

TV Communications

The Professional Journal of Cable Television



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In This Issue...
PUC Regulation
Microwave & CATV
Half-inch VTRs

**Simplest
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channel FM head-end

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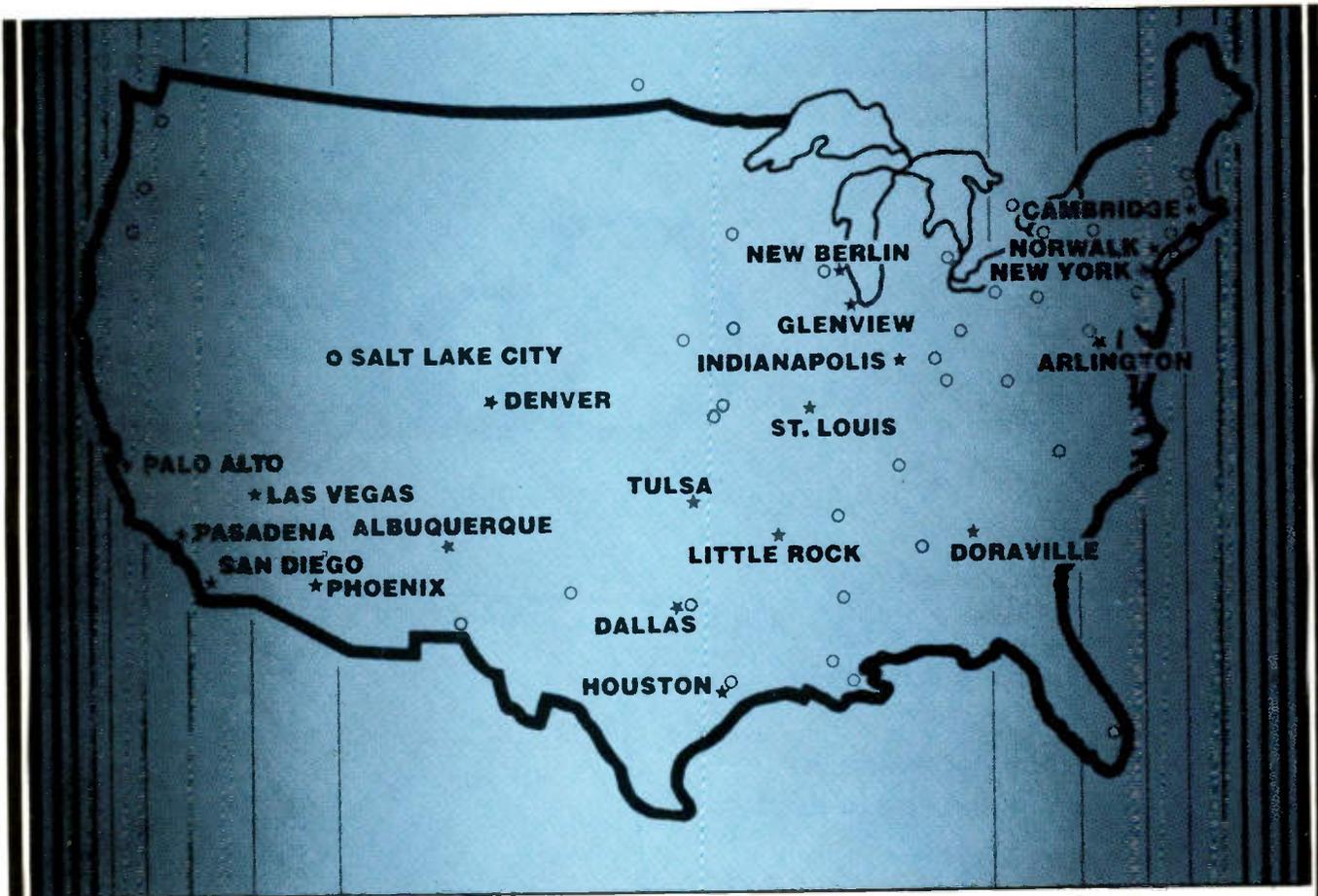
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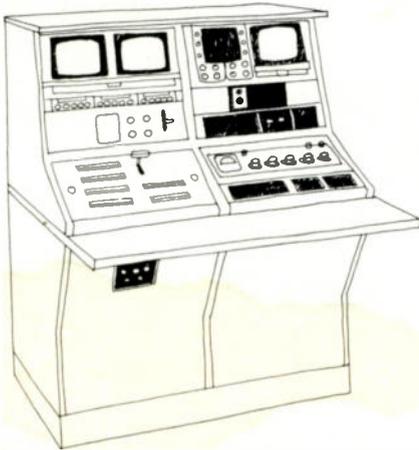
November 1970, Volume 7, Number 11

TV COMMUNICATIONS is published on the first day of each month by Communications Publishing Corporation, 1900 West Yale, Englewood, Colorado 80110. Second Class postage is paid at Englewood, Colorado with additional entries made at Oklahoma City, Oklahoma. SUBSCRIPTIONS: One Year, \$10. Two Years, \$17. Three Years, \$26. Foreign subscriptions (except Canada) add \$4 per year.

Cable

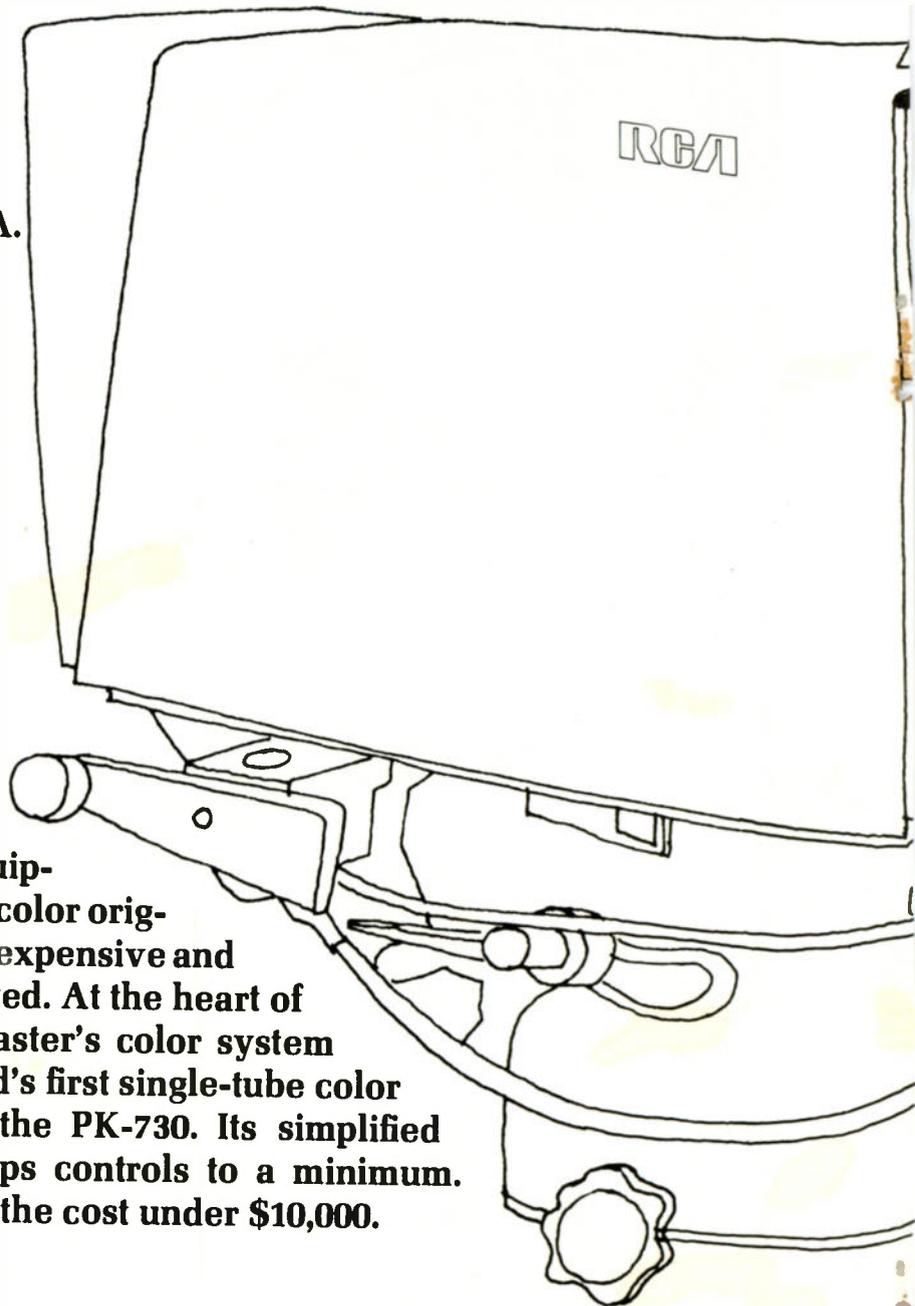
Local origination is no longer a future possibility—it's a here-and-now necessity.

If you are about to invest in an origination system, look first to RCA.

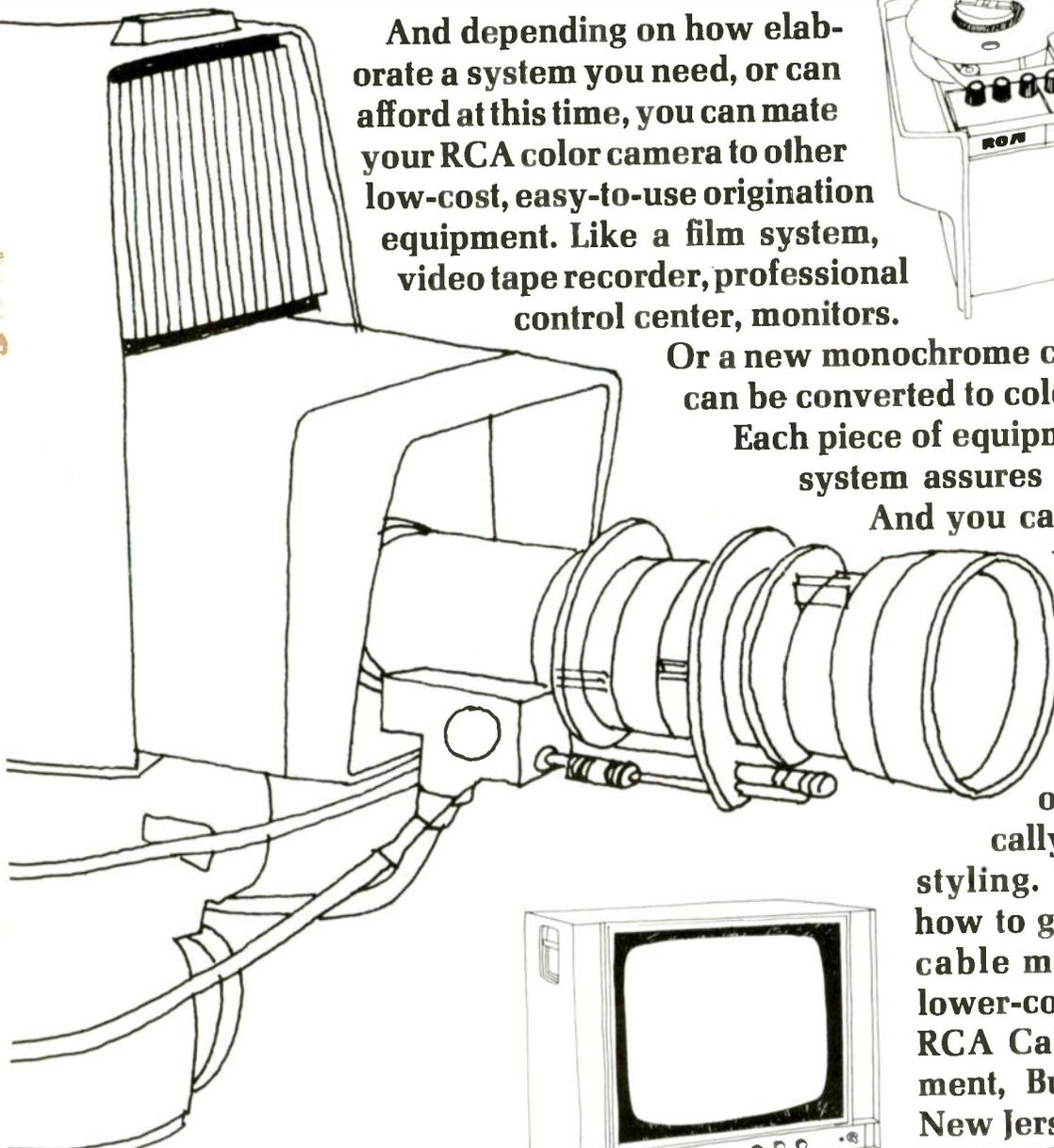


We have a full complement of "cable mates" to meet your present and future needs—including an exciting line of equipment that makes color origination both inexpensive and

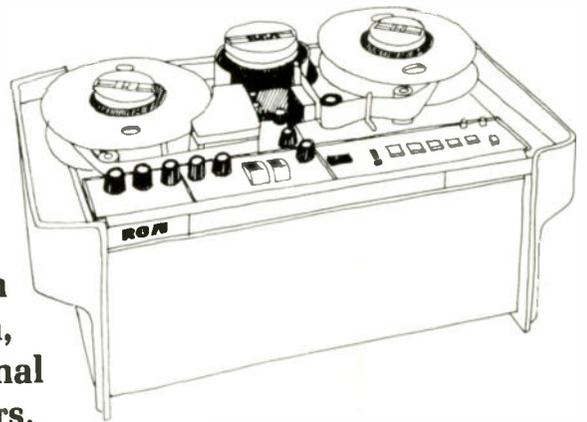
uncomplicated. At the heart of our cablecaster's color system is the world's first single-tube color camera ... the PK-730. Its simplified design keeps controls to a minimum. And keeps the cost under \$10,000.



Mates



And depending on how elaborate a system you need, or can afford at this time, you can mate your RCA color camera to other low-cost, easy-to-use origination equipment. Like a film system, video tape recorder, professional control center, monitors.

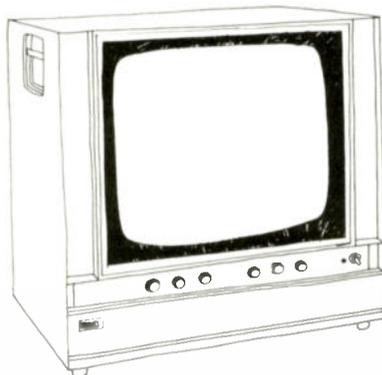


Or a new monochrome camera that can be converted to color at any time!

Each piece of equipment in the RCA color system assures you of quality color.

And you can add to your system without fear of obsoleting your original investment. Because every component is designed to match perfectly with every other one . . . electronically, mechanically and in

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RCA

TV Communications

The Professional Journal of Cable Television

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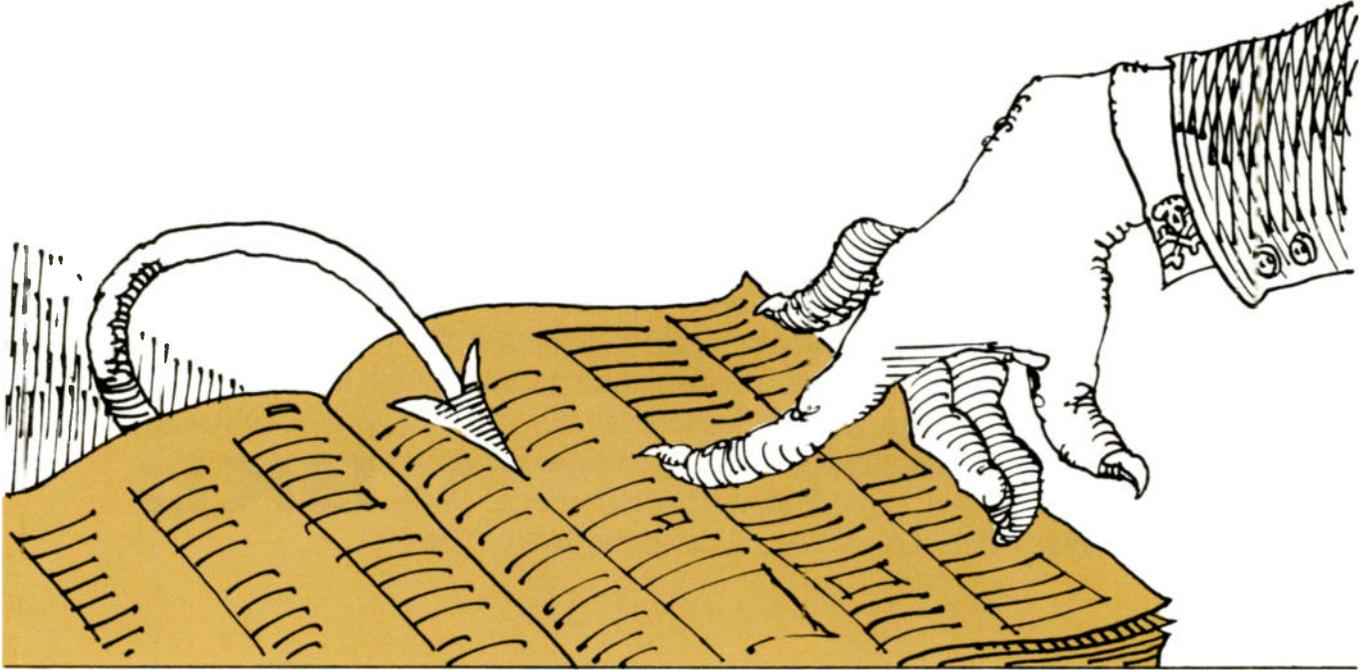
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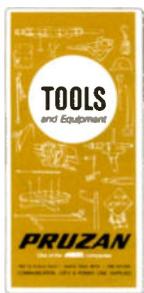
Patrick T. Pogue

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*Hell, Michigan, has two sources: the general store and the gas station.

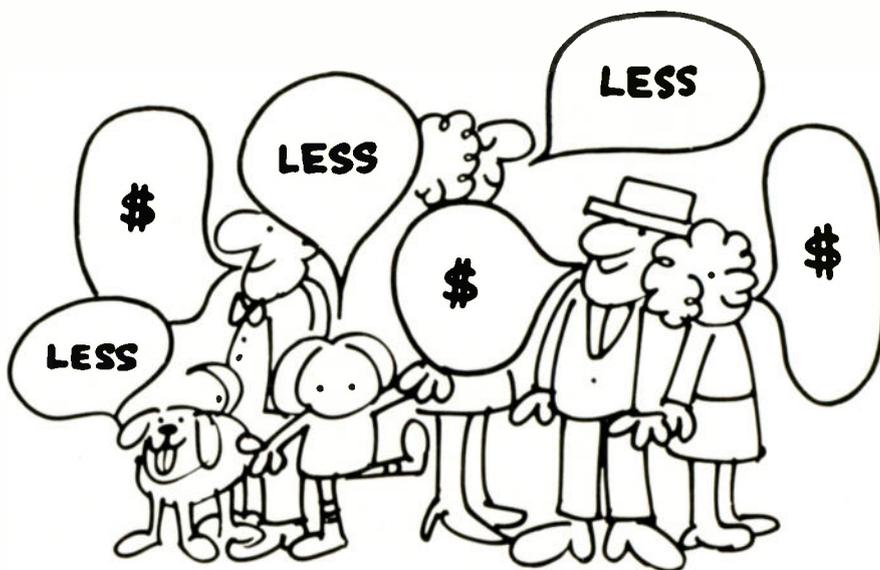
Everyone in CATV talks about lower costs, but only an SKL system does something about it.



Every SKL/262A high-level distribution amplifier you add drives an extra 4000 feet of cable at no extra cost. Outputs 10 db higher than any existing distribution amplifier eliminate many bridging and line extension amplifiers. Result: more branch lines, extra coverage area, maximum system flexibility at lowest cost. Learn how this high

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SKL



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There's nothing more upsetting than a perfectly good imported video recorder turning out unacceptable pictures. So we decided to do something about it.

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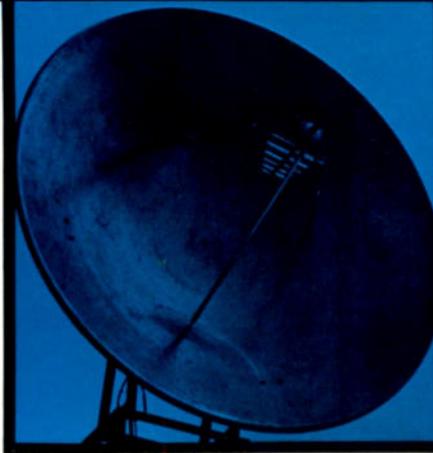
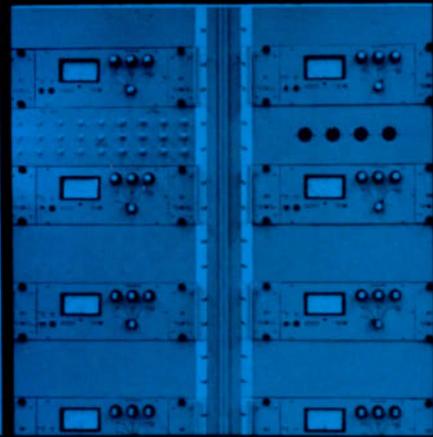
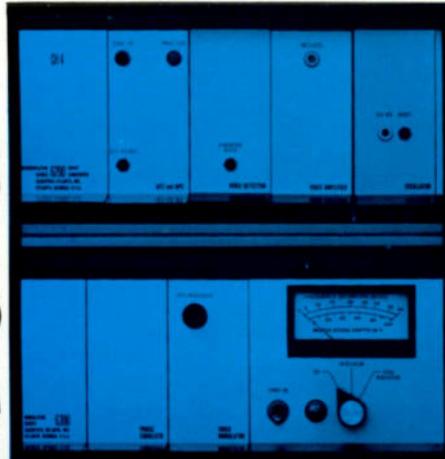
It works for color. It works for black and white. It works on any half-inch slow-speed recorder. It comes

in every reel size and length you could ask for. In fact, there's virtually no reason for not using it.

Start cleaning up right away by contacting your Memorex tape distributor. Or write Memorex, Video Products, Memorex Park, Santa Clara, California 95050.

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Cavity-tuned VHF preamplifiers in weatherproof enclosures minimize adjacent channel interference, noise, and maintenance.

Rugged broadband antennas, designed for optimum electrical characteristics, have demonstrated less co-channel interference, less maintenance and maximum gain.

For more on less, contact Dick Walters, Marketing Manager, Commercial Communications Scientific-Atlanta, Inc., P.O. Box 13654, Atlanta, Georgia 30324, Phone 404-938-2930

Less signal distortion, less interference, less noise and less maintenance result in a more profitable operation with Scientific-Atlanta equipment. Consider these examples:

Demodulators have phase-locked synchronous detectors. Quadrature distortion is eliminated. Differential gain and phase distortion are reduced to the lowest levels in the industry.

TV Modulators provide accurate vestigial wide band filter and optional phase-lock capability.

Scientific-Atlanta

The TVC Viewpoint

EDITORIAL



Robert A. Searle
Editor

Impact-Through PACCT

Political Action and Cable Television may seem like strange bedfellows. *But they need each other.* And the Political Action Committee of Cable Television is the matchmaker.

PACCT was organized to represent the CATV industry in the political arena, especially in Congress. PACCT is bipartisan in character, both in its organization and in its support of Congressmen. It is an unincorporated committee whose sole purpose is to help CATV's voice be heard in Congress through a common effort by concerned cable system owners, managers and equipment suppliers.

It is no secret that those who are dedicated to stifling the orderly growth and expansion of CATV for their own selfish economic gain have spend hundreds of thousands of dollars in that effort. *And they are prepared to pour more into the fight — much more!*

PACCT is the only way the CATV industry can pool funds to assist those members of Congress who endorse our position and goals and to encourage other Congressmen to do the same. CATV systems — in fact, all corporations, companies and trade associations — are prohibited by federal law from making political contributions to members of Congress. *Only concerned CATV cable system owners, managers and equipment suppliers, acting as individuals can make such political contributions.*

PACCT maximizes individual efforts by providing a central fund which can be used to CATV's best advantage. Remember, if we expect Congressmen to listen to us, it will certainly help if they hear from us

now — when *they* need help.

A crucial test is shaping up now in the Judiciary and Commerce committees; to be more specific, the copyright subcommittees of the Judiciary Committees and the communications subcommittees of the Commerce Committees of both the House and Senate. Important, basic legislation which will affect CATV's future is being formulated in the subcommittees.

These committees are the immediate battleground where our cause can be won or lost.

Of course, we must eventually face the hurdles of the entire Senate and House when the bill starts to move through Congress. At that point, *every bit of local pressure* must be mobilized in *every* community and state. *Every* system operator will then have the obligation of making his congressmen aware of cable's position.

But first things first. Let's get our legislation through the committees. That is why PACCT so desperately needs your support so it can assure key committee members who are sympathetic to our problems that we support them.

PACCT, however, is not a lobbying organization. Its sole concern is helping the CATV industry equalize its position on Capitol Hill with strong opposing interests. With personal contributions up to \$99, PACCT will help secure election and support of those favoring a fair national CATV policy.

In short, PACCT's impact depends on you.

Get in on the action! Send your check to PACCT at 1538 28th Street N.W., Washington, D.C. 20007.

We've proved AML microwave here.



Now we're set for CATV systems

For three years, we've been proving the practicality of this new concept in CATV distribution. In the concrete canyons of Manhattan. Across remote reaches of New Mexico.

Now we have FCC approval to use AML in the 12 GHz band as a supplement to cable distribution systems. Anywhere.

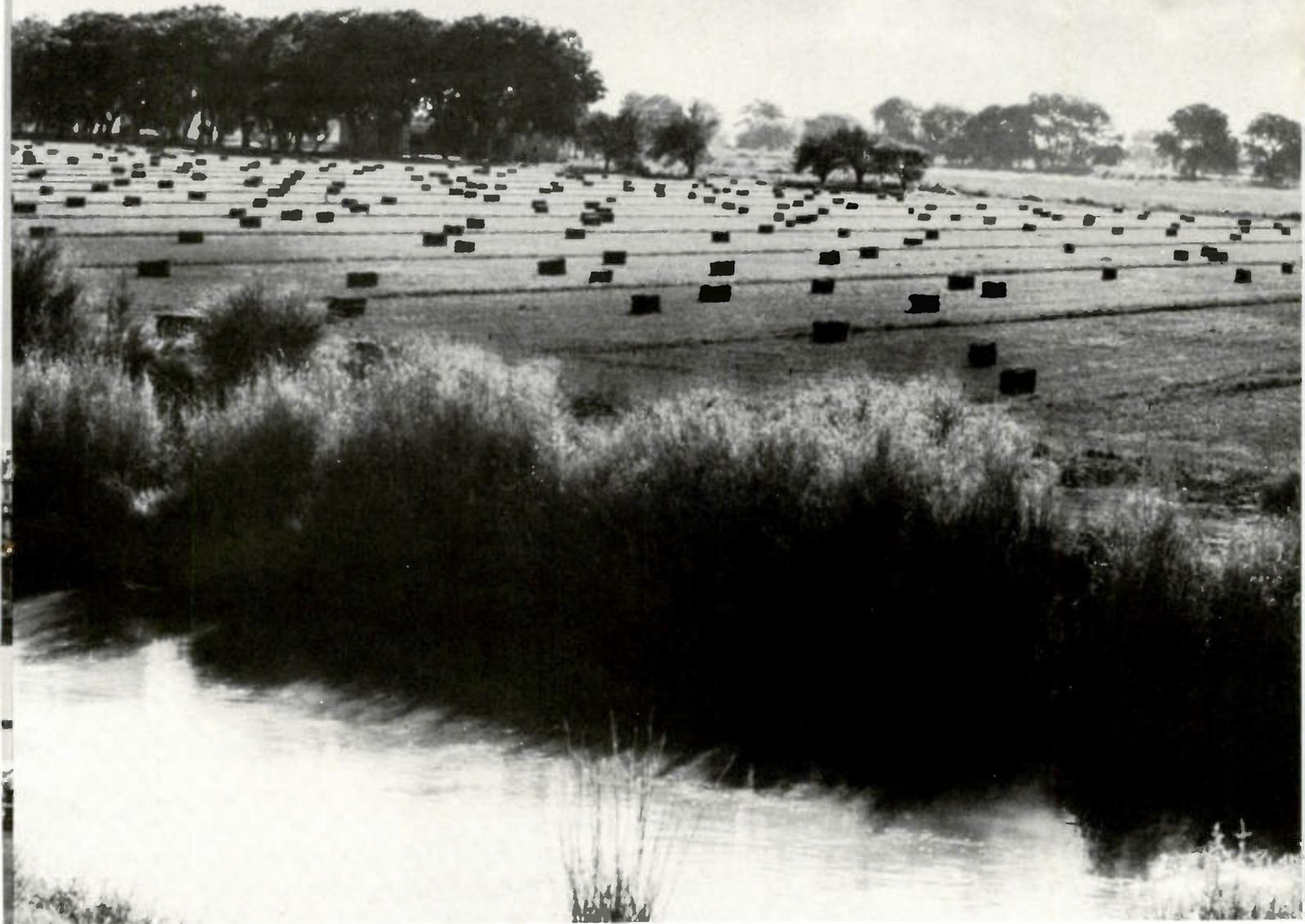
Suppose you want to extend your cable TV plant into outlying areas. Only they're too far away to warrant the trunk cable and headend investment.

A problem as old as CATV. But now there's an affordable answer: leap-frog across the miles. A single AML transmitter beams high-quality signals to any number of receiving points, up to 20 miles away.

Each point then becomes a distribution center for a local cable plant. In effect, an entirely new headend.

AML stands for Amplitude Modulated Link. It can transmit four TV channels in the same spectrum space used by one FM channel. It's compatible with all existing CATV

And here.



anywhere in between.

systems and utilizes the same channels normally carried on cable.

In the city, separate receivers in each block can end the costs and complications of underground duct construction or overhead cable. You bypass rivers, freeways, rail terminals.

In the country, forget about

how many miles your trunk cable would have to stretch to reach isolated residential pockets. That's no problem with our non-cable system.

Have any questions? Our new brochure probably answers them. Mail coupon now for your copy of "Your Link With the Future."

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Title _____

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City _____ State _____ Zip _____

I'm interested in AML

for an existing CATV system.

for a future system.

TV

Perspective

on the news



Tele-Communications, Inc. merger with Centre Video is indicative of continuing trend for CATV bigs to get bigger. Combines will result in greater technical and management strength within MSO organizations, and some streamlining of operations in general. Corporate earnings and borrowing power will both be enhanced by such combinations.

Fall election results will affect future of CATV copyright legislation in at least one instance. Sam Friedel (D.—Mass.) (D.—Md.) was defeated in the primaries, making CATV sympathizer Torbert Macdonald (D.—Mass.) number two man on the House interstate and foreign commerce committee. Macdonald will continue to act as chairman of the communications subcommittee, in spite of the fact that he had a shot at the chairmanship of the transportation subcommittee. As number two man, Macdonald is in an even better position to make the need for positive CATV legislation known.

Franchise battles are getting even hotter. Atmosphere of “friendly competition” between bidders is starting to give way to an atmosphere of downright hostility.

Expect the warfare to get tougher still. Cablemen are driven to more competitive bidding by the increasing demands of franchising cities. The money pinch has put a real squeeze on metropolitan income, and councilmen, mayors and city commissioners are anxious to find revenue sources to fill depleted coffer.

According to recent issue of Wall Street Journal, a number of big advertisers have committed funds to advertising on cable. Included are General Foods, Montgomery Ward, American Airlines, Campbell Soup and Lever Brothers. Although amounts committed to cable are hardly impressive, fact that biggest spenders will even look at cable is significant, according to Journal. Results of “trial balloons” will probably reveal a mixed bag.

Canadian Television Bureau of Advertising “uncovered” interesting fact recently: CATV does not cause significant fragmentation of TV audience in Canadian big markets, and does not significantly hamper local stations in providing their advertisers with total market coverage. A little more ammo in the fight against broadcast paranoia.

Delay in FCC’s handling of proposed CATV rulings may be in the offing, despite Chairman Burch’s promise they would be handling expeditiously. By special request the Commission extended the deadline for initial comments on proposals, and for reasons unknown at TVC press time, chose to delay oral reports and hearings on the issue indefinitely.

A NEW SPECTRUM ANALYZER SYSTEM

The New Tektronix 1401/323 Spectrum Analyzer System is for people who like to travel light.



The 3½ x 8½ x 13-inch 1401 Spectrum Analyzer Module weighs only eight pounds including an internal rechargeable battery pack.

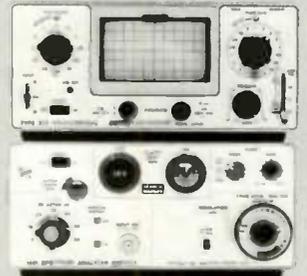
Add a 323 Sony/Tektronix Oscilloscope for a display indicator: Total weight of both? Less than fifteen pounds!



For fifteen pounds, here's some of what you have: A portable, 1-to-500 MHz analyzer with 60-dB dynamic range and up to 500-MHz frequency span—plus a complete DC-to-4 MHz, 10 mV/div, DC powered (AC, too) oscilloscope.

AND FOR PRESENT SCOPE OWNERS: The 1401 Spectrum Analyzer Module is compatible with any oscilloscope with full-screen deflection of 5-volts horizontal (adjustable ±10%) and 1.2-volts vertical.

When you make local service calls or field trips, climb towers, are in and out of airplanes and ships, and use spectrum analyzers and oscilloscopes, take along the New 1401 and the 323. With this pair of light-weight performers you'll travel easier and solve more field problems with much less effort.



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For additional information contact your local Tektronix Field Engineer or see the 1970 Tektronix catalog supplement.

1401/323P7 Spectrum Analyzer System \$2860
1401 Spectrum Analyzer Module \$1900

U.S. Sales Prices FOB Beaverton, Oregon

Available in U.S. through the Tektronix lease plan



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committed to progress
in waveform measurement

Spotmaster

Cartridge Tape Supermarket!

Here's a one-stop shopping center for the most and best in broadcast quality cartridge tape equipment—a SPOTMASTER supermarket of variety and value.

Just check the boxes and send us this advertisement with your letterhead. We'll speed complete information to you by return mail.

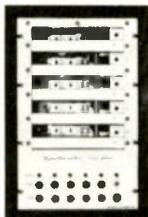


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Ten/70 Record-Play

- The incomparable Ten/70
- The classic 500C
- The economical 400 (from \$415)
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- Delayed programming models



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Versatile Five-Spot

Cartridge Tape Accessories

- Tape cartridge winder
- Calibrated tape timer



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- Remote controllers
- Cartridge racks (wall, floor & table top models)
- Degaussers (head demagnetizers & cartridge erasers)

- Telephone answering accessory
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- Tape tags
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Management Guidelines

D. Stuart MacPhail
Managing Editor



Delegate...How Much? When?

Last month we considered the first and foundational question related to the delegation of authority and responsibility. There are limitations on the kinds of authority that should be delegated.

What kind of authority should you delegate to others?

Since you can't delegate authority you don't have, start by finding out exactly what your authority is. To delegate a part of it, you may need your superior's consent, permission from a policy body, or other clearances.

Never delegate policy formulation, nor over-all supervisory duties. Without these, a system manager cannot control his staff and as a result, can lose his authority. The CATV manager must retain authority for major discipline, for promotions, and for appraising subordinates.

How much of your authority should you delegate? Delegation can be a chain reaction. As a supervisor effectively exercises authority delegated to him, his superior, in turn, is freed to manage more authority than before. This releases still higher management, in succession, from some of its routine and gives them more time for long range planning.

Thus, it is in the cable organization's interest that every manager handle as much authority as he can. The general rule is: Delegate as much as you can of your authority in technical matters. But always delegate in keeping with the ability of your subordinates. As they develop through the authority

that you've given them, you can delegate more to them, take on more yourself, and so on up the line.

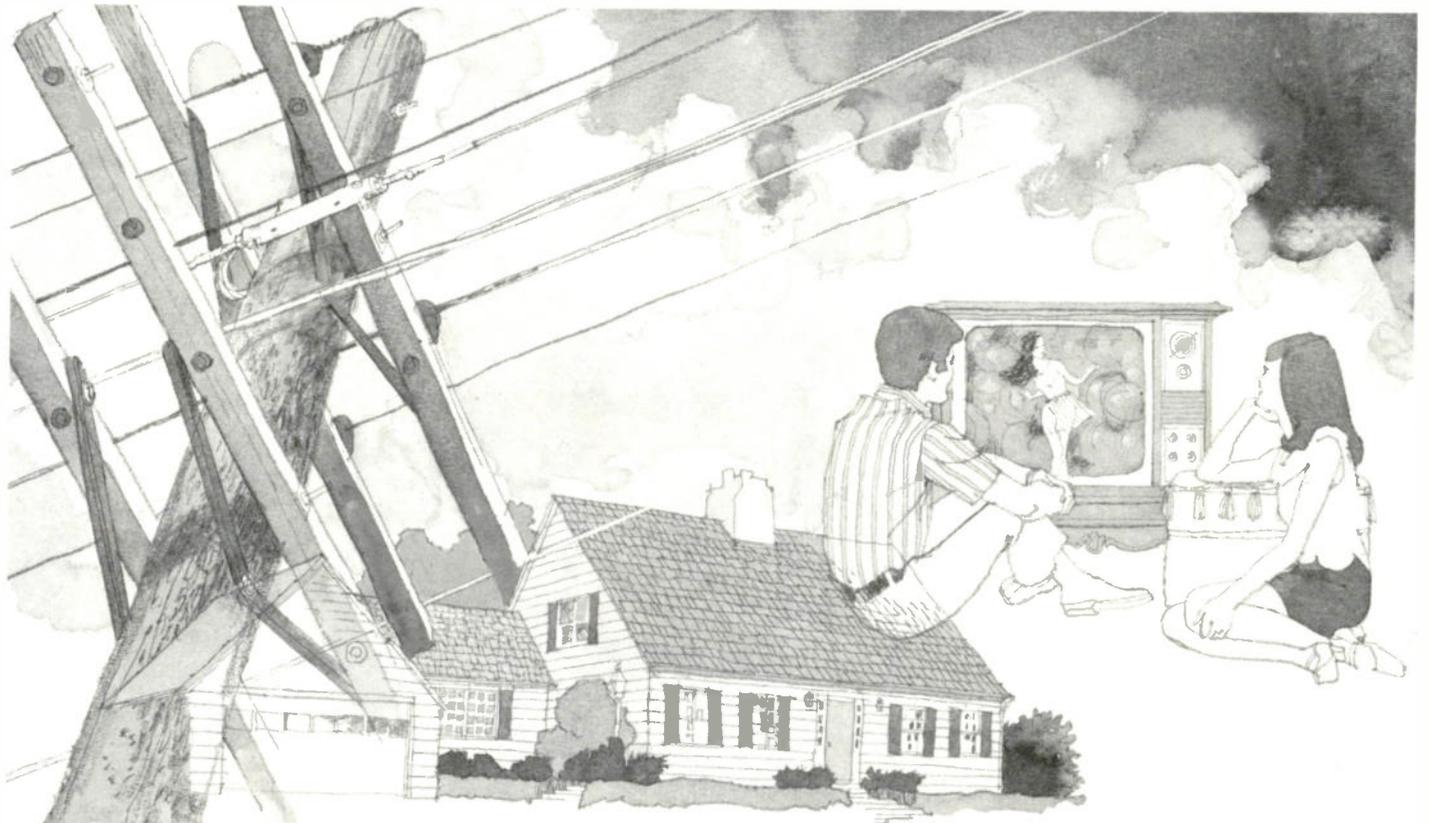
When is the right time to delegate? Before you can delegate, the following conditions should exist.

Delegation must fulfill a specific purpose. It is not enough to say, "This will streamline the operation." Instead, you should determine specifically what you are trying to achieve. Will delegation save you time? If not, what results do you expect?

You must have an immediate subordinate to whom you can delegate. If you don't, train someone.

Before a CATV manager can delegate successfully, he must be willing to accept the decisions made by his delegates. You can't expect every job to be performed exactly as you would do it. If, for any reason, you find yourself unwilling to accept subordinates' decisions, something in your delegation picture is wrong; you may not have the proper attitude, or the task may be too important to be delegated. Be realistic and face the facts. If you can't delegate, then do it all yourself and face the consequences.

Next month this column will consider the principles behind determining who is a candidate for your delegated authority... and how that authority should be delegated. An important final aspect we will cover deals with the maintenance of control over the delegated authority. TVC



Aqua CATV distribution components Available for immediate delivery

That's right. We said IMMEDIATE DELIVERY. Because the complete Aqua line of CATV devices is now being manufactured and stocked by Cunningham Corporation . . . for over 16 years a leader in the design and manufacture of audio-video switching devices. It was only a matter of time before Cunningham entered the fast growing CATV field . . . because these products dovetail so beautifully with our own line of switching products. And we couldn't have picked a better line than Aqua . . . a line that has been proven

reliable in applications from coast-to-coast.

The full range of these superior CATV products which are now in stock and ready for immediate shipment—includes:

- **Splitters (2-way and 4-way)**
- **Outdoor Directional Taps**
- **Outdoor Dual Taps**
- **FM Taps**
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- **Matching Transformers**

And we've made certain that every Aqua device meets Cunningham's strict requirements for design excellence, quality and built-in

reliability. A look at the new Cunningham/Aqua CATV Equipment Catalog will give you some idea of what we mean. Send for your free copy today. Then let us prove to you that we mean it when we say "IMMEDIATE DELIVERY."

Cunningham Corporation,
10 Carriage Street
Honeoye Falls, New York 14472

**Cunningham
Corporation**



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LEVEL HEADED?

Plug Level Monitor modules into your Unicom trunk amplifiers; hook up a Cascade Status Monitor at any suitable point in the trunk line, then sit back and watch the performance of any amplifier you wish. Better still, let the monitor do the watching, it will tell you (audibly or visually) if anything goes wrong.

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CASCADE

CASCADE ELECTRONICS LTD. PORT MOODY, B.C.

"the CATV people you can rely on"

✓ NARUC TELLS FCC CABLE RATES, SERVICE ARE IN LOCAL DOMAIN

Just before Late News press time, the National Association of Regulatory Utilities Commissioners told the FCC that the regulation of CATV rates and service quality "are subjects which lend themselves naturally to local control and supervision. National uniformity (under Federal regulation) is probably not a possibility, let alone an acceptable ideal."

Filing comments on the FCC's CATV proposals asking for ideas on the relationship between Federal, state and local regulation, NARUC said neither Federal rules nor Federal guidelines respecting state and local regulation should be issued. The organization further said that "consistency" requires the Commission to stick by its earlier assertions that it has no business meddling in state and local affairs.

Cities that commented in the case were notably cool to the notion of limiting their franchise fees to 2%. New Orleans, Ann Arbor, Mich., Lewiston, Idaho, Modesto, California, and an organization representing Atlanta all favored local regulation, and were dubious about the fee limits. In addition, New York City commented that if cable television must give 5% of its gross to the Corp. for Public Broadcasting, so should commercial TV outlets.

A group of CATV operators that included Cox Cable, Jerrold Corp., Athena and National Trans Video came down hard on a position opposite NARUC's — they want Federal guidelines, which they said are necessary to bring order to the "double and triple imposition of various regulations, fees and administrative proceedings" that so often threaten to cripple cable.

TELE-COMMUNICATIONS AND CENTRE VIDEO TO MERGE

Tele-Communications, Inc. (TCI) and Centre Video Corporation have announced an agreement in principal on a proposed merger that will increase the number of TCI's CATV subscribers to more than 130,000 through 73 systems in 21 states. The merger will make surviving TCI the nation's sixth largest MSO.

Approval of this transaction by the directors of the two companies was announced jointly in Denver and State College by TCI president, Bob Magness and James R. Palmer, president of Centre Video.

Palmer explained that Centre Video shareholders would meet later to ratify the agreement which makes Centre Video a wholly owned subsidiary of TCI. Magness remains as president of the parent firm, while Palmer will be president of the subsidiary.

Palmer is also president of C-Cor Electronics, Inc. of State College, Pa., manufacturer of amplifiers and other electronic equipment for CATV and the military. C-Cor is not involved in the TCI transaction.

Centre Video's 15 systems, serving 35,000 subscribers, are located in the Pittsburgh area and in Ohio and West Virginia. TCI systems have over 95,000 subscribers from California to Georgia.

The merger agreement provides for an exchange of about 650,000 shares of TCI common stock on a ratio of 2.13 for each share of Centre Video stock.

Late News (Continued)

Both companies hold franchises to serve additional communities. Centre Video operates 380 miles of cable plant serving 18,000 subscribers in the Pittsburgh area, the nation's tenth largest television market. There are 152,000 total homes in the 83 municipalities in which it holds franchises.

TCI announced recently (*CATV Magazine*, Oct. 5) that it had acquired 11 other new franchise interests with over 80,000 homes in Riverside, California, nine other cities in San Bernardino County, California and Carrollton, Georgia.

With the Centre Video merger, TCI reports the total number of potential homes in franchise areas exceeds 400,000.

VIKOA, INC. PROMOTES STAFF; EXPANDS SALES TEAM

In major head-office shuffles, Hoboken-based Vikoa has in effect changed out a significant portion of its executive staff. In the company's CATV system operating division, Continental CATV, president Stan Kaufman has been replaced by Charles Harmonowski. Kaufman left Continental in a "mutual agreement" situation. Harmonowski was previously president of Vikoa subsidiary, Telaction, a position which he will retain, along with that of chief executive officer.

Mike Rodriguez, previously executive director of engineering, is now general manager of the firm's electronics division, and Joe Einsidler, previously a vice president, is now sales division manager. No details of these changes were available at press time.

Further changes at the head office include the promotion of Francis P. Murphy from the position of assistant controller to that of controller and the promotion of Arthur Einhorn from the position of assistant treasurer to that of treasurer.

The company has also expanded its sales staff, adding Marion Carver, John Glass, Mason Hamilton and Carolyn Sim in the south, Pete Boss in the Los Angeles area, Dan Walls in the Texas area and Sol Gins in the mountain states area.

BROADCASTERS REORGANIZE TOP EXECUTIVE STRATA

The National Assn. of Broadcasters, worried about its cumbersome administrative structure and the public relations set-backs it has suffered in recent years, is revamping its organizational chart in an effort "to move into a new phase of active, aggressive, effective leadership in the present unsettled conditions in the broadcasting industry."

The NAB's reconstituted Future of Broadcasting Committee — which has prime responsibility for keeping track of the development of CATV as it affects broadcasting — is not a part of the reorganization, though it too is supposed to be newly vital. Its hard-line fight against cable is being pressed with the aid of the outside public relations firm of Phil Dean Associates, which runs the "Free Broadcasting News Service," which in turn promotes a virulently anti-CATV line.

For over 10 years experts tried to design an amplifier to connect MATV to CATV systems.

Now Benco has four of them!

Four new high level, solid state, broadband amplifiers especially designed to connect MATV systems to CATV systems—yet versatile enough for nearly any application.



MODEL	DA 40-252-B	DA 45-252-B	DA 50-252-B	DA 55-252-B
FEATURES:	Balanced output Stage	Balanced driver and output stages	Balanced driver and output stages	All stages balanced
Frequency Response	40-252 MHz $\pm 1/2$ dB	40-252 MHz $\pm 1/2$ dB	40-252 MHz $\pm 1/2$ dB	40-252 MHz $\pm 1/2$ dB
Minimum Gain (flat)	36dB	44dB	44dB	14dB
Maximum Output	+45dBmV with 12 channel loading.	+51dBmV with 12 channel loading.	+55dBmV with 12 channel loading.	+58dBmV with 12 channel loading.
Maximum Noise Figure	8dB	8dB	8dB	
Gain Control (flat)	10dB	10dB	10dB	
Tilt	Adjustable for 0 to 30dB cable.	Adjustable for 0 to 30dB cable.	Adjustable for 0 to 30dB cable.	
Input and Output	18dB return loss Regulated power supply	18dB return loss Regulated power supply	18dB return loss Regulated power supply	12dB minimum Regulated power supply

NOTE: All amplifiers available for Cable Powering or Line Powering. Add CP or LP to model number.

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further information



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Canadian Study Finds Minimal Impact of CATV on TV Stations

A study ordered by the Television Bureau of Advertising of Canada (TvB) concludes that cable television has a minimal impact on TV stations in the same market area. The study was ordered by TvB and conducted by the A.C. Nielsen Company and Canadian Family Opinion, both of Toronto.

Advertisers and agencies in Canada have become quite worried about CATV, fearing that the additional signals cable affords causes severe fragmentation of the local viewing audience.

"There have never been any

in-depth examinations telling exactly what the situation is," said TvB President Ross Downey, who went on to say, "This study should clear up a lot of misconceptions and end many worries."

And end worries the study should. It was conducted in a strong CATV market, that of London, Ontario and the surrounding Middlesex County area. CATV became established in the area before it even had its own local TV station, CFPL-TV. Cable saturation is 80% in London and 60% in the county. This is the highest CATV saturation in Canada among major markets.

The cable system makes it possible for local viewers to watch 12 stations in addition to the 9 they can watch off the air. Local origination from the CATV system is extensive — an average of 35 hours a week.

"These conditions are most severe," the TvB report states, "If CATV does affect the ability of a home-market station to provide adequate coverage of the market, then it would have to be most pronounced in the London area."

In spite of the "severe conditions" produced by CATV, the survey revealed that CFPL-TV is the most watched station of the 21 available, picking up a 50% audience share at any given time. The remaining audience is shared by the other 20 stations and the cable origination channel, but not equally. The largest single share next to CFPL's goes to the neighboring CATV station CKCO-TV in Kitchener, Ontario. The local origination channel drew no "viewing of measurable proportions."

The conclusion of the report: "It is quite apparent that it is

uneconomical and unnecessary to buy (time on) more than the home station for local market coverage. Regional marketing practices would have to take into consideration the supplementary benefits in Middlesex County of purchases on the neighboring CTV station." The report further concluded that viewers lost to the local station are regained in large measure by other Canadian stations.

Burch Tabs Wiley New FCC General Counsel

Chicago lawyer Richard Wiley has been confirmed as FCC general counsel. Wiley, a 36 year-old partner in the firm of Burditt, Calkins, and Wiley, succeeds Henry Geller, who becomes a personal aide to FCC Chairman Dean Burch.

Wiley won the choice political appointment on the strength of his rapid rise up the legal ladder plus his impeccable GOP credentials, rather than for experience in communications law.

A 1958 graduate of Northwestern University Law School, he served until 1962 in Washington as a captain in the Judge Advocate Corps, when he joined the Chicago law firm of Caldwell, Keck, Kaysor, Ruggles, and McLarsen (the latter now leads the Justice Department's antitrust division).

Wiley became assistant general counsel of Bell & Howell Co. in 1968. In that same year he took a leave of absence to serve on the United Citizens for Nixon-Agnew during the presidential campaign. During that period he also served as a Republican committeeman from his hometown of Northbrook, Ill.

Regulatory Commission Proposed for N.Y. CATV

In an unprecedented effort, New York state politicians have initiated an attempt to form a state commission specifically designed to regulate CATV. State control of cable is usually devel-

Are you going to need announcers?

Write me.



Miss Marijo Rison
Job Placement Department

Hundreds of CATV systems are soon going to need announcers. The best come from Columbia School of Broadcasting. We have nearly 500 announcers on the air in radio and TV. Simply write your requirements for a complete resume and photo. Free service to CATVs. We have students coast to coast — we'll select one from your part of the country.

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CUSTOMIZED HEADEND SIGNAL PROCESSING AND CONTROL CENTER

The Ameco Customized Headend is a complete, composite signal processing and control center providing up to 27 television channels, FM radio, and special r.f. signal output suitable for direct connection to a coaxial cable distribution system. Input and output signal characteristics specified are fully and accurately adhered to, using state-of-the-art equipment and techniques. Test and monitoring facilities may be included in a variety of forms depending upon the required capability.

From customer-furnished specifications of the input and output signal characteristics, the center is designed using reliable solid-state electronic equipment and rugged mechanical components. The center is then assembled and checked out in the Ameco plant, including extensive testing with modern laboratory test equipment not ordinarily available in the field.

Upon satisfactory proof of the specified performance, the unit is disassembled with each subassembly being carefully tagged for convenient and trouble-free assembly on the customer's site. After packaging in heavy protective cartons, the complete assembly is shipped to the customer's headend location.

Upon arrival, an Ameco field engineer will unpack and inspect the various assemblies. Using the factory-prepared diagrams and instructions, he will then assemble and check out the complete center. During this assembly and testing at the customer's site, the Ameco field engineer will thoroughly instruct the system technician in all phases of the operation and maintenance of the equipment.



Complete compatibility of the various items of electronic equipment is assured, with Ameco ONE-SOURCE RESPONSIBILITY assuring satisfactory performance.

SPECIFICATIONS

GENERAL

Input Connections	-14 to +30 dbmv, any VHF channel. 0.6 volt peak-to-peak video (for 87.5% modulation). 600 ohm audio, -10 dbmv for 100% (25 KHz) modulation. FM radio (88 to 108 MHz).
Output Connection	Combined television and FM radio at any frequency from 50 to 260 MHz. (Other than standard VHF frequencies on special order).
Output level	+32 dbmv, maximum
Output impedance	75 ohms, 16 db return loss (minimum)
a.c. power	1,000 watts, (maximum), 90 to 130 volts, 60 Hz.
Spurious output	60 db below any visual carrier output

OFF-THE-AIR TELEVISION

Sensitivity	200 microvolts (-14 dbmv) for full rated output
Automatic gain control	Maximum $\pm 1/2$ db output change with input change of -14 to +30 dbmv
Noise figure	7 db maximum
Image rejection	50 db, minimum
Adjacent channel carrier rejection	50 db, minimum
Video IF response	41.57 to 46.5 MHz, within $\pm 1/4$ db
Power requirement	30 watts per channel, 90-130 volts, 60 Hz

TELEVISION ORIGINATION

Inputs	0.6 volt video (for 87.5% modulation) -10 dbmv audio for 100% modulation (25 KHz deviation) or 0.05 to 0.5 volt 4.5 MHz FM sub-carrier
Input impedance	75 ohm coaxial (video) and 600 ohm (balanced or unbalanced) audio (or 75 ohm coaxial 4.5 MHz FM audio)
Frequency response	+1 db, -1.5 db video carrier to +4.2 MHz and 50 to 15,000 Hz ± 1 db audio (standard pre-emphasis)
Carrier stability	Video carrier 0.005% (at 70°F), audio carrier ± 1 KHz (referred to video carrier)
AM hum and noise	60 db below 100% video modulation and 45 db below unmodulated audio carrier
FM hum and noise	55 db below unmodulated audio carrier
Power requirement	9 watts per channel, 105-125 VAC

FM RADIO

Inputs	Wide-band (88 to 108 MHz) or separate channel FM radio signals, 0 to +10 dbmv recommended level
Noise figure	10 db, maximum
Power requirement	15 watts, 115 VAC

TEST & MONITOR

Optional facilities available:

1. Input and output signal level monitor (selectable)
2. Input and output video monitor (selectable)
3. Input and output audio monitor (selectable)
4. Video waveform monitor ("A" scope)
5. Spectrum analyzer
6. System malfunction indicator
7. Non-duplication switching

Specified performance is based upon recommended input signal levels which are furnished by the user. Published specifications subject to change without notice.

oped through state Public Utility Commissions, but some assemblymen apparently feel this type of state control of CATV is inadequate for New York.

The purpose of the bill is "to amend the executive law in relation to the creation of a state commission on cable television,

prescribing its functions, powers and duties and making appropriation for its expenses."

New York operators estimate the proposed five-man commission would require a staff of 200 people. It would probably be headed by a chairman who would be salaried for \$35,000.

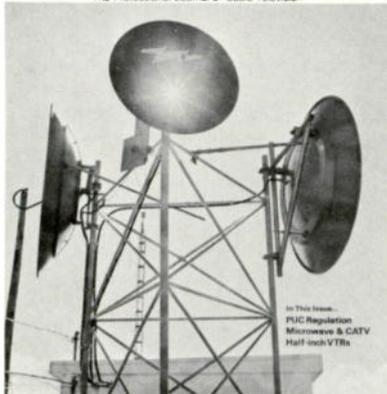
Burch Cites "High Hopes" For Future of Cable

FCC Chairman Dean Burch made several significant statements about cable television recently. The best sign from the CATV operator's point of view came from statements he made in a Los Angeles speech. Speaking before the American Political Science Association, Burch said cable is "a relatively recent development for which I have high hopes." In a New York speech last week he urged the development of children's programming on cable, and in between speeches he heard a delegation from the National Association of Broadcasters warn him about the impact of CATV on commercial television.

In his Los Angeles speech on "Informing the Public: The Role and Opportunity of the FCC" Burch stressed the recent rules and proposals of the Commission designed to open up the communications industry to the public, and he cited CATV as "a national force of great promise."

TV Communications

The Professional Journal of Cable Television



In This Issue:
FCC Regulation
Microwave & CATV
Half-inch VTRs

This Month's Cover...

Microwave technology is playing an increasingly important role in the CATV industry. This issue of TVC contains two articles on microwave (see pages 32 and 59). Tele-Communications, Inc. is active in both microwave communications and cable systems. The cover picture shows parabolic receiving and transmitting antennas at Grand Junction, Colorado. It is part of a new ten-station TCI microwave system between Denver and Salt Lake City. TCI, described as the largest non-telephone common carrier in the U.S., provides video service to more than 100 CATV systems. 



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It's engineered for great resistance to vibration and shock. It's safe — tough butyrate housing and shock absorbers stop fluorescent tube breakage — complete insulation of all conductors prevents shock — all electrical components UL approved. Housing and vinyl end caps are oil and grease resistant — power cord, too. The 15-watt fluorescent bulb gives cool, glareless light — outlasts easily-broken incandescents 10 to 1 — costs only 1/4¢ to 1¢ per twelve hours operation. Users report additional big savings in manhours for bulb replacement and maintenance. *Wonder Wand can save money and prevent accidents for you as it has others

And! with its optional, compact, solid-state Converter mounted in car, truck or boat, it operates from any 12-volt battery — a great emergency light for fire, police, camper, marine, utility company use.

Write for descriptive bulletin.

*Independent laboratory report on request.



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He went on to say that the Commission's primary challenge was the encouragement and development of "structural diversity through new and competing modes of expression." He stressed further that it is now most important to concentrate on new modes of expression to promote diversity — media with a different economic base than broadcasting as we now know it — with the capability of responding to specialized audiences.

Speaking to the International Radio and Television Society in New York Sept. 16, the Chairman encouraged broadcasters to offer better children's programming, and once again he brought up the promise of CATV.

"If the cable system originates in a small community," Burch said, "it can make its camera and other origination facilities available to the local educational institutions and can make an effort to obtain outstanding film series like Sesame Street, which may well have had no local showing.

"If it is a large system in a city

such as New York, there is no reason why it also should not undertake its own production of children's programming. For this system has available great channel capacity, and thus could devote an entire channel to children's programming of its own production or re-runs of worthy programs produced by others.

PAACT Launches Fall Legislative Campaign

The Political Action Committee of Cable Television (PACCT) has launched its fall campaign for funds to make friends among those whose votes and voices count in fair legislation for the CATV industry. PACCT is asking all system owners to contribute \$99. The organization was formed in mid '69 under the leadership of Martin Malarkey of Malarkey-Taylor Associates.

Through a central fund, PACCT channels its efforts to financially support members of Congress who

endorse CATV's position and goals — regardless of political party affiliations.

The objectives of PACCT are two-fold: political action and political education. It generates financial support for national legislators and key committee members who are sympathetic to CATV, and informs federal legislators about CATV's problems and promise.

PACCT is not a lobbying organization. Its' sole concern is helping the CATV industry equalize its position in Washington.

New York City Construction Frozen by Commission

The FCC has frozen New York City cable television construction pending the resolution of the Section 214-franchising squabble in that city.

The Justice Dept. also sought Commission permission to enter the controversy, as it wants to

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FST-4 FIELD STRENGTH METER

All silicon solid state . . . 54-250 MHz in one continuous range . . . Vernier drive optional extra . . . Separate and continuous audio and video monitoring . . . Highly sensitive 200 μ A meter movement . . . 5 μ V to 3 Volt input capability . . . Powered by 120 VAC or self-contained 9 Volt batteries.



FSM/C-4 FIELD STRENGTH METER CALIBRATOR

All solid state . . . Lightweight, portable . . . Will calibrate any field strength meter . . . Use as a marker generator to align amplifiers and passive networks . . . Signal source for amplifier gain test or dynamic "ringing" of distribution lines . . . Range 54-250 MHz continuous . . . Output level 6mV . . . Accuracy of output ± 1 dB.

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We can now deliver and install a complete color studio for you at an amazingly low cost.

You get a versatile, broadcast quality studio: the new IVC COLORCASTER III studio package capable of live, videotape, slide or film programming. You'll own all the equipment necessary for television commercial and program production in color.

We designed the COLORCASTER III package to specifically meet your needs. And there's no trick about the price. Most studio color cameras used in broadcast applications cost far more than our complete, 2-camera system.

The COLORCASTER III package includes two IVC-90 color cameras—one studio and one filmchain. These are the most widely used low-cost color cameras in television today. Another major item is the new IVC-870 color videotape recorder, with assemble and insert editing. Also included are the: audio and video consoles, multiplexer, slide projector, film projector, switcher with special effects, and a studio lighting kit plus the sync generator, distribution amplifiers, intercom, cabling, and all other items necessary to give you a totally complete package. Every component has been pre-selected for your optimum operating efficiency. Home viewers will see color pictures on your cable channel that match the quality of the network channels on your system.

The COLORCASTER III package sells for \$47,900. If this combination doesn't suit your needs, ask us about other available studio packages.

Why an IVC System?

Owning an IVC system provides you with three forms of insurance: (1) Insurance against incompatibility—all equipment has been engineered to work together. (2) Insurance against malfunction—an IVC cable television studio is designed for upgrading, expansion, or re-configuration to suit your future needs.

We Install What We Sell

You provide the location—IVC will handle all details of system planning, installation, set-up and training. Our experienced personnel are part of the package, with systems know-how that parallels the proven performance of IVC equipment.

IVC is a pioneer in the installation of cameras, recorders and complete color systems in CATV. IVC has supplied the cable television industry with more color recorders and cameras than any other manufacturer.

Local origination of full color programming is easily and economically within your reach, with broadcast-proven color cameras and videotape recorders. For complete color studio systems information write us in Sunnyvale or contact your local IVC sales office.



This complete color studio at Peninsula TV Power, Inc., Sunnyvale, California is typical of studio systems designed, and installed by IVC.



International Video Corporation

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The standard for color in cable television.

argue on the side of TelePrompTer Corp., Manhattan Cable Television and the City government that New York has franchising rights.

The dispute centers around Comtel Inc.'s attempts to use the New York Telephone Co. CATV distribution facilities for a non-franchised cable system, in defiance of the City.

The New York courts have backed Comtel. TelePrompTer, Manhattan Cable the City of New York have all opposed Comtel, however, and now the Justice Dept. wants to support the franchising argument as well.

The Commission freeze extends to all three cable systems and allows only drops from trunk and distribution cable already constructed and in operation. Comtel argued that TPT and Manhattan Cable don't need Section 214 authorization for their construction, and so if it was held up, its competitors could virtually saturate the market.

The Commission said that it could not allow the situation to deteriorate, and that the public

interest requires "the status quo be maintained until a final decision is issued or, in the event that an alternate remedy is devised as herinafter discussed, until further order of the Commission."

Origination Praised By Latest Rand Study

The third of the Rand Corp. studies of cable television, this one centering on local program origination, notes the extreme difficulties that CATV systems will have in generating effective programming. The report praises origination but stresses its difficulty and the unpreparedness of cable operators to effectively sell advertising.

Rand also encouraged origination as potentially of great public benefit, however. It further noted that distant signals will have to be imported in order to make CATV workable in the major markets. Local signals plus origination simply won't be sufficient to draw subscribers, Rand said.

Broadcast Talent Flowing to Cable Industry

According to a recent edition of the *Gallagher Report* newsletter, a "vase exodus of broadcast talent from broadcasting to the CATV industry has begun."

Due to the emphasis on construction and subscriber sales during CATV's early years, the majority of systems are managed by non-broadcasting personnel. Evidence to this can be seen in a quick look at the backgrounds of 33 of TelePrompTer's system managers.

With the recent FCC rules stating that systems with over 3,500 subscribers must initiate programming, a number of television and radio professionals have gone into CATV.

President Charles Dolan of Sterling Communications reports that he receives an average of four broadcast resumes per day, and Dolan's commercial channel, Manhattan Cable Channel 6, is managed by former WWJW Cleveland manager John McPherson. 

TACO High Performance Parabolic Antennas are for Tall orders.

Hydroforming of the reflector affords superior axial symmetry, surface tolerances and finish, particularly important in the 11 GHz range. The cylindrical metal shroud gives increased directivity and reduced interference on frequency-crowded paths. Careful matching of the feed to the reflector over the desired band within the 5.925 - 6.425 GHz and 10.7 - 11.7 GHz ranges ensures low VSWR and optimum directive performance.

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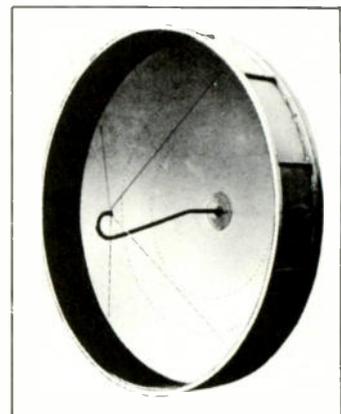
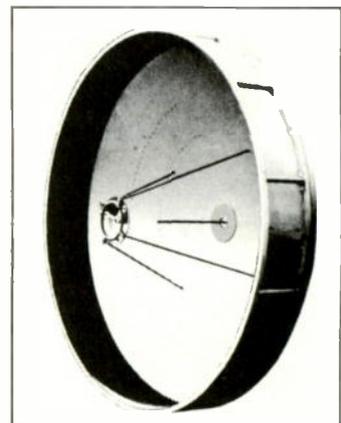


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(PLAN FOR PERFORMANCE,
GET IN TOUCH WITH TACO.)

- Wide-angle radiation exceeding 45 dB
- Low VSWR
- Front-to-back ratio of -70 dB
- Diameters of 8 thru 15 feet

Performance is high in every aspect, from the closely matched low-VSWR feeds to the precision hydroformed reflectors and stray r-f absorbing shroud ring. Even the radomes (not shown for clarity) exhibit only negligible attenuation and additive VSWR.



General Instrument Corporation TACO DIVISION, 1 Taco St., Sherburne, N. Y.

Calendar

November 4-7. The California Community Television Association's fall meeting will be held at the Hotel Del Coronado in San Diego.

November 8-11. The National Association of Educational Broadcasters' annual convention will be held at the Sheraton Park Hotel, Washington, D.C.

November 16-20. Vikoa will hold a CATV Service School, technical session in Dallas, Tex.

December 6-9. The Center for Communications, workshop seminar, "CATV - New Profits and New Services," will be held at the Ambassador Hotel, Los Angeles. 

System Sales

Community Tele-Communications, Inc., has announced its acquisition of majority ownership of Twenty CATV, Inc. of Carrolton, Ga. The facility is currently under construction. Purchase price was not disclosed.

KLOE, Inc. Hays, Kansas, has purchased the operating assets of Soo Electronics, Inc., a wholly-owned subsidiary of the Minneapolis Star and Tribune Co., for an undisclosed price.

U.S. Cablevision Corp., and Beacon Cable Corp. have been purchased by Colony Communications. U.S. Cablevision operates systems in Wappinger, Wappingers Falls, East Fishkill, Hyde Park and Highland, New York. Purchase price was not disclosed.

Downe Communications, Inc. has reached an agreement to acquire Imperial Broadcasting Company, operator of the system in Canton and Louisville, Ohio. Terms were not disclosed.

Sterling Communications, Inc., and Time-Life Broadcast, Inc., have completed an exchange of stock which gives Sterling 100% ownership of Manhattan Cable Television.

American Cablevision has assumed responsibility for development and management of 17 cities who had granted franchises to American Tele-systems. 



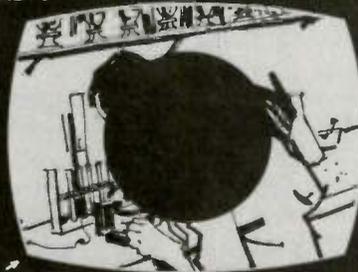
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... and dozens of combinations limited only by your own imagination.

If you go into TV with a Model T Budget Viscount Video can still give you Cadillac production capability

We know how it is: you want big production capability on a modest budget. You want a switcher with all the resources of a professional studio, yet at a price you can afford. We understand. At Viscount Video, we've concentrated almost entirely on bringing modern broadcast technology to smaller system operators. Switchers are compact and self-contained taking advantage of the latest advances in linear and digital circuit technology. VVS Routing Systems are equally sophisticated. Fact is—VVS router equipment was specified in the U.S. Manned Orbital Laboratory.

Whether you're starting from scratch or modernizing your present installation, see what a Viscount distributor can offer you. He'll show you how a Viscount switcher can give you flawless professional productions at a surprisingly low cost. For the name of your nearby distributor, write or call the nearest VVS representative below:

EXCLUSIVE: *The Viscount "Iso-Switch" (patent pending) is the only solid state, hybrid, integrated video crosspoint in use in such equipment. It has high input impedance, wide band-width and exceptionally low crosstalk. These unique switches are incorporated in all VVS units.*



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Southern Region: 3286B Covington Drive, Decatur, Ga., 30032 (404) 284-4102
(Dealerships established in Europe and the Far East)

FOCUS

... On People

Systems

Wayne R. Hauser, vice president and general manager of Newport Beach Cablevision, Newport Beach, Calif., has announced the appointment of J. Fred Weber as director of marketing. Weber will be in charge of the firm's Newport Beach, Seal Beach and Mission Viejo, Calif. marketing department. Previously, he was with American Cablevision for two years, and prior to that he was with TeleSystems Corp.

Thomas F. Cosgrove, Jr., has been appointed vice president and general manager of Tele-Vue Systems, Inc., according to Richard A. Forsling, vice president of Viacom International Inc. In the position, Cosgrove will be responsible for all CATV operations on the West Coast, and will have his headquarters in the San Francisco area.

John R. Calvetti has been named director of programming of Cypress Communications Corp., California based system operator, according to an announcement by Burt I. Harris, president. In his new position, Calvetti will be responsible for local origination in the nine largest Cypress systems.

Martin J. Barche has joined Valley Cable TV Co. as vice president and general manager. Barche will have overall responsibility of cable service to customers of Valley Cable and its subsidiary, Western Penn Cablevision, in nine Pennsylvania communities.

Poughkeepsie (N.Y.) Cablevision Inc. has announced that Richard W. Forsyth has joined its staff as chief technician. Formerly employed as supervisor of construction with Pennsylvania

CATV, Forsyth brings to Poughkeepsie Cablevision a wide knowledge of the engineering and construction aspects of the business.

Norma J. Kraus has been appointed personnel manager of TelePrompTer Corp. A former Navy personnel officer, Miss Kraus comes to TelePrompTer from Rosenthal and Rosenthal, Inc., a commercial finance firm where she was personnel manager. She is a graduate of the University of Pittsburgh and attended the Graduate School of Business Administration at New York University and Cornell University's Graduate School of Industrial and Labor Relations.

Barry D. Stigers, formerly director, community services and local origination support operations for Athena Communications, a wholly-owned subsidiary of Gulf + Western, has joined Columbia Cable Systems, Inc., as director of marketing. Primary areas of responsibilities for Stigers will concern development of local origination throughout Columbia systems, as well as overall planning for selling programs.

A. Ross MacGregor, general manager of Maclean-Hunter Cable TV, Ltd., has announced the appointment of Douglas F. Metcalf as Community Program Coordinator. In his new position, Metcalf's duties will include the organization of community programs for the Toronto area systems. In a similar announcement, the board of directors of Huron Cable TV, Ltd., a Maclean-Hunter affiliate, confirmed the appointment of Larry Scabar as manager of the firm which serves Sarnia and Wallaceburg, Ont.

W.R. Brazeal, executive vice president of Community Tele-Communications, Inc. has announced the promotion of Dave

Willis as district manager at large.

Richard R. Peterson, formerly district manager of TeleMation California, Inc., has been appointed vice president, marketing, for TeleMation, Inc., according to Lyle O. Keys, president. In his new position, Peterson will be responsible for planning and directing corporate marketing efforts, coordinating the activities of the departments of sales, advertising, market and product development, customer training and shows and exhibits. Peterson has a lengthy record in marketing and sales management, most recently as manager of Ward/Davis' Video Division, a position he retained when the division was acquired by TeleMation.

Suppliers

Bruce C. Emonson, president, Caldwell A/V Equipment Company Ltd., has been elected to the board of directors of CCA Electronics Corp., Gloucester City, N.J., according to Bernard Wise, CCA president. He joined the TelePrompTer Division of S.W. Caldwell Ltd. in Canada in 1957,



Mr. Crist



Mr. Weber

Robert W. Behringer, Vice President and Manager has announced the return of Duane Crist to Kaiser CATV and his appointment as Manager of Special Projects. Crist has extensive background in CATV marketing and management and has held top positions with such firms as Ameco, Anaconda, and Kaiser CATV. Initially, Mr. Crist will coordinate the setting-up of the marketing program for the new Kaiser CATV Cable Plant which is slated to be in operation early in 1971.

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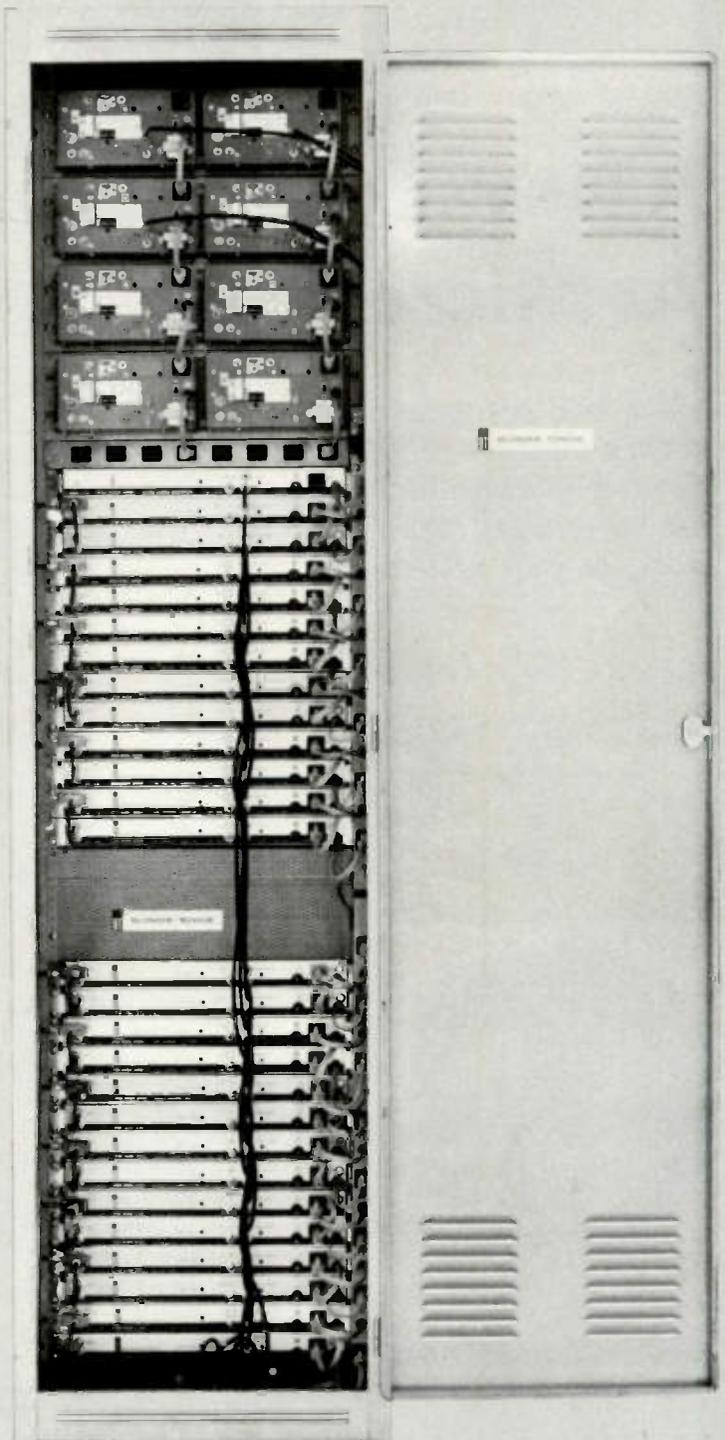
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A New Look At Microwave

Microwave can provide a service-extending, cost cutting adjunct to cable technology. Here are some ways microwave can work for your system.



Author Grover C. Cooper is a partner in the communications firm of Fisher, Wayland, Duvall, Southmayd & Cooper. He is a member of the American Bar Association and the Federal Communications Bar Assn.

There were about 2,500 CATV systems operating in the United States as of August, 1970. The great majority of these systems obtain the signals they carry on a direct off-the-air basis without the assistance of microwave relay, either for improved quality or for obtaining otherwise unavailable signals.

For these systems which use microwave relay, the principal source of service is the miscellaneous common carrier. Commission records indicate that there are presently some 70 miscellaneous common carriers serving 795 CATV systems throughout the United States.

The remaining cable systems which use microwave have either CARS microwave or grandfathered Business Radio authorizations. A study of Commission records reveals that there are licensed or approved CARS microwave systems serving, or proposing service to 118 CATV systems. Commission records note that there are 37 CATV microwave relay systems in the Business Radio band, so presumably they serve approximately this number of CATV's.

In other words, approximately 62% of the cable systems throughout the United States do not employ microwave for any purpose and depend on their own ingenuity and skill with off-the-air reception to provide their customers with television service.

Considering recent developments at the Commission, perhaps the time has now come for CATV operators to take a new look at the merits of microwave for their particular systems. This evaluation should not only include the use of microwave for signal relay purposes—this use comprises almost the entire present use of microwave by CATV—but also for intra-system use, in lieu of cable, and in augmentation of cable facilities.

Intra-System Uses Of Microwave

Two FCC actions within the past year make the integrating of microwave into system construction and daily operation technically possible and in many cases, practical. In Docket 18452 (released November

14, 1969) the Commission concluded that the public interest would be served by establishing a Local Distribution Service.

This action permitted systems to be constructed substituting microwave for cable lines in areas of dense population where overhead construction is uneconomical. Further, the LDS service might make practical the serving of outlying population pockets, presently too far away from the central system to justify cable construction and maintenance costs.

Highly sophisticated LDS equipment in the 18 GHz band was developed by Hughes Aircraft Co. and is presently in use in New York City as a part of the TelePrompTer installation.

For reasons of possible conflict with satellite use of the 18 GHz band, the Commission's LDS rules contemplate that the 12.7-12.95 GHz band (the CARS band) will be used for local distribution purposes. Hughes has equipment which will function in this frequency band.

The initial LDS rules contemplated vestigial sideband amplitude modulation. On petition by the Laser Link Company, however, the Commission on July 20, 1970, modified the rules permitting LDS equipment to employ frequency modulation — thus expanding the opportunities for development of LDS hardware (Docket 18838).

In a second action, issued concurrently with the LDS rules, the Commission expanded its CAR rules permitting use of microwave to transmit program material originated by CATV systems. Prior to the institution of the CAR rules (First Report and Order in Docket 15586, released October 18, 1965), in order to obtain private microwave authorizations, cable operators had to file applications in the Business Radio Service.

Finally, cable operators can obtain authorizations to microwave their own televised programming (e.g., on-the-scene coverage of sports, news and other events) back to the CATV studios. This latter type authorization would be similar, if not identical to, the remote broadcast authorizations used by regular television stations.

It will become increasingly important in 1971 when the required program origination rules become effective.

Microwave For Signal Relay

Microwave is still available for the traditional purpose of relaying TV signals, thereby improving the quality, and often the quantity, of TV signals at a particular location. These relay systems will undoubtedly provide the paths for future wide distribution of special, CATV-originated, programming.

Indeed, the Commission is obviously encouraging the interconnection of CATV systems by microwave. This was articulated in the "First Report and Order" in Docket 18397 (October 27, 1969) and recently reiterated in the "Notice of Proposed Rule Making and Inquiry in Docket 18891 released July 30, 1970: *"As previously emphasized, we are against any restrictions that might preclude inter-connection of CATV systems on a national or regional basis or CATV network operations"* (Paragraph 7).

Relay-type microwave is presently available to the CATV operator in either the Community Antenna Relay or Common Carrier service. The essential difference between these two services is that the CAR service contemplates a private use of the microwave, whereas the common carrier service looks to a public use.

In the CAR service there can be cooperative and interconnecting CAR systems, but the rules are essentially designed to prohibit an individual from simply operating as an unregulated common carrier (and charging for the service) under the guise of a private CAR authorization.

On the other hand, in order to qualify for a common carrier microwave authorization, the applicant must essentially propose a service to the public at large, and not just to himself. Specifically, the rules require that the common carrier applicant propose to serve at least 50% unrelated customers and that usage by such customers (in terms of channels and hours delivered)

must constitute 50% of the system's usage (FCC Rules, Section 21.700).

Prior to the First Report and Order in Docket 15586, the Commission was not so strict with its "common carrier" definition and permitted CATV operators to obtain authorizations for microwave facilities serving their own systems, so long as they held out common carrier service to all those who desired it. Following the First Report and Order the interpretation became extremely rigid.

The 6 GHz Band Versus 11-12 GHz

In addition to matters of basic qualifications, another very important aspect of the CAR-versus-miscellaneous Common Carrier question is the frequency band and equipment authorized for each. As indicated earlier, the great majority of microwave service to cable systems is presently provided by common carriers. This is probably attributable to the fact that the pioneers in CATV became the pioneers in "microwave serving CATV," and in the early days (prior to the First Report and Order in Docket 15586), it was easy to obtain a common carrier frequency to provide microwave to one's own CATV system.

In addition, there were technical reasons, such as the availability of tried and true 6 GHz equipment, which made operation in the common carrier service attractive.

Action in Docket 15586 tightened up the ground rules in a number of ways, however. This Docket established the CAR service and required that CATV's proposing service to themselves apply for CAR facilities. Frequencies allocated for CAR use were in the 12 GHz band (viz., 12,700 MHz to 12,950 MHz).

Further, the Docket required that (1) common carrier applications filed after March 22, 1968, proposing *new* service to CATV systems utilize the 11 GHz band (viz., 10,700 MHz to 11,700 MHz), and (2) existing common carriers serving cable systems which were located within 50 miles of the 25 largest metropolitan areas of the country be prepared to change over to the 11 GHz band on

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February 1, 1971, however, only on a "secondary basis" and the frequencies could be preempted by land line (telephone and telegraph) carriers or satellite-terrestrial facilities, if interference problems arose.

As a result of numerous petitions for reconsideration, the Commission on February 3, 1970, released an Opinion, in effect backing down — at least temporarily — on the required changeover to the 11 GHz band.

Pending final decision on the petitions for reconsideration the Commission imposed the following interim conditions: (1) They will entertain waivers permitting the filing and granting of new common carrier applications in the 4 and 6 GHz band where there is a showing such will not cause frequency congestion in the foreseeable future; (2) Carriers located within 50 miles of the top 25 markets will not have to shift to the 11 GHz band nor will existing carriers be placed in an inferior status to land line and satellite carriers. There is hope then that the question of whether or not common carriers are required to shift to the 11 GHz band may be a matter of frequency congestion in a particular area and not simply an arbitrary standard.

There has been much concern over the possible shift of CATV microwave to the higher (11 and 12 GHz) band. It has been argued that the 11 and 12 GHz equipment is more expensive unit for unit, and, due to its lower reliability over longer path lengths, requires more relay stations, thus compounding the expense factor.

It may well be that shifting to the 11/12 GHz band is not as bad as some argue, since despite claims of "less reliability" for the higher band equipment, numerous 11 GHz (common carriers serving CATV) applications on file with the Commission propose path lengths which seem generally about as long as their counterparts in the 6 GHz band.

The FCC common carrier computer sheets indicate that there are approximately 232 common carrier CATV microwave authorizations in the 11 GHz band. Of these authorizations, 147 proposed path lengths in excess of 40 kilometers (over

24.86 miles); 83 have path lengths in excess of 50 kilometers (31.07 miles or more); and 46 propose paths in excess of 60 kilometers (37.28 miles or more).

There are seven path lengths in excess of 100 kilometers (100 kilometers equals 62.14 miles), and the longest hop on file is for 128.5 kilometers, or 79.89 miles in length. When one considers that many of these high band authorizations involve splits, thereby tending to reduce the path lengths possible, and further since some of the shorter hops were simply not striving for distance (due, perhaps, to the proximity of CATV towns along a microwave route) . . . it appears that the high frequencies have not been as great a limiting influence as feared.

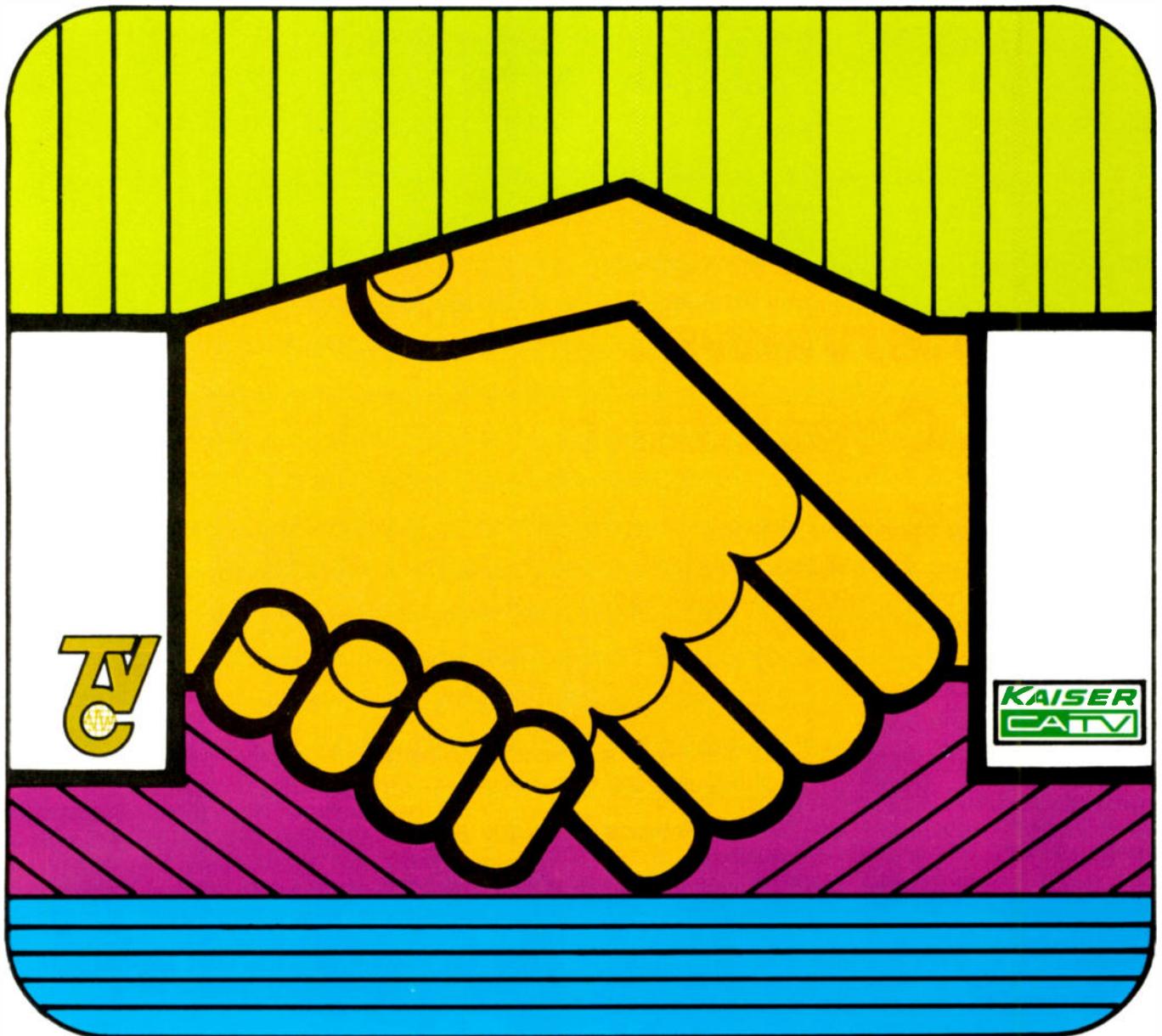
Indeed, an informal survey by a common carrier staff member of fifty 11 GHz common carrier applications showed path lengths averaging 35.8 miles, as compared with a 36.4 mile average for 50 pending 6 GHz applications. It is important to note that the 11 GHz applications studied were for *new* paths, hence path lengths were *not* influenced by *existing* installations. Rather, transmitters were presumably placed at optimum locations.

Microwave — An Important Technology For a Growing Cable Industry

It is obvious that as part and parcel of accepting CATV into the nation-wide communication system, the FCC is offering the technological wherewithall permitting it to do a better job. This is not to say that the problems and frustrations of the future are eliminated.

There will surely be many non-plussing situations as past experience will attest. It is rather to say that the cable operator should stay alert to the opportunities for improved signal reception, interconnection with other CATV systems, and greater flexibility in the internal operation of his system through use of microwave.

In short, the operator of the 70's should not lose sight of the opportunity which microwave offers in adding to and in renovating his system. 



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TVC Interviews

A PUC Consultant

CATV has increasingly been the target of PUC-type regulations. This interview gives insight into the why of such regulation. . . and the ways to avoid it.

PUC regulation of cable television has been a major topic of discussion at most regional conventions recently . . . as well as at the 1970 NCTA convention. PUC regulation in one form or another is currently in effect in Nevada, Connecticut, Rhode Island, and Vermont. TVC recently interviewed Robert A. Brooks, Vice President, J.C. Barnard and Associates, a St. Louis based Consulting Engineering firm. The firm is currently retained by the Vermont Public Service Board to assist in designing regulatory guidelines for cable systems operating in Vermont. The following summarizes the discussion relative to cable regulation.

TVC: *What function is your company performing for the Vermont Public Service Board?*

BROOKS: J.C. Barnard and Associates was selected to assist in formulating initial regulatory procedures, such as a line extension policy, service standards and technical guidelines and to provide general CATV consultation to the Board.

TVC: *Were you selected because your company supports state regulation of cable television systems?*

BROOKS: The principle of PUC regulation of CATV is decided in the political arena, not by consulting engineers. Because we are professional consulting engineers, we necessarily confine our activities to engineering problems as it is our responsibility to remain as completely objective as possible. This applies to type of equipment, methods, and standards implemented in the cable television industry.

We were selected by the Vermont Board for our experience in cable television engineering and operation; and because of our regulatory experience,

which, incidentally, is largely based on representing clients before PUC Boards.

Had a cable operator or a cable group requested our services in connection with discussions held with the Vermont Board, we would have been more than pleased to have represented them. However, since cable regulation is quite controversial, it is obvious that it is impossible to serve both the PUC and a system operator in the same state concurrently. We do represent cable operators in other states.

TVC: *Bob, can you give a simple explanation of what a PUC is supposed to do?*

BROOKS: Briefly, the PUC has a two fold purpose. First it oversees the operation of utilities by protecting the interest of all customers, today and those in the future, against inadequate service, discriminatory practices and excessive charges. Second, the investor must also be given the protection of economic regulation. The private investor in a utility business must be able to make a reasonable return on moneys he has invested in public services. It is the PUC's responsibility to find the proper balance between those two areas of interest.

TVC: *In your opinion, is a CATV system a utility?*

BROOKS: According to Webster's Dictionary, a public utility is an organization supplying something useful to the public, operated by a private company under a government franchise. In the final analysis, it would be up to each state to determine whether or not a CATV system is a public utility and falls under the jurisdiction of the PUC. If, as in Vermont, the state legislature says CATV will be regulated as a public utility, it would be so classified and regulated.

TVC: *In your opinion, why is CATV now regulated in Vermont?*

BROOKS: You know I have been involved deeply in CATV since the early 1950's, and I think I know as much about it and am as sympathetic with its problems as anyone. From my observations, I believe CATV is regulated in Vermont because some operators were unresponsive to complaints and service requests.

Right or wrong, many of these complaints to the operators were unanswered, and ultimately found their way to individual legislators and to the Public Service Board. The Board had no jurisdiction and its informal efforts to handle complaints were not received with favor by the operators. As a result of the accumulation of a substantial volume of complaints, the legislature finally passed a law regulating CATV.

TVC: *What was the nature of these complaints?*

BROOKS: The principal problems were line extensions, inadequate service, and rate discrimination, in that order of importance.

Refusals of requests for service requiring line extensions were the greatest source of dissatisfaction. Requests for connection, even within the service area, were often unanswered or denied without explanation.

Inadequate service was the second greatest problem. Long outages caused frequent complaints, followed by poor pictures.

Rate discrimination followed in importance. Charges to new customers often varied widely from those paid by earlier subscribers, and service differed widely in areas of comparable size.

TVC: *What has been your experience with these complaints?*

BROOKS: At the request of the Board we have investigated some of these complaints. We have not had the time to make a comprehensive study of all of them, but we have done considerable work in reviewing them, both written and at the site. While, as you would expect, there are some complaints which are unjustified, a substantial majority of those we have investigated have merit.

TVC: *Are all CATV systems in Vermont involved in these complaints?*

BROOKS: Practically all of the systems are involved in line extension complaints, as you might expect. There has apparently been no uniform approach to this problem. On the matter of inadequate service, all systems are not involved. A number of the systems we have visited are as good as anyone could want; with good service record, fine picture quality, and good management.

TVC: *Is the Vermont Board planning to regulate the CATV rates?*

BROOKS: While the responsibility and authority given to it by the legislature encompasses rate regulation, I am not aware of any plans to do so



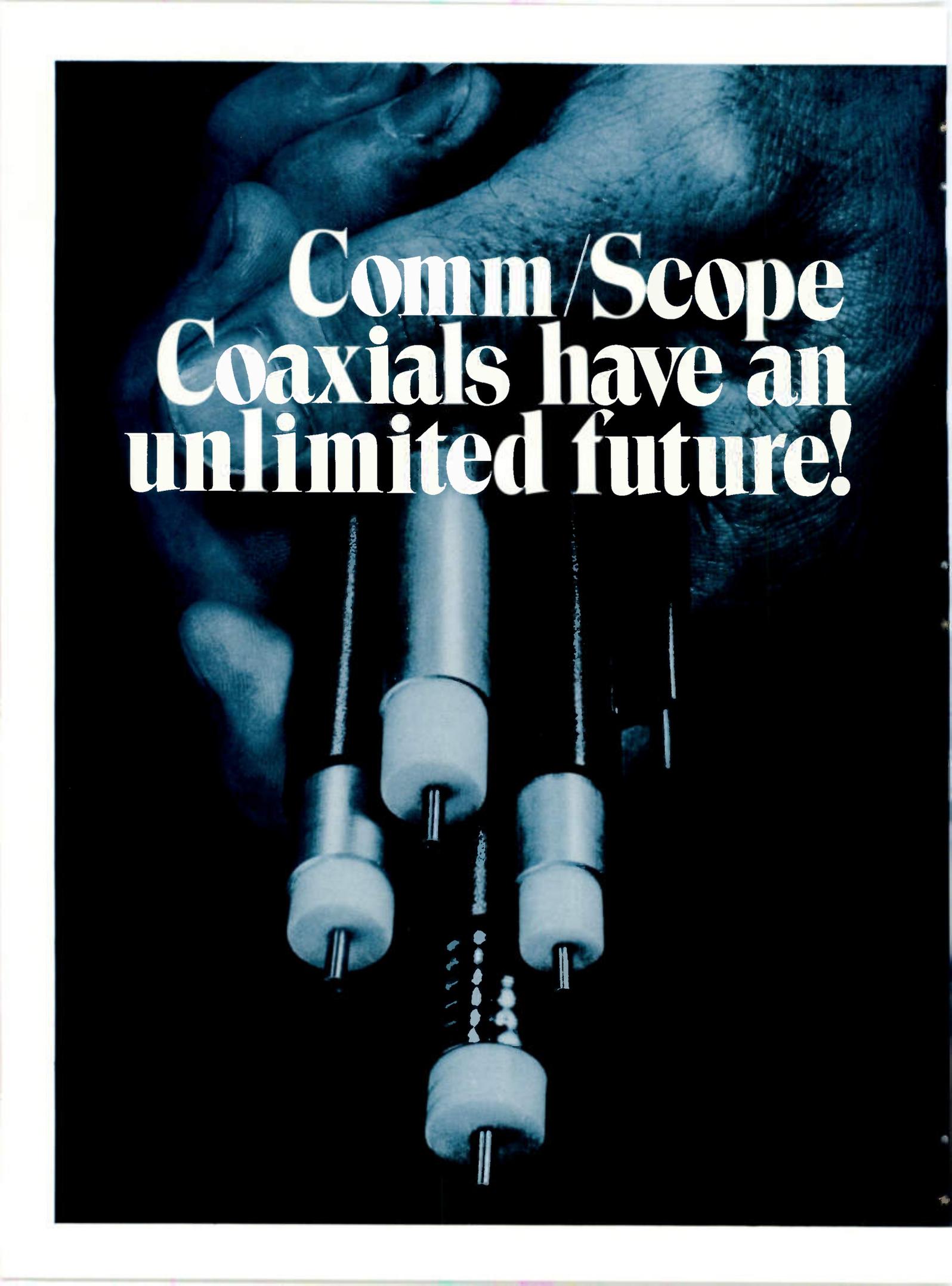
Before joining J.C. Barnard & Associates in 1969, Mr. Brooks was Vice President at Spencer Kennedy Labs. There he supervised contract administration, systems engineering, field engineering and all construction activities of the company. His CATV experience dates back more than a dozen years. In 1965 he was the CATV Manager for Anaconda Electronics. Mr. Brooks is a member of the Institute of Electrical and Electronic Engineers (IEEE).

immediately. I do feel, however, that the implementation of one or another of the regulatory procedures will lead into it, or at least to an examination of a rate structure.

TVC: *Why does the PUC feel it is better qualified to regulate CATV systems than the FCC or the municipality served?*

BROOKS: There is a general impression that the FCC has established policies that thus far have stifled the growth of CATV through broad rule-making that attempts to protect the broadcasters. The PUC's maintain that they are interested in the customers served by CATV systems and not in protecting special interest groups.

Under these circumstances the entry of the PUC's into the CATV regulatory field, could easily be an important factor in protecting the cable operators from such special interest groups. For example, several CATV systems operating in southern



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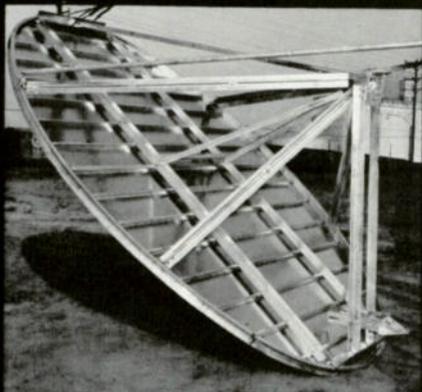
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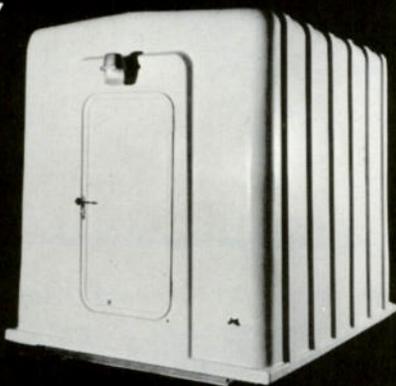
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Vermont, are prohibited from carrying the signals of any commercial television station located in Vermont, due to the existing restrictions on "distant signal importation." In the opinion of the Board this is not in the best public interest, and with the cooperation of the cable operators, the Board might seek to obtain a waiver of the rules to permit Vermont CATV subscribers to receive programs from Vermont TV stations.

Concerning local or municipal regulation, the PUC's feel that for effective regulation, it should be uniform through the state and implemented by a staff experienced in municipal distribution service and regulation.

TVC: In a May (1970) TVC article, one of the authors stated that the "Vermont operators are already deluged with pages upon pages of forms to fill out." What exactly is the purpose for all this?

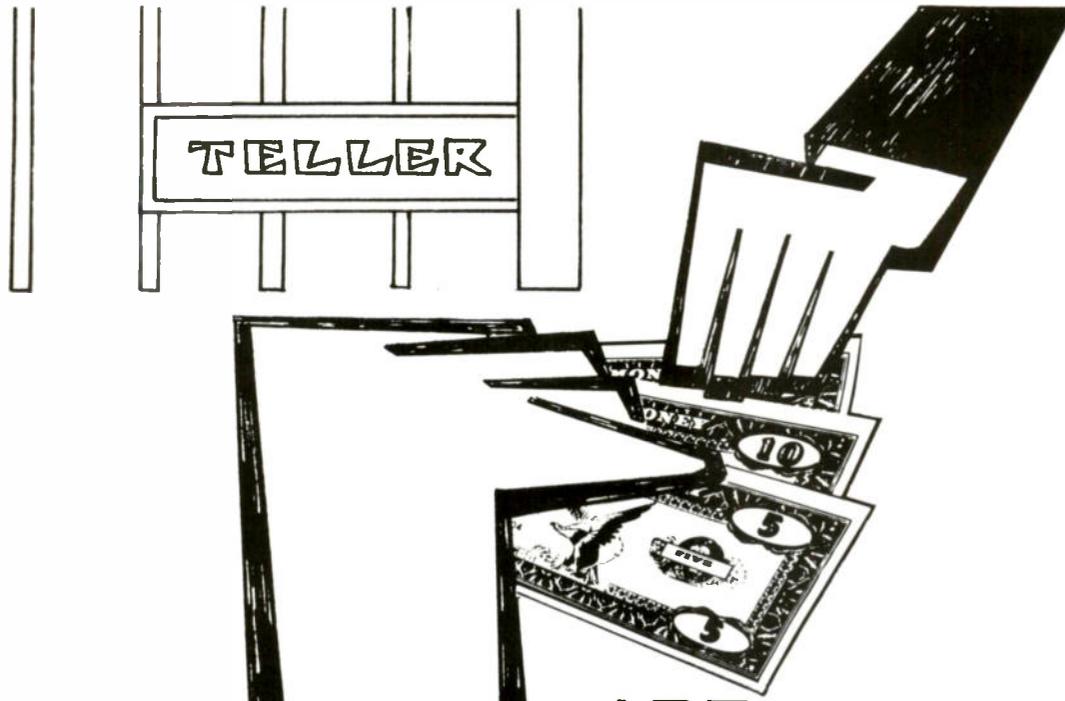
BROOKS: I am not aware of any "deluge of forms" as stated in the article. To the best of my knowledge the only form mailed to date by the Board to system operators consisted of two pages calling for eleven schedules, most of which should be readily available in any well-run CATV system.

TVC: What does the Board consider when determining the award of a CATV license?

BROOKS: The Board is primarily concerned with the character and ability of the system owner and the operating management, the soundness and completeness of the proposed system design and operation, and the ability of the applicant to adequately fund the total project.

TVC: Could you be more specific in describing the assistance your company is providing to the Vermont Board?

BROOKS: The formulation of a uniform line extension policy was a top priority project of the Board. Past history has shown that, for economic reasons, CATV systems did not provide service to sparse or rural areas. A line extension policy is a procedure
(Continued on page 86)



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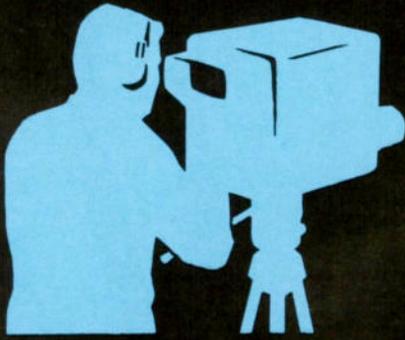
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Video Recording Equipment: What's Best for Your System?

The half-inch VTR could prove to be the best on-the-go workhorse for your origination system. Last of a three-part review of various VTRs.

By Jack A. Rickel

The half-inch helical scan video tape recorder offers the small system owner the least expensive means of recording and storing programs. To the owner of several small systems, it is a means of distributing locally-originated programs, that is less expensive than either a long cable run or a single microwave hop. About the size of a good home audio recorder, it is almost as inexpensive and easy to operate.

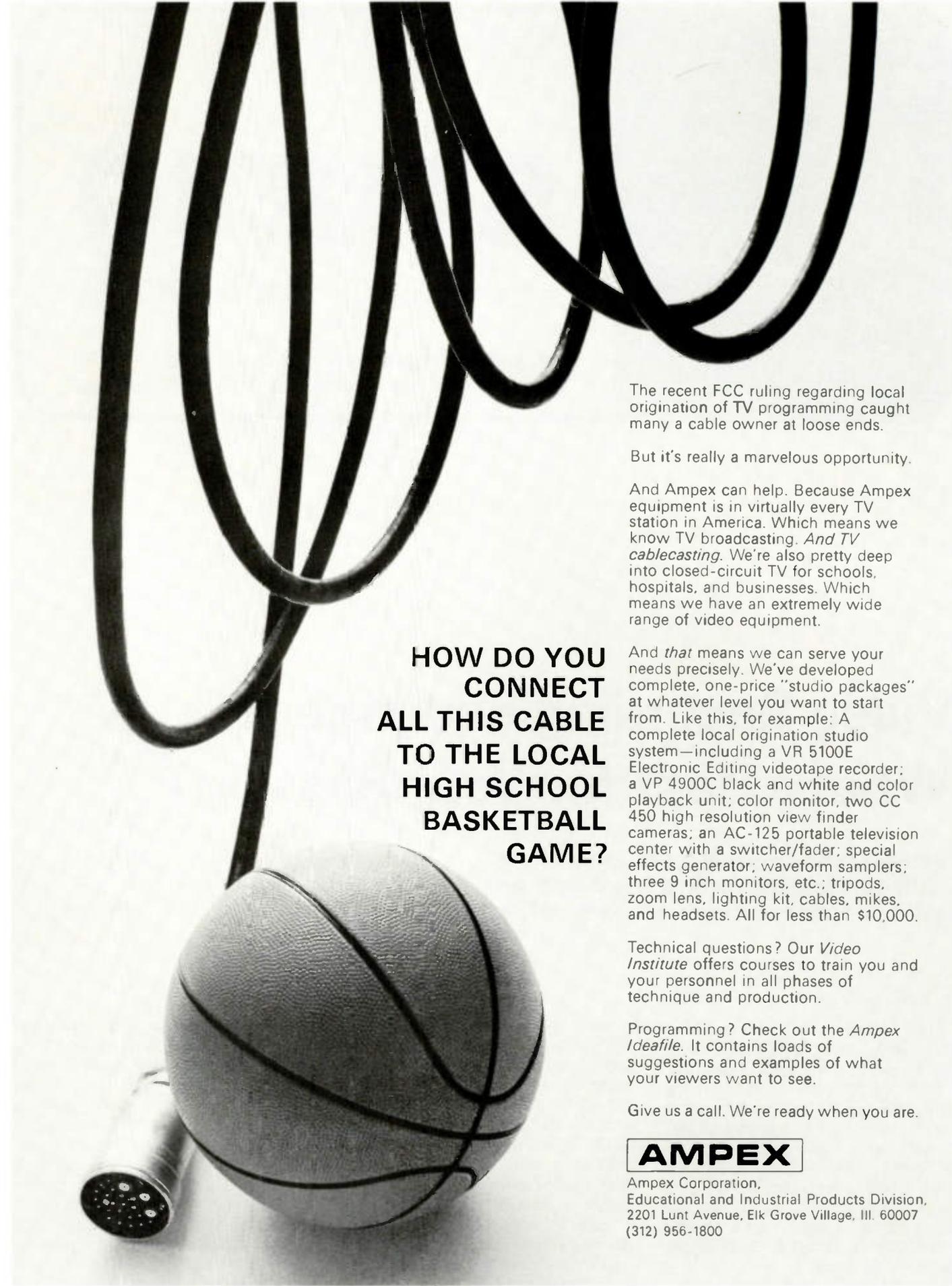
In our last two articles we dis-

cussed quadruplex and one-inch and two-inch helical scan video tape recorders. The "quad" machines are used for high quality broadcast production. Prices start around \$40,000 and go well over \$100,000. Tape costs over \$200 per hour, and a skilled maintenance technician is required for periodic checks of performance.

Helical scan recorders operate on the same basic principles as quad recorders but scan tape in a significantly different pattern.

Their performance is not as good and only a few one-inch and two-inch (tape width) models meet broadcast requirements. Prices, however, are much lower, starting below \$2,000 and running to around \$18,000. An hour of one-inch wide tape costs around \$45.

In this article, we will review helical scan VTR's, which use one-half inch width tape. Technically, these recorders are very similar to the one-inch models. Tape is threaded around a slotted drum



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The recent FCC ruling regarding local origination of TV programming caught many a cable owner at loose ends.

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And Ampex can help. Because Ampex equipment is in virtually every TV station in America. Which means we know TV broadcasting. *And TV cablecasting.* We're also pretty deep into closed-circuit TV for schools, hospitals, and businesses. Which means we have an extremely wide range of video equipment.

And *that* means we can serve your needs precisely. We've developed complete, one-price "studio packages" at whatever level you want to start from. Like this, for example: A complete local origination studio system—including a VR 5100E Electronic Editing videotape recorder; a VP 4900C black and white and color playback unit; color monitor, two CC 450 high resolution view finder cameras; an AC-125 portable television center with a switcher/fader; special effects generator; waveform samplers; three 9 inch monitors, etc.; tripods, zoom lens, lighting kit, cables, mikes, and headsets. All for less than \$10,000.

Technical questions? Our *Video Institute* offers courses to train you and your personnel in all phases of technique and production.

Programming? Check out the *Ampex Ideafile*. It contains loads of suggestions and examples of what your viewers want to see.

Give us a call. We're ready when you are.

AMPEX

Ampex Corporation,
Educational and Industrial Products Division,
2201 Lunt Avenue, Elk Grove Village, Ill. 60007
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inside which a spinning disc scans the tape with one or two heads. Sound is simultaneously recorded along the edge of the tape.

These machines were initially designed for less critical, relatively low budget applications in education, industry and home entertainment. Picture quality and stability are not as good as with either the one inch helical scan or quadruplex recorders, but both initial and operating costs are lower.

Some of these recorders, however, produce pictures which look much better than might be expected from such small and inexpensive equipment. There are a few models which record and reproduce color signals and allow simple electronic editing (editing helical scan tapes by splicing is practically impossible).

Low Cost and Simplicity Are the Main Features

Low cost and simple operation make these units attractive to smaller systems interested in doing limited origination. For less than \$2,000 a cable system owner can have a self contained black-and-white camera and tripod, a microphone, a half-inch VTR, a stock of recording tape and a few flood lights. The whole works can be transported, set up, and operated by one person.

With a second VTR, tapes can be copied. Copies could then be played on other systems which are perhaps presently too small to support any programming equipment of their own. If one of the VTR's is equipped for so-called "assemble" editing, then previously recorded segments on different parts of a tape or on different tapes can smoothly be added, one after the other, to make a longer program. It is also possible to "assemble" live segments. Attempting this type of editing without a properly equipped VTR will result in very noticeable breaks between segments.

As with any magnetic recorder, recorded tapes can be stored for long periods of time or erased and re-used hundreds of times. To our knowledge, all VTR's will, in record mode, automatically erase

any previously recorded program.

An important change has occurred recently in many of the half-inch machines which gives them an advantage over one-inch machines. There is finally a standardization of tape speed, writing (scanning) speed, track width and other factors affecting the interchangeability of recordings. A tape made on any recorder having the EIAJ Type 1 format can be played on any other recorder with this format, regardless of model or manufacturer.

The recorders must have this format, and not all currently on the market do. This is important to remember in buying a half-inch VTR, since it is not practical to convert an existing unit even to a slightly different format.

There are perhaps a dozen different brands on the market, though in some cases the same machine is marketed under more than one name. Prices vary from around \$650 to \$1,500. Tape costs are less than \$40 per hour. Quality of construction, performance, and availability of parts and service also vary considerably, but not necessarily according to price.

Light Weight Is Another Advantage

Most models are in the range of 30 to 60 pounds, typically around 50 pounds, and of a size, shape and portability similar to reel-to-reel audio tape recorders. There are also several battery operated models which weigh around 15 pounds including a small camera. These are designed to be carried and operated by one person. Recently introduced models include provision for playback through the camera viewfinder. One manufacturer, Ampex, has just announced a battery model which provides for "elementary editing" and color recording and playback.

As with the larger units, these portable units simultaneously record sound. Fully automatic audio and video level circuitry and a start/stop trigger switch on the camera pistol grip make these units quite useful for one-man remote recordings.

The fact that half-inch helical



While several firms are developing conventional VTRs in the half-inch format, Ampex and a few others are working on cartridge VTRs. The man above is using the Ampex Instavision system which is scheduled for production in early or mid-1971. The hand-held camera weighs five pounds and the recorder/player, which can be carried with a shoulder strap, weighs less than 16 pounds (including batteries for portable operation). A trigger control built into the pistol-grip handle enables one person to operate both camera and recorder. The recorder may also be operated with a.c. power for recording and playback in color or b/w.

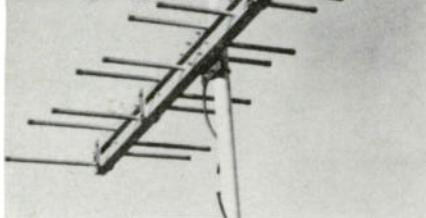
scan VTR's bear some resemblances to audio recorders has one potential disadvantage. This is that one might not tend to treat them with the respect and care given a \$10,000 or \$100,000 recorder. However, these small, rugged machines must still precisely scan a track only a few thousandths of an inch wide, at an exact velocity many times that of any audio recorder. Any wrinkles in the tape, any dust or dirt on the tape or in the machinery can seriously affect performance and render an important recording unusable.

This is meant to caution, not to frighten the potential user. We have seen these recorders operated quite satisfactorily by non-technical persons under far less than ideal conditions.

Since there is a fairly wide

Scala

COLOR LOG



Model CL 26 & CL 713
VHF TV Channels 2-13

Applications ● VHF TV pick-up & transmitting ● CATV ● Commercial off-the-air monitoring

- A frequency-independent array designed to meet the most exacting requirements of VHF TV pick-up antennas.
- Excellent color response. Careful design and exhaustive quality control guarantee that the gain will be held to less than 1/2db throughout the channel.
- High gain: Unique combination of double boom and flexible transmission line makes it possible to take advantage of larger active regions, resulting in more efficiency. Model CL26 covers channels 2-6 with gain exceeding 10 1/2db over isotropic source. CL713 covers channel 7-13, with gain exceeding 11db over isotropic source.
- Lower tower load: Two models cover all 12 VHF TV channels, providing a coverage equal to or exceeding that of a dozen 5-element single-channel yagis.
- Co-channel rejection is possible because the Scala Color Log has a minimum of side lobes and a very high front-to-back ratio. Special arrays can be designed to solve additional co-channel problems.
- Thoroughly tested: This product is the result of two years of research; and before release to the CATV industry, 24 Color Logs were field-tested (for a full year) nationwide.
- Extremely rugged: Booms are 2" x 2" square 6061-T6 aluminum tube. Elements are 3/4" OD tubing laminated over 5/8" tubing, fastened to boom with 1/2" studs locked in position with 1/2" lock nuts. Fastenings are stainless steel. Scala Color Logs are fastened to tower at the balance point, not on an end, where a small load on the opposite end can cause an extreme load to tower and mounting brackets.
- Experience: Scala developed the first professional CATV antenna. The third CATV system in the country is still using its original Scala Yagis.

Write for detailed specifications—and complete catalog on corner reflectors, color logs, UHF-VHF yagis, ground plane antennas, and Paraslot and Paralector antennas by Scala.

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(415) 351-3792

STUDIO Technology

range of models, the buyer must be very careful in making his selection. Some models are designed primarily for home or non-critical instructional applications. These lack such features as editing capability, and may put out a signal which can not be properly handled by a modulator.

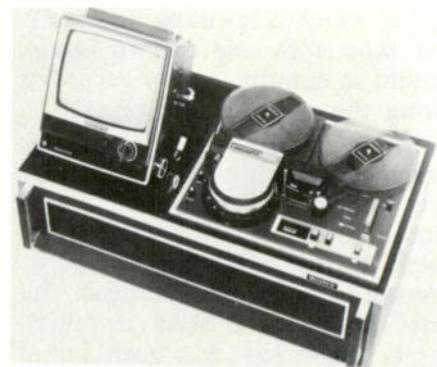
Another problem sometimes arises from lack of close tolerances in construction. When a recording from such a machine is played on another machine, it may be of noticeably lower picture quality and may have a tendency to jitter or even break up. These same problems can arise when a tape is played on the original machine after a period of months or years. This is due to a change in the mechanical and electronic characteristics.

Important Rule For Copying Video Tapes

This brings up a good rule to follow in making copies of tapes, whether on the same size format or from one-inch to half-inch. That is, that better results are generally obtained when the tape to be copied is played on the machine on which it was originally recorded. Another rule is that a copy is never quite as good as the original and a third generation tape (a copy of a copy) will show at least twice the degradation.

To review, then, there are two basic types of video tape recorders: quadruplex and helical scan. The former are expensive, high quality machines used by networks and most broadcast stations and produce fully interchangeable tapes. The latter are divided into three sub-groups according to tape width: two-inch, one-inch and half-inch.

The two-inch and one-inch types are similar in performance and one-inch models are the more common. Tapes made on a given model can only be played on similar models of the same manufacturer. Better models approach quad performance and include reasonably good editing capabilities. They serve quite well as program production machines for many cable and other closed-circuit facilities.



Top photo shows Sony's new Video-corder half-inch VTR (model TAV-3610). It includes a built-in monitor/receiver and provides a full hour of monochrome recording and playback. It features stop action and audio-after-video recording capability. With an optional RF modulator it can playback through regular TV sets.

The second photo shows a half-inch VTR by Diamond Power. This unit is designed to record both video and sound simultaneously or separately. It is silicon-transistorized throughout and is equipped for electronic editing. The lower photo shows the Ampex Instavision recorder/player with its small circular plastic cartridge.

Half-inch recorders, while they do not have the performance of the other VTR's, are the least expensive. As the new standard for tape interchangeability is adopted and technology continues to improve, we will see increasing application of these recorders. **rv**

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on high towers...**

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Field-proven on anchor locations of high tower guys, BIG-GRIP dead-ends are gaining favor among design engineers and contractors for strength, reliability and ease of application. More and more BIG-GRIP dead-ends are used at the top of the tower, as well as at the anchor.

Before you specify any dead end fitting, top or bottom, why not review the many advantages of BIG-GRIP dead-ends:

- High rated holding strength.
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- No strand wastage.
- Proper application easily checked by visual inspection.
- Uniform application on all guys.
- Modern design — BIG-GRIP dead-ends look like the strand itself.

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BIG-GRIP, the dead-end with plenty of holding power for big holding jobs.

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Typical rated strengths of BIG-GRIP dead-ends for some sizes of strand are shown in the table at right.

Material	Size	Rated Holding Strength of BIG-GRIP dead-ends
Alumoweld	37#7	100,700 lbs.
Gal. Steel	3/8"	42,400 lbs.
Gal. Steel	3/4"	58,300 lbs.
Gal. Steel	7/8"	79,700 lbs.
Gal. Steel	1"	104,500 lbs.

PREFORMED

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if
one
won't
do
the
next
one
will

- EDKOTRON
- MOBIL - Q
- Q-PACK 1/3
- Q-PACK 1/6
- Q-PACK 2/3
- Q-PACK 2/6
- Q-PACK 3/3
- Q-PACK 3/6
- Q-PACK 4/3
- Q-PACK 4/6
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Studio Notebook

answers to program problems



By Ken Lawson

QUESTION: What are some helpful but inexpensive techniques for the CATV newscaster?

ANSWER: This is the third of three columns on techniques for producing news programs. The topic this month is "content."

The cable system news program should distinguish itself from national network and regional broadcast television news shows by confining the area of coverage mostly to the cable area served. It should be so local that subscribers find themselves dependent upon CATV for much important information.

There are at least four different styles of news reporting: (1) a series of brief (one-minute) news items, (2) in-depth interviews, (3) special news analyses, and (4) the "what's new" or "what's happening" format.

The fifteen-minute news brief show is the most common type and it requires a continuous and well-staffed news gathering effort. It is common to supplement this program with one of the three other types of shows.

Some operators report that communities often lend themselves to the development of special news departments. For example, Geoff Ferber, Program Director of the FCB Cablevision system in Oceanside, California, is successfully carrying two three-minute segments in his regular newscast—a minority area report and a social activities

report. Each is staffed by a volunteer who gathers and reports the news on-camera.

I think we will see the supplemental show, describing what's new or what's happening in the area, become a fairly standard cable system format. This is an ideal type of show to describe community events and the people behind them, leaving the "hard news" items to the standard news briefs program.

Sources of general news information include the local police, fire department, county sheriff, hospitals (births, admissions, dismissals), stock brokers (stock market report), schools (lunch menus, parent-teacher, sports, schedules), bankers (area development and finance), city and county government, politicians, chamber of commerce, airport, and the morning newspaper (credit your sources).

National and international news may come in handy as "filler material." A national newswire service teleprinter costs approximately \$30 to \$60 per month.

There are a variety of weather information sources: local newspaper (national and regional); ESSA teletype weather forecasts, updated every 30 minutes by region (approximately \$45 per month); local weather bureau (get to know these highly trained people); and readings during the day made from your automatic time and weather machine.

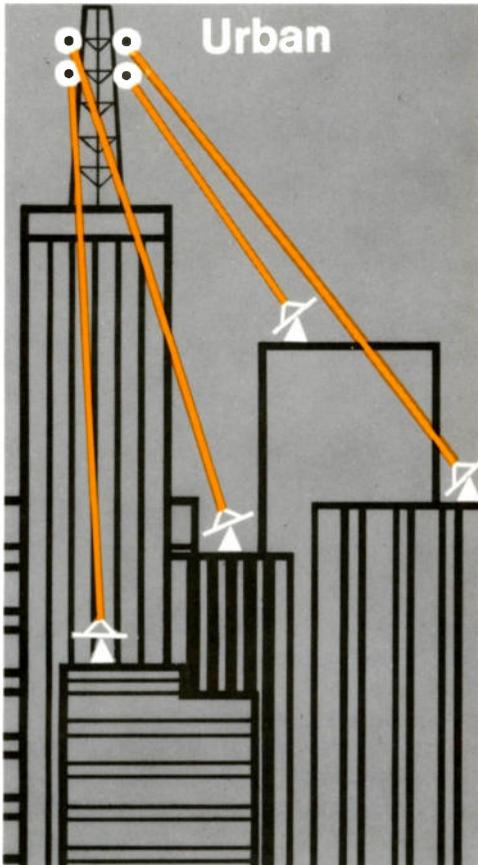
Start newscasting on a modest basis at first—say ten to fifteen minutes—and build as you go to a half-hour and more. 

Now... New Laser Link* Cableless Systems

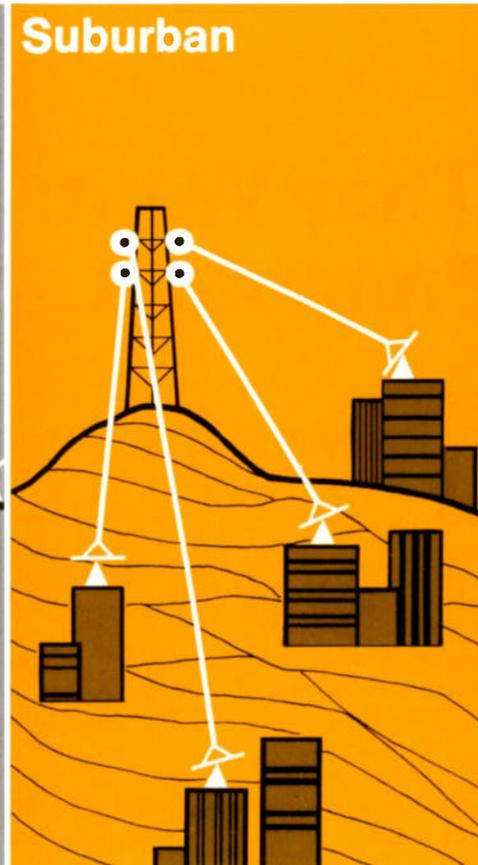
Vastly Increases CATV Subscriber Potential



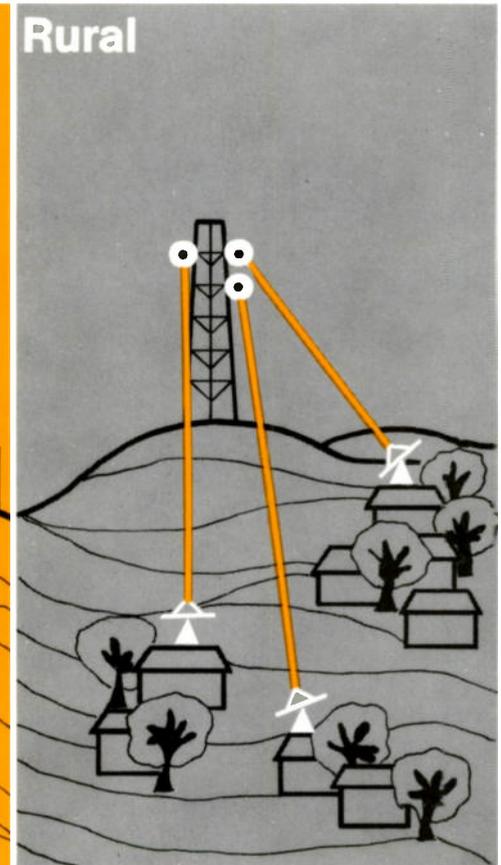
Complete Laser Link transmitting and receiving cableless CATV terminal shown.



Urban



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Rural

One cableless Laser Link transmitter at each "headend" and each origination point of an existing CATV System can beam up to 18 channels from each location to millions of city subscribers more quickly, economically and efficiently than any other method. Eliminates costs, rights of way, pole line charges, and delays of cable construction.

New Laser Link system makes it easy and profitable for every suburban CATV operator to expand his present system into tens of thousands of additional homes — in or near his area — without costly, cumbersome trunk cables.

Cableless Laser Link QLL12 enables any rural CATV system to expand profitably into surrounding areas by transmitting 12 channels over a 20 mile range or more — without paying the price of a "dry trunk."

Cableless Laser Link, when added to any headend, can transmit 12 to 18 channels simultaneously on a single FCC assigned carrier (12.7-12.95 GHz) to other Laser Link receiver locations over distances exceeding 20 miles.

By utilizing pencil-shaped transmitter beams, Laser Link eliminates the delay, expense, and trouble of trenching cable through asphalt and concrete — vaults signals over barriers of terrain and water. Result: You can extend present CATV service into other contiguous or distant areas, regardless of trunk cable continuity.

Our engineers and management will be pleased to assist you in your (1) financial planning, (2) FCC documentation preparation, (3) surveys and studies of technical and economic viability of the Laser Link application you require — at no obligation. Write or phone us collect today for prompt action.

features

- All equipment backed by performance guarantee.
- Compact — no bulky racks or banks of equipment.
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- 12 to 18 channels on single carrier over 20 mile range — to single or multiple receiver locations.
- Unique modulation technique delivers high signal-to-noise performance despite weather and noise conditions.
- Turnkey installation available on request.



Laser Link Corporation

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Phone (212) PLaza 1-6868

*FCC Rule-Making Docket No. 18838. "This equipment may not be sold until tested and type approved by the FCC."

*FCC Rule-Making Docket No. 18838

Learn What They Want: Provide It & Promote It

When a formula for local programming has been determined, an active promotional effort must be undertaken. Get their attention. Tell 'em what you have!

The key to successful cablecasting is programming. While programming is the what, where, when, and how of the material sent out on cable or air waves, its success can be measured only by the reaction it receives.

Whether a potential viewer listens or watches depends on the individual's needs and desires. If he wants a certain type of entertainment and it is not

available he either goes without it or seeks it elsewhere.

The spectrum of entertainment in itself is vast, for it encompasses many active and passive elements. Games of skill and chance as well as educational material are active programs because they require thought, calculation, or the ability to draw on past data for a solution. Exercise programs go one step further by requesting physical participation. Passive programming does not require thought or action. Programming of this sort would include westerns, soap operas, and cartoons. Talk programs are generally a mixture of active and passive elements.

ABOUT THE AUTHOR

Roland O. Reed is the National Sales Manager for R Associates, producers of "Parsley, Sage, Jani and Love," and distributors of "The Dennis Wholey Show" for CATV. Prior to joining R Associates, Roland spent three years producing radio and TV programs for the Air Force, two years in corporate promotion for Westinghouse Broadcasting Corporation, one year as

Assistant Production Manager of the Merv Griffin Show and a year as Program Manager for WNEP-TV, Scranton, Pennsylvania (Taft Broadcasting). His experience also includes promotion of the "Dennis Wholey Show" when that program ran on 22 TV stations, prior to its release to CATV.



Study Your Prospective Audience

The fact is, programming is not as simple as it might appear. First you must find out who your audience is and what it is that they want. Don't be led to believe that what you want is what they want.

A brief survey of your community will help to give you an idea of what your viewers would like. Such a survey should include: income, education, recreation, community involvement, personal preferences, and current radio, television, and newspaper habits. Then you must seek out ways to give them wholesome programs that answer their needs. Some of these needs are fulfilled on the channels you are presently carrying on cable. Others are not.

While it is impossible for television stations serving a large area to cover every local event in the communities in their coverage area, you can! You can

do it well—even better than competitive media. Cable can cover local happenings at community institutions such as council meetings, scholastic sports, and open houses. Thereby, cable can become a vital means of communication within the community. Cable should not offer only limited programming. It must offer a variety and truly serve its community and entire coverage area.

A Regular Schedule Is Mandatory

Seek programs that are of interest to as many viewers as possible. Gear programming to attract an audience by building blocks of programming. A regular schedule is mandatory, for it develops a continuity in programming and fosters a regularity in viewing habits.

Do not make the mistake of trying to do too much too soon. Build your programming so that the economic base can support your efforts. There is an old saying, "Don't run 'til you can walk," and indeed, it applies here. Find out what your audiences want, then give it to them as often as you can and on a regular basis.

Promote Your Programs

Now that you have selected programming and developed a schedule, it is time to let your audience know about your programming and cable system. Successful promotion is centered on the development of an organized plan or concept. What is the purpose? To promote viewership of specific programs, improve relationships in the community, and promote subscriber hook-ups.

One of the most important and often overlooked promotion devices is your own system. Thirty-second and sixty-second promotion spots can be prepared and aired in and around your own programming, and in place of duplicated network programs, to let the viewers know what is coming and what regular features are on your cablecasting channel.

Viewers often tune around the dial, so don't think that because a spot has been shown five times that everyone has seen it five times. Rotate it vertically and horizontally so that it is seen on different days at different times. It does not hurt to have several different promos about the same subject, cut at the same time, because it will make the material seem fresh and exciting. Do this live, on tape, or with slides and art work with an audio cartridge or tape.

The time and weather and community information (rotating wheels) channels offer an excellent location for printed information about what is on the cablecasting channel schedule. Even a brief mention of upcoming events in your live programming is greatly appreciated by viewers.

Trade Advertising Space/Time

Cross media promotion can be established at little or no cost. Reciprocal trade agreements should be established offering a newspaper or radio station \$1,000 worth of cable advertising for \$1,000 worth

of ad space or air time. A reciprocal agreement works to your mutual advantage because no money changes hands, and it does not become an expense item or an income source (which helps at tax time).

Normally each party charges a mechanical or make-up charge for any out-of-pocket costs. Reciprocals can help both media because you are not, in fact, after the same audience at the same time, and an awareness of both media increases the circulation of both.

The success of newspaper and radio promotion is measured in the effectiveness of your promotion material, and not in the dollars spent. Sharing news stories daily with your local media can go a long way in getting a story about your new plant, open house, or system construction to the public.

Newspaper ads do not have to be large to be effective, if you employ proper techniques. Reverse ads (white on black) placed properly (preferably right page, right side above middle) on the television page can provide excellent results. Program information supplied by programmers, including pictures and stories about the stars and programs, will get space because they are available and are offered as a service by the cable company.

Radio spots should be brief, to the point, and heard often. Short (10 and 15 second) audio cuts can be recorded by your local talent to promote the programs and features available exclusively on your cable channel.

Consider Unusual Promotions

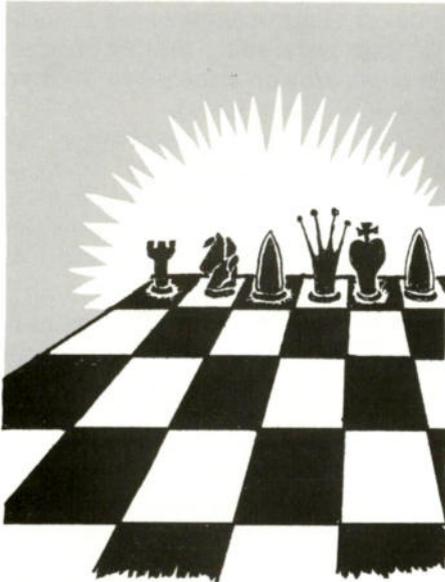
Create excitement by having contests and doing the unusual. Rent an airplane and tow a sign or use a hot air balloon for a contest. Cover local parades and fairs, and let people know what you are doing.

If your studio or offices are located in a shopping area or other heavy traffic area, place several color television sets in your front window and tune each to a different channel available on your system. Have a speaker connected to your cablecasting channel so that people passing on the street can hear and see what you are up to.

Hook up all television repair shops and advertising agencies at no charge, and place attractive signs about the advantages of cable in each repair shop. Give the serviceman the cable story. Print a brochure explaining cable's advantages.

Have little bags (promoting a cleaner community) printed with a number on one side and a message by the sponsor who paid to have the bags printed on the other. Then each day draw numbers corresponding to the ones on the bags and offer prizes to people who are watching. Give the Boy Scouts a chance to promote paper drives, and have them pass out handbills at shopping centers and door-to-door.

These are by no means the only ways to promote, but they are effective. Develop a theme and pursue it with creative thought and lots of effort. Keep your cable company in the eyes and minds of the public. It will pay off. You must make your community aware of who you are, what you are, and what you are doing.



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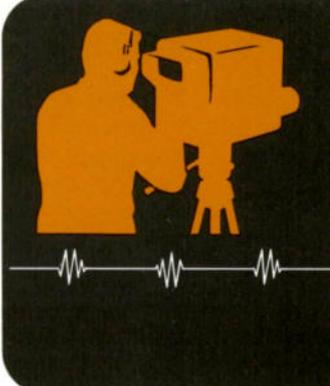
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STUDIO

Equipment

A special monthly section devoted to TV programming operations in small studios

Hand Control Unit Is Heart of New Studio Setup

A new device developed by Diamond Power Specialty Corporation (P.O. Box 415, Lancaster, Ohio 43130) makes it possible for one man to control a complete closed-circuit television studio system. The remote control electronic unit, called Hand Command, combines all the operations normally done by three or four men.

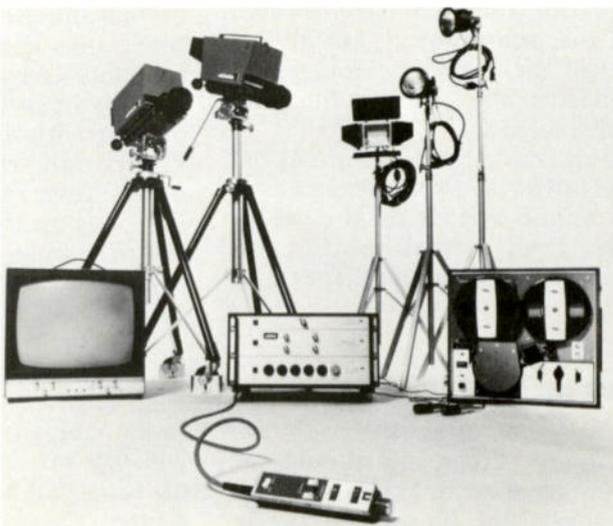
With Hand Command, a single producer/director/cameraman has at his fingertips the ability to switch the picture from one camera to the other and control six special effects. Using the five controls on this 14-ounce hand unit he can make switches, corner inserts, position reversals, fades, superimpositions, and both horizontal and vertical splits. The system with all optional accessories lists at \$10,680.

Diamond Power describes the system as the consolidation, coord-

dination and simplification of all the mechanical aspects of TV production. This leaves the director free to concentrate on the creative contributions he alone can bring to the programming.

Within about an hour of instruction, a producer/director/cameraman perform all the basic TV techniques with the Hand Command control. The total system includes: the hand control; two solid-state viewfinder cameras; a control center; one ½-in. video tape recorder; two customized camera tripods and a professional audio system.

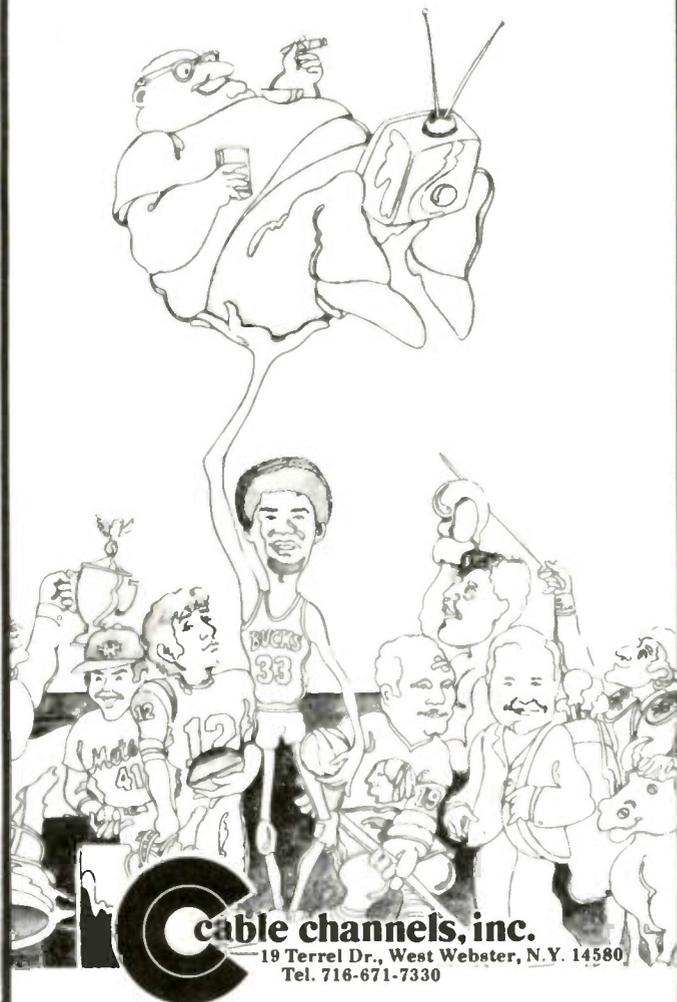
Standard accessories include zoom camera lenses; a 3-unit quartz light kit for key, fill and back lighting; two dynamic low impedance lavalier microphones with auxiliary stands; and an instructional video tape on techniques of Hand Command operation. FVC



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When he finds out that you are featuring the most exciting and diversified blue-ribbon sports package ever assembled for the dedicated sports fan. NFL and college football classics, top NCAA events, America Cup races, boxing, championship golf and bowling, the blazing Indy "500", world famous hunting and fishing ... even Bridge with Goren ... and more. All our video tapes are pre-cued for local advertising.



Cable channels, inc.
19 Terrel Dr., West Webster, N.Y. 14580
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New From Halline



The HALLINE Model EMES-25SLA Aerial Ladder is a compact and versatile unit, designed to mount on a 3/4 Ton chassis (built up to camper special specifications) with single rear wheels. Mounting the EMES-25SLA on a 3/4 chassis provides a unit that is easy to handle in heavy vehicle traffic or confined space at the job site. The EMES-25SLA with its counter-weighted pedestal design is completely stable without the use of outriggers or ballist added to the chassis frame.

An Aluminum Self-Leveling Basket combines durability with light weight design to provide a large comfortable work platform that remains level regardless of the degree of ladder elevation.

The EMES-25SLA Aerial Ladder has a ground to bottom of work platform height of 25 feet and a comfortable working height of 30 feet. Full top controls are available to give the workman full control of the ladder from the work platform. The top controls are mounted on the self-leveling basket and remain in the same relation to the workman through the complete elevating arc of the ladder.



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GUARDSMAN

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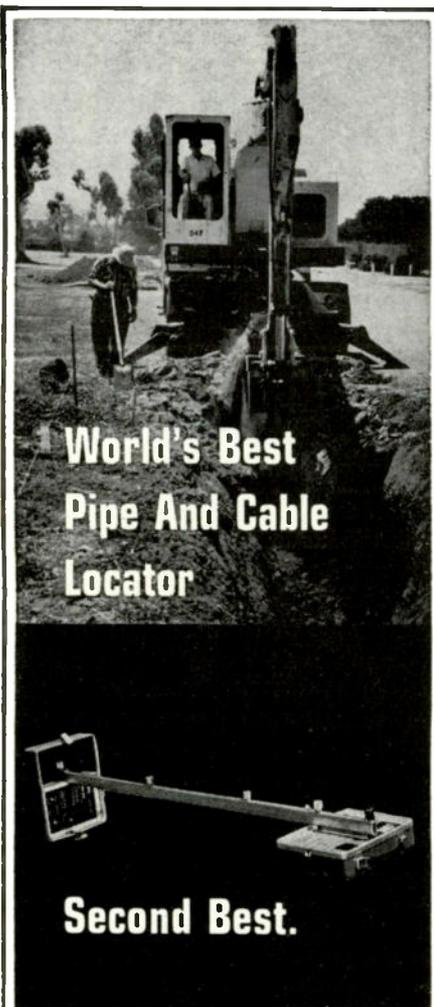
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CATV Programming

software news and tips

Seminar on CATV Ads/Programs

The first annual CATV Advertising/Programming Seminar has been announced by Thom Keith, Director of the Center for Communications. See page 87 of this month's TVC for the big names that will be there... for costs... and for registration information. The December 6-9 meeting will be geared to show CATV operators how to design programming to attract advertising dollars.

The session is intended to give cablemen an opportunity to meet advertising people who have money available now for CATV. No doubt ad agency people will be falling over each other for the opportunity to place ad dollars with cable people. Seriously though, if the seminar speakers make a reasonable attempt to understand today's CATV, the sessions could prove to be very much worthwhile. This writer wishes well to anyone who will work toward the practical professionalization of CATV programming and its associated revenue-producer: advertising.

Another meeting of interest to CATV programming people is a panel discussion which will be held during the Nov. 4-6 meeting of the California Community Television Assn. That panel, sponsored by CCTV's new committee on local origination (headed by Tony Acone of Coachella Valley TV) will review CATV programming from the varied viewpoints of programmers, software suppliers and system management. The recent establishment of CCTV's local origination committee should spell greater emphasis on program development by this and other cable associations.

Here are five pieces of literature CATV programmers should have in their files. U.S. Government Films, a catalog of motion pictures and filmstrips for sale by the National Audiovisual Center, Washington, D.C. 20409. No price is shown on the 165 page book. Films For Television 1970 is the title on a new listing of 550 free films for TV. For a free copy of the 48 page catalog, write Modern Talking Picture Service, 1212 Avenue of the Americas, New York, N.Y. 10036. A recent HEW release says "The Department of Health, Education and Welfare is prepared to help CATV system operators acquire materials to meet your systems' program-origination needs." Write them for their most recent bulletin on "people oriented" public information films — HEW, Office of Public Information, Audiovisual Services, 330 Independence Avenue, S.W., Washington, D.C. 20201. Educators Guide to Free Films is a 798 page listing of free films available from government, industry, educational and other sources. This \$10.75 book is available from Educators Progress Service, Randolph, Wisc. 53956. Last but not least, if you are a member of the National Association of Broadcasters (or have a friend who is), you can write to NAB for a copy of their 55 page directory of films available (mostly free for CATV use) from government and civic agencies. All films listed have been cleared for commercial TV. Write to NAB at 1812 K Street, Washington, D.C. 20006 (but don't tell them TVC sent you... remember, cable people are regarded as their enemy!) TVC

November 1970

TV Communications

CATV Technician

This Month...

**Short Haul Microwave
An Antenna Built for CATV
Two-Way Transmission**



Shown above is a UHF parabolic section receiving channel 44 from San Francisco. It is located at Almaden, one of five head-ends currently bringing 20 channels to San Jose, California.



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Short-Haul Microwave And the CATV Industry

Short-haul microwave links are likely to find increasing use by the CATV industry. Transmission characteristics, problems and typical applications are covered in this state-of-the-art review.

Microwave relay systems were first used in the 1940's. But almost twenty years passed before authority was extended by the

FCC for the private business community to share in their use.

Since 1960, however, the number of microwave users has increased very rapidly to the point where many frequency bands are fully saturated. This rapid growth has caused relentless pressure to be directed to the development and use of ever higher frequency bands.

In recent rulings the FCC has allocated the 12.7 to 12.95 GHz frequency band for use within the CATV industry as Community Antenna Relay Stations (CARS). The use of such microwave stations offers great flexibility in transporting CATV signals. System operators should have an appreciation of microwave propagation characteristics and equipment design techniques in order to gain an understanding of what may and what may not be expected from the use of microwave services.

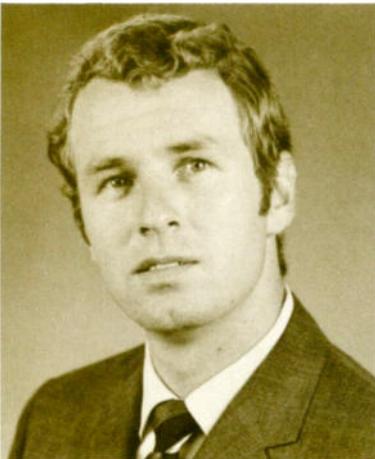
Microwave Applications For Cable Television

Short-haul microwave links are employed in the CATV industry for three main purposes: inter-city

relay, studio to head-end link, and remote pick-up. A single head-end may serve several neighboring communities if a microwave link is established between the communities and the common head-end. Smaller communities which would not justify the investment of a separate CATV head-end system may more easily justify the cost of a multi-channel microwave system if the output of the microwave system can be split and furnished simultaneously to receivers in each community. As many as ten channels may be transmitted on CARS band systems, using FM transmission techniques. With AM transmission techniques, a larger number of channels may be transmitted.

It is usually advantageous to use microwave for studio to head-end links which are longer than two to three miles. Installation of a microwave system is relatively inexpensive and maintenance is probably less than would be required on trunk line amplifiers in an equivalent cable system. In addition, a microwave system may be bought and depreciated rather than leased indefinitely (as is the case with services provided to

ABOUT THE AUTHOR



Robert G. Holman is a Marketing Manager for Scientific-Atlanta, Inc. He received his BEE and his MSIM from Georgia Institute of Technology. Additional graduate study was done at the University of Munich, Munich, Germany. Before joining Scientific-Atlanta, he was employed by the Long Lines Division of AT&T.

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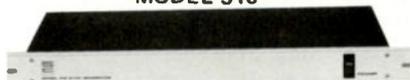


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cable operators by telephone companies).

Remote pick-up is the most obvious application for microwave use. Depending on the system's mechanical design, transportation requirements may cause little or no difficulty. At least one manufacturer has designed the high frequency transmitter and receiver units to be mounted directly behind the antenna, simplifying the installation procedure since such an equipment configuration allows the use of standard co-axial cable rather than waveguide. The typical set-up time for such a remote pick-up terminal is thirty minutes to one hour.

In general, the advantages of microwave for short-haul requirements include the following points:

1. Microwave is the least expensive alternative for many applications

2. It offers ease of transportation and relocation

3. No long installation delays are experienced

4. The system may be purchased and depreciated.

Possible disadvantages are:

1. An FCC license is required

2. A line-of-sight path is required

3. The antennas must be redirected for each different remote pick-up location.

FCC Regulations On Microwave

Present FCC regulations governing the operation of microwave systems in the CARS band are found in volume 3, part 74, subpart J of the FCC Rules and Regulations. Ten primary channels, as well as nine secondary channels, have been allocated

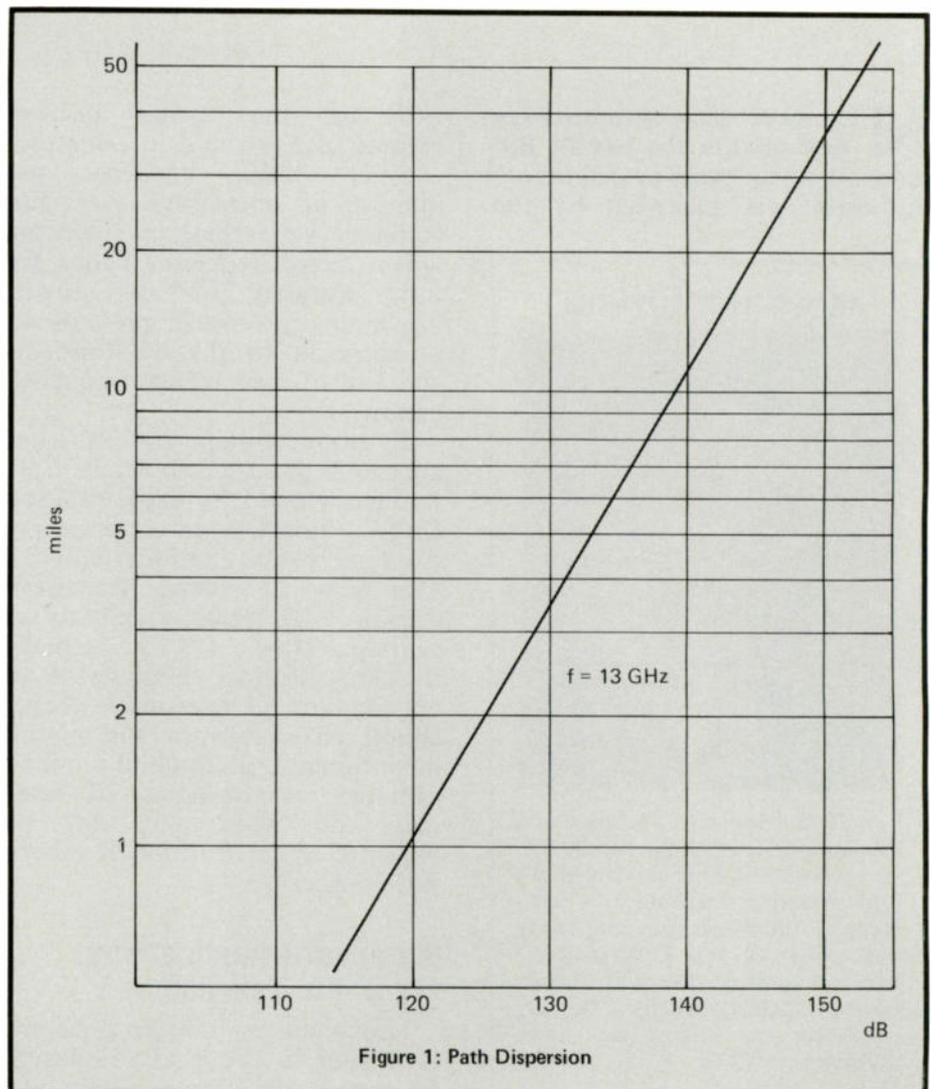
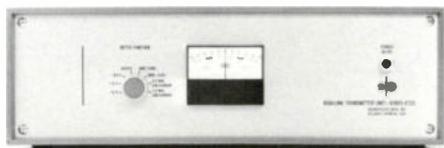


Figure 1: Path Dispersion

within the 12.7 to 12.95 GHz frequency band. Each channel may occupy no more than 25 MHz bandwidth.

The transmit and receiving antennas may vary in size according to the gain required over the transmission path; however, the 3 dB beamwidth of the transmitting antenna may not exceed 3°. This beamwidth restriction effectively sets the minimum antenna reflector size at a diameter of two feet.

A wide range of microwave equipment is available for CARS band operation, and each equipment manufacturer must demonstrate to the FCC that his equipment meets several minimum



Above: Front-panel view of Scientific-Atlanta "Busi-Link" microwave transmitter. Left: View of a studio terminal in a studio-to-head-end microwave link. The S-A "Busi-Link" system is designed for hops of up to 25 miles.

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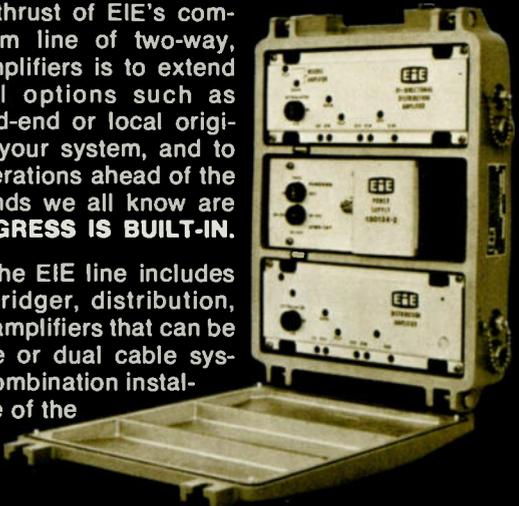
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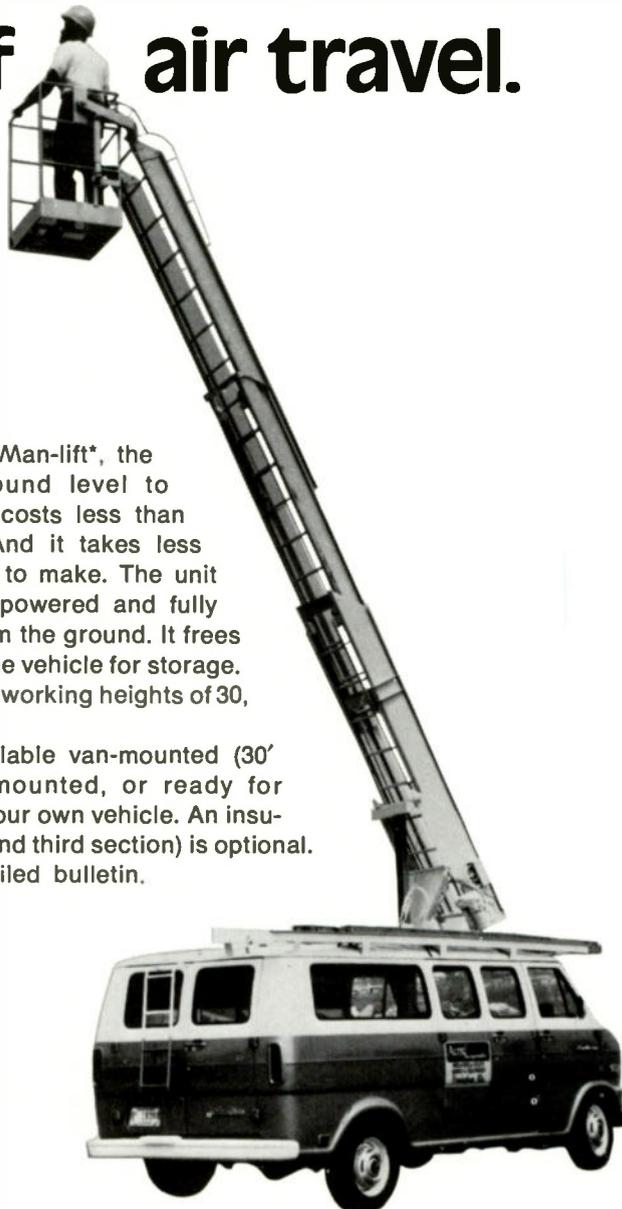
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Table I: Signal Characteristics for Various Reflector Sizes.

Antenna Diameter	Gain (50% Efficiency)	3 dB Beamwidth	Allowable Tower Twist
2'	35.5 dB	2.8°	±2.2°
3'	39.0 dB	1.9°	±1.4°
4'	41.5 dB	1.4°	±1.1°
5'	43.5 dB	1.1°	±1.0°
6'	45.0 dB	0.9°	±0.8°
8'	47.5 dB	0.7°	±0.7°

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operating specifications. Certain obligations are also placed on the operator of microwave equipment.

For example, an operating license must be secured by the operator from the FCC before service may be begun. Usually the equipment manufacturer is willing to offer assistance in completing this license application. In addition, a log or journal must be maintained by the operator and must contain entries showing the dates and times for all transmissions.

Basic Characteristics Of Microwave Transmission

Several useful comparisons may be made between the electromagnetic signals transmitted in the CARs frequency band and visible light. The wavelength of CARs band signals is approximately 0.9 inches, some 45,000 times longer than that of the wavelength of light. However, the two waves have very similar physical properties. Both tend to travel over straight, "line-of-sight" paths; both may be reflected and refracted; and both tend to dissipate over a given transmission path. Each of these characteristics must be considered in planning a microwave link. The antenna size and the tower height may be varied to satisfy the transmission requirements.

The graph in Figure 1 gives an indication of the amount of dispersion experienced for 13 GHz signals. This dispersion is to be expected since neither microwave signals nor visible light remain the same size as their sources. Instead the waves spread out in all directions and the signal energy spreads out accordingly. A parabolic reflector, which is generally employed in microwave links, focuses the signal energy into a small, cone-like beam. The width of this beam varies inversely with the size of the reflector as shown in Table I.

As the size of the reflector increases, it becomes increasingly more difficult to aim correctly. Correct aim (boresighting) is necessary if the maximum gain from the reflector is to be realized. The beamwidth of a

given reflector is also important in the determination of the allowable tower twist if the reflector is to be tower mounted. Star mounts may be required if wind conditions would cause the tower twist to exceed the amount shown in Table I, since the full gain of the antenna would otherwise not be realized and the signal might be temporarily lost.

If a microwave system is to perform dependably, a certain amount of excess signal strength must be available above that level which is actually required to yield a usable signal. This excess signal is called "fade margin" and is necessary to assure that the signal is not lost under conditions of fading. Microwave systems always include an allowance for a certain amount of fade margin; however, there is no general agreement as to how much fade margin allowance is enough.

Each extra dB of fade margin decreases the chance of losing the signal due to fading, but, at the same time, each extra dB usually increases the system cost. As a result, microwave systems are logically engineered in accordance with the amount of "down-time" the user can tolerate. An examination of the types of fading and the causes of fading will be helpful to CATV operators in understanding the operation of microwave links.

There are two broad classifications of fading: frequency selective fading and flat fading, which is nonfrequency selective. Selective fading is due to irregularities in the atmosphere which cause the signal to have multiple paths to the receiving antenna instead of following the expected direct path. As a result, two or more separate components of the signal may travel over slightly different paths and arrive at the receiving antenna out of phase with each other. These out-of-phase components tend to cancel each other and cause the effective signal strength to drop. If the components are of equal amplitude and are 180 degrees out of phase with each other, total cancellation can occur. For 13 GHz signals, a difference of about one-half inch in the distance traveled by two signal components

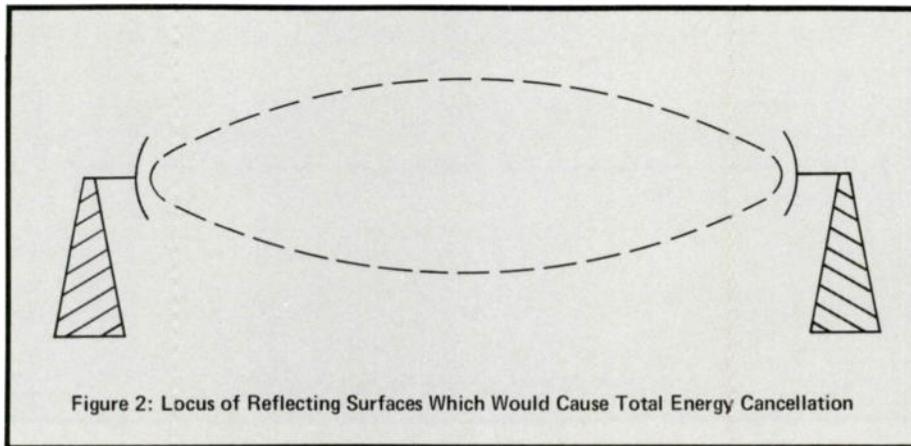


Figure 2: Locus of Reflecting Surfaces Which Would Cause Total Energy Cancellation

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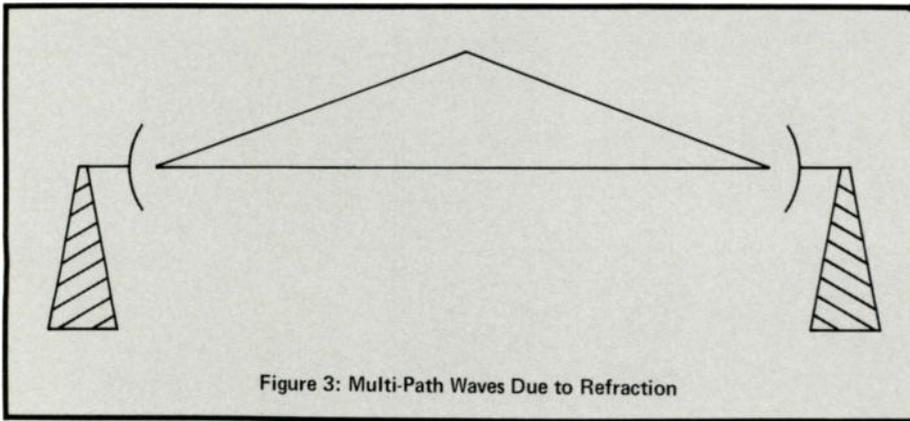
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can cause energy cancellation at the receiving antenna.

Because of this cancellation effect it is important to aim the transmitted beam so that reflected signals do not cause an intolerable amount of interference and cancellation. If reflecting surfaces are far enough away from the direct signal path the cancellation effect is lessened. Figure 2 shows a line representing locations at which reflecting surfaces could cause total energy cancellation. This line is an ellipse and is called the first Fresnel zone.

The amount of clearance between the direct path and any obstruction must be greater than the distance represented by the first Fresnel zone to reduce the cancellation to tolerable levels. The Fresnel zone clearance for 13 GHz signals is approximately twenty to fifty feet (at the widest point), depending on total path length.

Although physical obstructions can usually be avoided, or at least minimized, multi-path fading still may occur due to atmospheric conditions. The density of air

changes irregularly due to changes in temperature, and portions of the transmitted signal are bent at unpredictable angles, causing some refracted waves to arrive at the receiving antenna out of phase with the direct wave. It is quite possible, in fact, for the entire beam to be bent so that none of it arrives at the receiving antenna. (See Figures 3 and 4).

Multi-path fading due to atmospheric conditions may be statistically predicted. Fades of 30 dB may be expected approximately 0.06% of the time or about 5.6 hours per year. Conversely, a microwave system with a 30 dB fade margin could be expected to be operable 99.94% of the time.

Heavy Rain Can Alter Microwave Signal Strength

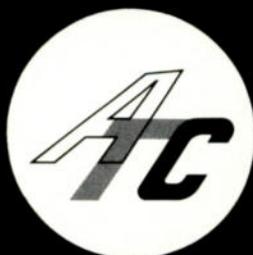
Most flat fading at 13GHz is caused by heavy precipitation. Microwave signals are attenuated by precipitation in two ways. Moisture absorbs the energy while water droplets scatter it. The severity of the attenuation

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Yours truly,

Eugene R. Moon
Eugene R. Moon
General Manager

ERM

depends on the size of the droplet, the volume of water involved, and the signal frequency. Heavy rain causes much more attenuation than light rain. For example, in the 13 GHz frequency range, a rainfall of 0.1 inch per hour causes about 0.1 dB of attenuation per mile, while a rainfall of 2 inches per hour causes about 5.5 dB of attenuation per mile.

Interestingly, there appears to be little correlation between annual rainfall and expected outages. Outages (excessive attenuation) are caused by high instantaneous rainfall rates; however, heavy rain tends to be localized in "cells" which rarely exceed four to five miles in diameter. Fortunately, too, heavy rain is generally of short duration and fade margins of 30 dB will usually be sufficient to allow signal transmission under all but the most adverse circumstances.

Recent studies have shown that geographical areas of the country which have frequent, high instantaneous rainfall rates can be identified. The Gulf Coast tends to

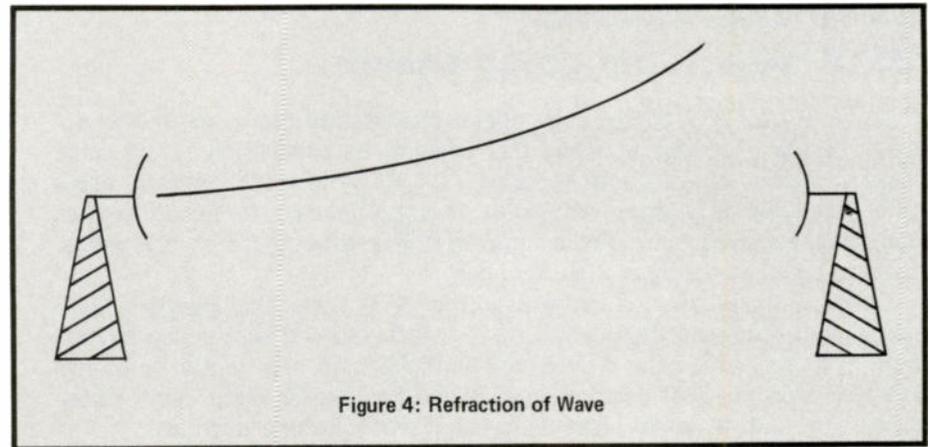


Figure 4: Refraction of Wave

have the most severe rainfall occurrences while other sections of the United States have progressively fewer severe occurrences as the distance from the Gulf increases. As a result, microwave systems in areas near the Gulf Coast should be engineered with more fade margin than is required for systems in other geographical area.

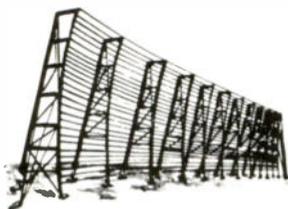
For example, a 30 dB fade margin provides a precipitation reliability of about 99.9% over a fifteen mile hop in southern

Mississippi, while an identical link in Maryland would have a precipitation reliability of about 99.98%. This difference is solely due to the fact that Mississippi can expect more frequent, severe rainfall than Maryland.

Luckily, the system fade margin does not normally have to be divided simultaneously between selective fading and precipitation fading. The atmospheric conditions which cause selective fading do not tend to occur during periods of rainfall, and the total



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CATV construction: GMP makes the going easier

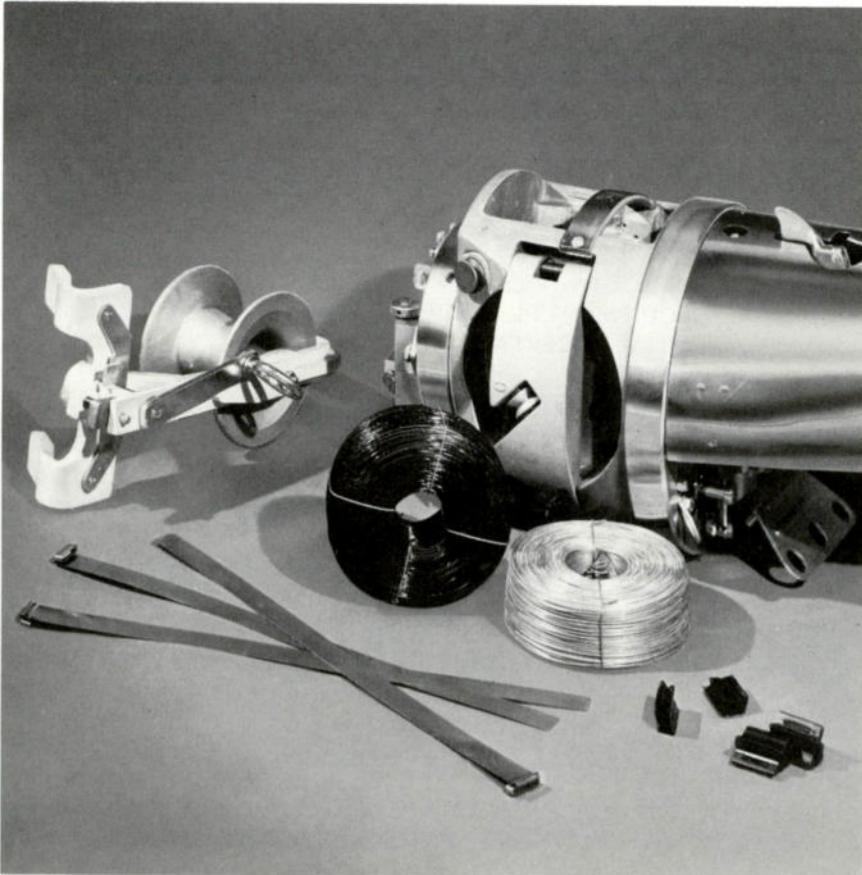
If you've got a CATV construction chore, chances are GMP's got the equipment, tool or accessory to speed that chore to its completion. From cable lashers, blocks, spacers and supports . . . to cable block pushers, cable guides and guards, lashing wire grips, drop wire clamps, extension handles and safety equipment . . . there's a quality GMP product to match your needs. Here's a small sampling of what we mean.

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fade margin may be applied to either type of fading.

In general, rainfall attenuation does not prove to be as much of a problem as it might first appear. In most areas, precipitation rarely occurs at rates of an inch or more per hour, and when it does, the duration is usually quite short. Also, since CATV systems operate only about eighteen hours per day, some 25% of the potential outages during a year would occur during the early morning hours when there is no transmission, thereby reducing the expected yearly outage by 25%.

In planning a microwave system, a certain minimum amount of fade margin is required to buffer the effect of selective and precipitation fading. Although there is no general agreement as to the correlation between fade margin and reliability, a 30 dB fade margin is thought to be sufficient for a propagation reliability of 99.9% or better under average conditions. This amount of fade margin will prevent all but about 0.06% of the cases of selective fading and it is sufficient to counteract reasonable amounts of rain attenuation. A higher fade margin is not necessarily to be recommended since only extremely high margins can provide uninterrupted service if a rain cell passes through the transmission path.

No significant improvement in service would be realized, for example, by increasing the fade margin by 5 or 10 since a rain cell would likely cause outage in such a system for about the same period of time as for the system with 30 dB margin. Also, the incremental price of each extra dB should not be forgotten. Providing an additional 10 dB of fade margin could increase the system price by as much as 25% to 30%.

Typical Equipment For Short-Haul Microwave

The most common type of transmitter employed today for FM microwave links use klystron tubes. When operated at CARS band frequencies, these tubes offer typical power outputs between 0.5 watts to 1.0 watt and

Table II: A Comparison of Microwave Transmitters.

Transmitter Type	Power Output Watts	Typical Operating Life	Normalized Cost Per 1000 Hours Operation
Klystron	0.5 to 1.0	15,000 hrs.	3.75
Harmonic Multiplier	0.1 to .25	100,000 hrs.	1.3
Gunn-effect or Avalanche Oscillator	0.025 to 0.1	100,000 hrs.	1.0

have a typical operating life of 15,000 hours.

At the present time, new equipment is being developed for CARS band operation with completely solid-state transmitters, utilizing either the harmonic-multiplier or the fundamental oscillator types of frequency generation. These transmitters require power supplies which are simple and inexpensive and they offer klystrons.

The power output furnished by solid-state transmitters is somewhat less than that available from klystrons. However, as the state-of-the-art advances, this difference is being lessened. Table II compares the relative cost, power output, and operating life of typical CARS band transmitters.

Gunn-effect transmitters with power outputs in the 25 to 50 milliwatt range can provide system fade margins comparable to those provided in systems having higher transmitter power, if the compact, Gunn-effect transmitter is located at the antenna. Such an arrangement is particularly suitable for remote pick-up and short-range studio to head-end links. Present day CARS band receivers are completely solid-state and utilize local oscillators which may be stabilized by a crystal, an oven, or by an AFC system.

Although the receiver and transmitter designs must be directed toward long life performance, the need for maintenance and periodic repair cannot be overlooked. This service can be accomplished more easily if the equipment is designed to allow convenient maintenance during operation, and if the equipment is designed with plug-in circuit modules which can easily

be replaced. It is desirable, in fact, for a front-panel metering circuit and function selector switch to be included to enable rapid, on-the-spot evaluation of equipment performance and identification of faulty circuits or modules

Microwave Is Important Part of CATV Future

Short-haul CARS band microwave links will soon be in widespread use in the CATV industry;

particularly for remote pick-up, studio to head-end links and inter-city relay. The CATV operator can expect high performance and reliable service from these systems over path lengths out to twenty-five or thirty miles.

The available equipment is designed for long life, low maintenance, and ease of operation. In many cases, microwave technology offer a less expensive alternative to leasing lines or laying cable. With a basic familiarity of transmission characteristics and equipment design techniques, CATV operators can select a system which offers top-quality transmission of TV signals. TVC

REFERENCES

1. Transmission Systems for Communications, The Bell Telephone Labs.
2. The Lenkurt Demodulator, Lenkurt Electric Company.
3. Television Engineering Handbook, D.G. Fink.

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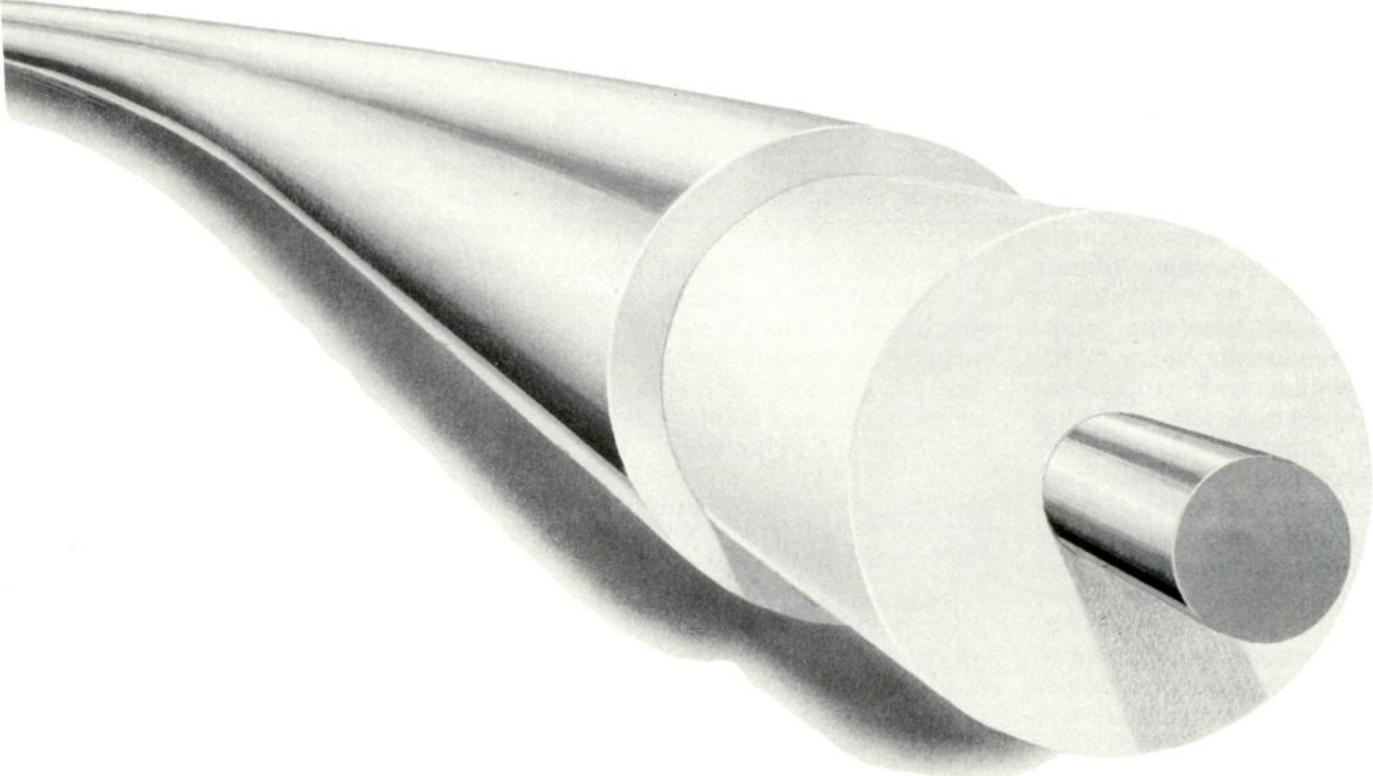
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TA-4J*	.0752	.362	.412	.480	100
TA-5	.098	.450	.500	—	102
TA-5J*	.098	.450	.500	.575	132
TA-8	.146	.690	.750	—	218
TA-8J*	.146	.690	.750	.850	274

ATTENUATION IN DECIBELS PER 100 FEET

CHANNEL	2	3	4	5	6	7	8	9	10	11	12	13
TA-4, TA-4J	.77	.82	.86	.93	.96	1.46	1.49	1.51	1.54	1.56	1.59	1.61
TA-5, TA-5J	.63	.68	.71	.74	.79	1.12	1.15	1.17	1.20	1.22	1.24	1.26
TA-8, TA-8J	.42	.44	.47	.51	.53	.80	.81	.82	.84	.85	.87	.89

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Design Considerations For Two-Way Transmission

This detailed look at bi-directional transmission was presented as a paper at the national convention of the Canadian Cable Television Association last May. Part 2.

By Michael J. Rodriguez
Executive Director of Engineering
Vikoa, Inc.

Last month, the first part of this article discussed transmission problems that tend to limit bi-directional technology; the design objectives of a two-way system and; three potential methods of two-way transmission. This second part of the article concentrates on a fourth potential method of providing for bi-directional transmission.

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

Figure 4 describes one of these means. In this scheme channels in

direction 1 occupy a frequency band different than that of channels in direction 2. At the inputs and outputs of each amplifier, diplex filters serve as directional devices to steer signals in the

directions shown in Figure 4. Signals in direction 1, which occupy frequency band 1 are blocked by filter 2, but are permitted to pass through filter 1, and be amplified. This band is

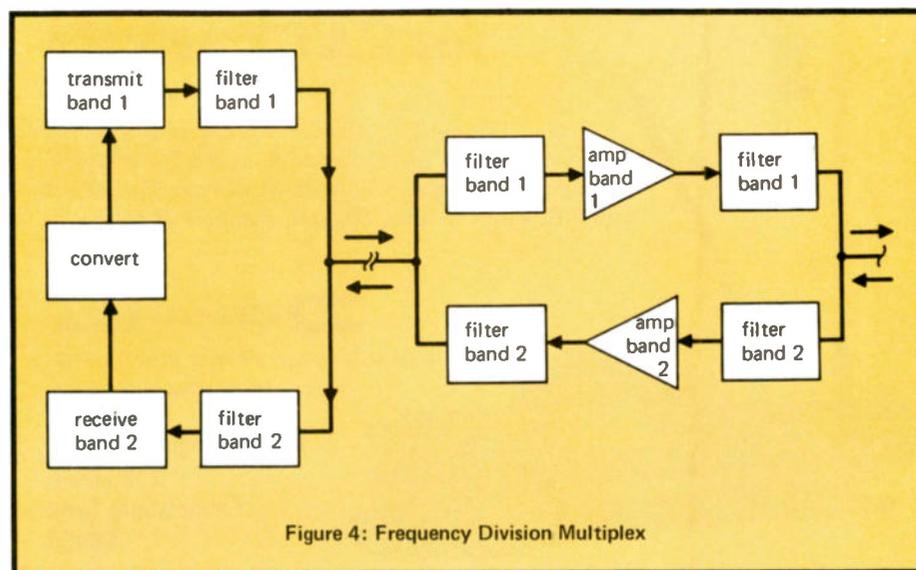


Figure 4: Frequency Division Multiplex

then blocked again at the output by filter 2, but is permitted to continue down the line.

Channels coming in direction 2, which occupy frequency band 2, are blocked by filter 1, but are allowed to pass through filter 2 to the input of the amplifier. After being amplified these channels are again blocked by filter 1 and are steered so that they continue in direction 2, down the line.

Therefore, at the expense of the addition of highly selective filters (which need not be too expensive and which are highly reliable), an amplifier is used for amplifying signals in each direction. The amplifier can be one designed specifically for extended channel use such as a Futura 21 channel amplifier, or for limited channel use such as sub-channel of 5 MHz to 35 MHz.

In order to ensure that a "singing" condition (where the amplifier output signals are returned through some feedback path to the input) does not occur, sharp skirt selectivity of the diplex filters is required. This type of "singing" condition could lead to regeneration, resulting in amplifier oscillation, or (in the case of TV signals) to a "ghosting" problem. The required adjacent band rejection for a diplex filter pair used for separation of TV signals can be derived from the sum of the following:

$$\begin{aligned} \text{required signal/ghost ratio at TV sets} &= 40 \text{ dB (industry accepted value)} \\ \text{gain of amplifier} &= n \text{ dB} \\ \text{derating factor due to } m \text{ amplifiers in cascade} &= (10 \log m) \text{ dB} \\ \text{TOTAL} &= (40 + N + 10 \log m) \text{ dB} \end{aligned}$$

In order to assure that "ghosting" does not occur under any circumstances, (i.e., if the signal delay through the complementary filter and amplifier is 1,000 nanoseconds or greater . . . also assuming a 50 amplifier cascade and amplifiers of approximately 20 dB of gain) the required filter rejection is approximately 77 dB. This requirement is not as difficult as it may seem if it is kept in mind that each arm has 2 filters.

The frequency bandwidth limitations of the amplifiers unfortunately would not contribute significantly to the total rejection since in all probability the frequency bandwidths would overlap and the most significant rejection problem occurs for frequencies in the vicinity of the filter "cross-over" points. Other significant design problems relating to the filters would be the envelope delay distortion as well as pass band ripple; however, these will be discussed later.

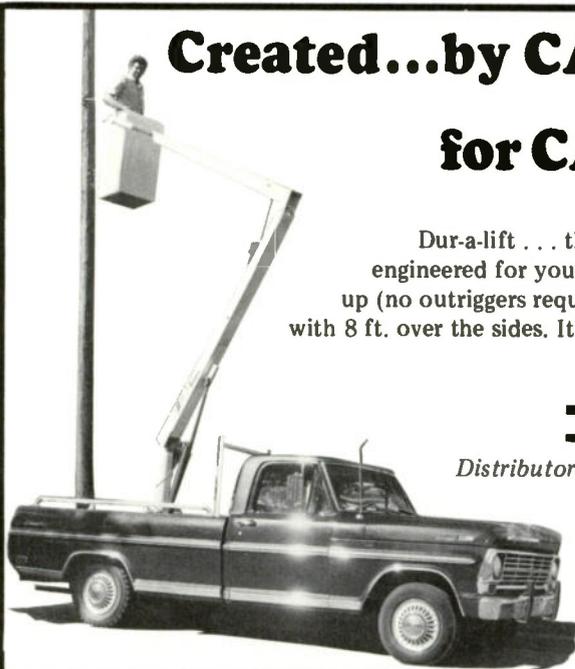
Frequency-division multiplexing is a very valid scheme for bi-directional transmission in CATV systems. Essentially it trades the complete use of available spectrum and increased, but tolerable effects of cross-talk, "singing" and echo for decreased cost, when compared to space-division multiplexing.

Frequency Division Multiplex Equipment

As indicated earlier, the FDM (frequency division multiplex) system is a reasonable compromise in terms of the technical difficulties in design, and in terms of the cost of the system.

Prior to a discussion of system design, it is best to examine the characteristics of equipment suitable for installation in a bi-directional plant. Naturally, the exact requirements of the particular system (in terms of additional services) will determine the extent to which the system must be bi-directional.

For example, if all that is required is a bi-directional trunk line for insertion of local programming, the complexity and cost of the system would be considerably less than if it were required to provide complete bi-directionality in all feeder lines. Vikoa has engineered equipment capable of



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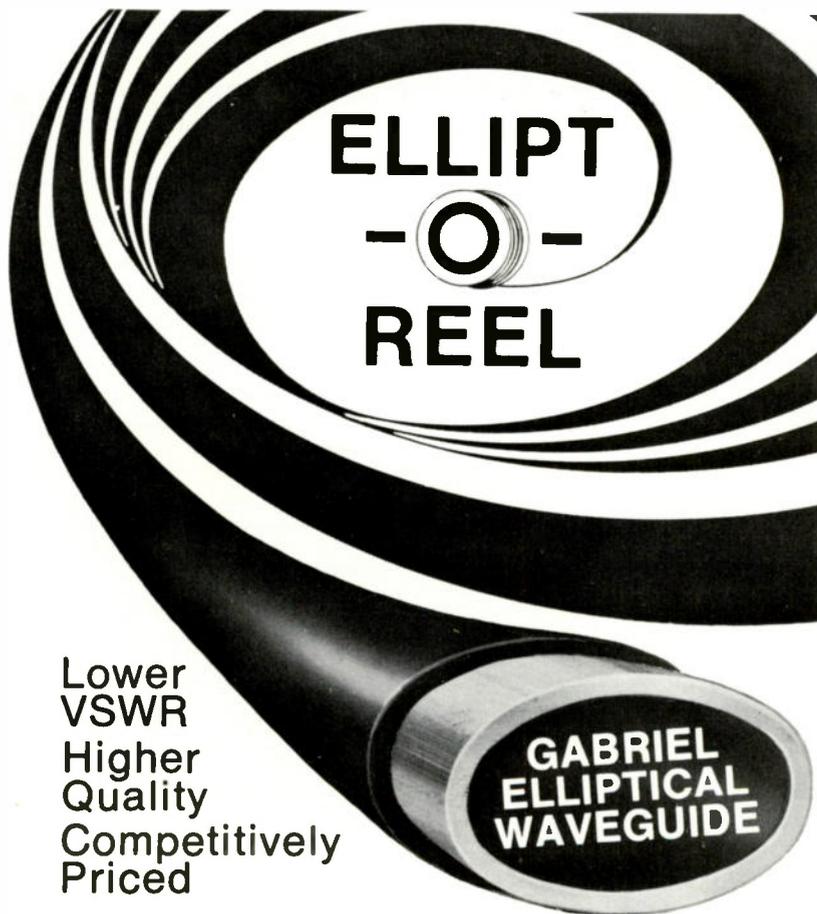
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the means of inserting into the trunkline, sub-channel returns from any or all bridger ports. In this manner, signals occupying the 5 MHz to 35 MHz spectrum (which are returning to a trunkline site from the feeder lines) are automatically inserted into the input of a sub-channel amplifier or the return path "bypass."

Definitions For Design Criteria

Perhaps the most difficult aspect of a high performance FDM system is the design of the diplexing filters. It appears that the general feeling among designers and potential users of FDM equipment is a distrust for the ability of diplex filters, not only to provide adequate frequency rejection but also to cascade successfully, and introduce negligible "envelope delay" distortion. Invariably, whenever filters with sharp skirt selectivity are considered, there is an immediate concern for the phase distortion characteristics of the filters and their possible effects on color transmission. However, before these aspects of design can be treated quantitatively, it is necessary to examine some basic definitions.

GROUP DELAY: This is defined as the rate of change of phase with angular frequency, or expressed mathematically —

$$\tau (w) = d\phi / dw$$

where $\tau (w)$ is group delay and is dimensionally expressed in seconds. More fundamentally, this refers to the time in seconds that electrical energy takes in traveling through a network.

ENVELOPE DELAY: This refers to the time of travel of the modulation envelope and does not in itself cause any distortion in the video signal. It can, therefore, be said that group and envelope delay are analogous and do not produce distortion. However, any filtering network will introduce a certain amount of distortion owing to the variation of group or envelope delay in its passband.

When the chrominance signal is not received at the same time as the luminance signal, colors will appear on the picture either on

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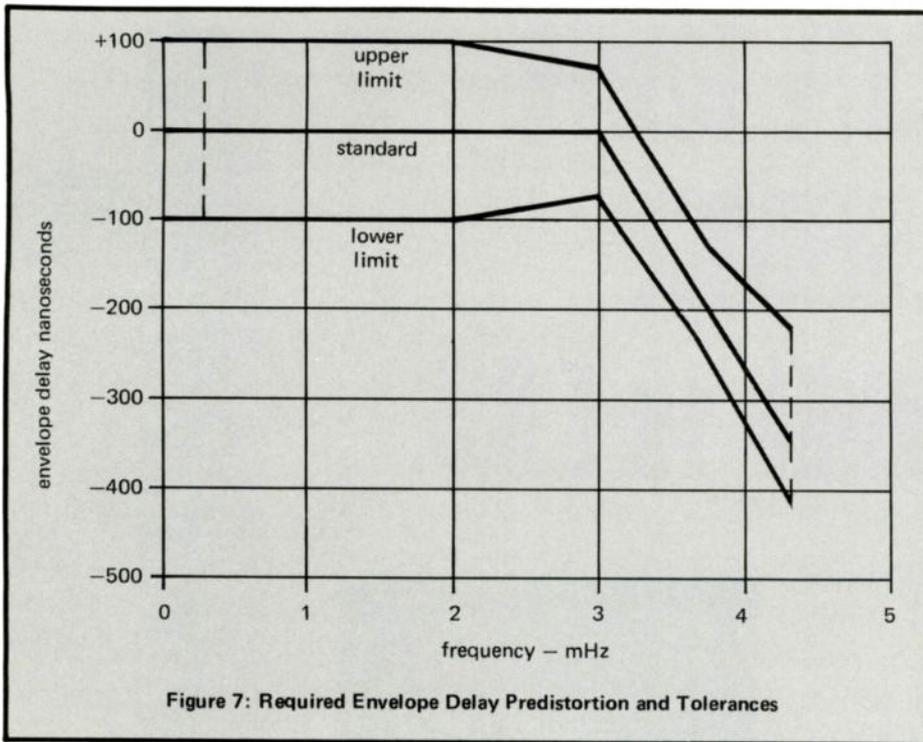


Figure 7: Required Envelope Delay Predistortion and Tolerances

Envelope delay measurements can be performed with a Rhode and Schwartz group delay meter consisting of a model # BN 17950 modulator/demodulator and indicator and a #BN17951 RF modulator. Also, they can be performed much more tediously with an HP Vector voltmeter, HP608F signal generator and synchronizer.

The FCC has established requirements on the envelope delay characteristics of a TV transmitter based on predistortion to compensate for the envelope delay distortion of the receiver. Figure 7 illustrates the required envelope delay predistortion and, of greater interest to us, the tolerances. From this graph it can be seen that if a cascaded filter system remains well within the tolerances, its effects due to envelope delay distortion should be completely negligible.

one side or the other of the image. For example, a blob of red may appear at lip level to one side or the other of a face. This condition results from improper delay rela-

tionships between the lower and upper portions of the frequency video bandwidth. The effect is referred to as envelope delay distortion.

The final portion of this article will appear next month. That part will consider design criteria... and will look at a practical experimental system. TVC

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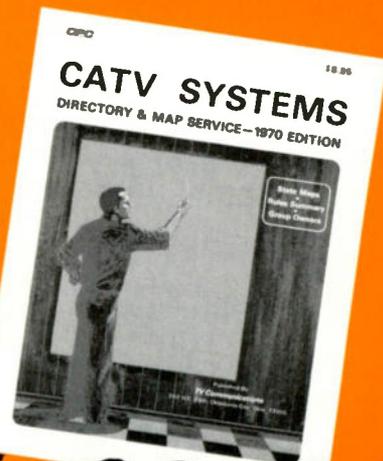
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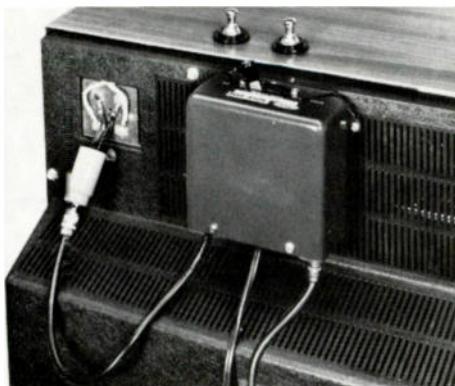
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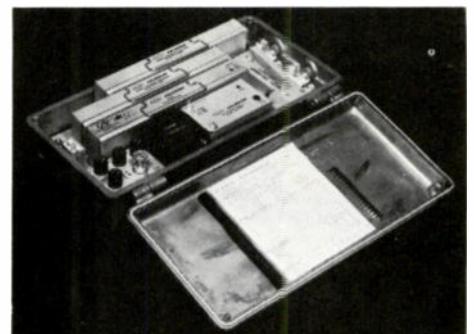
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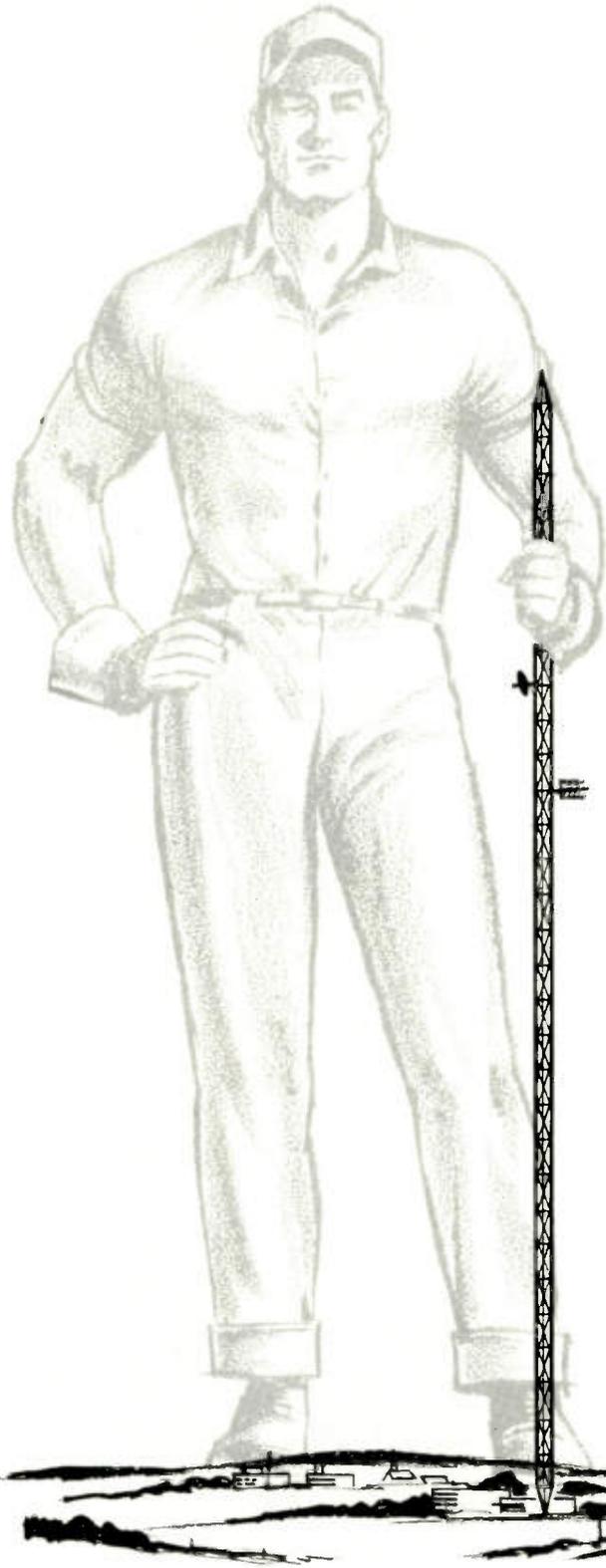


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Designed specifically for the reception requirements of a CATV head-end, this new antenna also serves as a test device to be used as a standard of comparison.

By I. "Sruki" Switzer
Technical Editor

There is a high degree of instrumentation among CATV operators today for measuring return loss, gain, cross-modulation, etc. on devices that can be placed on the bench. However, few systems have the equipment, facilities or time to evaluate the CATV antennas they buy and use. Hence decisions made to buy and use are made by reading manufacturers specifications, heeding salesmen's urgings, or buying on appearance or price.

Off-air signals deserve to be properly received and processed. Any device that can be used for testing, evaluating or comparing antennas, can add a greater degree of reliability to the CATV system.

Lindsay Specialty Products (50 Mary St., Lindsay, Ontario, Canada) has developed a heavy duty, professional all-band antenna, intended for CATV use as a broad-band, search or stand-by antenna. It has numerically specified characteristics for the major parameters of interest in CATV application and is built ruggedly for CATV applications.

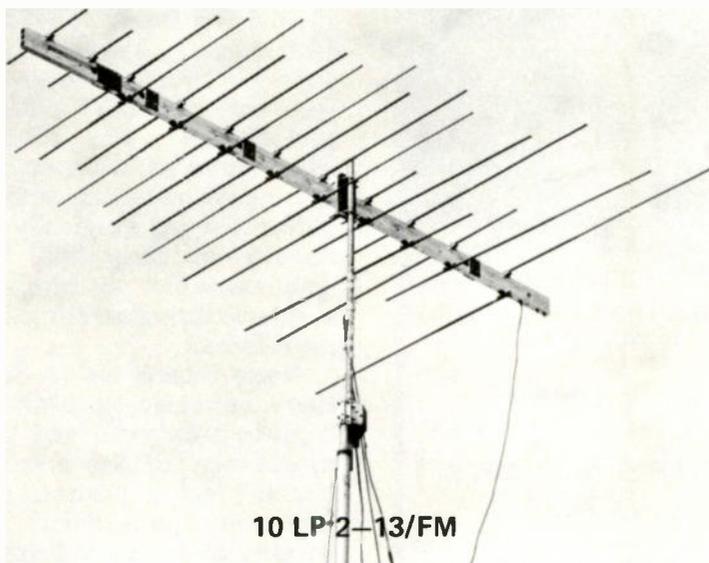
The Lindsay 10LP2-13FM U series represents a new concept of antenna design to provide CATV antennas of well defined and guaranteed parameters. These

antennas can be used to evaluate signal level and picture quality for various locations. A calibrated field strength meter, level recorder, FM set and a good color TV set can be connected simultaneously to visually and aurally monitor signals . . . and permanently record them for evaluation.

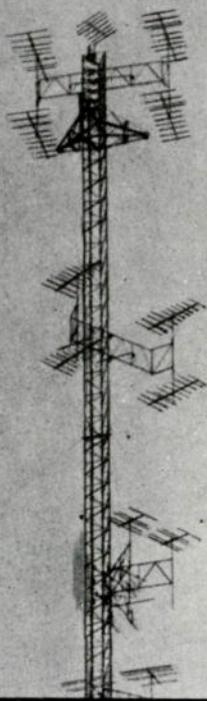
By knowing the exact gain and pattern of the receiving antennas,

it is possible to observe signal levels and check for man made, co-channel and adjacent channel interference. Very good indication of end results can be predicted, and needs for stacking (for gain and interference elimination) is shown.

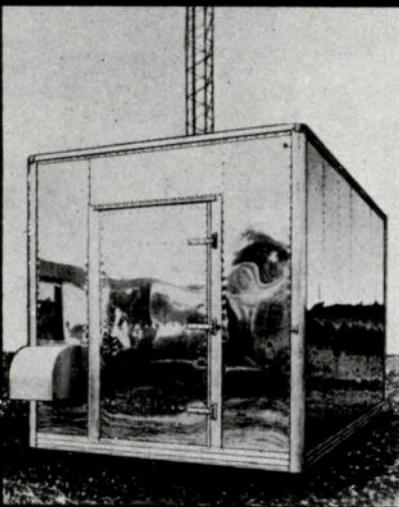
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antenna should be mounted in the clear, and usually with a height advantage. Forty feet is usually easy to obtain, 60 feet gives more reliable information and the use of a 100' crank-up tower with the antenna rotator-mounted would give the results more in line with the actual, height of a tower.

The antenna should be kept free of any metallic items that could disrupt its field. This includes other antennas placed too close, guy wires, buildings etc. A rule of thumb is to keep other antennas, guy wires, etc., away from the front and sides of the antenna by at least two wave lengths at the lowest frequency. If it is possible to do an aircraft survey, the antenna should be mounted free of the aircraft, otherwise the antenna pattern and gain will both be disturbed.

The actual loss of the length of the cable to be used should be measured on the bench, using reliable attenuators. It should be verified that return loss of the cable is high. Try to use a piece of cable with a return loss of at least 30 dB. Correct for the cable loss when computing signals.

For permanent use, Lindsay offers a heavy duty model. This can be mounted on the top of the tower in a fixed position, or (preferably) on a heavy duty rotator, to be able to swing the antenna. The antenna can also be mounted anywhere on the tower in cantilever fashion or center-mounted on an out-rigger.

By this means, a test antenna can be established and used as a standard of comparison. Individual sets of receiving antennas can be compared to the test antenna and calibrated in performance. This information, when recorded, will quickly tell if the regular receiving antennas are performing as originally set up. Should an array fail, the test antenna can be put into service as a substitute antenna until repairs are affected.

Noise tracing can be done with these antennas since the 20 dB front-to-back ratio and high side suppression of the antennas can give a fast indication of noise direction. A vehicle bearing another antenna and field strength

meter can cruise around, and by means of triangulation, pin-point a noise source.

Up to now, because there has been a limited amount of antenna engineering on all-band antennas, antennas have been restricted to either low-band or high-band types. The Lindsay 10 LP2-13 FM U provides an all-band antenna in one package, covering the full spectrum of interest to CATV operators. This antenna can be put to regular use in a fixed position for receiving a variety of stations in the same direction.

Since the high-band gain is 9 dB over reference dipoles, the antenna can be used to receive any stations, channel 7-13, and any combination of stations in the low-band, as well as stations in the FM band. There are many occasions where several channels can be received from the same direction but up to now separate antennas have had to be used.

Almost every CATV system has surplus antennas that are not being used, because their condition and performance is questioned. For re-use, these antennas should first be swept for return loss measurements and for determination of channel or channels they can best receive.

Then they can be put on a mast and compared against the standard antenna, checked out for gain, pattern, signal level and picture quality. For such checking, place the antennas on a 30' pop-up mast, keep the antennas at least 3 wave lengths apart and, if possible, switch the position of the antennas to see if the location makes any difference in performance.

A comparison can be quite meaningful and may pay for the price of the test antenna by enabling the use of surplus antennas or by showing which should be rejected from use. It is better to prevent the use of sub-standard antennas that would degrade performance.

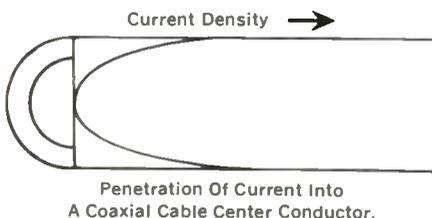
Use of an antenna of known parameters can prove to be a very useful tool in the cable TV industry. An all-band, spare antenna, around the head-end also eliminates the need for stocking individual antennas.

rvc

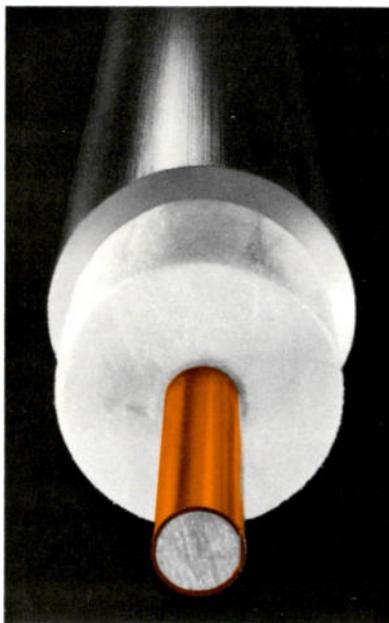
We wanted a cable with the advantages of solid copper, but at less cost to you.

Copper clad aluminum gave us the edge.

A copper edge. On the center conductor for a CATV cable. Since CATV electronic signals are transmitted only along the outer surface—the edge—of solid copper conductors, most of the copper is wasted, electronically, anyway. So it makes sense to use the transmitting copper where it's needed most, around the surface. And let the non-transmitting core be more useful by being less expensive.



Copper clad aluminum conductor does just that. It makes a center conductor



for coaxial cable that handles the full range of RF signals, weighs much less than solid copper, and is easier to handle. And of course, much less expensive.

We offer this tested and proven center conductor as one of many choices in our CATV cables. It's another example of our ability to provide you with the finest quality cable in the CATV market, at the right price.

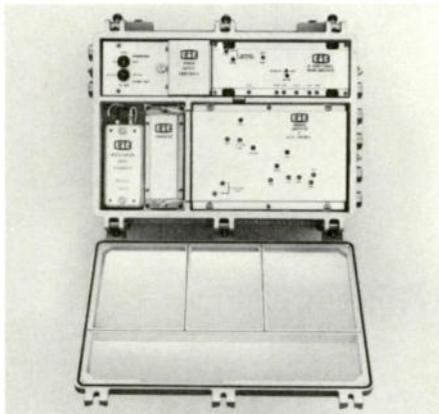
Whether your choice for your system is ALUMIFOAM® (standard foamed polyethylene dielectric) or DYNAFOAM® (with foamed polystyrene dielectric) you can now specify copper clad center conductors for your choice and receive the *same return loss values* and the *same attenuation characteristics* as with solid copper center conductors. Write for complete information and specifications today.

PRODUCT REVIEW

NEW COMPONENTS FOR CABLE TELEVISION SYSTEMS

24 CHANNELS AVAILABLE WITH IN-SYSTEM CONVERTER

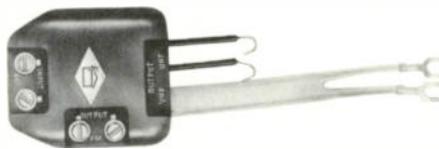
Specifically produced as an economical and dependable way of providing up to 24 channels, a new in-system converter from Electronic Industrial Engineering, 7355 Fulton Ave., North Hollywood, California, adds full range capabilities to new construction or existing installations. Processing up to



24 channels down a single trunkline in the frequency range 98 to 250, the converter can typically service approximately 300 houses. When used with EIE bi-directional trunk, trunk bridger and distribution amplifiers, the in-system converter is capable of providing two-way transmission between head-end and all subscribers. Total weight of the unit is 38 pounds. It is 12.4 x 15.3 x 6.0 in size. Contained in heavy duty aluminum housing and finished in epoxy paint, it is sealed against moisture and includes provisions for either horizontal or vertical mounting. Power requirements: voltage 20-36 Vrms; current (maximum) 1.2A rms.

JERROLD OFFERS NEW 300-OHM SIGNAL SPLITTER

A color-rated VHF/UHF/FM signal splitter designated model FS-1314-FM is the newest product released by Jerrold Electronics Corporation, 401 Walnut Street, Philadelphia, Pa. This unit, connected to the lead from any all-channel antenna, produces signals for an all-channel television receiver in color or in black & white, and for FM mono or



stereo. The splitter separates the incoming signals according to frequency range and the signals are available at three different sets of 300-ohm outlets: VHF-TV from 54 to 216 MHz, UHF-TV from 470 to 890 MHz and FM from 88 to 108 MHz. No stripping of the lead is needed. Price per unit is \$3.95.

MASAR FIBERGLASS PARABOLIC ANTENNAS

A complete line of standard fiberglass plane and dual polarized parabolic antennas are offered by Prodelin Inc. of Hightstown, N.J. 08520. The new series called MASAR (Microwave Accurate Surface Antenna Reflector) are constructed entirely of durable corrosion resistant fiberglass reinforced thermo-setting materials and have a metalized reflecting surface. The MASAR fiberglass antennas feature repetitive contour and surface accuracy and uniform high performance. An ultraviolet absorber and color pigment are pre-mixed into the material. Unitary stress-free con-



struction includes integral back-up structures. Standard models are available for frequencies from 406 MHz to 15.2 GHz with choice of sizes from 2 ft. to 15 ft. diameter.

SURGE PROTECTOR ELIMINATES POWER DAMAGE

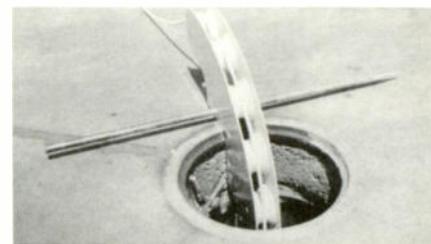
Effective grounding of overvoltage surges on commercial power lines is the purpose of the TII-411 Thunderbolt



power line protector manufactured by Telecommunications Industries, Inc., 71 Verdi Street, Farmingdale, New York 11735. Momentary voltage surges caused by lightning, electrical disturbances or power fault conditions are instantaneously diverted to ground through the self-restoring type 16 gas tube arrester. Excess current or voltages of longer duration are prevented from entering the equipment by the opening of circuit breakers which automatically return the line to service after the fault condition is eliminated. In field use for over 5 years, the protector is now available in a weather-tight enclosure, with or without input/output cords. Prices range from \$33.95 each, less cords to \$35.95 each, with cords.

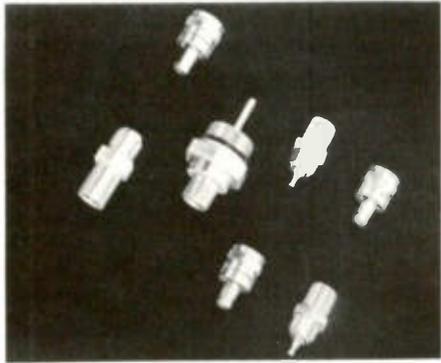
NEW QUADRANT BLOCKS EASE UNDERGROUND CABLE PLACING

Two new B quadrant blocks designed specifically to facilitate underground cable placement and removal operations are now available from General Machine Products Co., Inc., Old Lincoln Highway and Pennsylvania Turnpike Trevoese, Pa. 19047. The B quadrant blocks feature a large, 24" bending radius to minimize the possibility of damage to cables during their placement or removal. Used with the C pulling frame or B cable sheave shackle in place of the B, L, or S cable sheaves, these blocks can also be used in place of the C manhole sheave on the edge of manhole openings.



**LRC INTRODUCES NEW
LINE OF CATV CONNECTORS**

LRC Electronics, 901 South Ave., Horseheads, New York 14810, has begun production of a new line of CATV connectors. The company is



manufacturing standard "F" series connector models 59, 61 and 81 in both brass and aluminum, and soon will have available newly designed connectors for all cable sizes .340, .412, .500 and .750.

**NEW LAWN PLOW FROM
RYAN MANUFACTURING**

Ryan Manufacturing Company, Box 451, Chariton, Iowa 50049, announces its heavy duty lawn plow for laying



underground cable. The firm specializes in underground cable-laying equipment.

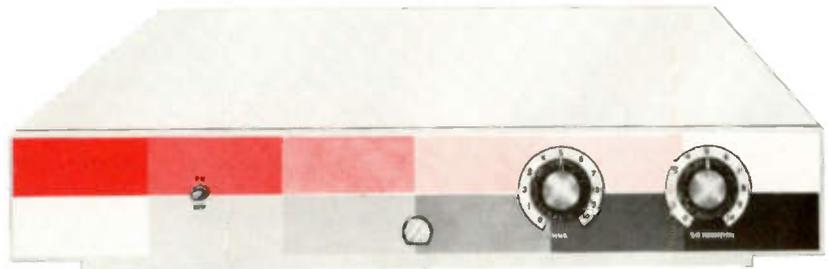
**CONTROL CONCEPTS OFFERS
NEW SYNC GENERATOR**

Control Concepts Corporation, 411 N. Stonestreet Avenue, Rockville, Maryland, announces the availability of "a new concept" in sync generation, the model 601. The time base oscillator of the 601 uses a precision cut high temperature quartz crystal in an actively driven proportionally controlled oven. This eliminates the gross phase/



TV Communications

**Now, cablecast in color
from a black & white camera!**



**RIKER COLORIZER
only \$995.**

Use the Colorizer on your **time-weather** channel to cablecast commercials in color!

- CONVERTS THE OUTPUT OF ANY MONOCHROME TV CAMERA TO FULL NTSC COLOR
- CHANGES SHADES OF GREY FROM BLACK AND WHITE TV CAMERA TO NTSC COLOR
- PROVIDES TWO FULL NTSC COLOR OUTPUTS
- WORKS FROM EIA, 2:1 OR RANDOM INTERLACE COMPOSITE INPUT

We sell the Colorizer with complete instructions on how to prepare black and white artwork for best results. This makes it very easy for you to offer advertisers **COLOR COMMERCIALS!**

SPECIFICATIONS

Input: Composite video, EIA, 2:1, Random Interlace
Video Input Level: 1 volt peak-to-peak
Outputs (2): NTSC Color, 1.0 volts peak-to-peak
Signal-to-Noise Ratio: 50 db
Bandwidth: 4.5MHz
Hue Range: 270°
Saturation Range: 120 units peak-to-peak

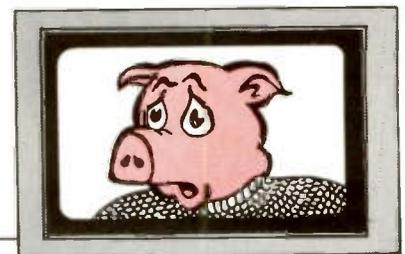
The Colorizer is the least expensive way you can cablecast in color. Of course, it can't be used to convert live scenes, tapes or films to color, but it is great for slides, flip charts and animation.

For more information, or a free, no obligation demonstration, call or write.



CAMERA

COLORIZER



RIKER VIDEO

142 CENTRAL AVENUE, CLARK, N.J. 07066 / (201) 382-3700

frequency transient characteristic of a thermostatically controlled oven. The aging rate of this oscillator is claimed to be better than 1 part in 10^6 per year, thus necessitating re-calibration only once every three years. Extremely low FM content and high immunity to power variations is provided by integrated circuit power supply regulators.

NEW SERIES OF BLACK AND WHITE EIAJ STANDARD VTRS ANNOUNCED BY CONCORD

A complete line of one-half inch video tape recorders featuring the new standard EIAJ format is now available from Concord Communications Systems, 1935 Armacost Avenue, Los Angeles, California 90025. The basic model is the VTR-800, designed to



record and playback audio and video. Manufacturers of the 33-pound unit claim sharp, clear, 300 line horizontal resolution. Features include: manual/automatic gain control for audio and a separate manual/automatic gain control for video, audio dubbing and still frame. It has standard UHF video connectors for video input and output, as well as 8 pin audio/video connector for a monitor receiver. The video recording system is the standard NTSC system, 525 lines, 60 fields, interlaced. User net is \$695. The model VTR-820 offers electronic editing. Another feature is controllable slow-motion, that can be speeded up or slowed down for observation purposes. User net is \$950. Rounding out the line



is a half-inch portable, battery-operated model, the VTR-450T. It consists of a camera with built-in viewfinder, portable video tape recorder with rechargeable batteries. The camera weighs $5\frac{1}{2}$ lbs., and records up to 40 minutes of sound and picture on a single battery charge. The user sees exactly what he is recording through the camera's built-in 1.5" CRT. The built in 5-to-1 zoom lens can cover wide angle scenes and then zoom in for a closeup of details. Horizontal resolution is 300 lines. Standard accessories include batteries, earphones, microphone, battery charger. User net is \$1,350.

VACUUM FORMED SCENERY AVAILABLE FOR CATV USE

Feller Vacuum Form Studios, Inc., 68 East 153rd Street, New York, N.Y. 10451, has introduced to the CATV industry its line of pre-fabricated, ready-to-use background scenery. The scenery is vacuum formed for low cost and



quick installation. The scenery is fabricated of vinyl and may be used repeatedly in display capacity. It comes in variations of paint finishes. The units are handpainted and made to order.

COLOR FILM CHAIN ADAPTOR FROM SONY

Sony Corporation of America, 47-47 Van Dam Street, Long Island City, New York 11101, announces a color film chain adaptor, model VCR-1, which provides a simple means of projecting motion-picture and slide images into the Sony DXC-5000 color video camera. The VCR-1 accommodates both a motion picture and slide projector and has a separate telop input for 4" x 5" title cards. It can be operated with most 35mm slide projectors as well as most 8mm and 16mm motionpicture projectors. Projector outputs are selectable by switch. Because the color camera can be mounted on the film chain adaptor or removed from it in seconds, a single Sony DXC-5000 can double as studio camera and film chain camera. No modification of the camera is required. Manufacturer's suggested list price is \$1,200.

TVG

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION (Act of October 23, 1962: Section 4369, Title 39, United States Code)

1. Date of filing: October 12, 1970.
2. Title of publication: TV Communications.
3. Frequency of issue: Monthly.
4. Location of known office of publication (street, city, county, state, zip code): 1900 W. Yale, Englewood, Colorado 80110.
5. Location of the headquarters or general business offices of the publishers (not printers): 1900 W. Yale, Englewood, Colorado 80110.
6. Names and addresses of publisher, editor, and managing editor:
 Publisher (name and address) Communications Publishing, 1900 W. Yale, Englewood, Colorado 80110.
 Editor (name and address) Stanley M. Searle, 1900 W. Yale, Englewood, Colorado 80110.
 Managing Editor (name and address) Robert A. Searle, 1900 W. Yale, Englewood, Colorado 80110.
7. Owner (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.)
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 De Lois Nell Matthews, Oklahoma City, Oklahoma.
 Jean Schaefer, 1416 N.W. 105, Oklahoma City, Oklahoma.
8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities (if there are none, so state): None.
9. For completion by nonprofit organizations authorized to mail at special rates (Section 132.122, Postal Manual): Not applicable.
10. Extent and nature of circulation.
 A. Total number of copies printed (net press run): (Average number of copies each issue during preceding 12 months): 5723. (Actual number of copies of single issue published nearest to filing date): 6250.
 B. Paid circulation:
 1. Sales through dealers and carriers, street vendors and counter sales: None.
 2. Mail subscriptions: (Average number of copies each issue during preceding 12 months): 3892. (Actual number of copies of single issue published nearest to filing date): 3892.
 C. Total paid circulation: (Average number of copies each issue during preceding 12 months): 4068. (Actual number of copies of single issue published nearest to filing date): 4068.
 D. Free distribution (including samples) by mail, carrier or other means: (Average number of copies each issue during preceding 12 months): 1630. (Actual number of copies of single issue published nearest to filing date): 1962.
 E. Total distribution (sum of C and D): (Average number of copies each issue during preceding 12 months): 5522. (Actual number of copies of single issue published nearest to filing date): 6030.
 F. Office use, left-over, unaccounted, spoiled after printing: (Average number of copies each issue during preceding 12 months): 201. (Actual number of copies of single issue published nearest to filing date): 220.
 G. Total (sum of E & F—should equal net press run shown in A): (Average number of copies each issue during preceding 12 months): 5723. (Actual number of copies of single issue published nearest to filing date): 6250.
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 (Signature of editor, publisher, business manager, or owner)

B. S. Marsh, Jr.



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POWER
SUPPLIES



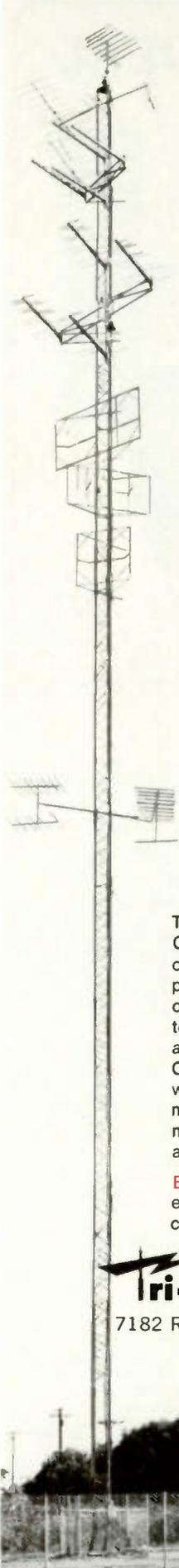
After several years of research, development, and field experience, GLENTRONICS has developed a simple, easy-to-use CATV power supply that will fit any CATV operator's requirements anywhere. GLENTRONICS' CATV package units provide a modular power supply that enables the CATV operator to design his own package for his own particular preference and at the same time develop his own price. With the GLENTRONICS modular power supply system you have up to 180 different combinations, including DC/AC standby, of custom power supplies developed from four basic modular types.

Build your own price by picking the components you need — get custom power supplies at standard power supply prices.

CT	N	60R	SC	HD	(SP)	SPECIAL INSTRUCTIONS
						Any extra or option not listed Special Paint, Fittings Etc.
						MOUNTING
CB						POLE CHANNEL BRACKET FOR LOW POLE MTG.
PD						PEDESTAL Surface Mtg (UNGD System)
HD						HEAVY DUTY TAB FOR HIGH POLE MTG.
						CABINET TYPE
MA						WITH METER ADAPTOR AND POWER CO. TEST BLOCK
NA						WITH POWER CO. TEST BLOCK NO METER ADAPTOR
SC						NO POWER CO. TEST BLOCK NO METER ADAPTOR
UG						FLUSH GROUND LEVEL (Underground System)
NC						NO CABINET
						OUTPUT VOLTAGE (REGULATED)
30R						30V @ 12A
35R						35V @ 10A
60R						60V @ 9A (XFMR TAPS) 30V @ 9A
						(UNREGULATED)
30U						30V @ 12A
35U						35V @ 10A
60U						60V @ 9A (XFMR TAPS) 30V @ 9A
						BASIC UNIT
N						NORMAL (AC TO AC)
S						EMERGENCY STAND-BY Battery pac optional
						PRODUCT
CT						CATV POWER SUPPLY

GL: *Glentronics, Inc.*

CATV DIVISION
P.O. Box 66/748 EAST ALOSTA AVE.
GLEN DORA, CALIFORNIA 91740
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CATV

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Tri-Ex

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BONUS: Tri-Ex guarantees its CATV towers will meet the most rigid building codes in the U.S.A.

Tri-Ex TOWER CORPORATION

7182 Rasmussen Ave., Visalia, Calif. 93277

(Continued from page 40)

under which a subscriber living outside of the service area of an existing CATV system can request service and the CATV operator must provide it. The policy provides for a sharing of the cost and a multi-year service contract by the subscriber, among other provisions. *

TVC: *It seems apparent that most cable people do not desire PUC regulation. What can the CATV industry do to discourage PUC regulation?*

BROOKS: I believe that the industry has been fighting regulation in the wrong way. It has been shown in Vermont that fighting regulation without doing anything about the problem, is a waste of time and effort.



If CATV does not have regulation, and does not want it, the industry must offer and implement a self-regulating organization which will protect the interests of the public as well as those of the operators. This organization, which we can call a "commission," must have the complete support of the operators and its rulings must be enforceable.

This "commission" should have as its basic objective that no complaints, or at least as few as possible, would reach political channels. This means, first, that all possible problems will be identified and resolved at the system level. Second, for the small level, the complaint should have quick recourse to the industry "commission."

The stimulus for regulation is generally the out-cries of citizens who have complaints about inadequate service, high rates, or unfair treatment. Through political channels these voices of the people may convince the legislature that regulation is necessary.

It seems to me that if the industry is able to solve these problems internally, by giving good service at reasonable rates, with fair treatment for everyone; there should be fewer political cries for help, and less pressure for regulation.

TVC

*EDITOR'S NOTE: A free sample copy of the Vermont "uniform line extension policy" is available by writing directly to Mr. Brooks at J.C. Barnard & Associates, 10121 Manchester Road, St. Louis, Missouri 63122.

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Sunday, Dec. 6 thru Wednesday, Dec. 9
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For the first time, an open-exchange seminar brings together the important U.S. advertisers, ad agencies, CATV systems owners with their programming executives and the leaders of Hollywood's major studios and production industry. CABLE-TV is here...now...and

in this must-attend 3½ day Seminar, the experts will share the answers and offer the ideas...Advertising, Program Origination and New Profits from this welcome new medium.



Thom Keith, Director
The Center for Communications
6290 Sunset Boulevard, Hollywood, California 90028/Telephone: (213) 462-6464

The 1st Cable-TV Advertising/Programming Seminar will be held December 6-9, 1970, at the Ambassador Hotel in Los Angeles. Registration fee, including all luncheons, the keynote dinner and a complete syllabus of all meetings is just \$265. But hurry, registrations are strictly limited.

Name _____
Company _____ Address _____ City _____
State _____ Number of persons in party: _____
Total amount enclosed ((@ \$265. per registration) _____
(Upon receipt of above card we will send to you complete hotel accommodation reservation forms)

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TV Communications ADVERTISING DATA 1900 WEST YALE • ENGLEWOOD, COLORADO 80110 • PHONE 303/761-3770

TV Communications is published by Communications Publishing Corp., publishers of CATV Weekly, the CATV Directory of Equipment, Services & Manufacturers, the CATV Systems Directory Map Service, the NCTA Convention Daily, and CATV Product Showcase.

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For Information About: ADVERTISING SPACE

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Contact Traffic Supervisor Karyn Zimmerman for full information on production requirements, copy modifications, or creative services.

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Contact Marketing Services Manager Phil Cook. Phil will assist you with full information on reprint and direct mail programs designed to supplement your total marketing effort.

THE CATV

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TV Communications Reply Address: 1900 West Yale, Englewood, Colo. 80110
Rate for classifieds is 25 cents per word for advertising obviously of a non-commercial nature. Add \$1.00 for Box Number and reply service, per issue. Advance payment is required; minimum order is \$10.00. Classified rate to commercial advertisers is \$30.00 per column inch (2-1/4" col.). Deadline for all classifieds is 1st of preceding month.

WANTED

Two assistant chief technicians, with CATV experience — with or without FCC licenses — Top salaries — Due to expansion of large systems. Contact: Midwest Video Corp., Tower Bldg., Little Rock, Arkansas 72201. FR5-8885 — FR5-7628.

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Able to assume complete responsibility for advertising program of a major full-line CATV equipment manufacturer. Must be capable of technical and sales copy writing... and produce results... without extensive supervision. A challenging opportunity with great potential. Send resume indicating present salary and approximate salary requirement to Box T1170-2, TVC.

What is CATV?

This question and many others are answered in the new book published by The National Cable Television Institute.

Its 105 pages contain:

- History and development of CATV
- Future prospects of the Industry
- Complete description of each component from antennas and headend to connection at the subscriber's set all described in layman's terms.

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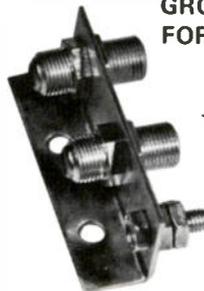
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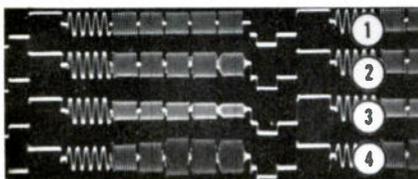
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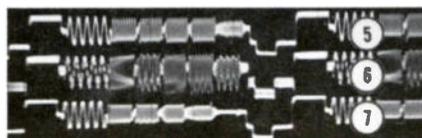
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The unique color compensation function of the DYNA-TUNE is evident in waveforms 1 through 4. The test set-up for these waveforms consisted of an off-the-shelf DYNA-MOD modulator supplying a modulated 4.2-MHz multiburst signal to the DYNA-TUNE. Waveform 1 is the output of

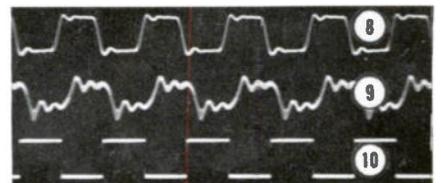
the multiburst generator. Waveforms 2 through 4 are the demodulated outputs of the DYNA-TUNE with (2) proper compensation, (3) no compensation (note the inherent roll-off in the higher frequencies) and (4) overcompensation, such as might be desirable to compensate for remodulation. All waveform photographs were taken with the tuner oscillator set for maximum aural rejection.

Waveforms 5 through 7 show the results of a conventional CATV demodulator tuned for the best overall picture (note the roll-off in the color region). Waveform 6 was taken with the demodulator tuned for the best 4.2-MHz response (note overall distortion, including degradation of sync pedestal) and waveform 7 was taken with the demodulator tuned for best overall sync. Remodulation of this output would result in even further degradation.

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was taken at the output of a conventional CATV demodulator driven by the same DYNA-MOD. Waveform 10 is the squarewave source. (Note the overall improvement in ringing and overshoot in waveform 8.) No external envelope-delay correction equipment or filters were used when performing any of the above tests.



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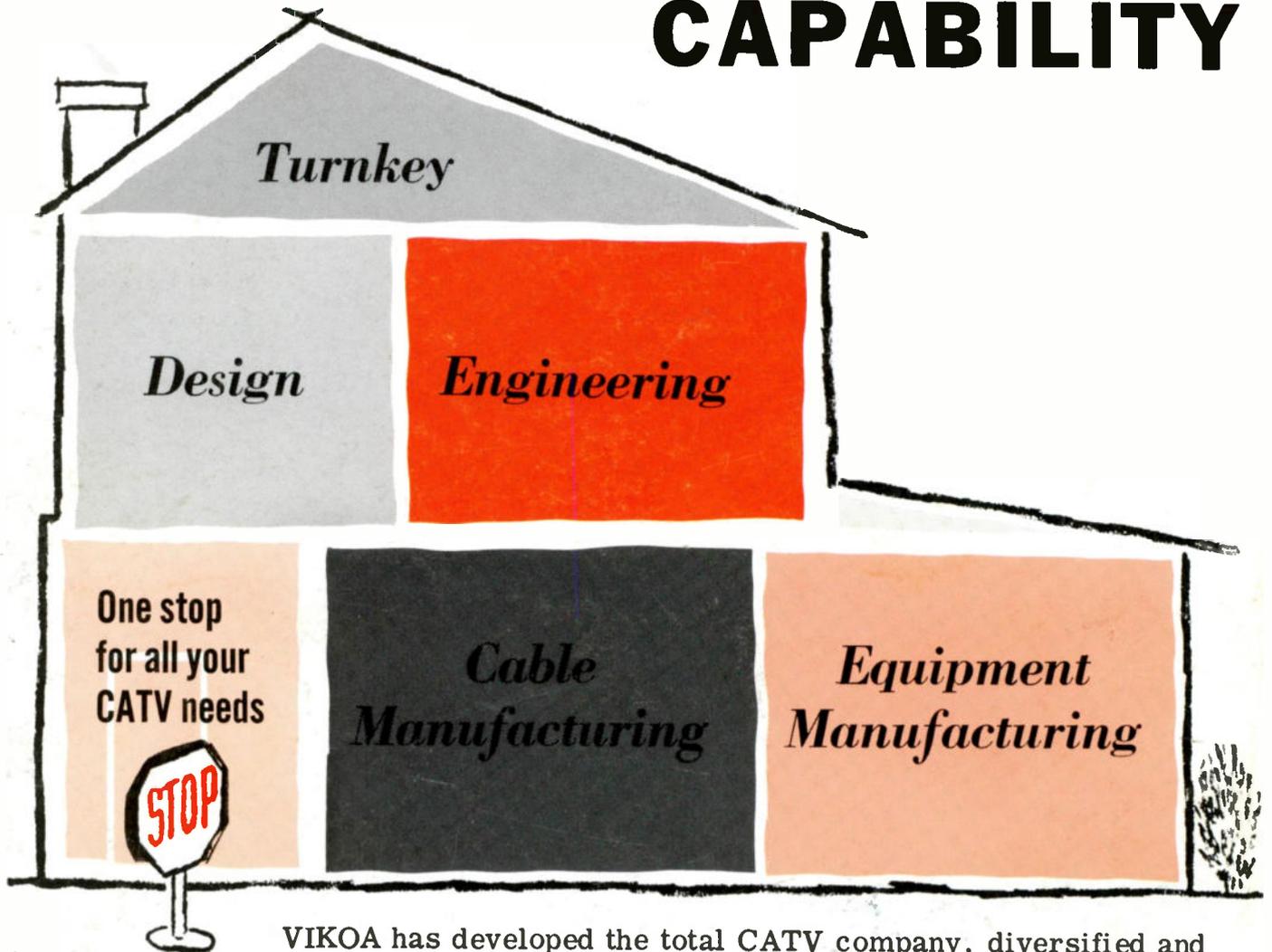
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