to await decisions rendered by the courts under the new law as well as the rules and case law which the regulatory body would establish.

With the assumption by the Commission of jurisdiction over CATV, we too must await decisions to be rendered by the courts under this newly recognized authority as well as the rules and case law which the regulatory body will establish to put flesh on this bare bones phrase as it relates to cable television.

I do not believe that either the First or Second Reports and Orders adopting rules for CATV were written with the full impact of Section 1, and the public's interest and convenience in wire foremost in the Commission's mind. The language of those reports rather indicate impatience with CATV systems and a paternal protectionism for broadcasters, program suppliers, market delineation (See CATV and Copyright Liability, 80 Harvard L.R. 1514, 1521, 1967.) and other factors adverse to the viewer. The Supreme Court has now made it clear to the Commission that some of these underlying attitudes are without foundation in the law. I look forward, hopefully, to a more objective and balanced review by the Commission of its obligation to make available so far as possible to all of the people of the United States a rapid, efficient, Nation-wide and world-wide *wire* and radio communications

service with adequate facilities.

We believe that one important sign post for the Commission's exercise of its newly recognized jurisdiction can be found in the language of another Supreme Court case wherein the Court said, "that the Congress declared that the people of all the zones 'are entitled to equality of radio broadcasting services, both of transmission and reception.'" (*Federal Radio Commission v. Nelson Brothers Co.*, 289 U.S. 266, (1963). The corresponding provision, Section 307(b) of the Communications Act, as amended, has been construed to the same effect.) . . . This is a clear declaration that there should be no second class television citizens. The elimination of second class television citizenship is what CATV is all about.

Let me refer to a second and more recent sign post. In the recent copyright case, the Supreme Court, speaking through Mr. Justice Stewart said: ". . . broadcasters have been judicially treated as exhibitors, and viewers as members of a theatre audience. Broadcasters perform. Viewers do not perform. Thus, while both broadcaster and viewer play crucial roles in the *total television process*, a line is drawn between them. One is treated as active performer; the other, as passive beneficiary. When CATV is considered in this framework we conclude that it falls on the viewer's side of the line." (emphasis supplied)

This sign post says only too clearly that CATV is a reception service. To be able to perform its function, CATV must be freed of restrictions which are designed with broadcasters in mind and not the needs of viewers.

The Supreme Court has ended the controversy over copyright. There is no reason why the Congress should not accept the views of Assistant Attorney General Edwin Zimmerman and other authorities cited by the Supreme Court, that is would be preferable to leave the FCC free to regulate CATV in terms of the public interest rather than have regulations within the framework of a copyright statute with attendant restraints by non-cooperative private interests.

We must, however, be prepared for assaults upon the results of

the copyright case. Make no mistake about it—we are still the economic underdogs in our communications society. We have many long and hard fights ahead which will require the full support of this entire industry. . . .

We are not engaged in a business along—ours is a movement, ours is the bright communications future of tomorrow. We are engaged in a most exciting venture in the maintenance of our democratic system of government.

In your hands is the means for more efficient delivery of better pictures and greater variety of programs of television stations. You also have the potential to supply an infinite variety of auxiliary services for the public good, many of which have been suggested, but many more, I venture, have not yet even been conceived.

I would like to single out one service today for special attention—the origination of local live public service programs. Two years ago, at our Miami convention, I carefully documented the rationale, history and background of this local live public programming concept of our national communications policy. . . .

In the Miami speech I said: "There are literally hundreds of communities, in fact, 4,899 communities with a population of more than 2,500 throughout the United States. There are only some 612 (now 646) television stations to serve their local needs and interests. How can such a limited number of television stations serve the purely local interests of more than 4,600 communities without trespassing on the time of uninterested viewers? How can such a limited number of stations serve the churches, the civic, religious, educational and cultural interests, and provide time for the discussion of public issues, and the political campaigns of all of these communities? How can they serve as a show case for all of the communities? Television cannot to the job. Cablecasters can do the job in the 4,389 communities where there are operating systems, franchises granted, or applications pending. You can do it, but the broadcaster cannot.

"Furthermore, television broadcasters are faced with a very dif-

ficult and perplexing problem in providing public service for the total areas they serve. Although a television station is assigned to a principal city, the Commission has held that it is responsible for providing public service to the entire area covered by its signal—an area in which it claims to be the 'local station.' Since the broadcaster's only saleable commodity is time on one channel, he is faced with a dilemma in allocating time for public service use, sufficient to serve his area, while retaining most of his broadcast time to serve his commercial interests."

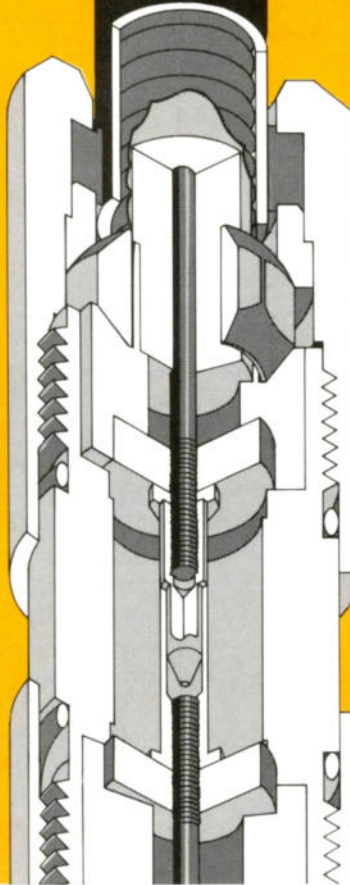
The CATV operator is faced with no such dilemma. He does not serve a wide area. His dedication is to a single community. Within the limits of at least one channel in our CATV systems, can we not establish an industry tradition not only of free speech, but of freedom of access to our sound cameras to exercise that right of free speech which is the inalienable right of every race, creed or color?

Imagine the benefits of a channel of television in each community in our country devoted to exploring in depth the problems, the tension, the hates, the poverty, the hopes, the plans and dreams of viewers for a better place in which to live—a channel to discuss local bond issues, to hear debates between candidates for local offices, to retrain the jobless, and on which to celebrate local events. . . .

I quote from a letter I recently received—"Never has an industry been so rich in possibilities for the improvement of responsible dialogue and constructive action in American life. Never has the opportunity for realization of those possibilities been so great. Never has the *need* been so imperative."

A dream? I ask, "*Why Not?*" Let us leave this convention with the high purpose that we will dedicate our technological success to serve the public and not attempt to make it the public's master. Let us here resolve that we will not become complacent, that we will not rest on our past successes, but together we will push ever forward with service to the viewer and the public's interest, convenience and necessity as the polar star by which we set our course. (NVC)

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# 1968 NCTA Trade Show Review

A deluge of new and sophisticated equipment marked this year's NCTA Trade Show, along with an atmosphere of maturity and anticipation. The following report provides a complete review and analysis of the new equipment available to an industry which has come of age.

*By I. Switzer  
Associate Technical Editor*

**T**his is a vintage year in cable television equipment. The Boston War Memorial Auditorium was packed with a wide range of equipment—some of it designed to do new jobs and some to do old jobs better. There were more exhibitors than in former years and exhibits were generally more polished and professional looking. The growth in size and sophistication of the cablecasting equipment exhibits added some glamour and color to the exhibit area with live models demonstrating equipment in settings that more and more approach the color and glamour of the annual NAB exhibition of professional broadcast equipment.

## **New Cable Lines Feature Aluminum Sheathed Drop and Cable for Special Applications**

Three developments were noteworthy in the ten or so cable exhibits. The "Zetabon" material which Anaconda introduced two years ago in its new line of trunk and distribution cables is now available in service drop cables. Zetabon is a plastic clad aluminum foil developed by Dow Chemical. Aluminum foil, 8 mils thick is coated on one or both sides with a polyethylene copolymer. This copolymer adhesive permits the foil to be bonded to itself or to polyethylene jacketing or dielectric materials. This chemical adhesive bond to the jacket and/or dielectric permits the cable to be flexed repeatedly without kinking or cracking the foil sheath (sheath will usually break after many repeated sharp bends). This type of sheathing material has been used by Anaconda very successfully for at least two years in their trunk and distribution cables for cable television and this type of cable construction is now available in service drop cables. Amphenol and Times both showed drop cables with Zetabon sheaths. These are available in 59 and 6 sizes, solid or foam dielectrics, with or without messenger. Times, somehow, is using a low temperature PVC jacketing which would make it suitable for use where building codes do not permit use of polyethylene jacketed cables. Amphenol has accumulated a fair amount of experience with its product and there seems no doubt that this form of drop cable has a significant future in the cable TV industry. These drop cables are 100% shielded showing negligible radia-

tion into or out of the cable. Drop cables with the plastic coated aluminum sheath material use virtually no copper and there is no doubt that the lapped seam construction is much cheaper to produce than braided copper shielding.

A wider variety of jacketing and armoring processes was in evidence in cable manufacturers' exhibits. Most manufacturers offered flooding compounds, steel tape armours, multiple jackets, etc. in an almost unlimited number of combinations. Vikoa offered jackets specially treated to repel burrowing rodents. These "variety" cables are generally intended to provide added protection for cable which is directly buried either in trench or by plow. Stalpeth sheath construction, borrowed from telephone cable technique, is also available from several manufacturers. It would now seem that CATV cables are now used in such quantities that most users can practically order their cables custom jacketed for their specific requirements and applications. Whitney-Blake, an old timer in the cable industry but a new-comer to cable television, offered a particularly wide variety of specially jacketed and armoured cables. Outer sheaths of copper clad aluminum and copper clad stainless steel are available in combination with copper, copper clad steel, and copper clad aluminum centre conductors.

Whitney-Blake offered its new trunk and distribution sizes with optional copper-clad aluminum centre conductors. These laminated metals are supplied by a division of Texas Instruments, the transistor people. Copper clad aluminum center conductors were introduced last year by Times in its largest cable sizes, but Whitney-Blake now offers this material as an option in its full line of CATV cables. Price sheets indicate significant economies in the use of the copper clad aluminum, although part of the savings are lost in the lower power distribution efficiencies of these cables in cable powered amplifier systems. RF characteristics are the same for both types of center conductor. Some mechanical stress problems are relieved by having sheath and center conductor of very similar material although some of the Whitney-Blake advertisements are more optimistic about this feature, claiming "Conductor expansion matched with aluminum outer con-

ductor eliminates conductor pull out." The technical paper presented by Texas Instruments at the convention quite correctly points out that a copper center conductor would *protrude* from the sheath at low temperatures, just the opposite of "pull-out." A closer study of the problem actually shows that conductor pull out at low temperatures is due to shrinkage of the polyethylene dielectric which pulls the center conductor back with it. Nevertheless the more widespread availability of copper-clad center conductors is a significant development in CATV cables.

General Cable showed some of the "375" type disc insulated air core cable that has been used as a high quality co-axial by telephone companies for many years. This cable has not been too popular with cable TV operators because of its fussy handling and connector problems, but it is interesting to note that it is available outside the Bell organization by those who may have a need for it. General also showed pressurizing equipment, along with Phelps Dodge, producers of Spirafil II, a cable which would be ideal for pressurized systems.

Increasing participation in the CATV industry by telephone companies will probably encourage development and more extensive installation of pressurized systems. We may expect air dielectric cables in pressurizable form to be the next significant development in coaxial cable for TV distribution. In the meantime, this year's main trends are the introduction of aluminum sheathed drop cables and a wide range of cable constructions for special installation problems.

### Amplifier Field Expanded by New Offerings

The strand-mounted "suitcase" amplifier is now firmly entrenched as the standard amplifier offering. Amplifier manufacturers are now sorting themselves out according to design philosophies on problems such as AGC system and approach to more-than-12-channel operation. Several manufacturers who have entered the cable TV field during the last year or two with a limited range of equipment have now elaborated their offerings to include a full range of amplifiers, while longer established manufacturers have refined and further broadened their established equipment lines.

Some general trends were obvious after a tour through the exhibition area. Jerrold has relaxed its "Jerrold knows best" approach to the industry. You can now buy any kind of twenty channel (or more) system you like from Jerrold—Jerrold makes them all. Thermal gain control systems are alive and well in both Canada and Texas—Cascade and CAS both offer trunk systems with thermistor gain control systems. Line extender amplifiers are becoming more sophisticated. Benco and Lindsay showed line extenders with extended frequency range and thermistor gain control. Vikoa has a line extender with electronic gain control and Jerrold and Lindsay, anticipating multi-channel operations, showed models with push-pull output.

Ameco has refined their amplifier offerings and showed a new "split-band" amplifier for multi-channel operation. This amplifier has two amplifier sections in parallel. The 'low' section covers 50-108 MHz while the high section covers 126-260 MHz. This permits

single octave operation within each section and gives separate electronic AGC for each band. This kind of operation would permit up to 25 channels to be carried, plus full FM band. The standard 12 channels would still be available for normal operation, while the additional 13 channels would require a converter system of some kind. Dividing the amplifier into single octave sections eases equalization problems and eliminates concern with second order distortion products. All in all, the split-band unit is a promising amplifier that should be carefully considered by cable systems contemplating multi-channel operations.

American Electronic Laboratories has expanded their line to offer both standard band versions (50-220 MHz) and extended frequency range equipment (50-270 MHz). They have also added a line of passive devices.

Anaconda Electronics has now completely dropped its former tie with Astrodata. The amplifier line has been improved and is now offered as the 8800 series.

Benco Television Corporation's most notable new amplifier offering is new line extender featuring thermistor AGC, extended frequency range and switching



The large Jerrold Electronics exhibit, part of which is shown above, featured the firm's wide line of CATV products and services.



Getting down to business at the TeleMation exhibit are (seated left to right) Bob Bacon (TeleMation), Jim Loker (SKL), Ken Lawson (TeleMation), Harmon White, and Jerry Bogan (both of Community TV, Laconia and Franklin, N. H.).

mode power supply. This amplifier is representative of a trend to greater sophistication (and cost) in line extenders. Long, tight spec systems, probably need extenders like these. The AGC feature of such extenders permits some cascading. Benco's M9A amplifier is offered as a "drop in" solid-state replacement for high output level tube type units.

Blonder-Tongue showed new solid-state strip amplifiers. These are high-gain, high-output strip amplifiers with wide range AGC action. They are suggested for head-end application in systems not requiring channel conversion or separate sound and picture AGC. Supplementary filters are offered to permit adjacent channel operation.

CAS Manufacturing Company introduced a new "suitcase" housed amplifier featuring thermistor control of system gain. Thermistor sensing and gain control is fitted to each amplifier. The series is called "Long-line," no doubt because of the Texas proportions of the housing—21" overall length.

Cascade Electronics has repackaged its line of amplifiers and now offers captive center connector facilities with standard  $\frac{5}{8}$ " 24 hardware. Gain control is thermal throughout. The new series II equipment also features switching mode power supplies. A new line extender with thermistor AGC is being offered. This will permit some cascading of line extenders.

C-Cor Electronics offered its NOVACOR line of amplifiers, bridgers and line extenders. Emphasis is one the main line equipment. Main trunk amplifiers are offered in 34 and 40 dB gain versions with electronic AGC in every trunk amplifier. Significantly higher than usual output capability is claimed, in order to justify and permit efficient use of the higher than usual gain in each amplifier. Bridging amplifiers feature dual output stages with separate driver and output stages for each of two bridge outputs. Jim Palmer's "magic amplifier" promotion brought a number of smiles from visitors. Palmer's "magic amplifier" was indeed the ultimate amplifier—just a piece of cable—in C-Cor's case the cable which takes the place of the amplifier not needed with the company's higher gain equipment.

Conductron entered the CATV equipment field last year with a conventional line extender. This line ex-



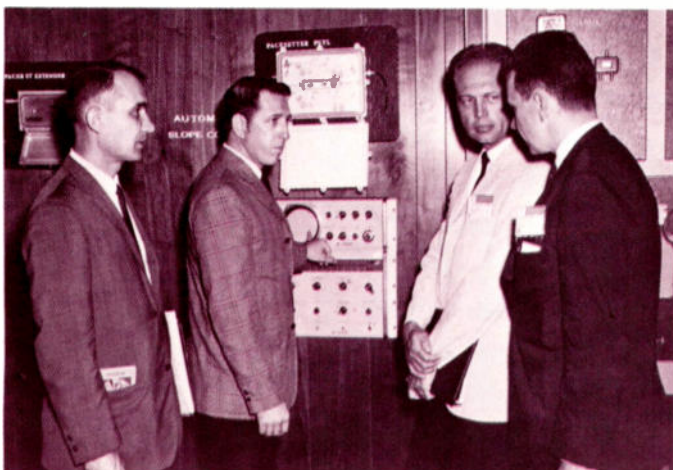
Miss Colorvue, Carolyn Daley is shown at the American Electronic Labs display with Joseph Belshar of AEL and Frank Chiodo of Indiana (Pa.) Cable TV.

tender has been refined and a full line of cable TV amplifiers has been added to bring Conductron into the "full line" field. Conductron is one of the leaders in the laser holography field. The hologram displayed in their exhibition booth created considerable interest.

Entron has been energetically refining its solid-state amplifier line and now offers systems using two pilot carriers for automatic slope control. A high output, thermal AGC's line extender was also shown. Most notable was Entron's pulsed pilot carrier system. Some systems using pilot carriers at 73.5 MHz have experienced problems caused by intermodulation between the pilot carrier and adjacent channels. The resultant intermodulation beat often caused serious interference problems. The intermodulation usually occurs in subscriber's sets, and has been a difficult problem to handle. Entron offers an ingenious solution. The pilot carrier is pulsed and is phase and frequency locked to the adjacent TV channel. Since the pilot carrier is on only during the TV channel sync pulses, it cannot cause beat interference to the channel picture. Time constants in the system amplifiers' AGC systems are modified to make sure that they will work with the low duty cycle of the pulsed pilot. Entron had a working demonstration in their exhibition booth showing that the system completely eliminates the pilot interference problem for users of 73.5 MHz pilot systems.

HTV Systems is a newcomer to the cable TV equipment field. This group was recently organized in Rochester, N.Y. and was able to prepare a comprehensive amplifier line in time for this exhibition. Housings are the now common suitcase style. Amplifier sub-systems are modular and plug-in in a vertical format.

Jerrold Electronics has reconsidered its approach to the multi-channel problem. They have backed off from their insistence on single octave 120-240 MHz operation as the only way to go multi-channel. Jerrold introduced



Bob Wilson (second from left) demonstrates Ameco's new PSTL split band amplifier to Boras Maximow, George Hansel and George Wood, all of RCA Electronic Components.



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push-pull versions of both the Starline-20 (introduced last year) and the older Starline I, as well as push-pull, extended frequency line extenders. Jerrold customers now have the option of operating multi-channel systems in virtually any mode they choose. Other notable Jerrold introductions at this exhibition are a low-cost, fixed-gain (9 dB) line extender, amplified splitters for multi-set home installations, and new passive subscriber tap devices. Jerrold was criticized last year for introducing a whole new amplifier for multi-channel operation instead of making replacement modules available for the widely used Starline I series. The introduction of push-pull modules for Starline I makes updating of earlier Starline installations feasible. Published price sheets for the push-pull version show price increases that are significant but not prohibitive. Push-pull design gives virtual freedom from second order distortion problems in multi-octave amplifier operations and usually improves output capability, since more transistors are used in higher level stages.

Kaiser CATV Corporation celebrated its divorce from Cox Broadcasting by giving away a free Jeep and promoting the Kaiser industrial image. Kaiser is standing pat with its equipment line for this year. The equipment has been successfully demonstrated in multi-octave more-than-12-channel operation in medium size systems. It would appear that Kaiser fortuitously has a design which has reasonable control over second order distortion products. The firm has had an additional year to field prove its systems and consolidate its position in the cable TV equipment field.

Lindsay Specialty products, a Canadian manufacturer of professional cable TV antennas and passive devices, has developed a sophisticated line extender using thermistor AGC and offering push-pull, extended frequency range operation. This amplifier should be of interest to operators requiring cascable line extenders with potential for use in multi-channel mode.

Spencer-Kennedy Laboratories is one of the old-timers in the cable TV equipment field and showed a comprehensive equipment line. The company's Colorburst/7000 series equipment features automatic slope control using a two pilot system, competitive specifications, and competent execution. SKL researchers have calculated a system of 18 channel allocations which do not suffer from second order distortion problems. This system is being offered as a possible operating mode for systems requiring more-than-12-channel operation. Unfortunately, none of these 18 channels is the same as any of the standard VHF broadcast frequency allocations.

Vikoa showed a wide range of CATV amplifier equipment. The Futura 21 series uses push-pull techniques to permit multi-octave operation permitting use of up to 21 channels in the usual 54-216 MHz spectrum. The Futura 21 modules are interchangeable with the Vikoa Futura 12 modules. Vikoa showed probably the most elaborate of all line extenders, an extender unit offering dual electronic AGC based on composite low and high band and providing both automatic gain and slope control. A line of "economy" trunk equipment is also offered for use in shorter systems not requiring the great dynamic operating range found in "first line" equipment.

## **New Head-end Gear; Last Year's Prototypes in Production**

Head-end equipment shown last year is now closer to actual availability. CAS and Scientific-Atlanta units are being delivered in modest numbers. Dynair and Jerrold equipment is now much closer to delivery. I am sure that all units shown as prototypes last year have been undergoing extensive final development and testing prior to production and that delivered units will have few bugs in them.

Benco introduced its new head-end control unit. This Canadian company had considerable success with its tube unit and appears to have done an excellent development job in its solid-state offering. Packaging and hardware details of the Benco prototype shown were outstanding and published electrical specifications are competitive with other units offered.

Jerrold introduced a head-end control unit for FM channels. Input/output frequencies can be either crystal controlled or adjustable, but the same frequencies cannot be used for both input and output. The unit is modestly priced and should be widely used for individual controls of FM channels. It remains to be seen whether the specification will be adequate for critical applications.

Deliveries have started on Dynair's solid-state demodulator and operators requiring high performance demodulators may be interested in this product.

Jerrold also announced development of new demodulator and modulator. Former Jerrold TD and TM models have been industry stand-by's for many years, but badly needed modernization. The older TM modulator particularly fell short of modern system performance requirements.

Some refinements are evident in the CAS head-end unit introduced last year, and a modulator version is now available. Increased interest in cablecasting and introduction this year of color cablecasting equipment makes it important that first class modulator equipment become available.

## **Strip-line Techniques Employed in Passive Equipment**

A significant trend was evident in the field of passive devices. Strip-line techniques were shown by several manufacturers of directional coupler devices. Strip-line technique is not new to the cable TV industry, having been used by SKL some years ago. Renewed interest in devices requiring response towards 300 MHz has revived interest in the technique. Manufacturers are finding that 200 MHz is the practical boundary between lumped constant and distributed constant techniques and rather than push lumped constant techniques upward in frequency they are moving distributed technology downward toward the lower limit of the cable TV spectrum.

Craftsman Electronic Products is an example of a company that has chosen a single specialty and is doing it extremely well. Craftsman has added a line of directional taps using strip-line techniques. They have refined their former line, adding a variety of housings and physical configurations, and have added strip-line



# WORLD'S FIRST LOCAL COLOR CABLECAST

History was made on April 18, 1968, 6:30 PM, Palm Desert, California. The world's first locally originated public service program\* was cablecast in color to 10,000 subscribers of the Coachella Valley CATV system. Cable management and subscribers alike were enthusiastic about the results. Color quality was as good or better than any color programming previously re-

broadcast from Los Angeles. According to Bill Daniels, President of Daniels Management Co., Denver:

"Outstanding local color will be part of our service in Coachella Valley because of recently purchased IVC color cameras and recorders. IVC's equipment mates well with cable systems . . . and IVC's price breakthrough now brings local color within reach for nearly any cable operation. I sincerely urge other cable operators to consider color equipment so they can take advantage of rapidly increasing color set saturation."

To see how IVC can add color to your cable operation, turn the page.

\* World's first local color cablecast was originated April 17, 1968. An IVC-100 color camera was set up in the auditorium at College of the Desert, Palm Desert. At a stage lighting level of 400 ft. candles, a one and one-half hour program of the Riverside County Industrial Development Council was taped in color on an IVC-810. This tape was played back the following evening (via the IVC-810) over the Coachella Valley cable system. Photo above is off-the-set image of actual cablecast seen by subscribers.



**\$14,000**



**\$4,700**



# LOCAL COLOR WITHIN REACH FOR CABLE SYSTEMS

**IVC-100 COLOR CAMERA** offers full broadcast-quality color at low cost. It is as easy to operate and maintain as standard monochrome cameras. The IVC-100 features: three-tube vidicon design, integral viewfinder, simplified controls, built-in sync generator and encoder. Options allow camera operation of a remote recorder, remote control of multiple cameras from a control room, use of external encoder and sync generator. Using the built-in sync generator and encoder, the IVC-100 requires only two wires (power in, video out) to produce NTSC-type pictures for input to the IVC-810 or cable system. A film chain version of the IVC-100 is also available.

**IVC-810 COLOR RECORDER** (IVC-800 monochrome version available for \$4,200) offers accepted 1" IVC Format\* that uses less tape . . . allows one full hour of recording on small sized 8" NAB reel of tape. Provides outstanding NTSC-type color pictures, or wideband monochrome pictures with bandwidth exceeding 4.2MHz. Electrical pushbutton controls make operation a breeze. "Alpha" tape wrap allows recording of more picture information than any other helical scan recorder. Available in portable case or rack mount. Stop motion is standard; slow motion available at extra cost.

\* Accepted format by Bell & Howell, GPL and RCA

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type devices. Craftsman continues to be a leader in this field.

Jerrold introduced new directional taps also utilizing strip-line technique and a new housing specially designed for tap device application. Strip-line technique appears to give much better efficiency than transformer-hybrid types and quoted insertion losses are lower than for corresponding hybrid types.

Most of the "full line" equipment companies offer a fairly complete line of passive devices for splitter, directional coupler and tap use in a wide range of housings

and physical configurations. Most of these have undergone some refinement and design improvement in the last year.

Canadian manufacturers have developed economical directional taps with plug-in versatility. Benco, Cascade and Delta all showed nearly identical versions. These directional taps are particularly interesting their use of Canadian developed connectors featuring simple capturing of the center conductor. Standard connectors for all common cable are available, of course.

SKL showed a unique directional tap with fully adjustable tap loss. This is adjusted by moving a lever which protrudes from the bottom of the unit. This unit also uses the strip-line coupler technique to which SKL is no stranger. This appears to be the ultimate development of the now common change-by-lug-in directional tap units.

American Technology Corporation, a newcomer to the cable TV equipment field, showed a directional tap with a clever physical configuration which permits quick field change from either aerial to pedestal connector configuration. The tap was shown in ATC's new buried enclosure. This is a small enclosure designed to permit direct burial of small CATV devices such as directional taps. The design appeared effective and economical. ATC also showed a novel form of cable entry fitting, using the now standard 5/8-24 thread. Installation is extremely fast and simple and the connector, when produced in quantity should be very low in price.

Becker Davison showed a line of conventional indoor

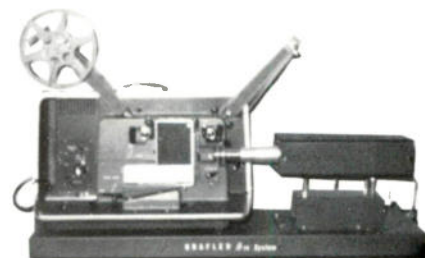


Pictured at Spencer-Kennedy Labs exhibit area are (left to right) E. Mark Russell, Jane Bluementhal, Carl Landrum, and Dottie Maher.



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Weather-Scan II, the popular time/weather economy package, increases your cablecasting capability. It may be ordered with up to seven Texas Electronics instruments. High performance AFCC camera: G.E. TE-20 camera optional. Camera easily adjusted for local origination. Custom select the features that will give your system maximum service . . . at the price best suited for you. Weather-Scan II—great new CATV economy package!

To take advantage of the Pro-CATV copyright ruling, equip your cablecasting studio with film-chain equipment now! Use the R. H. Tyler formula for local origination and gain greater returns per dollar invested . . . quality equipment at economical prices. Feature films provide a way to build subscriber interest and hook-ups. Maintain this high-interest with high performance film-chain equipment from R. H. Tyler.

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## **makes your system a real winner with your subscribers.**

Our cablecasting Bingo is a proven cable system promotion. In the past two years, CATV Bingo has been fantastically successful in every market, without exception.

You can't lose with a promotion like this. Here's why!

1. This economical package can easily be sold to participating merchants at double the price you pay.
2. While your subscribers are winning prizes on cablecasting Bingo, you can effectively sell cable television, and win new subscribers.
3. Everything for a most successful cable promotion is included in Bingo package. You even get day-glo printed banners, window streamers (another way to promote your system in the display windows of participating local merchants), also complete release for use of copyright are included in package.

Don't pass up the opportunity to expand the list of subscribers to your system. Act now.

Put this subscriber building, effective promotion to work in your system.

Write today for full information.

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passives developed originally for use by its parent cable TV group's own use but now available as a low cost line of passives for indoor application.

Some notable connectors were on view. Amphenol showed a captive center conductor type which can be used in new equipment or modernization of older equipment in place of conventional connector types using sliding center conductor fits. The connector uses a split, serrated center collet. Tightening the connector onto the cable pushes a wedge against the collet, tightening its grip on the center conductor. This produces a very strong grip on the center conductor. The connector is designed for excellent electrical characteristics, and installation is virtually the same as for standard connectors.

Jerrold has introduced a new quick connector for 412 cable called the FXQ series. The series is intended to be lower in cost than VSF type and will permit faster lower cost installation of connectors.

American Pamcor (AMP) showed its comprehensive connector series. This series is most notable for its efficient handling of disc insulated "375" type cables.

Gilbert Engineering is an experienced, competent manufacturer of connectors. A wide variety of stock connectors were shown. Gilbert is a large supplier of connectors under house brand designations to a number of CATV equipment manufacturers.

### **Antennas and Microwave Equipment**

Antennas for CATV appear to be in the consolidation phase. The log periodic types introduced by Scientific-Atlanta several years ago now appear very much in vogue and are available from several suppliers including Scientific-Atlanta, Taco division of Jerrold, and Lindsay Specialty. Lindsay showed hybrid yagi-log periodic designs, including models for UHF application. Taco showed a heavy duty turnstile for omni-directional FM reception and extra heavy duty yagi and log periodic designs.

RF Systems, Inc., is manufacturing a series of large parabolic antennas for mast mounting in 20 and 30 foot diameters. These would be particularly useful for high band VHF and for UHF use. RF Systems has also developed a version of the "Zig-Zag" antennas for VHF and UHF reception. This design has been commonly used for high power broadcast but these are the first suggestions that I have seen for application of this design to cable TV reception. The design may have some advantages in certain applications. Microwave equipment offered particularly emphasized CARS band operation. Systems were shown by Collins, Microwave Associates, Jerrold and Raytheon. Heterodyne systems were shown for longer TV relays. Microwave Associates, pioneer in the all solid-state microwave field, showed portable TV relays featuring complete solid-state designs.

### **Cablecasting Equipment Steals Spotlight**

Cable TV equipment manufacturers seem to have acknowledged cablecasting as a separate breed. With rare exceptions they appear to be staying out of the

cablecasting field. The most spectacular cablecasting demonstrations were staged by specialists in the field.

The most important demonstration was probably the International Video Corporation live color camera. This live color camera system is in a price class that many cablecasters will be able to afford, and is capable of turning out a very good color picture. More than 100 cameras have been delivered to a variety of users, and there appears no doubt that this is a practical color origination camera for those cablecasters willing to take on a moderate engineering burden in caring for a system of reasonable complexity.

Only AEL and Vikoa, among distribution equipment manufacturers appear interested in the cablecasting field. AEL has assembled a complete cablecasting package including EIA sync generator, special effects control, switching and monitoring, viewfinder cameras, 16mm projector, audio channels, videotape recorder, etc., all in one package and from one source. Vikoa has a line of cablecasting equipment of more modest capabilities in lower price ranges.

Dynair Electronics has a wide range of equipment for cablecasting. Switching systems of almost any degree of sophistication and complexity are available as well as a full range of distribution amplifiers, modulators, equalizers, and other cablecasting accessories.

GBC Closed Circuit Corporation offered low cost viewfinder camera systems and accessories featuring positive interlace and adaptability to external standard sync generators.

3M divisions offered magnetic tape for video and audio recorder use and a modestly priced zoom lens system for vidicon cameras.

Packard-Bell has a versatile line of vidicon cameras available separately or pre-packaged into small studio packages in a wide variety of configurations.

Sylvania demonstrated a complete low-cost studio set up with live vidicon cameras, film chains, control consoles and tape recorders. A portable cablecasting studio was demonstrated just outside the auditorium.

Sony also demonstrated a comprehensive camera and video recorder line including color and black and white recording. Videotape recorders and accessories were also shown by Ampex Corporation.

A number of firms showed cablecasting accessories, including camera tripods and dollies, special effects generators, and alpha-numeric display devices. Television Presentations, Inc., who showed the first computer type news services last year in conjunction with United Press International, is now using a character generation system by Scanlin Corp. The firm originally used the RCA Divcon system. RCA showed its Divcon system as an independent offering. Visual electronics showed a very elaborate character generation system manufactured by A.B. Dick. A variety of control and memory devices were shown. In its simplest form the unit generates print displays from keyboard or teletype inputs. These types of displays now seem to be the preferred display form for news service channels in higher budget systems. Even AP, the pioneer in news-channel service, showed an all electronic system as an alternate to its vidicon and teletype machine system. These character generation systems are very versatile in application and should be considered by systems re-



Morgan Anderson (Greater Winnipeg Cablevision) and Bob Searle (TVC) are introduced during discussion at Cascade Electronics display. At left are Cascade's Joe Cerocher, Pat Brown, and J. A. Spencer.



Vikoa's exhibit area, featuring a full line of CATV distribution equipment and services, plus cablecasting gear, attracted heavy crowds throughout the show.



Pictured at the Pruzan Company booth are William Hershey, Max Lekson (both of Preformed Line Products, Co.), Jack Snyder (Snyder Company), and Jack Pruzan.

quiring versatile alphabetic or numeric displays of professional quality.


TeleMation, Inc. is another example of a specialist doing a particular job exceptionally well. This firm is one of the pioneers in the cablecasting field, starting with weather display systems. Judging from the growth of its product line and exhibit year after year, the firm appears to be prospering. TeleMation showed a complete line of cablecasting equipment available in packages for any size of cablecasting facility.

The cablecasting equipment exhibited now approaches the class of equipment commonly used in closed circuit educational facilities. Most equipment shown either currently uses or is adaptable to EIA standard operation. This is a desirable move, since it facilitates multi-camera or source operation and ensures compatibility between different pieces of equipment. Equipment shown still falls short of broadcast standard equipment, both in terms of picture quality and reliability. Experience will show whether the public will demand broadcast standard picture quality from cablecasters and whether cablecasters will be able to afford broadcast standards of picture quality and program production if these indeed become the expectation of cable TV subscribers.

### Converter Devices Conspicuously Absent

Most notable by their absence were multi-channel converter boxes or other systems of providing more-than-12-channel reception. Amplifiers and cables are

all available for this operation, but satisfactory subscriber devices are not. Marketing of the Telemeter converter boxes has been taken over by Television Presentations, Inc., and these units were relegated to a place of minor importance in a show case at the side of TPI's exhibition space. Some Hamlin units were used to demonstrate Jerrold systems. Vikoa showed a back-of-the-set converter that converts the whole mid-band to a selected portion of the UHF band and delivers this to the UHF tuner on the subscriber's set. This approach has some serious problems in application, although it also has some advantages over other systems. In any case it probably needs further development, testing and consideration. The only thoroughly practical multi-channel device shown was the switch that Amphenol developed for the two cable systems in Buck County, Pennsylvania. No systems were shown that seemed to me likely to gain any significant measure of general acceptance. There is considerable room for better mousetrapmanship in this special cable TV equipment field.

There was considerable interest shown in the automatic fault reporting system shown by Advanced Research Corporation. This system monitors system levels and uses an audio tone system to report system status to a central annunciator board. Systems of this kind have worthwhile application in large systems and those having high reliability requirements. Judging from interest of those who stopped to see this equipment, there would seem little doubt that systems of this kind will be installed during the coming year. 



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# "Cable Communications" — Proposal For A Research Organization

In a day marked by the communications explosion, CATV operators cannot afford to overlook the vast possibilities of the future. The following presentation, by veteran industry leader Al Stern, outlines a concrete proposal designed to insure the CATV industry a birth in the communications world of tomorrow.

By Alfred R. Stern  
Chairman and President  
TeleVision Communications Corp.

In order to put the future of our business into proper perspective, it might be worthwhile to look at our industry's development over the last few years. In this connection our name offers a clue. As most of you know, we started by calling our operations *Community Antenna Television Systems*, bringing to smaller towns signals where none existed without our help. We served the community in a unique manner and found a welcome audience wherever we went around the country.

## The Past: Rapid Growth

Two years ago there was an attempt on the part of one of my colleagues, Bill Daniels, to change the name of the industry association to include "*cable television*." As in so many things, he was a bit ahead of his time and that motion was defeated. However, last year it was passed, and we are now known as the "*Cable TV Industry*."

The name *Cable Television* more clearly represents what we can make available to our customers and I suppose that is why it has caught on so rapidly. No longer are we just providing signals to communities otherwise unserved; we have on our own added many additional services as part of our basic growth and development. To mention just a few: time and weather are available to many of our customers. News from the wire services and stock market information directly from the exchanges can be seen almost simultaneously in homes around the country and newspapers and brokerage offices

in major metropolitan cities. Cablecasting, as we choose to call our closed circuit originations, has become very popular and undoubtedly will grow into wider and wider use in the next few years.

Inter-connection of local school classrooms has been a service we are pleased to perform where it can prove helpful in this most important area of public education. Over the last few years we have moved into larger and larger communities . . . two-station markets . . . three-station markets, and even some communities where there are more off-the-air signals than our cable service is allowed currently to provide. These widespread uses of our facilities have resulted in the development of Cable TV—formerly called Community Antenna Television.

## The Future: Expanded Services

With this background, let us look for a few minutes into the future and let me suggest a new name which will more clearly represent what we will be doing a few years from now. The name I am suggesting is *CABLE COMMUNICATIONS*. This name will describe a group of services based not only on TV but on other important additions which should be developed for use by our subscribers. These additional services will inevitably make the cable a more and more essential medium of communications. My ideas may sound like "blue sky," but I promise you sooner or later they will be realities.

For instance, we will sell merchandise through the cable; we may

even print newspapers through the cable and in my personal opinion we will be rendering the most significant service when we allow our subscribers—who by this time will be totaling many, many millions—the right to decide what shows they want to see, when they want to see them.

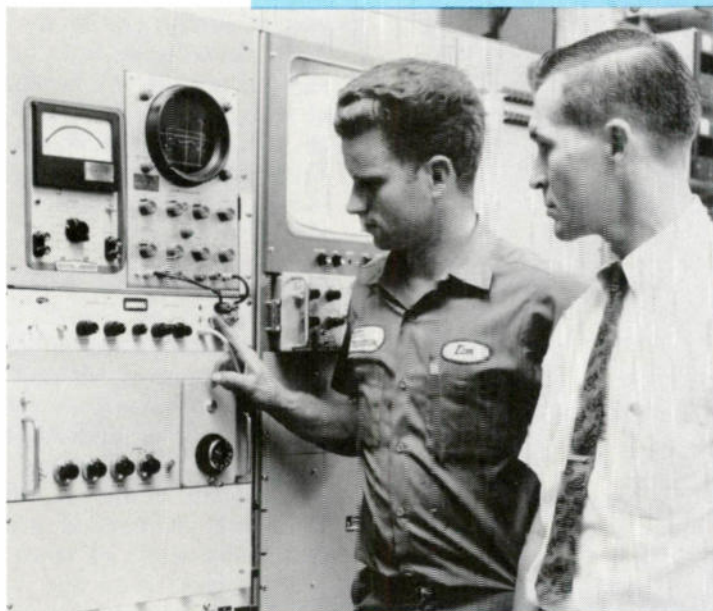
I firmly believe that in a matter of not too many years from now our "subscriber" will return to his home in the evening, decide what shows—either current or old—he would like to see, plan his evening's entertainment, dial some numbers on a dial installed as part of his TV set and sit back to enjoy what he has chosen for his mood on a particular evening. He may choose a sports broadcast of an old football game, movies—either current network fare or those of ancient vintage—interesting action news shows, public affairs panel discussions and an unending list of programs, many of which have already been telecast when he was not able to see them.

Why should the public be forced to watch a particular program only once and have it in most every case gone forever? Why should the specialized audience find its programming relegated to Sunday afternoons or early evenings? Why should sports programs be available only on weekends? Where are the good music programs that the large audience may not wish to see but a limited one will always be fascinated to watch?

I submit that we must take the "mass out of mass communication when we talk about the future of television in America! I know this is

# "EVERY CABLE TV SYSTEM USING MODULATORS NEEDS A SIDEBAND ANALYZER,"

says Don Cantrell of  
TOTAL TV,  
Santa Rosa, California



Don Cantrell, Chief Technician, demonstrates operation of TS-100B Sideband Analyzer to Jim Monroe, Mgr. of TOTAL TV.

TOTAL TV of Santa Rosa, California has been using a DYN AIR TS-100B Sideband Analyzer for over a year. Here's the way they feel about it . . .

*"The DYN AIR sideband analyzer allows us to check modulator operation at any time—precisely and in just a matter of minutes. It also greatly shortens the time required for modulator alignment."*

Yes, cable TV operators everywhere have discovered what broadcasters have known for years . . . *the only practical way to check transmitter operation is with a sideband-response analyzer.*

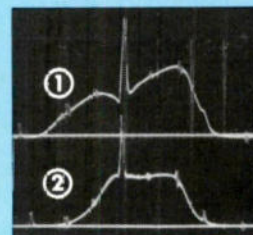
The DYN AIR TS-100B Sideband Analyzer is designed especially for the needs of the CATV operator. It is completely solid state and has a self-contained regulated power supply. It is extremely compact. And it is priced at only \$1250 . . . a small price to pay for the savings in time and the increased system performance that are immediately realized. (And an *especially* small price when compared with the \$8500-odd worth of standard precision test equipment you would have to assemble to do a roughly equivalent—but many times slower—job!)

These units are available for immediate delivery. Give us a call and place your order today. If you're still not convinced, ask the man who has one.

Dynair also manufactures audio-video modulators, TV demodulators and heterodyne channel converters for CATV use, as well as a complete line of local-origination accessory equipment. Write for complete information.



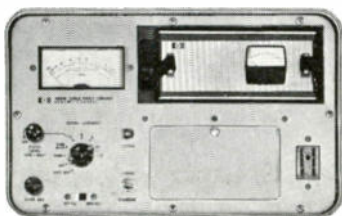
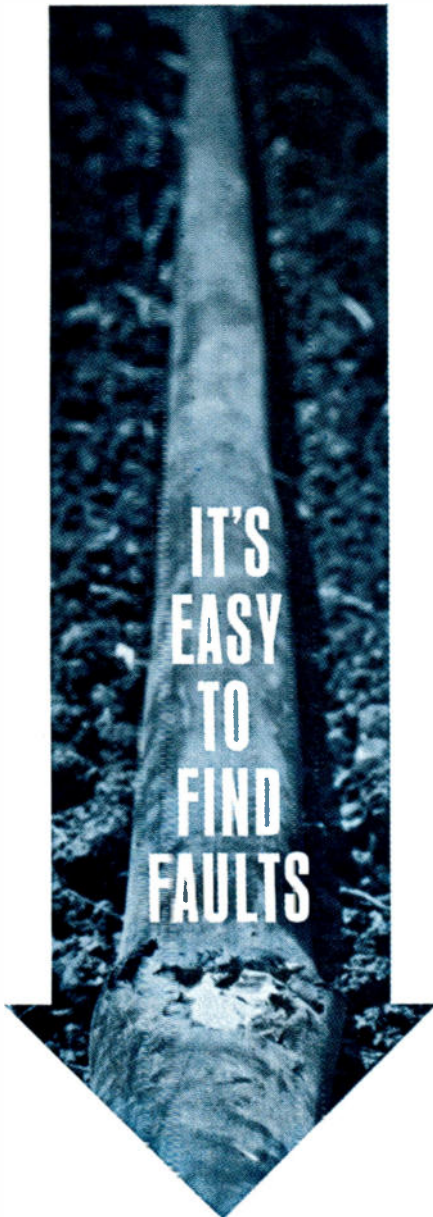
Actual Sideband Analyzer waveforms indicating (1) poor modulator response and (2) Proper response.



The Dynair TS-100B generates a video sweep signal which is applied to the video input of the modulator under test. The RF output of the modulator is then directed back through the TS-100B, where the RF spectrum is analyzed and then applied to an oscilloscope for display. The display is a precise representation of the sideband response curve, showing both the visual and aural carriers. Markers for frequency measurement are provided at 0.2, 0.5, 1.5, 3.6 and 4.5 mHz to allow exact frequency determination.



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what people all around the country want and will get sooner or later. Cable Communications is the only way available to the set owner of America to decide what he wants to see and not allow a handful of men at television stations and networks to make those decisions for him. This then is the excitement of the future of our industry.

### Forces to Combat and Convince

Sounds great, doesn't it! I really think it will happen, but believe me it won't happen without a lot of work, a lot of effort and many, many hours of dedication to this cause by Cable System Operators around the country. Obviously, there are entrenched groups who will resist some of these developments, but since our interest is much closer to that of the public's requirements, in the long run we will find an equitable solution to these problems. We will be successful because we are right, because the public needs, and will be willing to pay a modest fee to secure for themselves, what we have to offer.

The difficulty, of course, is to make a forceful impression on such diverse groups as the FCC, the Congress of the United States to whom we have not had much success telling our story but where we are beginning to make an impact; and lastly, a group of dedicated planners, members and staff of the President's Task Force on Communications whose report, which may establish some of the groundrules for both the Commission and Congress to consider, is due in a few months. Each Cable System owner must do his part in spreading the word about our business and our aims and dreams of the future. All of us have a lot at stake in what we can do and therefore must play a big part in our actions as a group over the course of the next few months and years.

### Proposed: An Independent Research & Development Firm

Let me end this discussion with a practical suggestion. Words are great, but practical deeds can sometimes speak with more wide-ranging emphasis. I propose that we form an independent industry com-

pany to be known as *Cable Communications Development Inc.* The role of this company will be to research and develop these new services which will result, I am firmly convinced, in a change of our basic business for the better.

The NCTA has all it can do to keep up the fight on the many fronts which it is currently waging. This new company will work closely with NCTA's President and his staff, since we want this to be a truly cooperative effort for the benefit of all.

The corporation which I propose be formed in the next few months will have a paid staff, with possibly an engineer, a market analyst, an administrator and a Board of Directors made up of those major contributors to this undertaking. I want to emphasize that right now there are scientists, engineers and statisticians working for many companies not in our industry. These people are developing services which can be sent down other wires or used over the air in ways which will exclude us from the development I sincerely believe we must strive to make. If we don't do it, somebody else will. Many of the services of our cable communications industry have yet to be tested and developed to the point of practical application. This developmental company which I am suggesting will have the responsibility of seeking maximum uses for the cable to benefit all of us.

Now, money! I have estimated in order to do this job correctly we will need to raise approximately \$750,000 for expenses over the next three years. My company, Television Communications, will pledge \$50,000 towards this goal. All we need is fourteen other companies to do the same, and we're in business.

Smaller organizations, individuals, system operators and anyone who is willing to back up his confidence in the future of our business with his money will find Cable Communications Development Inc. a grateful recipient for these funds.

Hopefully, this discussion and proposal will inspire some insight into the kind of realistic view of the future which I believe in a few years will make Cable Communications a reality.

TVC

August 1968

*TV Communications*

# *CATV Technician*



Photo compliments of B. C. Cable Contractors, Ltd

Testing Coaxial Cable • Portable Fault Locator • CATV Antenna Basics

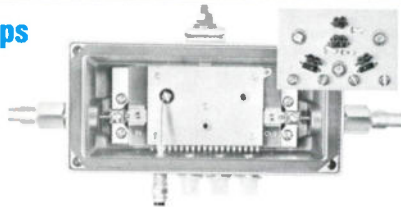
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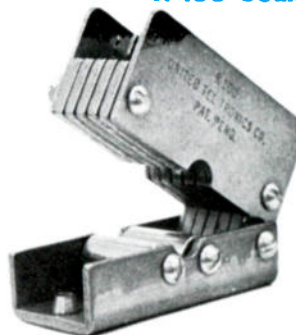
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# Performance Testing For CATV Coax

The most vital link in the signal-to-home chain of equipment is the coaxial cable itself. Accurate preconstruction evaluation of coax for electrical performance is essential to insure top signal quality and minimum maintenance problems.

## Part 1

By Walter L. Roberts  
Director of Engineering & Research  
Superior Continental Corporation

Only with conscious effort can the reviewer of CATV cable specifications and trade journal advertisements escape what might be termed "goal amnesia." If one recalls that the CATV coaxial cable is but one member of the more general class known as transmission lines, its *raison d'être* is not so easily forgotten: the coaxial cable is a line whose intended purpose is the transmission of energy. This objective was restated quite clearly in a recent paper<sup>1</sup>, but the cacophony of "3-dB/octave weighting," "average minimum," "guaranteed maximum nominal," and footnoted exception clauses serve to obscure such lucid statements—by deteriorating the signal-to-noise ratio until the information is drowned in this sea of confusion.

The writer's intent is not to offer a new definition for the coaxial cable or for its purpose; the subject deals with tests for coaxial cable. However, unless the basic purpose of the cable is kept paramount, tests (and required test values) which have excellent correlation with performance too often mutate until their significance is no longer obvious.

Perhaps the most desirable performance test for a CATV coaxial cable would involve application of the composite set of TV signals which it is intended to transmit and the evaluation of the emergent signals after transmission. But, the evaluation must be reducible to an unequivocal result which can be compared against some standard of acceptance. The importance of a test yielding results which are not

ambiguous is second only to the requirement of its correlatability to actual performance.

The measurement of cable attenuation characteristics at a sufficient number of single fixed frequencies (over the intended frequency range) by a well-defined test procedure offers a means of obtaining a set of measured values which can be compared and which also define performance in direct terms. Single-frequency measurements can become quite burdensome indeed if a large number are required. All too often, anomalies in coaxial cable transmission characteristics occur over very narrow frequency bands, and an exorbitant number of single-frequency measurements would be required to assure suitable performance over the usual CATV frequency band. Because of this, swept-frequency techniques have been developed and utilized to great advantage in CATV cable measurements.

Swept-frequency attenuation measurements suffer from certain limitations which restrict resolution of very small fluctuations in loss. Depending on the underlying cause of such fluctuations, large excursions might accumulate on long cable sections which would not have been detected when measuring individual factory lengths. Evidence of most (but not all) of those conditions producing such effects can be found through measurement of the input impedance as viewed from the ends of the cable lengths. Several techniques have been developed for measuring this characteristic, the most generally

accepted method for CATV being swept-frequency return loss testing<sup>2</sup>. Assuming certain limitations of the test method are recognized, return loss and attenuation testing together give reasonably good characterization of the cable's electrical performance for CATV.

In this article are presented discussions of the effects of various types of cable discontinuities on input impedance and of their influence on cable performance. Differences between results obtained by several variations in return loss measuring techniques are discussed.

Also presented are factors affecting cable attenuation measurement accuracy, including effects of impedance mismatch, length errors, and temperature effects.

Practical test methods for assurance of cable electrical performance are included as appendices. All are suitable for field use. More exotic techniques may be used but may not be suitable for use on in-place cable systems (e.g., many attenuation measurement methods require access to both ends of the circuit).

## RETURN LOSS

Swept-frequency return loss measurements have been employed extensively in telephone and television applications, and it is presumed here that the basic techniques are known to the reader. The significance of a particular set of measured return loss values (with respect to cable performance) depends upon the circumstances causing the voltage reflections from the cable and also upon the refer-

ence impedance with which the cable input impedance is being compared. In the discussion that follows, comments are presented regarding various internal cable reflections and their significance to cable performance, effects of various terminating impedances on measured return loss, and effects of sweep width (or rate) on apparent return loss values.

### Cable Impedance Variations

Variations in local impedance along the length of a transmission line cause part of the transmitted energy to be reflected. The reflected voltage as measured at the cable input is the composite result of all of the individual reflections along the length. These reflected voltages combine in a complex manner depending on frequency, distance of origin, cable attenuation and propagation constants, and nature of the local impedance discontinuities. The resultant reflected voltage is related to the input impedance deviation of the cable at that particular frequency.

The number of possible combinations of impedance discontinuities occurring along a cable length is obviously unlimited. As far as effect on cable performance is concerned, three classes of discontinuities can be considered: (1) A limited number (perhaps one or two) of gross discontinuities occurring at a short (electrical) distance from the input. (2) A set of discontinuities randomly distributed along the length of the cable (also random in magnitude). (3) A set of periodic discontinuities, not necessarily discrete, distributed along the length of a cable, with a period which corresponds to a half-wavelength for some frequency within the operating range of that cable.

A detailed study of the first class of discontinuities and their effect on input impedance has been published<sup>3</sup>. A practical study of such effects on coaxial jumper cables<sup>4</sup> described several cases of double impedance discontinuities separated by certain critical distances and their effects on input impedance.

Energy reflected when encountering a cable section with higher impedance undergoes no phase reversal; when reaching a lower

impedance section, phase reversal occurs in the reflected wave. If one then remembers that the frequencies employed in these broad-band applications are such that even a short physical length of line is many wavelengths long (and, therefore, phase shift must be reckoned with), qualitative description of the manner in which reflected voltages combine at the cable input can easily be formulated. It can be seen that as frequency is increased, reflected voltages from several discontinuities may alternately reinforce and subtract at the input.

Naturally, slight discontinuities produce small reflections but reflections emanating from a discontinuity located some distance away from the input are attenuated and the effect also appears as slight. This must be taken into account when considering the second class of discontinuities. As an extreme example, consider the case of a short (or open) circuited (reflection coefficient of 100%) length of cable with an attenuation of 20 dB at the test frequency: the reflected energy is attenuated on the return trip 20 dB as was the incident energy initially. The magnitude of the energy arriving back at the cable input is down 40 dB—thus producing the same effect as would a discontinuity having a reflection coefficient of 1% located near the input. Considering now a long cable containing randomly distributed irregularities, the manner in which their reflections combine at the input can be grasped intuitively if one mentally combines the effects of discontinuities located progressively further away from the input. (A mathematical treatment of random irregularities has been published by Clarke and Hinchliffe<sup>5</sup>.) The effects of these irregularities diminishes with distance from the input until those furthest reflections are negligible compared to the nearest ones.

The influence of irregularities on performance must naturally be considered if acceptable limits for return loss values are to be established. Shekel<sup>6</sup> showed that there is a worse case return loss value for a transmission line which will produce a minimum perceptible echo on a TV screen. The value is a function of both delay time and the

attenuation constant of the line. It thus varies with frequency, being less critical at higher frequencies.

There are two very important assumptions on which Shekel's results depend. He states these quite clearly in the reference cited,<sup>6</sup> but there has been frequent misapplication of the results through disregard of one or both. The first assumption is that the reflection producing the indicated return loss is from a single discontinuity. An equal return loss value produced by the combined effects of several discontinuities is not nearly so critical. A series of distributed discontinuities are also distributed in delay time. The reflections may add in phase at a particular frequency while being dispersed over a wide time delay range. It is secondly assumed that the signal-to-echo ratio is equal to the indicated cable return loss. The fulfillment of this assumption literally requires that the TV set be connected at the point where the input impedance is determined. In practice this is realized on a distribution line if a simple non-directional tap is used to couple the signal to the drop cable. On trunk cables and in most practical situations, the echo appears only after a re-reflection, and the return loss of the re-reflection junction must be added to determine the actual signal-to-echo ratio.

The effects produced by small, randomly distributed reflections have been treated as long ago as 1937 by Mertz and Pflieger<sup>7</sup>, and others. More recently, Ashcroft, et al<sup>8</sup> have estimated these effects at frequencies up to 3 MHz on a 600-mile system and found them negligible compared to other sources of distortion—and phase delay distortion effects tend to improve with increasing frequency. Essentially, only the reflected energy transmitted forward contributes to distortion (or noise), and this necessarily involves doubly reflected waves. The "return loss" of a typical doubly reflected wave is thus in the order of twice that of a singly reflected one.

The third class of discontinuities (periodicities) referred to arises most often as a result of recurring dimensional variations during the fabrication of the coaxial cable. At the frequency for which the period



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of this variation corresponds to a half-wavelength section, the input impedance can rise to substantial values even for extremely small fluctuations in local impedance. At this frequency the reflections from the various local discontinuities arrive at the input in-phase, and their additive effect can be quite astounding. The discontinuities do not have to be discrete; generally, they are rather smoothly changing values along the length of the cable. The same remarks regarding attenuation of the reflected energy as mentioned previously apply and, if the amplitude of a periodic disturbance remains constant along the cable length, there is an asymptotic value of input impedance which will be approached for an infinite length. Actually, a cable length

with about a 10-dB loss at the "critical" frequency would exhibit a return loss nearly equal to that of an infinitely long line having the same periodicity (see Figure 1).

The relationship between input impedance (VSWR) and attenuation for cable containing periodicities has been established by Fuchs and Peltier<sup>9</sup>. Since the reflected energy returning to the input is evenly dispersed with respect to time delay, echo effects are not generally of serious consequence. However, if the periodicity is quite pronounced—or if one with even a small amplitude persists over an extremely long circuit length, a serious excess in attenuation can occur.

The values shown in Table I are calculated using the relationship

derived in reference 9. It may be noted that a 2.5% attenuation discontinuity corresponds to a 10-dB attenuation excess at the "critical" frequency in a 400-dB cable system—if the periodicity continued for the full length at this level. A 26-dB (return loss) periodicity would correspond to a 2-dB attenuation discontinuity in the 400-dB system.

A periodicity producing a specific value of return loss would cause the most serious attenuation discontinuity at the highest operating frequency of the cable system—since the percentage variation in attenuation would be constant and the cable loss would be greatest at this frequency. It is well to note that this trend is opposite compared to the case of echo effects resulting from single discontinuities.

#### Effect of Terminating Impedances

The measured return loss of a cable input is a comparison test, the reference arm of the bridge being an electrical network, fixed in value or variable within a certain range not usually specified. Fixed value arms are (optimistically) designed to be resistive and equal to the intended cable high-frequency characteristic impedance—normally 75 ohms for CATV cables. Variable arm bridges may have both resistive and reactive elements which each have adjustment spans equivalent to as much as  $\pm 10\%$  of the expected cable impedance (the combination would allow an adjustment range of nearly  $\pm 15\%$  in impedance magnitude). Generally, bridge balance is established by adjusting the arm to minimize reflections over a preselected swept-frequency band, as the oscillographic screen is visually monitored. The least value occurring at any frequency within the test range is then determined. Experiments with a modified technique employ a null meter for balancing to a condition which yields a minimum RMS meter indication, then the minimum individual value is determined. This method would appear to remove the subjective element which exists with the unmodified technique. The test as described is commonly termed "structural return loss" while a

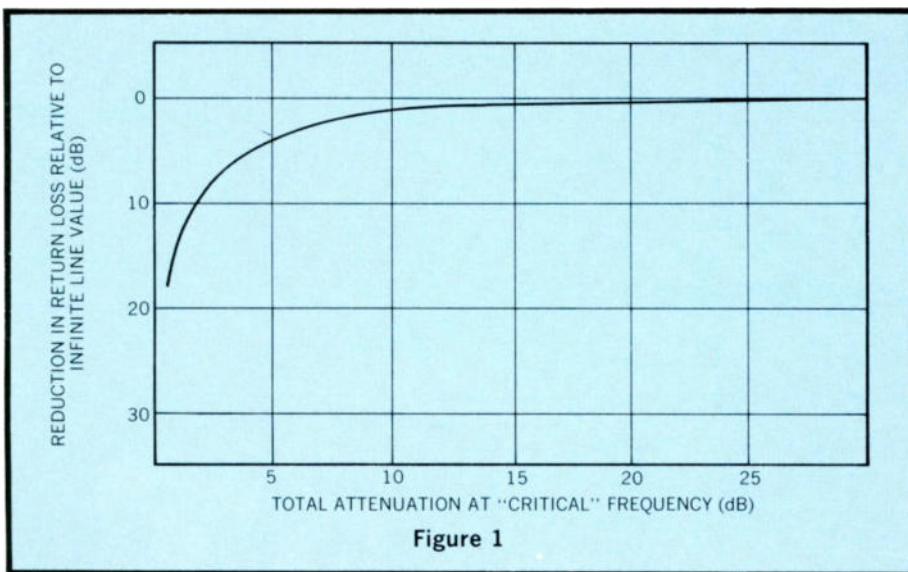


Figure 1

RETURN LOSS (dB)	VSWR	REFLECTION COEFFICIENT	ATTENUATION DEVIATION	
			PERIODIC (%)*	JUNCTION (dB)
1	17.15	0.890	860	6.8
5	3.56	0.562	92	1.7
10	1.93	0.316	83	0.45
13	1.57	0.224	11	0.22
16	1.38	0.158	5.0	0.10
19	1.25	0.112	2.5	0.056
22	1.17	0.080	1.4	0.029
24	1.14	0.063	1.0	0.020
26	1.10	0.050	0.6	0.012
28	1.08	0.040	0.3	0.007
30	1.06	0.031	0.2	0.005
32	1.049	0.025	0.1	0.0026
35	1.037	0.016	0.07	0.0015
38	1.026	0.013	0.03	0.0008

\*AT THE "CRITICAL" FREQUENCY OF THE CABLE PERIODICITY

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comparison with a fixed, 75-ohm resistive termination is, by default, simply "return loss." Perhaps a more distinguishing (though not too imaginative) nom de plume would be "75-ohm reference return loss."

The two return loss measuring techniques obviously can produce discrepant results. Calculation of the shift in return loss produced by adjustment of a bridge arm by 10% shows the possible range for disagreement: a return loss of 21 dB relative to 75 ohms can be shifted to 27 dB; 24 dB relative to 75 ohms can be shifted to 36 dB. The rules for minimizing average levels, etc., should prevent the discrepancy from approaching these extremes, but only if they are carefully specified and religiously applied in practice. Structural return loss is certainly justifiable as a meaningful and interpretable test, particularly for the cable design engineer. Definite adjustment limits both for resistive and reactive values should be established if the method is used in testing cable for conformance to pre-established return loss limits.

If a particular cable length should contain a noticeable discontinuity near the measuring end, a reasonably substantial reflected voltage will appear at the input and may persist without polarity

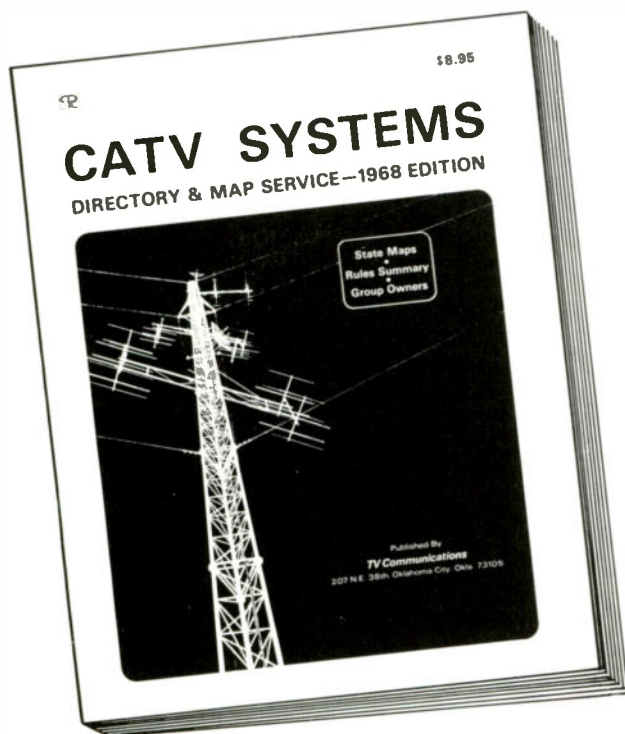
change over a broad frequency range. Whether bridge arm adjustment to minimize such an effect is justifiable is, for the most part, academic. Yet, were a particular limit of return loss critical for certain associated CATV system components (it is assumed that they do not possess an impedance self-adjusting capability), it would appear that the specified return loss should be relative to the aspired impedance of the associated equipment. Unless such sources of reflections can be excused as being innocuous to performance (and there also must be specified a means to distinguish these from other reflections), they should also be subject to the requirements imposed by cable performance specifications.

Some objections to fixed reference arm return loss testing have been based on the argument that tolerances on characteristic impedance (this is to be distinguished from input impedance versus frequency as is indirectly determined with return loss measurements) allow variations of as much as  $\pm 2$  ohms. Some adjustment must be allowed in recognition of this. This "kind" of characteristic impedance is probably that value which would be determined by methods equivalent to the one specified in the military specification MIL-C-17D

for coaxial cables. In that method the impedance versus frequency deviations are largely ignored for three reasons: (1) The test is performed on an electrically short cable sample. (2) The calculated impedance is based on a low-frequency capacitance measurement—assumed to be independent of frequency. (3) The calculated impedance is based on open circuit resonance determinations which are not affected by internally generated reflections—to the first approximation, anyway.

What is calculated in the above referenced test might be called the "geometric" or "average" impedance. Nevertheless, if one simply calculates the return loss resulting from a 73-ohm (or 77-ohm) impedance referenced to a 75-ohm system, a value of 38 dB is obtained (see Table I, VSWR = 1.026). This should require no special compensation, unless specification requirements for return loss approach this value.

Another area of concern when considering a fixed resistive reference is the fact that the cable's impedance is not purely resistive. For an ideal 75-ohm coaxial cable using a low loss dielectric and having no internal sources of reflection, the high-frequency reactive component of the characteristic impedance can readily be estimated.



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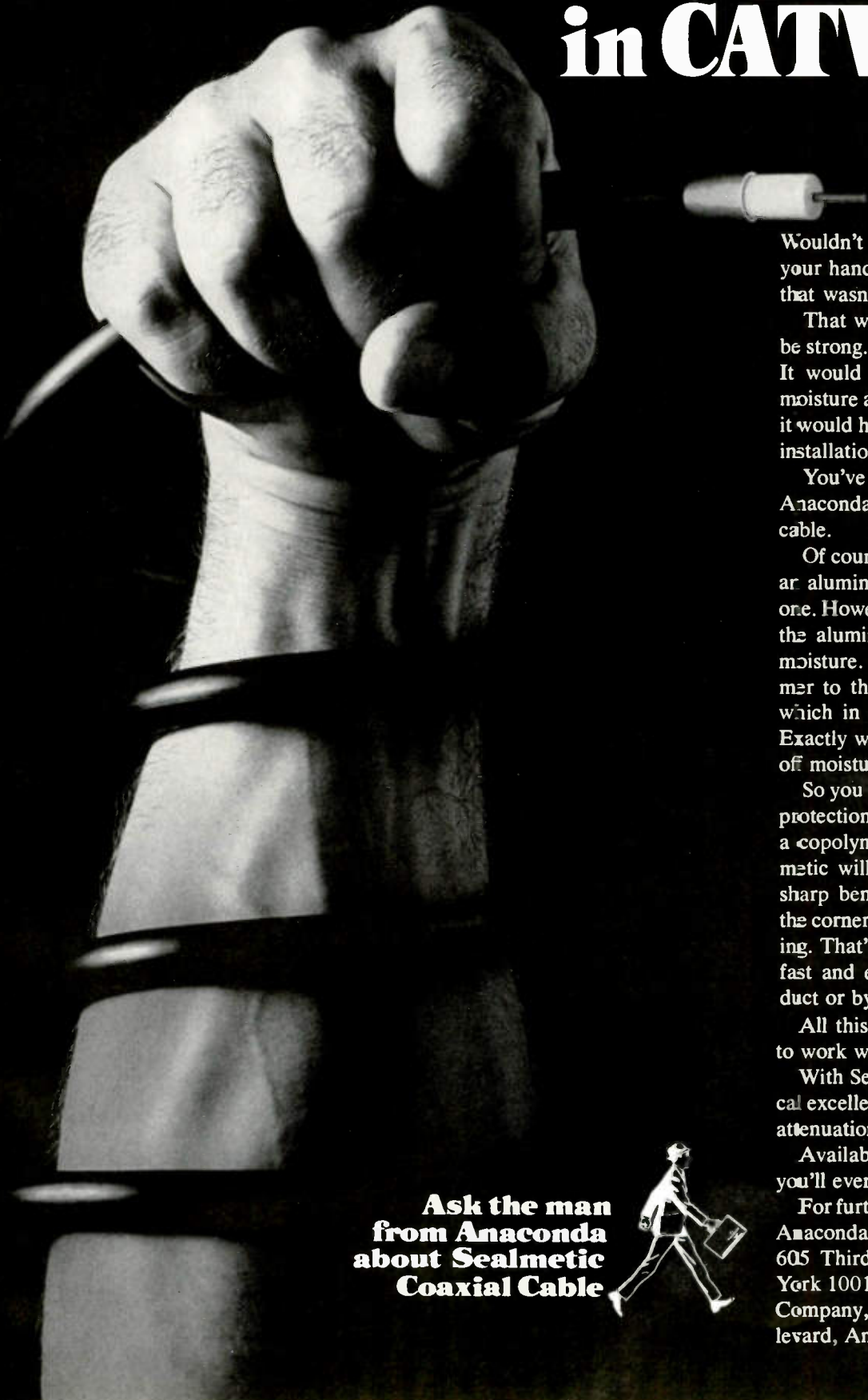
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As a ratio compared with unity, the deviation is numerically equal to half the resistance divided by the inductive reactance. For cables commonly used in CATV, a return loss relative to 75 ohms exceeds 40 dB for frequencies greater than a few hundred kilohertz. In fact, 60 dB is exceeded at 1 MHz on most cable sizes. Obviously reflections of these magnitudes do not materially affect measurements in the 30-dB range.

From the above considerations, it would appear that a "75-ohm reference return loss" test should be preferred for non-ambiguous specification testing. Implicit in use of this method would be the assumption of feasibility of calibrating the reference arm of the bridge by independent means. The arm may be calibrated in "absolute" terms with direct current, but a reliable independent comparison method should be available for translating the calibration to the operating frequency range. With regard to calibration, an accurate variable or step attenuator is vital for use in return loss measurements. The measured return loss is no more accurate (nor any less accurate in a well-designed test method) than the comparison attenuator used. Special precautions must be taken at higher frequencies because of attenuator error and possible errors produced by test leads.

### Sweep Rate Effects

Simons (reference 2, page 30) describes a source of return loss measurement error arising from limitations in detector envelope response. Extremely rapid level changes in reflected voltage occur as the sweep oscillator passes through the range of frequencies. The bandwidth of the return loss versus frequency curve in the vicinity of a peak resulting from a periodicity can be extremely narrow. Calculations based on equations presented in reference 9 predict bandwidths as narrow as 200 to 300 kHz for CATV cables and frequencies.


There is an additional source of error which can influence the apparent return loss from a periodicity. The extreme in input impedance is a result of many in-phase reflections returning from different locations within the cable. Since the swept signal is constantly changing in frequency, the reflected energy is somewhat dispersed in time and, therefore, phase addition effects. A review of sweep rate and bandwidth relationships is given in an article by Lucius<sup>10</sup>. The "within-the-pass-band" time must be sufficient for the circuit under test to respond to the signal just as is the case with the detector circuit used to display the voltage-frequency trace. The results shown by Lucius apply to lumped constant

circuits and do not allow for delay effects produced in the case of transmission line periodicities. Also, the equations apply strictly only to a circuit with an amplitude response characteristic approximating that of a Gaussian error distribution. The amplitude characteristic of a cable periodicity can appear much steeper than a Gaussian curve and, for this reason (in addition to transit time effects), "dwell time" requirement is more severe than would be implied by the equation used by Lucius. Experience has shown the true value of a narrow-band return loss peak is commonly 2 dB poorer than that indicated by wide (50 to 200 MHz) sweep widths and can sometimes be in error as much as 6 dB. Whichever the source of error, the correct value can be approached by reducing sweep width as suggested by Simons (alternatively, the sweep rate may be reduced if the sweep equipment is designed to allow this).

(To be continued next month)

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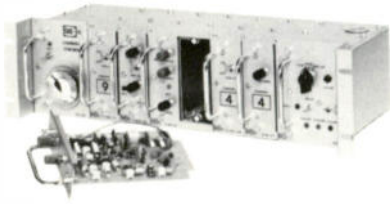


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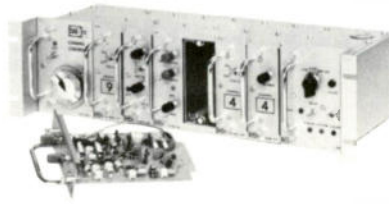
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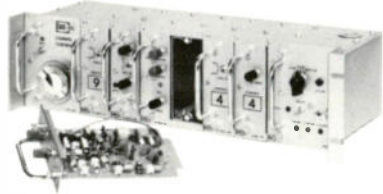
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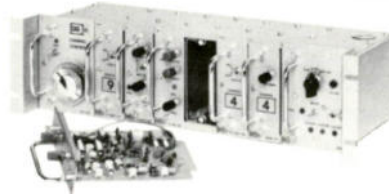
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## Portable Fault Locator

**Accurate and quick location of faults in coaxial cable can result in increased subscriber satisfaction and reduced maintenance costs. The test set described here utilizes the accuracy of TDR and the convenience of portability.**

Cable testing has "gone portable" with the introduction of the Jerrold 110A fault locator which is imported from Cossor Instruments, England. Soon after its introduction to Canadian cable TV systems about a year ago it was evident that the "go anywhere" aspect of this battery-powered, shoulder strap portable test set, and its comparative low price, would make the time domain reflectometry technique a practical everyday cable fault finding system.

The Jerrold 110A is a battery-powered oscilloscope system which utilizes the reflectometer technique to find faults in coaxial cable. The built-in pulse generator sends out 10 volt, 20 nanosecond rise-time pulses and then displays the reflections from faults in the cable. The instrument is calibrated in yards, and has full scale ranges from 100 to 10,000 yards. The pulse duration is automatically adjusted to suit the distance range selected. Self contained, rechargeable batteries power the instrument for portable operation. A built in trickle charger permits overnight recharging, or the instrument can be powered from an external 12-volt battery or from 115-volt AC power sources. A sturdy steel case with waterproof cover houses the test set, and a shoulder strap helps the operator to handle the 18 pound unit.

The author has had considerable experience with the Hewlett-Packard TDR system for cable testing. At first comparison the user may be disappointed with the Jerrold instrument when a direct comparison is made between it and the H-P instrument. This impression is soon replaced with a more favorable one when one gains an understanding of the differences between the two instruments. The Jerrold 110A, with its 20 nanosecond rise time pulse system cannot be compared with the 150 picosecond H-P instrument for fault resolution. (Fault resolution is the function of separating closely spaced faults or flaws, and is directly related to the "rise time" of the oscilloscope system used.) The H-P time domain reflectometer system (TDR) uses an expensive sampling type 'scope system to achieve remarkable resolving power. The 'scope system is also very sensitive, and features a wide range of accurately calibrated gain settings which permit observation and measurement of very small flaws in cable systems. The comparatively long rise time of the

Jerrold instrument and low 'scope gain limit the fault resolution and the sensitivity.

The Jerrold cable fault locator is, however, truly portable, while the H-P instrument must be considered a lab or truck mounted instrument. It is too heavy and too delicate (and too expensive) to be carried up poles, or into manholes or subscribers' back-yards. The "go anywhere, anytime" features of the 110A make it a favorite of cable TV technicians who find that it has adequate resolution and accuracy for trouble shooting the average cable problem. The instrument has been in service in a number of Canadian cable systems for more than a year with only minor service problems.



It has become the prime cable troubleshooting tool, demonstrating its utility in finding shorts and opens in both aerial and buried cables and locating shorted and wet taps. Multiple system operators and operators of larger systems have still found it worthwhile to have the H-P TDR instrument available for laboratory investigations of connectors and splices and for more difficult field jobs that require the superior sensitivity and resolution of the more expensive instrument.

The 110A is being distributed by Jerrold Electronics CATV Systems and G and I Divisions, and is available for less than one thousand dollars.

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# CATV Antennas

A survey of basic conceptions involved in signal propagation and reception, and an outline of the various types of antennas applicable to CATV.

By R. C. Eldridge  
B. C. Telephone Company  
Vancouver, British Columbia

Before the subject of antennas can be properly discussed, we must clear up a few points about the basics of signal propagation. CATV operators are usually interested in pulling in some distant stations, and it is on this aspect of receiving that much of the engineering of head-ends is concentrated.

There has been a lot of controversy about the mechanism of distant propagation, and argument as to whether or not the signal arrives by reason of tropospheric scatter. Any signal which comes over the horizon comes in by reason of tropospheric scatter, but when we consider that the troposphere starts right at the earth's surface, the argument becomes rather academic.

Undoubtedly there are useful low level areas of ionization (a few thousand feet above the ground) which causes a signal to be refracted downwards at useful distances beyond "normal" range. These are most likely to occur over the sea in calm areas and along a coastline. Sometimes ducting will occur, carrying the signal even further.

Higher layers, especially Sporadic E, cause trouble in that they reflect signals into a head-end installation from hundreds or even thousands of miles away. This spells interference.

Some recent VHF research in England showed that a double reflection from a relatively low layer will bring in a signal from distances of the order of 140 and 300 kilometers (86.8 to 186 miles) at a stronger intensity than would result from a single reflection from a higher layer.

Because of these various possibilities, we have to consider the *vertical directivity* of antenna arrays.

Many people think in terms of "the higher the gain the better the antenna," but this is not necessarily true. For example, if there are mountains behind the antenna array, or a source of electrical noise, front to back ratio may be more important than forward gain.

The precise *nature* of the directivity, horizontal or vertical, may be all-important. This does not necessarily mean the *narrowest* beam—it means the *right* beam and also the *right nulls*. If there is a bad ghost coming in from the side, you may be able to trade a few dB of gain to the front if you can get in return many dB of attenuation in the direction from which the ghost comes.

If there is no ghost problem, and you need a relatively wide horizontal beam because you want to pull in signals from different directions, vertical stacking will achieve this. It is very important to remember that if you stack antennas one above the other, the increase in gain will come from compression of the *vertical* pattern. The horizontal pattern will be just as wide as ever it was.

On the other hand, if reflected signals coming in from the sides are troublesome, horizontal stacking is more likely to be useful and the vertical lobe will remain as wide as it would have been for one antenna.

## Gain

The gain of an antenna is directly related to its *effective* area—sometimes called its aperture—and therefore to the product of the vertical and horizontal lobe half-power points. The business of effective area

is not easy to grasp, especially if you have an inquiring mind, but life is easier if you accept some things on faith.

An antenna which has greater gain than another *must* have a greater effective area, even though the *physical* area looking at it from the front may be smaller. To realize the maximum gain from stacked antennas their apertures must be just contiguous. If they are closer than that, so their apertures overlap, gain will be less than optimum and you may run into trouble because of mutual impedance coupling between the two antennas. If they are too far apart gain will also suffer. Mathematical proof of this, although readily available, will not be presented here.

If you want to stack antennas, find out from the manufacturer what the optimum stacking distance is for vertical and for horizontal spacing. The aperture of a dipole is elliptical, but as director and reflector elements are added to it the *shape* of the ellipse (or perhaps more accurately the *proportion*) will change. The matter is also complicated by the fact that when horizontally polarized antennas are stacked one above the other the elements are paralleled, and mutual coupling is more likely to occur. This not only upsets the pattern, but also changes the impedance at the feeder connection.

Every time you double the number of antennas in an array you should get a gain of about 2.5 dB. If you don't, look to the spacing, or the stacking harness, or the combining transformers.

## Rhombics

The Rhombic looks very simple, and has a reputation for wide bandwidth and high gain. For many years it was the "Rolls Royce" of antennas, first for HF radio, then for VHF. If all you are looking for is high gain in one direction, and there are no ghosts to trouble you from the side, and you have a nice big piece of land and some convenient trees, a rhombic is cheap, and easy to maintain.

The disadvantage is that there are dozens of spurious lobes, which vary in amplitude and position as the frequency of the incoming signal is changed. There is no way of getting rid of these side lobes. They are there because the rhombic consists of a large number of "out of phase" half-wave antennas.

The radiation pattern for a single wire three half-waves long is shown in Figure 4. The pattern for a wire four half-wave long is shown in Figure 5. Every time another half-wave is added, another small lobe appears on each side.

Now when you consider that the rhombic consists of four straight longwire antennas, disposed at such an angle that the main lobes coincide, you can see that all the secondary lobes, at all kinds of crazy angles, will sometimes add, sometimes cancel, but you can be sure they won't go away altogether.

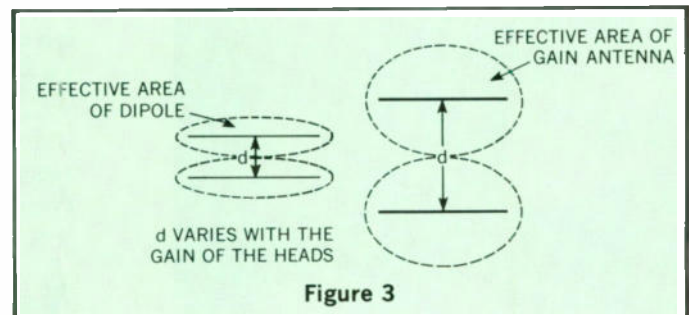
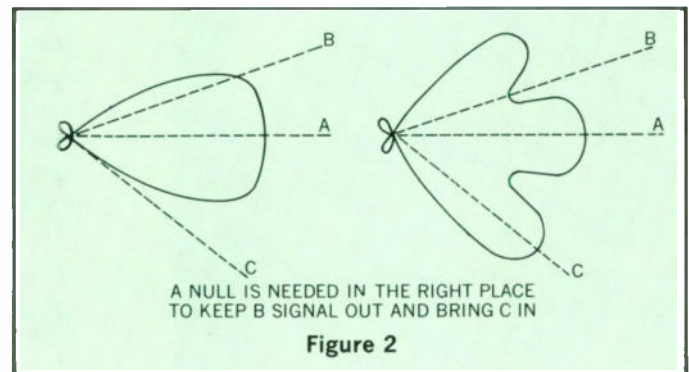
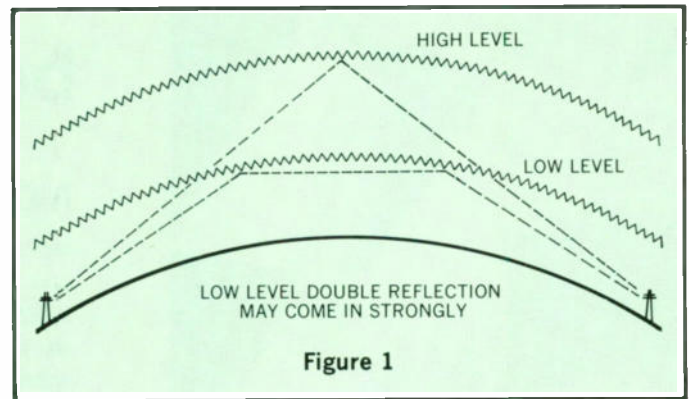
Unless you want to receive a signal from the rear, the front end must be terminated with about 800 ohms. This absorbs the wave travelling towards the front end. If the feeder is correctly matched, the wave

travelling towards the rear will enter the feeder and come on down to the receiver, which must be matched to the feeder.

The more wavelengths of wire there are in the legs of the antenna (or conversely the higher the frequency being received on a given length of wire) the narrower becomes the diamond. The *tilt angle* (see Figure 7), becomes correct only for one frequency. For some other channel the main lobe may not be forward in a straight line at all.

If the wire is long enough the diamond becomes infinitely narrow, and you have two long wires parallel to each other correctly terminated at the far end. Now you have a long piece of balanced transmission line, and theoretically you won't receive anything at all! In practice it would be pretty poor, too, so the less said about that the better!

But one long piece of wire (several hundred feet), pointing in the direction of the station you wish to receive, and terminated to ground at the far end with a correctly chosen resistor, makes a rather good antenna, except that since it is unbalanced it would pick up more noise than would a balanced antenna.



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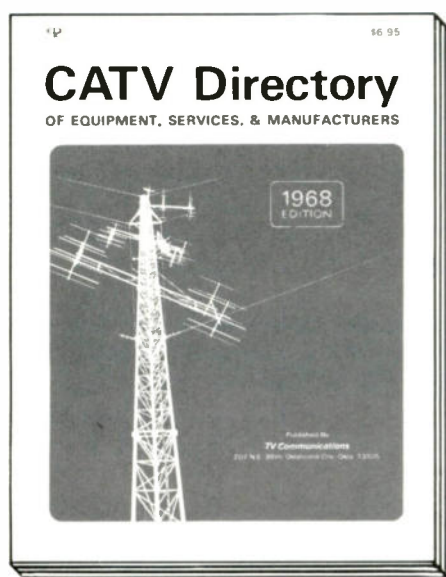
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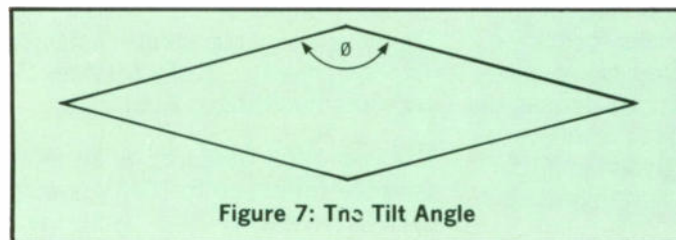
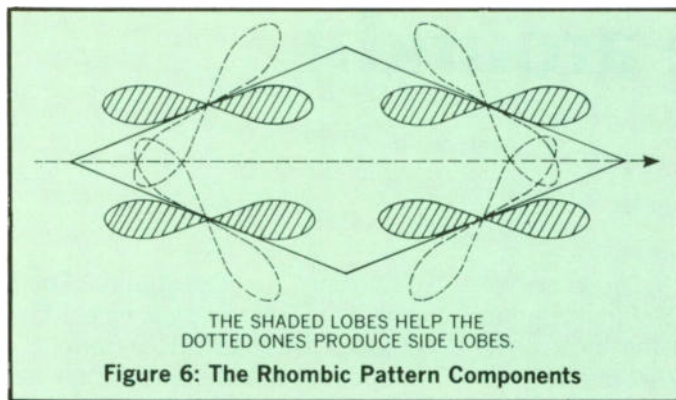
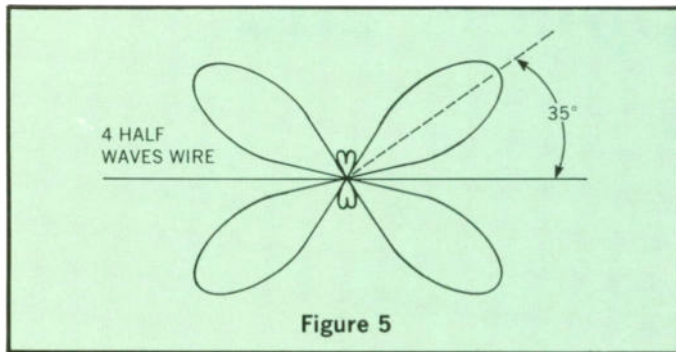
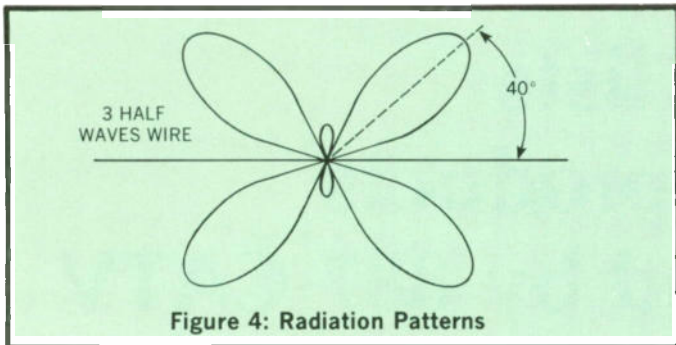
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## CATV Directory

OF EQUIPMENT, SERVICES, & MANUFACTURERS

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## VSWR

In a receiving installation, the antenna is the *source* of the energy on the feeder, and the receiver is the *load*.

If the receiver is not correctly matched to the feeder, not only will there be an inefficient transfer of energy, there will also be a standing wave built up on the feeder by the reflected wave. If the receiver input impedance is not what you want it to be, there isn't much you can do about it except put in a matching network.

If you have plenty of signal, or too much, a resistive pad will do a world of good. The pad should be designed to terminate the feeder correctly (and if pos-

sible the other end should match the receiver) and the pad will then serve the double purpose of attenuating the signal and preventing standing waves.

If there *is* a standing wave on the feeder, it will be worse if the antenna is incorrectly matched, too. A properly matched antenna will absorb (re-radiate) any reflected wave coming up from the bottom, rather than complicating things by sending most of it right back down again.

## The Yagi-Uda

For a given physical size the Yagi-Uda has the greatest gain of any antenna. The simple version also has a rather narrow bandwidth, and many of the weird and wonderful designs that have developed during the last 15 years or so in the TV industry are assemblies of elements intended to broaden the response of the basic Yagi-Uda.

There is no standard configuration. Element lengths and spacing are interdependent, and can be varied to produce higher gain, better front to back ratio, wider bandwidth, etc. Variants have been made using more than one driven element, and classification begins to get difficult.

This is one antenna that is well known, so there isn't much point in dwelling on it. Although many manufacturers are now going to the Log-Periodic, some are continuing to develop wider bandwidth Yagi-Udas.

## Log-Periodic

There are many physical arrangements of the log-periodic, but they are all based on the basic smooth progression of element lengths and spacing which give it outstanding bandwidth.

All the elements are connected to the feedline, but only those close to the resonant frequency are active on a given channel. Because of this, gain is not quite as high as that of the single-channel Yagi-Uda. But the pattern remains constant throughout the very wide range.

This is an ideal antenna to use under severe icing conditions. By choosing a model which covers frequencies several MHz lower than the lowest channel to be received, you can insure that you will still be in business even when the antenna is shrouded in thick ice.

Ice tends to detune an antenna downwards, but in the case of the log-periodic this merely shifts the operating area of the antenna towards the shorter elements and performance is degraded much less than would be the case with a Yagi-Uda. This advantage is not confined to the log-periodic, of course. Any truly wide bandwidth antenna will react in similar fashion.

The frequency range of a log-periodic is determined by the length of the shortest and the longest elements. All the elements being essentially half-wave dipoles at the various resonant frequencies, you can easily estimate the approximate highest and lowest frequency the antenna will cover.

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Other features of the EV-210 are slow- and full stop-motion in both color and monochrome; dual audio channels; electronic tracking control; guaranteed tape interchangeability; and optional remote control and electronic editing.

The hue and cry about standardization of VTRs goes on and on and on.

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Like any multi-channel head, stacking requires a lot of care, and the combining transformers or hybrid splitters must be capable of correct operation over all the frequencies being received.

### Corner Reflectors

Corner Reflectors and Para-Corner Reflectors (Figures 8 and 9) are not used as much as one would expect. Used on horizontal polarization, they have a typical front to back ratio of 30 dB or better, depending on the closeness of the mesh or horizontal rods of the reflecting surface.

The pick-up element is usually a single broadband dipole, often of conical or bowtie configuration, and a bandwidth of 20% of the center frequency is easily achieved. This is another antenna which laughs at ice and snow.

Corner reflectors can be stacked horizontally by constructing a long "trough" of wires, mesh, or rods, and mounting pick-up elements at intervals across the width. This would have a reasonably wide vertical lobe, and would be useful in the case of a site receiving a signal being diffracted over a hill rather close to the antenna.

The term Para-Corner is used when the screen is shaped with two or three angles of the plane surface, as in Fig. 9. As might be expected, the effect is somewhere between that of a straight-plane reflector and that of a parabola.

### Dishes

If the reflector is shaped in the form of a true parabola, much greater gain can be realized, and therefore much sharper directivity.

Although a small amount of direction changing can be done by careful positioning of the pick-up head around the general position of the focal point, the actual dish itself must be quite carefully pointed at the station to be received.

The more accurate the contour of the surface of the dish, the higher will be the gain and the more critical the positioning of the pick-up head. The position which gives best forward gain is not necessarily the position which gives best discrimination against a particular side angle.

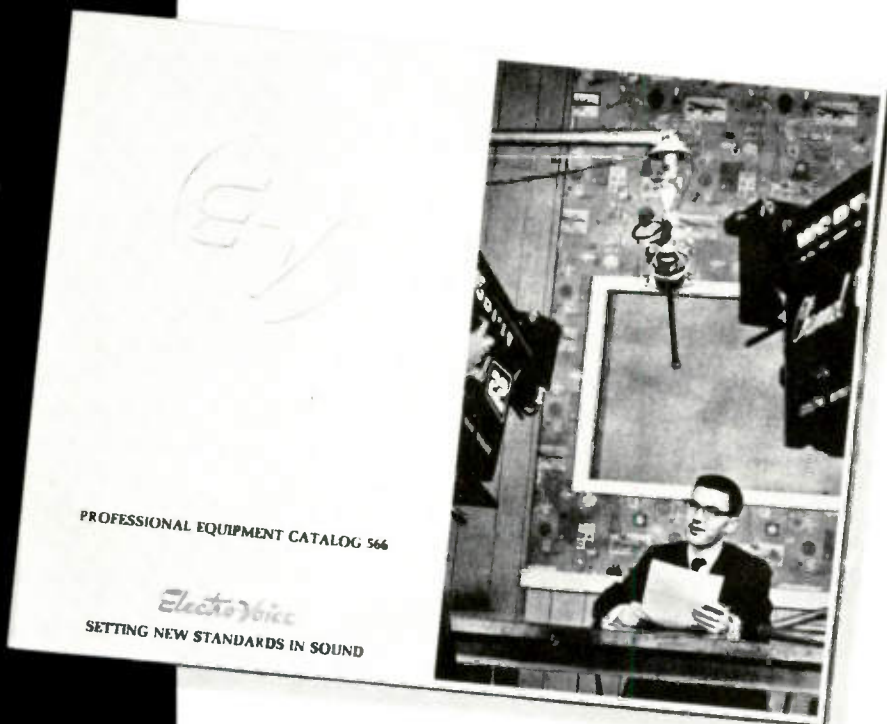
The pick-up head should not have too many elements, or its beam will be too narrow to accept signals reflected from all parts of the dish. With a large dish and very weak signals it is sometimes best to use a single broadband dipole element at the pick-up.


It has been generally assumed that dishes are not effective unless they are at least ten wavelengths in diameter, but a recent article (*Broadcast Engineering* Jan., 1968,) gave information on experience with 20 ft. and 36 ft. dishes which exhibited focal point effects and good gain characteristics down to frequencies representing about 3 wavelengths diameter. This means that a 4 ft. diameter is required for Channel 83, a 7 ft. diameter for Channel 14, a 14 ft. diameter for Channel 13, and that a 50 ft. diameter is required for Channel 2.



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## Big Screen Antennas

Screens are most useful if very high gain is required in one general direction. The screen surface acts as a reflector to send signals back to pick-up heads. When the channels come from slightly different directions, separate pick-up heads are used for each channel, and the heads are moved around to find the optimum position for each channel to get maximum signal and minimum ghost.

Sometimes these antennas are called parabolic when they really are shaped in a constant-radius arc. A parabola has one direction of pickup and one focal point, and the whole basis of the parabola is the fact that a signal radiated from the focal point will bounce

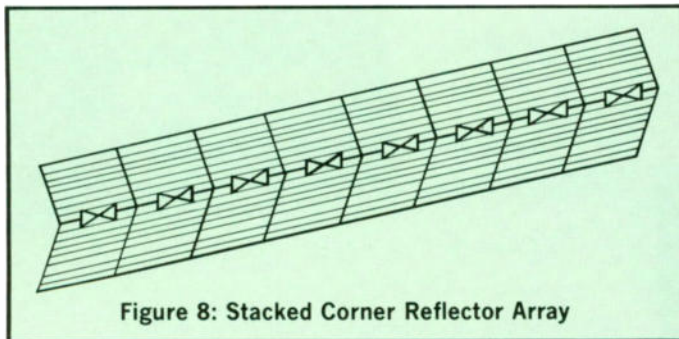


Figure 8: Stacked Corner Reflector Array

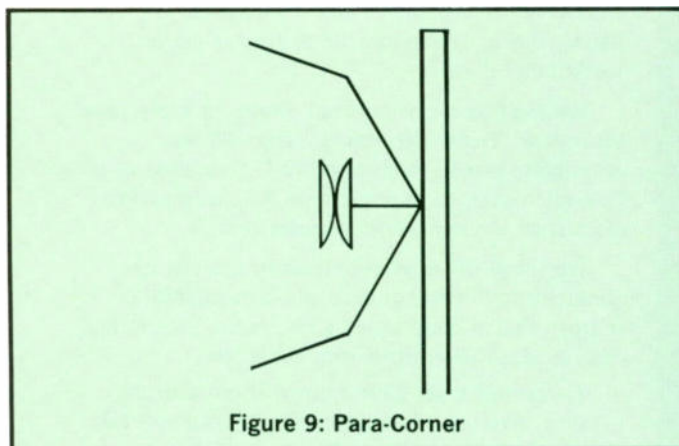


Figure 9: Para-Corner

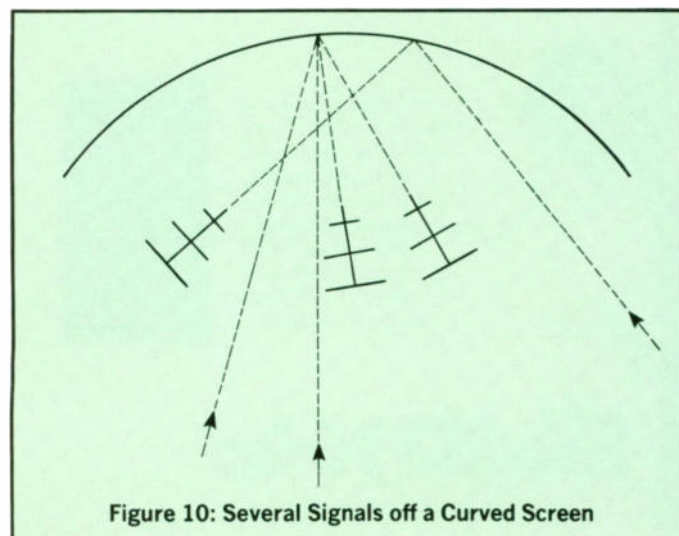


Figure 10: Several Signals off a Curved Screen

from the reflector in the same forward direction, regardless of where it hits the reflector.

This gives tremendous gain in that one direction, but doesn't leave much margin for error in erection, or versatility in picking up channels just off the main beam.

A screen shaped in a constant curve exhibits less gain, but pick-up heads can be positioned in front of it at various points channel by channel and best performance obtained from each. The radius of the curve should be chosen to fit a particular case, a sharper curve being useful over a narrower beam.

Medium gain pick-up heads are usually used, with screen reflector elements at the rear of the boom to eliminate direct pick-up from the station. Occasionally a separate screen is mounted behind the rear element of the pick-up head for even better front to back ratio.

## Gain Figures

It is time someone did something about standardizing the reference for antenna gain in the CATV industry. The two-way radio industry is now becoming accustomed to using the half-wave dipole as a reference for VHF antennas for fixed stations, since the CCIR has adopted a standard for Effective Radiated Power referenced to a half-wave dipole below 890 MHz and Equivalent Isotropically Radiated Power referenced to an isotropic source for frequencies above 890 MHz. This has been majority practice in the U.S.

It is disturbing to find that TV antenna manufacturers tend to use figures referenced to isotropic. It looks as though some use this reference because it yields a higher figure (like referring to an engine's 492 cubic inches rather than its 300 horsepower), and the others have to go along in self defense.

Just for the record, in case some people are—understandably—confused about it all, a half-wave dipole in free space, made of perfectly conducting materials, with a perfect match to the feeder, shows 2.15 dB gain over an isotropic source in the direction of maximum radiation. This is because a dipole radiates best broadside on to the element and poorly off the ends. An isotropic source is an infinitely small point, no length, no width, no polarization, which radiates equally well in all directions, up, down, sideways, and all angles in between.

So an antenna with 12.15 dB gain referenced to isotropic has the same characteristics as one quoted as 10 dB referenced to a half-wave dipole. And one quoted as 9.9 dB Power Gain is probably slightly better!

By the way, has it ever occurred to you that a figure for rear signal pickup would be much more useful than front to back ratio? An antenna with gain of 14 dB and a f/b of 22 dB picks up twice as much power from the rear as another antenna with 9 dB gain and a f/b of 20 dB. It would be nice if they were listed as having -8 and -11 rear pickup, respectively. As long as no one gets into the habit of listing them as 14 dB gain (isotropic) and -10.15 dB rear pick-up (dipole)!

TVC



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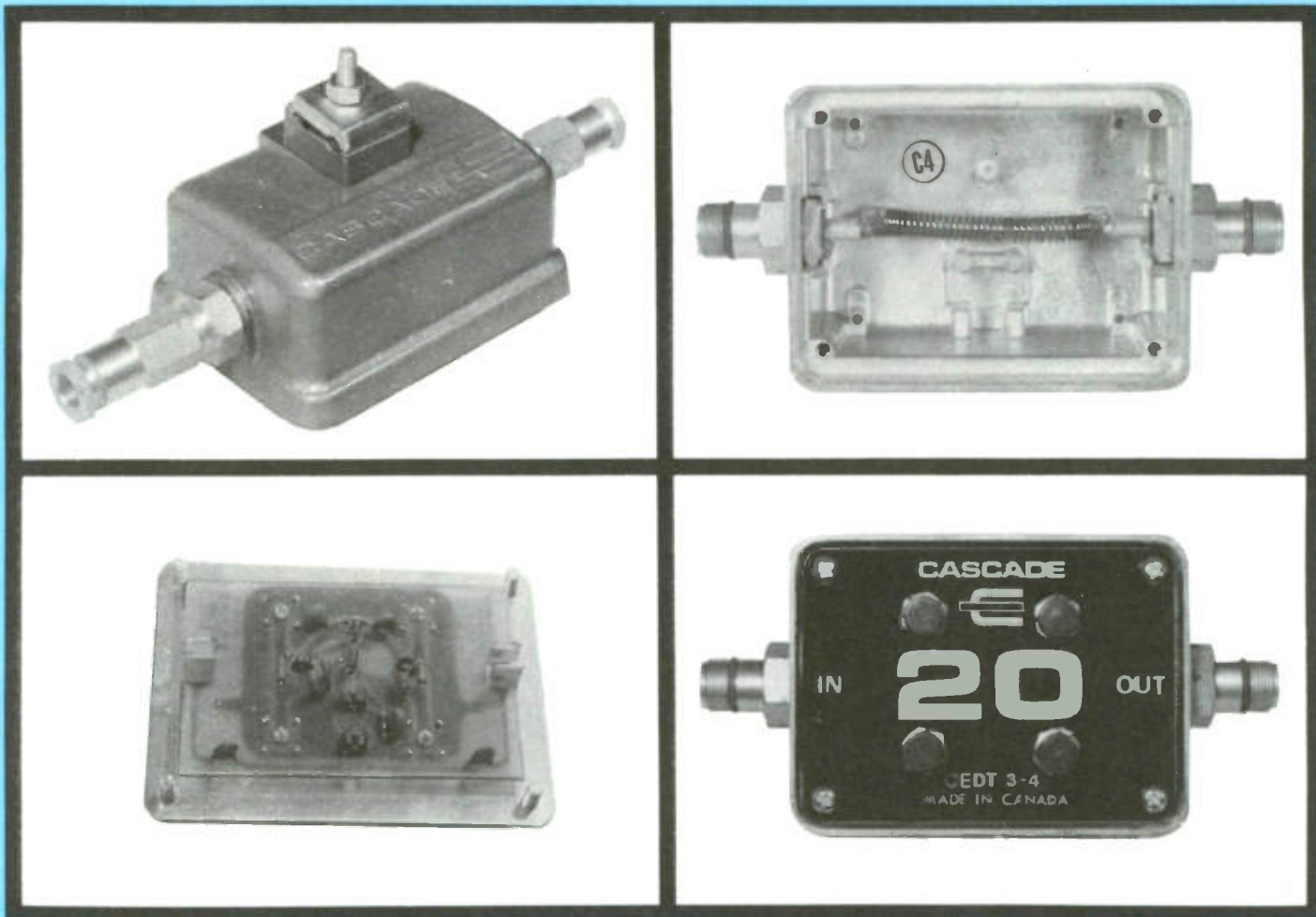
We believe The Money Tap is designed right, built right and priced right. We back it up with a 90-day warranty and the best service in the business.

Borrow a sample from your local Cascade Man and check it yourself. We want your business and we're prepared to scramble for it.

With a cordial tip of the tap,

R. Pat Brown,  
General Sales Manager.

\* The customer is always right.



The smart money is on Cascade's new modular directional tap. The basic housing, once installed in your system, can remain undisturbed and any one of twelve different modules snapped into place. You can choose two or four drops and tap values from 12 to 32 dB.

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The figures speak for themselves.

## MEET THE MONEY TAP

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CEDT 3-4/16	± 1.5	1.5	17	18	20	20
CEDT 3-4/20	± 1.5	1	17	18	20	20
CEDT 3-4/24	± 1.5	1	17	15	20	20
CEDT 3-4/28	± 1	.75	20	15	20	20
CEDT 3-4/32	± 1	.75	30	15	20	20

Note: Specifications shown are for CEDT 3-4. Similar figures apply to the CEDT 3-2. All specifications and prices subject to change without notice.

### CASCADE ELECTRONICS

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### FRED WELSH ANTENNA SYSTEMS

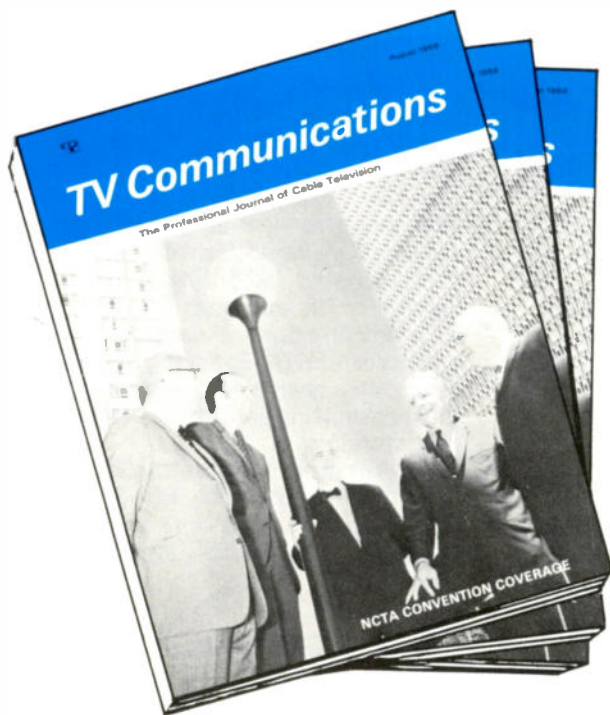
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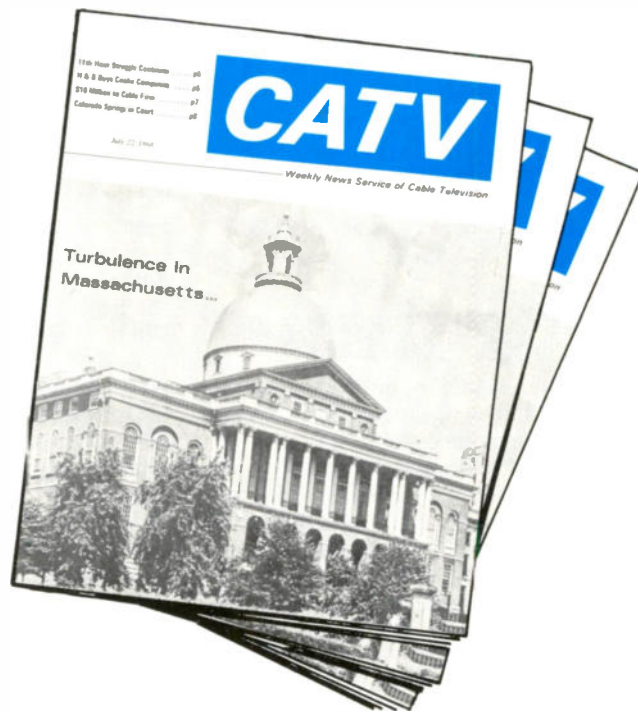
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# PRODUCT REVIEW

NEW COMPONENTS FOR CABLE TELEVISION SYSTEMS

## NEW "ST" LINE FROM AMECO

Included in Ameco's new "ST" package are a solid-state heterodyne head-end amplifier, designated "Channeleer ST," a series of amplifiers including MGC, AGC/Bridger, Bridger and MGC/Bridger amplifiers, designated the "Pacesetter ST" series, and a new low-cost line extender, designated "Pacer ST." The Channeleer ST gives +54 dBmV output, 6 dB noise figures, and spurious outputs down to 60 dB, according to the manufacturer. The Pacesetter ST amplifiers feature 50-240 MHz bandwidth for more than twelve channel operation. Cross modulation is given as -90 dB at +32 dBmV output; noise figure is 10 dB. The Pacer ST features +38 dBmV output at -72 dB cross modulation. It also features adjustable gain and thermal compensation. Ameco is also introducing a new split-band AGC amplifier which features automatic gain control and tilt control action for split frequencies 54-108 MHz. The manufacturer lists its cross modulation ratio at better than -90 dB; its maximum noise figure at 12 dB.

For further information on these new products, Contact Ameco, Inc., P.O. Box 13741, Phoenix, Arizona 85002. Phone (602) 262-5500.

## VIKOA 8-OUTPUT DIRECTIONAL TAP AND NEW 59U CABLES

Vikoa, Inc., has announced the availability of a new 8-output directional tap said to provide excellent directivity and high isolation for optimum cable system performance. It is designed for use in areas where a heavy concentration of house drops is required, such as multiple dwellings, hotels, motels and apartment buildings, and is suitable for either pole messenger cable or bracket mounting. Vikoa has also announced the production of a new series of 59U coaxial cables. These include the following types: (a) Mylar tape (reg TM of Dupont) coated both sides with aluminum foil with a braided shield, (b) An all new aluminum 59U solid seamless sheath. These cables are specially designed to be used in areas of high intensity signals, to

eliminate direct off-the-air signal pickup.

For further information on these new products, contact Vikoa, Inc., 400 Ninth Street, Hoboken, New Jersey 07030. Phone (201) 656-2020.

## COAX FROM WHITNEY BLAKE

Whitney Blake Company is now manufacturing CATV coaxial cable, including aerial, duct, integral messenger aerial, direct burial and armoured cable. The cable is available with a solid copper or copper-clad aluminum center conductor. According to the manufacturer, it has a return loss guaranteed not less than 30 dB at 5-220 MHz; not weighted; reference to 75 ohm standard, and is available in all standard sizes.

For further information on this new product, contact Whitney Blake Company, New Haven, Connecticut 06514. Ph. (213) 248-5515.

## NEW JERROLD EQUIPMENT

Included in abundance of new equipment shown at the NCTA convention this year was an impressive list of new CATV gear from Jerrold Electronics Corporation. Added to the company's mainline equipment is a full complement of "push-pull" modules for both Starline One and Starline Twenty Series amplifiers. With the new modules, Starline One amplifier stations can be given full mid-band (21-channel) capability, and Starline Twenty amplifiers can be modified to provide capability in the 50 to 260 MHz range, making available a total of 27 channels. The firm's new Starline line-extender amplifier Model SLE-2P also features 27-channel capability, along with 43 dBmV output and tilt and gain controls which are electronically independent of each other. Also added to the Jerrold line is the Channel Commander II head-end amplifier. The solid-state, modular unit completely processes and controls any single VHF input channel (2 through 13) and delivers it as any standard VHF channel or as any special VHF channel. The new Ranger feeder line amplifier provides a fixed gain of 9 dB at 240 MHz and

incorporates a fixed 5 dB tilt for its 40 to 240 MHz range. Its gain is a full 41 dB for 12 channels.

For further information on these new products, contact Jerrold Electronics Corporation, CATV Systems Division, 401 Walnut Street, Philadelphia, Pennsylvania 19105. Phone (215) 925-9870.

## ZIG-ZAG ANTENNAS

R F Systems, Inc. has announced the availability of their new Zig-Zag antenna for CATV head-ends. Available in several models covering the high band VHF channels and all UHF channels, this new antenna provides very high gain and front-to-back ratio characteristics, according to the manufacturer. The antennas are available in a tower-mounted vertical format and feature a Zig-Zag antenna design which has been used extensively as the transmitting antenna for TV broadcast stations.

For further information on this new product, contact RF Systems, Inc., 155 King Street, Cohasset, Massachusetts 02025. Phone (617) 383-1200.

## HTV SYSTEMS AMPLIFIER LINE

HTV Systems Inc. has developed a line of solid-state trunkline, bridging and distribution amplifiers known as the Vista 20 Series. The amplifier units are housed in two basic case sizes. Functional grouping assemblies such as the trunk amplifier, bridging amplifier, AGC circuit, power supply and splitter units are completely modular. An amplifier, once installed,



can be changed to perform a different function by the addition or substitution of modules, normally without removing the amplifier case from its mounting. Seized center conductor cable terminations are employed to help eliminate the possibility of cable pull out due to temperature changes or installation stress. A separate a.c. power feed connection is provided on each amplifier case, eliminating the need for separate power couplers in the cable.

For further information on this new product, contact HTV Systems, Inc., 210 Boxart Street, Rochester, New York.

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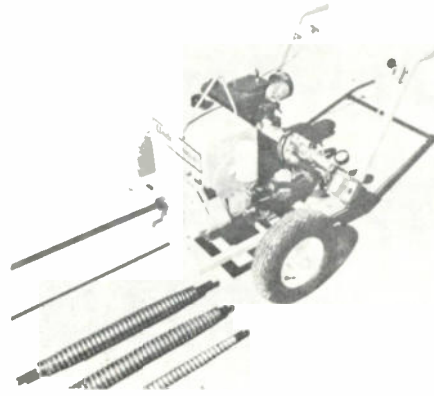
## CATV POWER SYSTEM

The PS-100 CATV power system, manufactured by Rich Laboratories is designed to satisfy all power needs for remote amplifiers, even during utility power outages. The complete equipment is enclosed in a single cabinet, which is pole mounted, and connected to the 115 V line and the TV cable. The power system has two modes of operation: (1) the normal mode with utility power supplying, through a regulating transformer, the load as well as power to the battery charging circuit. (2) the emergency mode, with power supplied to the load from a solid-state inverter and batteries. Switching is completely automatic and is controlled by the presence or absence of utility power. An optional signal device can be supplied.

For further information on this new product, contact Rich Laboratories, Box 1356, Santa Cruz, California 95060.

## UNDERGROUND COMPACTING AUGER

A new device for underground construction has been introduced by Contender Corporation. The model U-500 "Undertaker" underground



compacting auger has been designed by the firm to enable underground construction crews to bore under permanent structures such as streets, railroads and concrete areas. The Undertaker bores and reams to 3 1/4" diameter for distances to 200 ft. at a boring speed of 5 to 8 ft./min. Its hydraulic system develops 550 ft. lbs. torque.

For further information on this new product contact Contender Corporation, 433 Community Lane, Woodland, California 95695.

## CABLE LOCATOR COMBINES FIVE INSTRUMENTS

Availability of the new M-Scope

Model TW-5 pipe and cable locator has been announced by Fisher Research Laboratory. The TW-5 is 25% smaller than its predecessor Model TW-4 and offers a 15% increase in power and sensitivity over all instruments previously available, according to the manufacturer. The Model TW-5 operates in five different modes: 1, inductive location of discrete objects; 2, inductive tracing of cables; 3, conductive tracing of cables; 4, inductive determination of depth of cable; and 5, conductive determination of depth.

For further information on the new product, contact Fisher Research Laboratory, 1975 University Avenue, Palo Alto, California 94302. Phone (415) 322-4646.

## TIME-SAVING BILLING SYSTEMS

Transface Process Company, manufacturers of time saving plastic logs used by radio and TV stations, have announced the availability of their new "one write" plastic billing system. The plastalucet billing masters have been designed to obtain time-saving shortcuts in billing.

For further information on this new product and free kit contact Transface Process Company, 480 Canal Street, New York City, New York 10013. Phone (212) 697-6323. 



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Require knowledge in audio/TV/RC building systems. Some drafting and estimating skills. Minimum education: 2 years electrical-electronics. Send complete information and salary requirements to J. M. Grubb, Planning and Engineering, Physical Plant, Purdue University, West Lafayette, Indiana 47907.

## CHIEF TECHNICIAN

An excellent opportunity is available for a technician experienced in equipment installation and maintenance, minor head-end and amplifier repairs and adjustments, and general system checkout. System located in Louisiana. Excellent working conditions and growth opportunity in multiple system operation. Send resume to Director of Personnel, Entron, Inc., 2141 Industrial Parkway, Silver Spring, Maryland 20904.

## CALIFORNIA SALESMEN TO CATV

An unexcelled opportunity with leading CATV distributor for ambitious men experienced in manufacturer or distributor sales of CATV equipment. Territories centered in San Francisco and Los Angeles. Reply in strict confidence to **TV Communications**, Dept. T8-12, 207 N.E. 38th St., Oklahoma City, Oklahoma 73105.

## CHIEF ENGINEER SYSTEMS

A newly created position responsible for the maintenance and operational quality of systems product. Must be heavy in head-end and antenna orientation areas. Extensive travel from company base. Send resume to Director of Personnel, Entron, Inc., 2141 Industrial Parkway, Silver Spring, Maryland 20904.

## ADVERTISING, PROMOTION & PUBLIC RELATIONS MANAGER

Growing multiple CATV firm operating in several western states is seeking a sharp young executive with a knowledge of the CATV business. Must be able to set up successful subscriber promotions and handle all phases of local public relations work. Excellent opportunity for advancement. Starting salary according to ability and experience. Send resume, references, photo and present salary in complete confidence to **TV Communications**, Dept. T8-10, 207 N.E. 38th Street, Oklahoma City, Oklahoma 73105.

## CATV SYSTEM MANAGERS WANTED

To join with young dynamic group owner. Opportunity to advance with fastest growing company in the industry. Send resume to **TV Communications**, Dept. T8-2, 207 N.E. 38th Street, Oklahoma City, Oklahoma 73105.

## NEED EXPERIENCED CATV TECHNICIAN

For expanding plant located within 40 miles of Los Angeles. Reply to **TV Communications**, Dept. T8-9, 207 N.E. 38th Street, Oklahoma City, Oklahoma 73105.

## TOP FLIGHT ENGINEER AND CATV PURCHASING AGENT

One of the cable TV industry's most capable executives is seeking new employment opportunity. He has built hundreds of miles of plant . . . is thoroughly experienced in all phases of CATV, including construction. Reply to **TV Communications**, Dept. T8-6, 207 N.E. 38th Street, Oklahoma City, Oklahoma 73105.

## CATV EXECUTIVE AVAILABLE

Desires position as management executive in MSO. Presently employed, wishes to make a change in near future. Experienced in all phases of CATV Management. Proven background in all phases of CATV operations. Well known throughout industry. Will furnish resume upon request. Reply to **TV Communications**, Dept. T8-1, 207 N.E. 38th Street, Oklahoma City, Oklahoma 73105.

## POSITION WANTED

CATV Chief technician/manager desires position in Florida or deep south. Prefer coastal area but will consider inland. Experienced in system design, construction and maintenance. Also have 1st class license with microwave and FM communications background. Reply to **TV Communications**, Dept. T8-7, 207 N.E. 38th Street, Oklahoma City, Oklahoma 73105.

## CATV DIRECTOR

Former developer-owner-operator of several CATV systems now seeks to associate with large firm of new group to develop and operate same. Wide experience in advertising, broadcasting and sale promotion. Age 39 with college education. If you need an aggressive executive with the full range of management skills from financial to technical to sales in the CATV field, write immediately to **TV Communications**, Dept. T8-8, 207 N.E. 38th Street, Oklahoma City, Oklahoma 73105.

## SYSTEM FOR SALE SPRINGBORO-CONNEAUTVILLE, PA.

Fifteen miles of plant—new aluminum cable and new equipment; 8 channels. Plant in operation with 360 customers on system and adding more each week. Potential of 600 should be reached in one to two years. Present monthly rate is \$4.00 plus \$20.00 tap-on fee. Monthly rate to be raised to \$5.00 soon. Contact Joe Hardy, Hardy Television Cable Corp., 906 Main St., Conneautville, Pa. 16406. Telephone 814/587-5481 or Saturday through Monday, 412/475-2471.

## WILL PURCHASE FRANCHISES

Reply giving location and details. **TV Communications**, Dept. T8-5, 207 N.E. 38th Street, Oklahoma City, Oklahoma 73105.

## SYSTEM WANTED TO PURCHASE

Reply giving location and details. **TV Communications**, Dept. T8-4, 207 N.E. 38th Street, Oklahoma City, Oklahoma 73105.

## SMALL SYSTEMS WANTED

Group of private investors is interested in acquiring small CATV systems with fewer than 1,000 subscribers. Will also consider franchise situations in small communities. All replies will be treated in strictest confidence. Reply to **TV Communications**, Dept. T8-11, 207 N.E. 38th St., Oklahoma City, Okla. 73105.

Place your own classified message before the national CATV market . . . 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 in TV Communications. My check is enclosed.

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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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ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

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GE-4TE20A1 CCTV Camera \$925.00; Jerrold AT-13 \$95.00. Phone 218-262-1071, Range TV Cable Co., Box 321, Hibbing, Minnesota 55746.

**FOR SALE**

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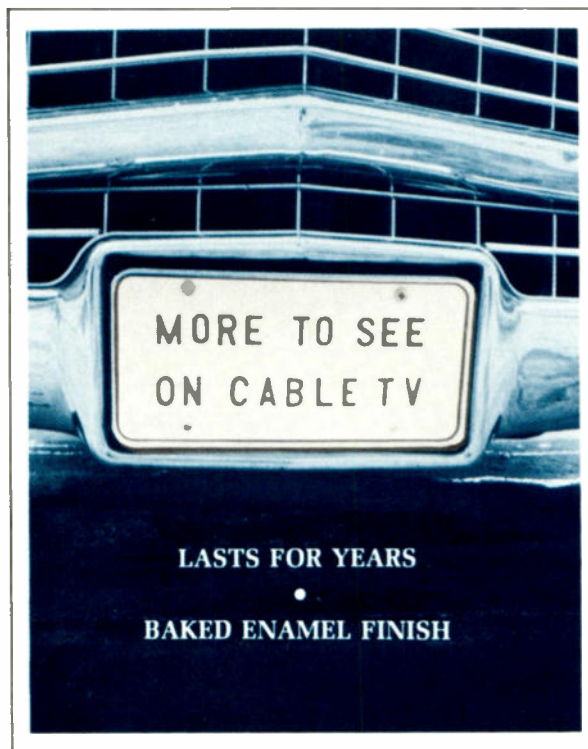
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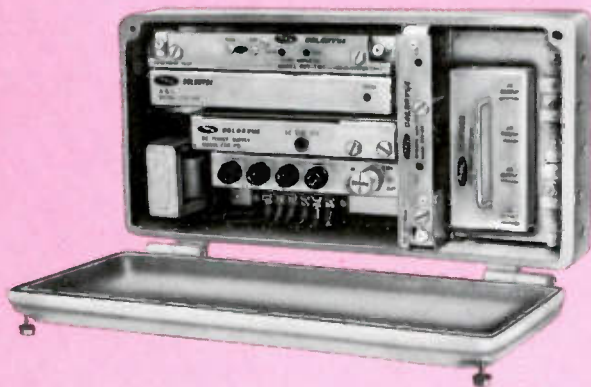
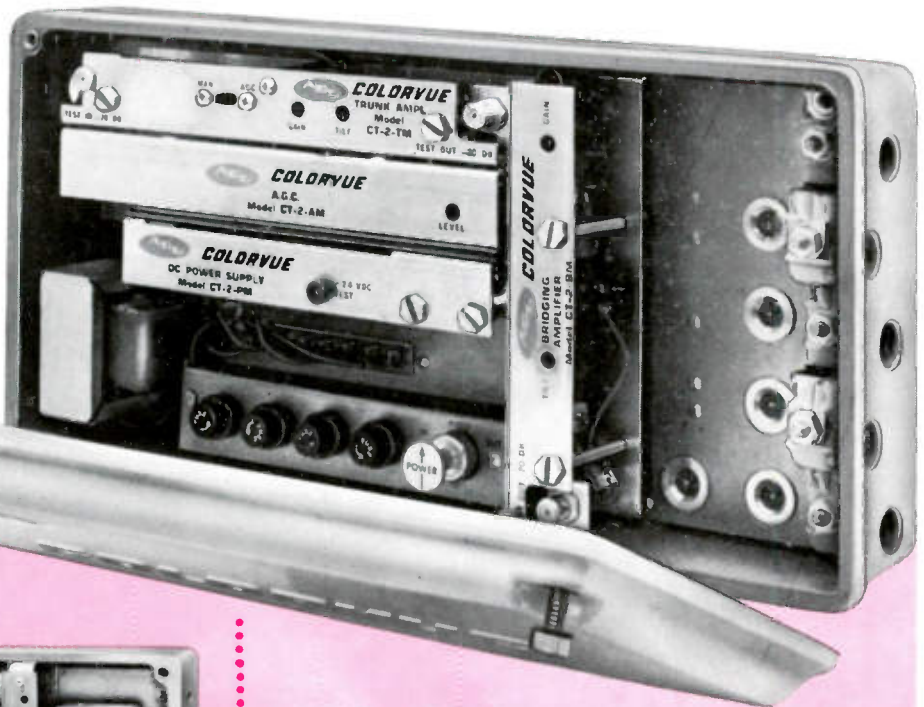
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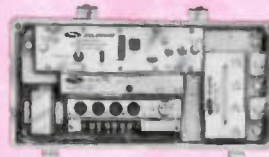
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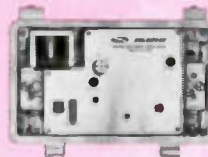
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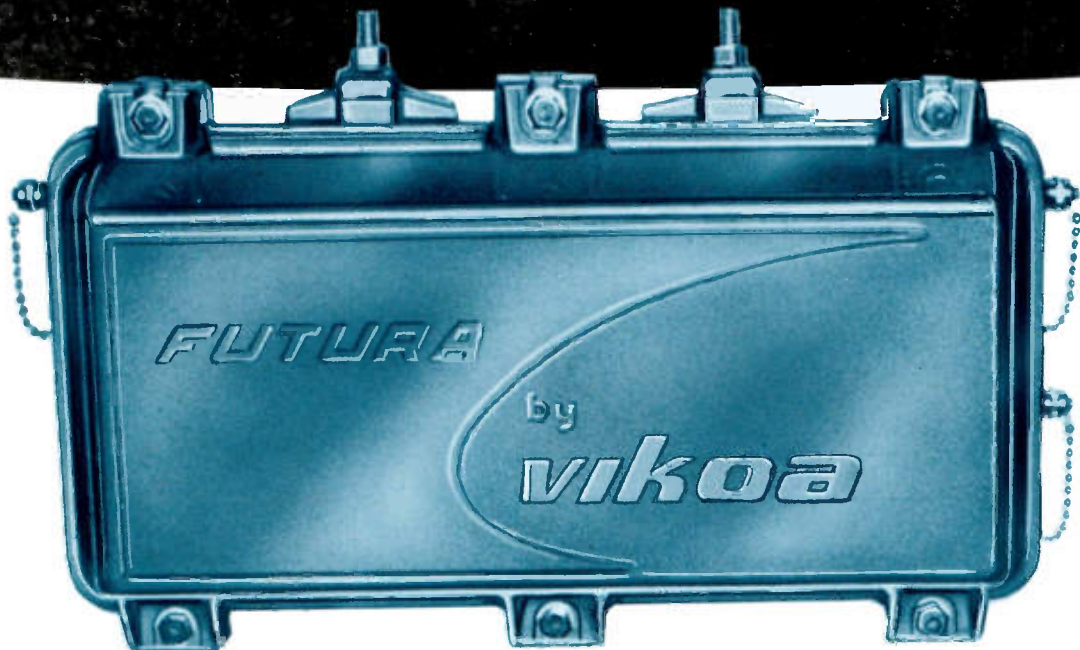
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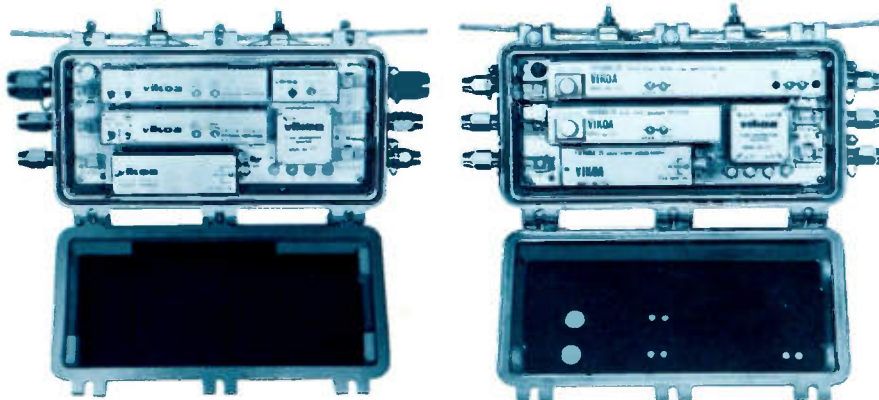
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