



December 1967

TV Communications

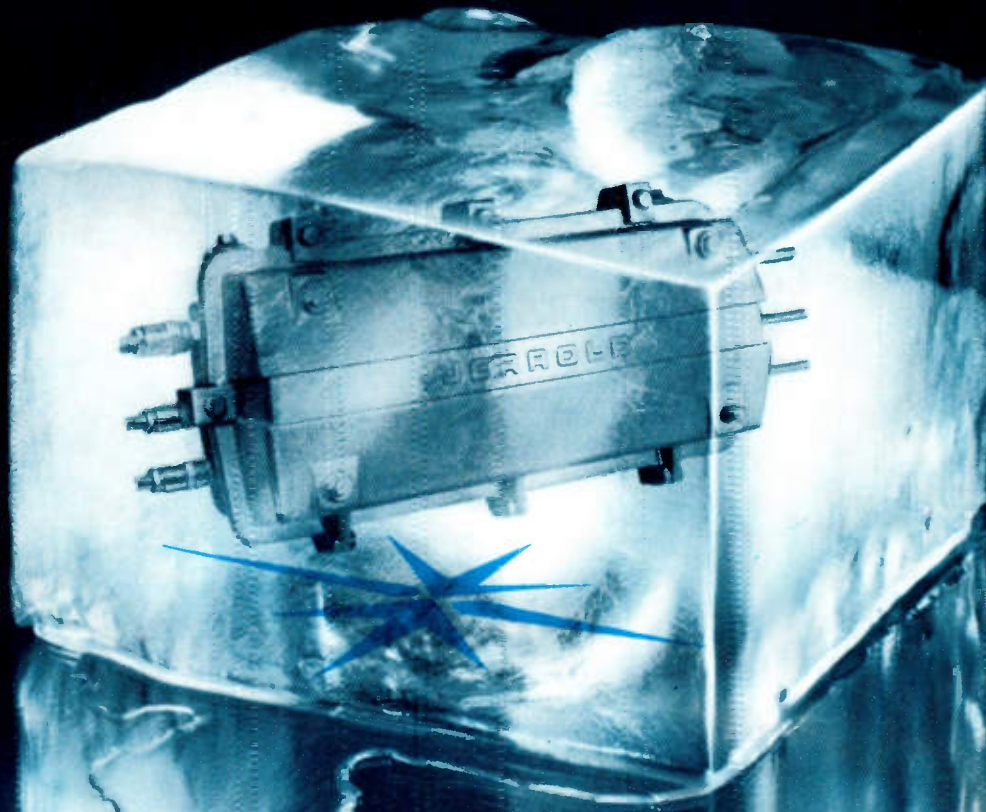
The Professional Journal of Cable Television



In This Issue...

Low-price Color VTR's
CATV Spectrum Analyzers
PR Planning for Rebuilds

- Sandwiched printed circuit boards ■ 120 dB well for radiation suppression
- Aluminum thermal finger inserts ■ Integrated AGC circuitry



Meet the cool one... the new Jerrold Starline Twenty

Starline Twenty is a cool performer in more ways than one. You get solid-state components throughout. Superb heat dissipation. Undetectable RF radiation. Ultra-flat integrated AGC circuitry. And built-in surge protection. Truly a distribution system unique in CATV history.

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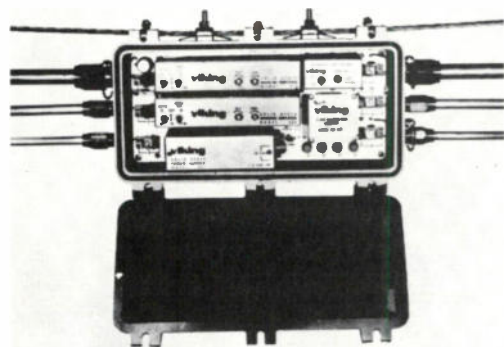
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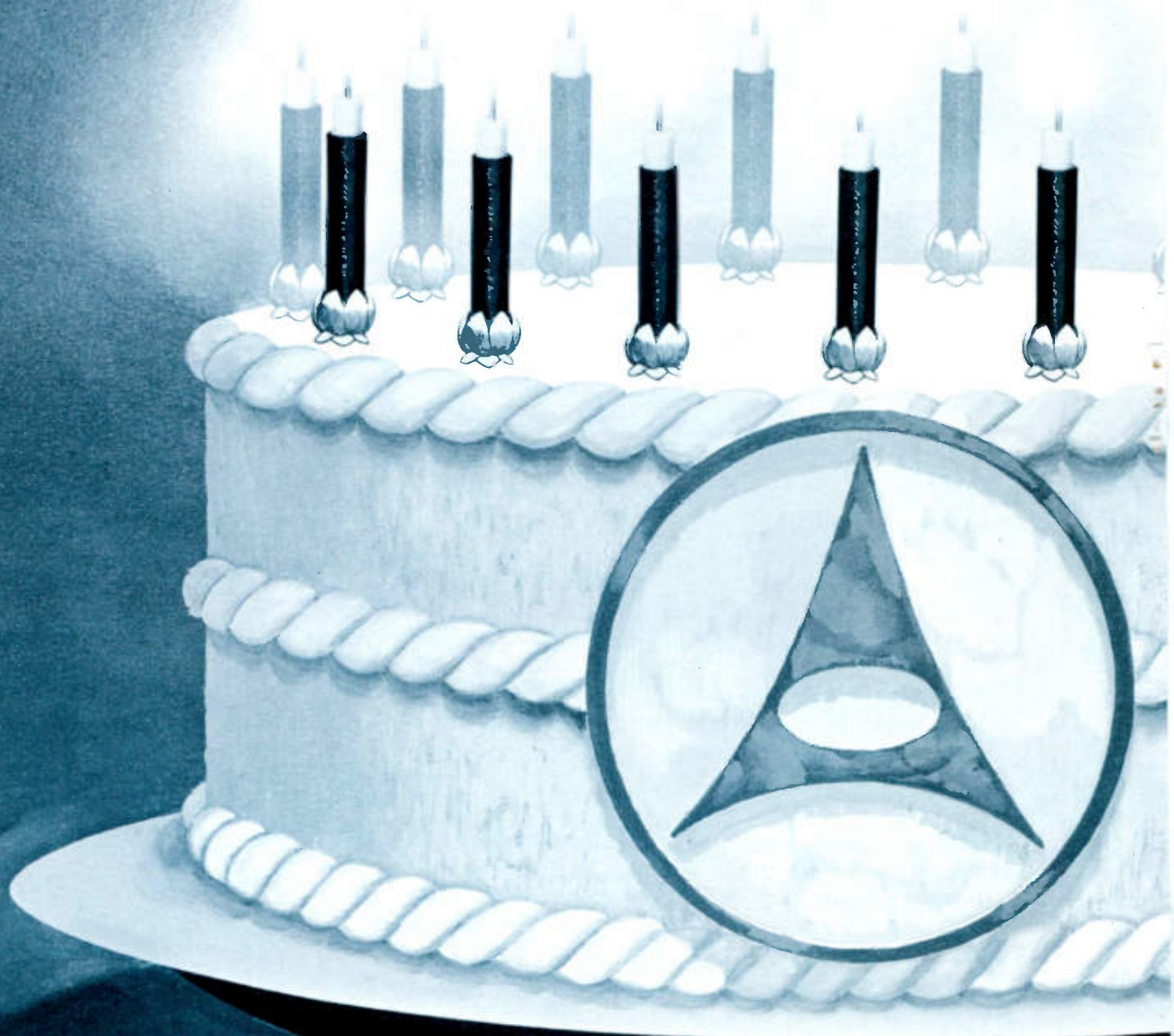
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DECEMBER 20 IS OUR 15TH ANNIVERSARY!

We don't think of it as 15 years of past history, though. It is 15 years of planning and preparation for next year — the biggest and best year for the Cable Television Industry!

CATV will be bigger and better in 1968. It will have more influence and be more important in the lives of the American Public.

Ameco will share in that future. We look forward to more advanced and efficient equipment for you; better service for your system, and improved systems design. In short, we will help you build better and more profitable systems in 1968!

That's how we'll celebrate our 15th! We hope you'll celebrate with us by having a Merry Christmas and a Joyous New Year.

Our 15th



ameco

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IN THIS ISSUE

Color VTRs for CATV

Although color originations on cable systems are not presently considered feasible, the rapidly decreasing price tag of color cameras is expected to make such programming possible within the next two years. Meanwhile, the development of a low-priced color VTR, says author Jan van Hemert, makes possible CATV originations of taped color programs obtained from outside sources. Read his explanation of Sony's new modified SECAM color system beginning on page 37.

Cablecasting Studio Guide

For the cable system operator who is initiating local programming on his system, a complete, step-by-step guide to cablecasting operations will be found beginning on page 48 of this issue. Although presented in basic terms, this article covers all essential elements of professional programming technique, and provides a handy review for experienced cablecasters as well as those just beginning.

Rebuilds and PR Problems

If you are planning an allband conversion, read John Monroe's article on page 52 of this issue. Keeping your subscribers happy while upgrading your plant and services can take some doing. And if you plan to shuffle your current channel numbers, don't count on word-of-mouth methods to inform your customers!

Viewers may require more education than you would expect when it comes to modified service, says John, and with your customer relations on the line, advance planning and sufficient PR efforts are a must.

CATV Spectrum Analyzers

Featured in the CATV Technician section, is I. Switzer's comprehensive explanation of spectrum analyzers as utilized for CATV. Beginning on page 74, he begins with a basic field strength meter, and works on through the operating principals of the spectrum analyzer, its applications, advantages and limitations.

Our Cover: This month's front cover photo was supplied by Vikoa, Inc. *TV Communications* pays \$20 for color photos supplied by readers and selected for publication. Both transparencies and glossy prints are accepted.

TV Communications

The Professional Journal of Cable Television

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Holiday Greetings and Best Wishes for 1968



nce in a while it's good to slow down, relax and reflect on the past as well as look at the future. the catv industry has made much progress since the holiday season last year. anaconda astrodata had a good year of progress too.

1968 promises to be an even better year for catv. with the advancing state-of-the-art, more and improved systems will be built. the problems of our industry are sizable and challenging but we are confident that 1968 will be the year for surmounting obstacles and achieving solutions.

thank you for your support during the past year. we, at anaconda astrodata, look forward to serving you in 1968.

Dean P. Roberts *Ed Regan* *Jama W. Emmick*
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The TVC Viewpoint

EDITORIAL



On Criticism of the FCC . . .

A few days ago, I heard FCC Commissioner Robert E. Lee tell a large audience of cable operators that the CATV industry is hurting its cause by characterizing FCC officials as "good guys or bad guys."

I strongly suspect that Mr. Lee was thinking of the cable television "trade press" when he made that remark — since *TVC* and *CATV Weekly* have been more outspoken than anyone else in criticism of FCC Commissioners. In fact, our editorials have even drawn criticism from a few CATV people who are worried that we may have been too harsh on some of the Commissioners and staff. With due respect to those who have expressed sincere concern . . . our answer is simply this: *If we don't speak up for the industry at this crucial hour, who will?*

We haven't labeled anyone as "good guys or bad guys" — but we *have* done the following in the editorial pages of *CATV Weekly* and *TV Communications*:

- (1) Exposed the improper lobbying by FCC General Counsel Henry Geller, on behalf of copyright legislation that would be pleasing to the broadcasters;
- (2) Revealed the fact that Mr. Geller's illegal contacts on Capitol Hill were made at the request of FCC Chairman Rosel Hyde and Commissioner Kenneth Cox;
- (3) Commented on Commissioner Nicholas Johnson's changeable attitude toward CATV (we think highly of Commissioner Johnson — but want to know where he stands);
- (4) Criticized the baseless assertion by Commissioner Cox that cable systems are preparing for "direct competition with the broadcasters."
- (5) Accused Rosel Hyde of having "tunnel vision" where cable television is concerned;
- (6) Reported the sudden "get tough with CATV" campaign that Commissioners Hyde, Cox, and Lee instituted right after the visit to the FCC by AMST officials.

One veteran observer of Washington affairs stated that Lee's complaint is proof that our editorials are having the intended effect . . . that the Commissioners are feeling the pressure of critical exposure of their conduct of FCC business. Far from hurting our cause, he says, these blunt editorials are creating a new sensitivity to cable industry welfare.

We agree with Fred Ford and Jack Crosby that relations with the FCC are so bad that they can't get any worse. So it seems a bit naive to worry about outspoken criticisms of the Commission hurting our industry's image. Certainly, we are not going to rely on Bob Lee or Ken Cox to advise us on how we should treat the FCC.

We feel that it is our *duty* to protest the anti-CATV actions of the FCC. Our exposure of illegal lobbying by an FCC staff member, for example, is made even more necessary by the fact that apparently we are the only ones willing to publicly condemn such activity.

The purpose of this editorial is not to defend our editorial position. Rather, it is to encourage cable television operators to ignore the claim by Commissioner Lee that the CATV industry loses ground by criticizing adverse Commission actions. After all, the Commissioners are employed by the taxpayers to serve the public interest. When it becomes obvious that two or three of these public servants are dedicated to crippling the cable television business, we see no reason for being bashful in our dissent.

So do not heed the advice of a Commissioner whose vote is apparently already committed to limiting your industry. The editorials of this publication and *CATV Weekly* are irritants to Mr. Lee, Mr. Hyde, and Mr. Cox only because the Commissioners know that cable operators will not stand for the prejudicial actions which the editorials expose.

Who will speak up? We will — and I hope you will, too.

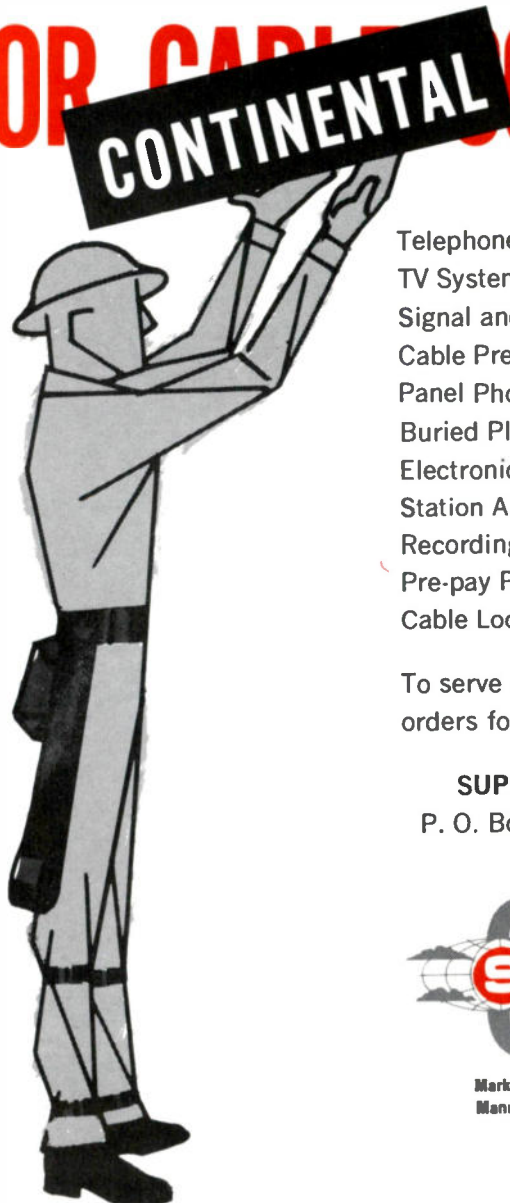
Stan Scarle

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a change
in our
name . . .**

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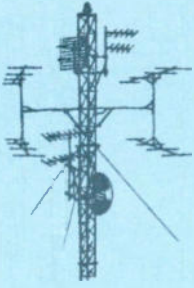
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CATV Industry PERSPECTIVE

A new problem looms for already restive cable operators. After several years under the shadow of copyright liability, adverse FCC rulings, threatened PUC regulation and the fear of telco domination... cable operators now face the "seige of the cities." Opportunistic city officials across the U.S. are mounting a "gold rush" for fat new revenues from CATV franchise fees. Figures such as 7%, 18%, 25% and 35% are tossed about by city officials with total indifference to economic realities. They will continue to receive enough encouragement from cable operators, both novices and old timers, to make franchise fee escalation a major problem for the next several years. Inevitable result will be hiked subscriber rates to cover the city's big "slice."

Biggest problem to industry, consequently, will be the threat of rate regulation arising from wide divergency in the cost of cable service in different communities. By mid-1968 these problems will be so severe that industry leaders will consider two possible solutions: (1) flat refusal to go along with cities' franchise tax demands and franchise auctioneering, and (2) legal challenge of the municipalities' right to levy franchise charges, other than nominal administrative fees. Neither approach is likely to succeed.

Economic realities of cable television, however, will eventually come to the aid of responsible operators. After a number of systems suffer severe financial problems due to high franchise fees, the "gold rush" may finally abate. But those cable operators who have "taken the bait" of dollar-minded city governments are likely to find themselves with long-range problems or, at best, with low-yield properties.

Don't expect resolution of the CATV copyright liability until October, 1968, at the earliest. Final answer will probably be a negotiated one, with legislators putting pressure on parties involved to reach essential agreement on key points before making new law. The anti-CATV broadcast forces are still holding out for terms that most cable operators would consider grossly unfair and unlivable. But the increasing stake of big broadcasters in the cable industry may have a moderating effect on the demands of NAB and AMST. Although cable holdings of such firms as Cox, Triangle, G-E, Cosmos and the networks themselves remain small in relation to broadcast interests, they are not likely to support an oppressive copyright formula.

Technical manpower shortage which has plagued cable television for years will be greatly remedied over the next 2-3 years. National Cable Television (NCTI) is offering five separate correspondence courses, ranging from Installer/Technician to Microwave Field Engineer. Initial response suggests that the school will train about 1,000 technicians in its first year. About half of these are already employed in CATV. In addition, CATV extension courses are being offered by Pennsylvania State College and at least two vocational training schools are considering a CATV technical course. NCTA has appropriated funds for preparation of a curriculum guide covering the two courses now offered by Penn State. Skilled manpower will continue as a source of concern for CATV operators due to rapid industry growth. However, these educational efforts will do a great deal to improve both the quantity and quality of available cable television technicians and engineers.

You think your system is good?

CATViewers don't like snow... And we know, from Entron's considerable experience, odds are even that your otherwise top-notch system has one or more channels somewhat snowy.

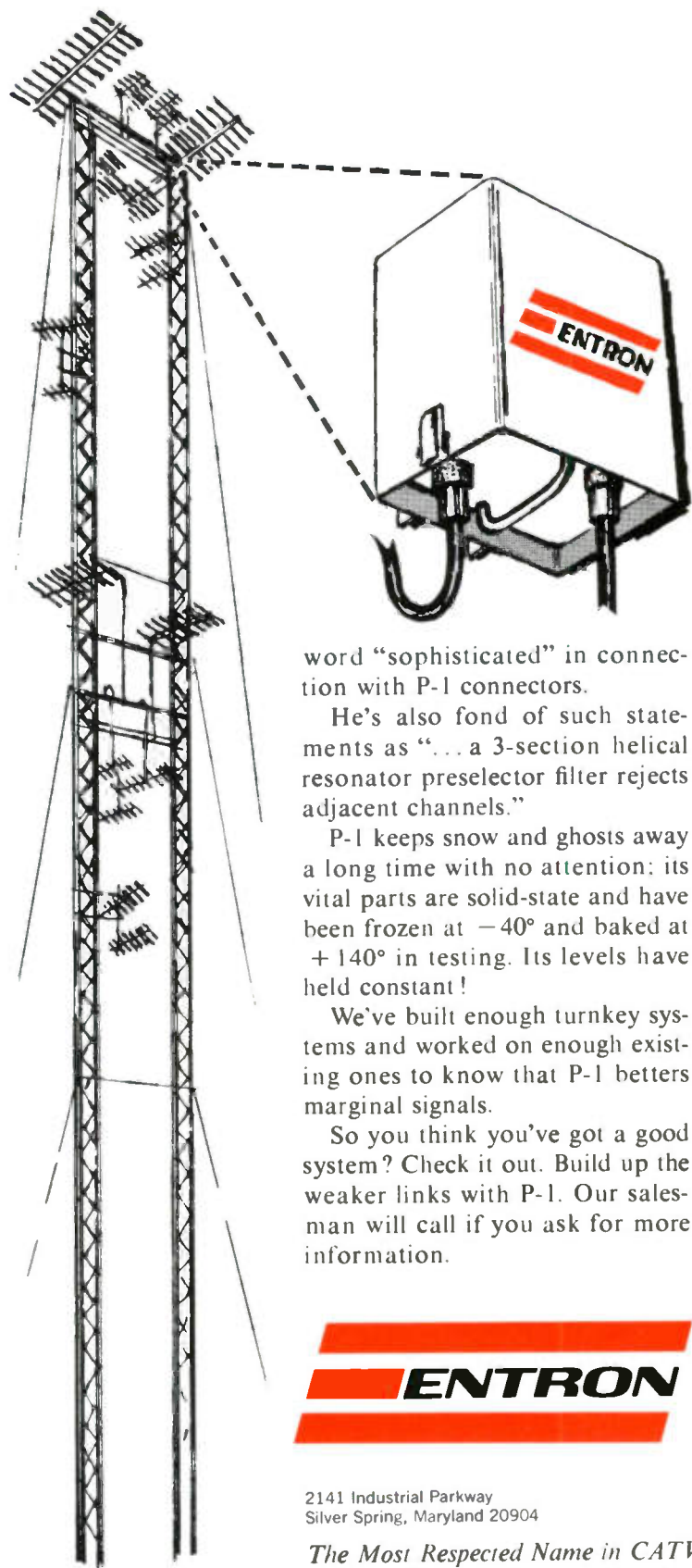
We also know your technicians get sick and tired of climbing your tower to change tubes in old-fashioned pre-amplifiers!

Spend \$195 (includes power supply) per channel and make your subscribers (and your technicians) happy. The price is for the pre-amplifier we designed—the P-1 (it's all solid state).

Who decides how much snow a subscriber should swallow? We're taking the stand that anytime a systems engineer reads much less than 0 dBmV into the headend, your signal is six-sided marginal. The subscriber may not know exactly what's wrong, but he knows he has a bad picture. If you're a technical man, you know where snow comes from and you also know that headend ALC gets loose unless signal level is above 0 dBmV.

P-1 provides 30 dB minimum gain on low-band and 24 dBmV on high-band, while noise figure is held to a very low 4 dB. It's got to be mounted next to the antenna or else you'll be amplifying cable loss. The gain's worth the climb.

Ghosts? P-1 with its top-grade matched connector provides the best impedance match on the market. One of our people uses the



word "sophisticated" in connection with P-1 connectors.

He's also fond of such statements as "... a 3-section helical resonator preselector filter rejects adjacent channels."

P-1 keeps snow and ghosts away a long time with no attention: its vital parts are solid-state and have been frozen at -40° and baked at $+140^{\circ}$ in testing. Its levels have held constant!

We've built enough turnkey systems and worked on enough existing ones to know that P-1 betters marginal signals.

So you think you've got a good system? Check it out. Build up the weaker links with P-1. Our salesman will call if you ask for more information.



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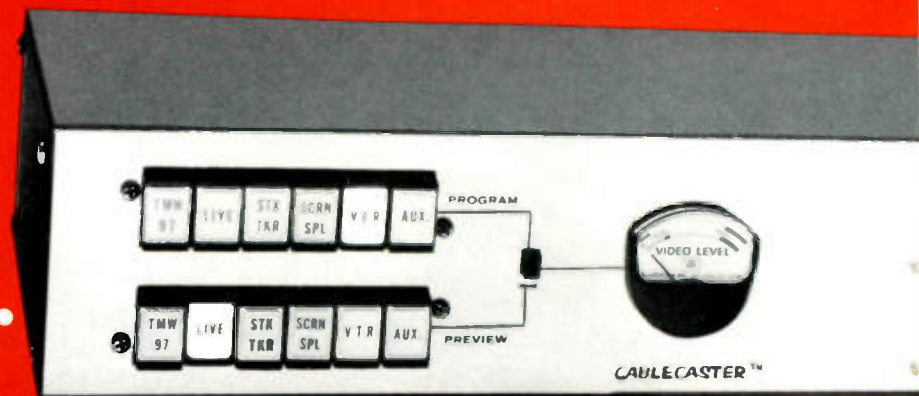
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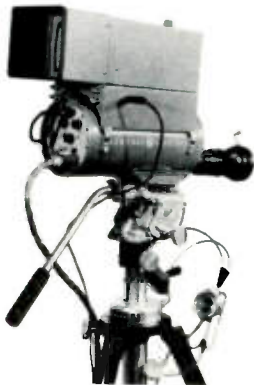
Without it, you have video sources.
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TeleMation furnished cameras, old or new, are easily converted to full broadcast specs. Your subscribers will praise the crisp, roll-free picture quality. Your personnel will applaud the professional ease of operation and extended usefulness of the system concept.

Systematic planning with compatible components is the way to start. The CABLECASTER® concept is the way to orderly growth — the way to maximum utilization — the way to excellence in program origination.



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In CABLECASTER® systems inexpensive industrial cameras with TeleMation modifications are converted to full broadcast specifications. Yet they will instantly revert to self-contained 2:1 interlace operation if fitted with TeleMation's industrial sync generator. All cameras are automatically synchronized for smooth professional switching. A single cable carries all signals and power, adding greatly to the appearance and convenience of operation.

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CATV operators can now take full advantage of the many plus features of the TMW-97 WEATHER CHANNEL® ... remote mirror positioning, remote slide change, 16 mm film accessory, and split screen presentations are all easily accomplished. Your WEATHER CHANNEL® old or new is converted to broadcast specs when operated with a TMV-600 video control center using EIA sync.

where experience powers pace-setting products!

The most significant development ever for CATV program origination

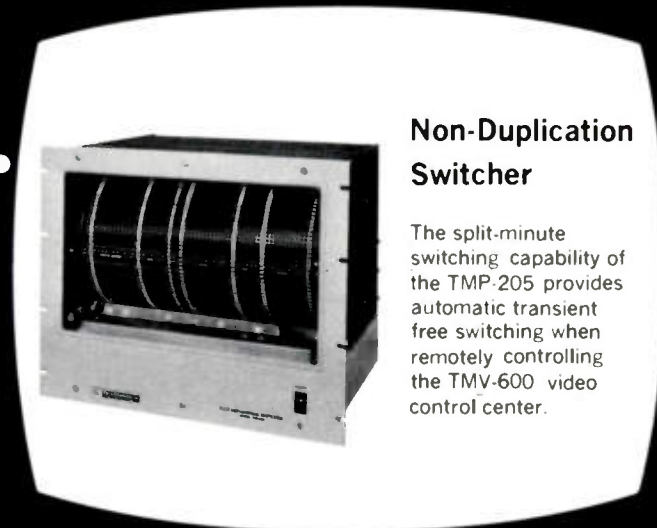
Features —

- Solid-state, synchronous vertical interval switching
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The split-minute switching capability of the TMP-205 provides automatic transient free switching when remotely controlling the TMV-600 video control center.



Video Tape Recorders

The "VTR" output of the TMV-600 can be switched to either preview or program switcher buss, permitting recording sessions without disturbing "on-air" operation. Video outputs of each VTR connect to separate switcher inputs.



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NEWS CHANNEL®, the exciting 24-hour-a-day AP news service may be CABLECASTER® modified for integration with other local origination equipment or for split screen presentation with stock ticker service. Also facilitates automatic presentation of locally produced news.

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LETTERS

TECHNICAL CONTROVERSY ENCOURAGED

● As you know, much controversy exists over the use of the mid-band. To a pilot the debate and proposed prohibition of certain frequencies on the basis of danger to aircraft is downright silly. On the general subject of controversial engineering topics, I think you should encourage expression of opinions divergent from the NCTA Standard Committee's... or any other body.

Philip D. Hamlin
Electronic Consultant
Seattle, Washington

We agree, as do most interested parties, that the exchange of ideas is vital to industry development—on management, political and technical topics. At the same time, of course, we support the efforts of NCTA's Standards Committee and the Engineering Subcommittee in particular. Archer Taylor and his committee members are conscientiously pursuing difficult but necessary technical standards, and are therefore due our thanks. As to the controversy on using the lower mid-band frequencies for CATV, we invite readers to see Mr. Hamlin's article in this issue, and also to review Archer Taylor's article on CATV Standards in our November issue.

MORE INFORMATION WANTED

● I have read the article "Construction and Maintenance of an Underground Distribution System" in the September issue of TV COMMUNICATIONS, and I wonder whether you can furnish the address of the Raybestos-Manhattan Company that makes the adhesive Number 84012 mentioned in the article. I enjoy the magazine very much, and it contains much useful information.

H. C. Ford, Jr.
Granite, Oklahoma

John S. Booth, author of the article mentioned, kindly supplied the address as follows: Raybestos-

Manhattan Inc., Raybestos Division, P. O. Box 1021, Bridgeport, Connecticut 06601.

● In your October issue of TV COMMUNICATIONS, you carried an article by Robert Finehout, vice-president of Association Films. The article mentions that free films were available for TV. Would you be kind enough to supply the address of the Broadcast Information Bureau... I would like to send for the "Free Film Source Book" that Mr. Finehout mentions.

William J. Keenan
General CATV Inc.
Delran, New Jersey

● In the October issue of TVC, I read a very interesting article titled "Free Films for Cablecasting" by Robert Finehout of Association Films. He mentions a "Free Film Source Book" published by the Broadcast Information Bureau. Would you please supply the addresses of both Association Films and the Broadcast Information Bureau?

Ralph Hillard
Farmington Cable TV
Farmington, New Mexico

Thank you for your interest, gentlemen. The addresses requested are as follows: Broadcast Information Bureau, 535 Fifth Avenue, New York, N.Y.; Association Films, Inc., 600 Madison Avenue, New York, N.Y. 10022.

CATV PIONEERS RESPOND

● Forgive me for being so tardy in writing this thank you note to you for the very fine plaque declaring me a CATV Pioneer. I have been in Europe for the past several weeks, and have just returned. May I congratulate you on the very fine trade magazine which you have developed over the years.

Dean M. DeVoe
The DeVoe Company
Barstow, California

● Please excuse this delayed thank you note for the CATV Pioneer plaque... I'm sort of retired now, and have been doing quite a bit of traveling, so have been away much of this year. Thanks again for the honor of being selected as

a CATV Pioneer, and especially for the handsome plaque.

Fred G. Goddard
Tele-Vue Systems, Inc.
Aberdeen, Washington

SOME SHARED PROBLEMS

● As a United Kingdom subscriber to your excellent publication I was most interested in your articles on buried CATV plant. My company operates a number of rural TV relay systems and cable burial is of considerable interest to us. We have buried quite a large amount of cable with our Vermeer Trencher and by a homemade plough attached to our land-rover. We are now seeking a vibratory unit to fit a plough direct to our trencher. Our problem is that in a lot of our rural areas there is quite a lot of stone and we are not too sure if the vibratory plough will handle this—it certainly hammers the digging chain of our trencher. Perhaps some of your advertisers or readers may be able to advise us on these matters.

CATV operation in the U.K. seems to be similar to that in your own country but we are allowed to relay only the programmes intended to serve the area—out of area programmes are frowned upon. Narrow-band (40-70 mc/s) and wide-band (40-240 mc/s) systems are both in use. Our main trouble is individual wayleaves on private property. Most equipment up to now has been valved. Early solid-state equipment proved very unpleasant although the equipment now being made appears to be different altogether.

My company operates both TV rental (a very competitive line) and CATV. We much prefer the latter since we have less trouble, a quicker financial return and much less bad-debt. I certainly do look forward to receiving your magazine and comparing notes—please keep up the good work.

H. N. Storey, Director
H. N. Storey Ltd.
Gateshead, United Kingdom

Thank you for your interest and encouragement. It may well be that some of our readers can offer ideas on your underground construction problems. □

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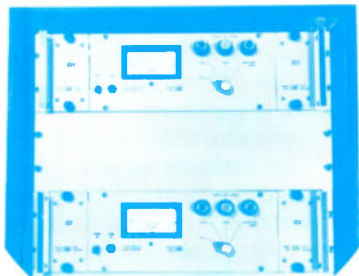
-minimize adjacent channel interference with reliable solid state construction. Field-effect-transistor front ends can accept 10 to 20 dB higher unwanted signal levels than ordinary bi-polar transistor preamplifiers.



BOTTOM

RECEIVERS

-optimize head-end performance with low-noise modular units. Separate AGC systems eliminate the effects of selective fading. Field-effect-transistor RF amplifiers minimize spurious responses and cross modulation. Compatible with existing commercial equipment.



For further information, contact Tom Smith, Marketing Manager, CATV

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Snow problems? Guarantee uninterrupted head-end winter maintenance with Tucker SNO-CAT — the SUREST-FOOTED snow vehicle ever manufactured. Tough! Specially designed for steep climbs and rough country. Travels over all types of snow. Rugged construction gives trouble-free access to isolated head-ends. Job-proved by CATV systems and microwave systems across the nation. Provide your maintenance crews with dependable, economical, winter-long transportation with Tucker SNO-CAT — the reliable way to service your system.

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CATV MANAGEMENT CORNER

She Makes The Difference

(Editor's Note: This month's Management Corner topic has been graciously supplied by Jim Barrett, manager of the ACT system in Pecos, Texas. We are pleased to pass on his most worthwhile ideas to other managers.)

For a long time I have wanted to write about my great admiration for the gals that make us managers look good (I mean better). A manager's success often depends on his office girl's personality, appearance and tact. He must remember that she will probably be the first person a customer sees when he enters the office, and that her dress, her attitude, and general demeanor will affect the image of the company and the manager.

She must be careful that her attitude and enthusiasm bespeaks confidence and shows the customer she enjoys working there and that he, the customer, will always receive courteous service from every company employee.

She should always be on the alert to recognize a customer's voice on the telephone (if he has called before) to call him by name, and make him feel, by her cheerful response, that his call is the most important of the day. Regardless of her many assignments, she should try to never give the impression of harassment in telephone conversations or over the counter.

Part of a good office girl's self-discipline is her ability to turn on that certain charm when called on to handle difficult customer relation problems. She also takes pride in her work and the company, and has the respect of her associates, both male and female.

The good office girl has the courage, the fineness, and the fortitude to front for a busy manager in almost any situation. She can assume responsibility and not assume control. She is conscious hourly and daily of her responsibility to her boss, and by helping him, she is part of the foundation upon which rests the future of his management success and the growth of the system he manages.

Such a girl-Friday doesn't panic, but can think through to a successful conclusion. The office girl is called upon to help the manager with his personal business too, as well as working for new connects and satisfied customers at all times. She can make the difference between "good" and "outstanding" in both the manager and his system.

Probably a major determinant that results in such an exceptional employee is the attitude of you, the system manager. People tend to treat others as they have been treated themselves. Witness the proverbial situation where the man is raked over the coals at the office by the boss or a grumpy customer. As soon as he gets home, he promptly bawls out his wife. She, in turn, gripes at the children who pass the ball along by kicking the cat. If you are rude, harsh, and lack understanding and sympathy toward your office personnel, they will more than likely be harsh and rude with subscribers, or potential subscribers. It's unlikely that such a volley will result in the family cat getting kicked, but you can be sure that the cable firm will receive a jolt or two around the dinner table.

As a businessman and community leader, it is paramount that the system operator never forget that "kindness pays", and that this addage is especially true in the area of employee relations. □

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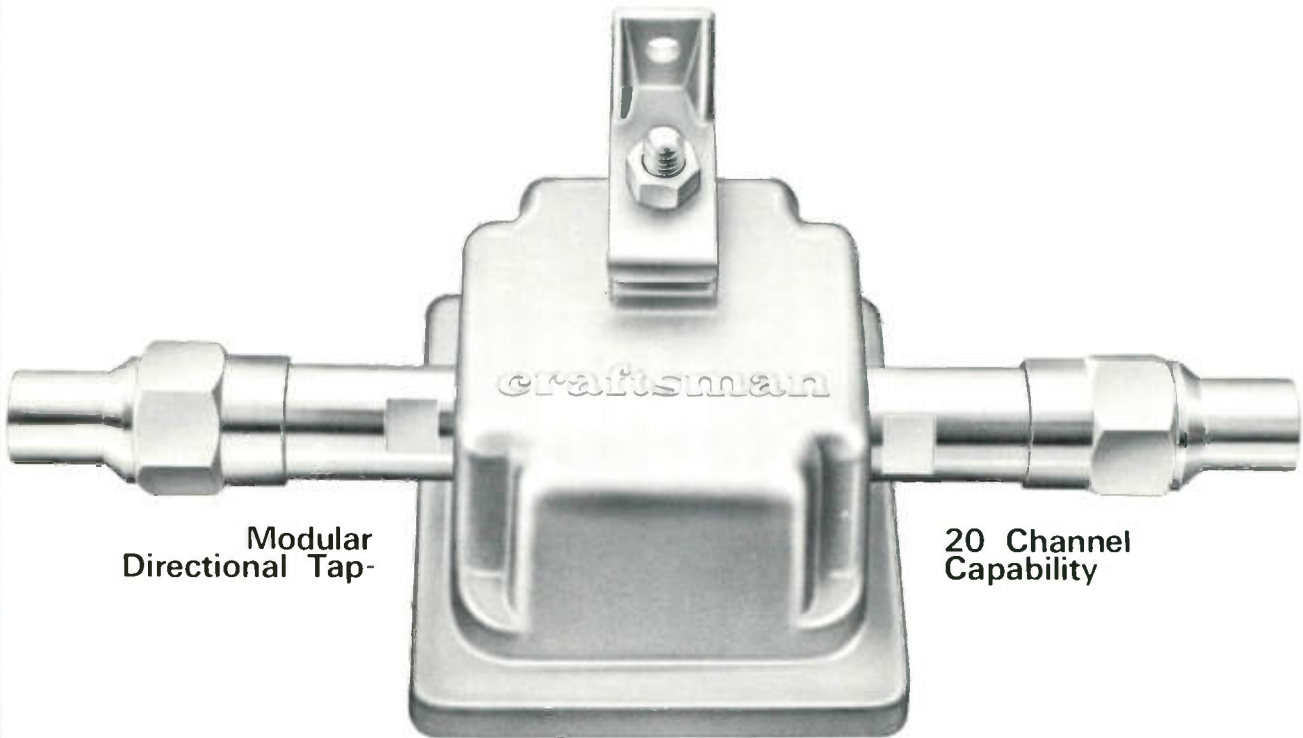
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Late News

PRESIDENT JOHNSON SIGNS PUBLIC BROADCASTING ACT



President Johnson is shown signing the Public Broadcasting Act as architects of the legislation look on (left to right): Representatives Wm. L. Springer (R-Ill.), Torbert H. Macdonald (D-Mass.), Harley O. Staggers (D-W. Va.); Senators Norris Cotton (R-N. H.) and John O. Pastore (D-R. I.); Alan Pifer, president of the Carnegie Corp.; Dr. James Killian, Jr., chairman of Carnegie Commission on ETV; and

John W. Gardner, secretary of the Dept. of Health, Education and Welfare.

At the signing, the President announced the first two members of the board. Named were Milton S. Eisenhower, president emeritus of Johns Hopkins University and James R. Killian Jr., chairman of the Massachusetts Institute of Technology and head of the Carnegie Commission, which proposed the Act. In his statement, the President looked ahead to an era in which satellites and computers will be linked together in a system which would make it possible for doctors to be in touch with distant hospitals and for students to have access to far-away libraries by means of an "electronic knowledge bank." Cable men on hand for the signing were NCTA president Frederick W. Ford and Joel Smith, executive assistant to the president of Jerrold Corp.

HOUSE COMMERCE COMMITTEE HALTS FCC PROGRAM ON PAY-TV

The House Commerce Committee has instructed the FCC to refrain for a year from implementing its proposal to authorize broadcast pay-TV. Acting on a Communications and Power Subcommittee resolution, the parent committee added the one-year stipulation, and just before this, another "whereas" clause stating that "it has not been established to the satisfaction of this Committee that authority to license subscription television operations comes within the power of the Commission under the provision of the Communications Act."

TIME-LIFE DROPS LEASEBACK; CITY BREAKS TELCO POLICY

Developments in Lake Charles, Louisiana have resulted in a losing round for Ma Bell in the form of the Southern Bell Telephone and Telegraph Company. The outcome in the conflict left Southern Bell unable to enforce its customary pole attachment policy which allows but one CATV party on telco poles at a time. Winners in the battle are KAOK-CATV, which exchanged a leaseback arrangement for a pole attachment agreement, and the city of Lake Charles, which proved that it does have power to decide what happens in its public domain.

In 1964 the city granted a franchise to Louisiana Cable TV, Inc. but the company showed little immediate activity in system construction. At Southern Bell's request, the city later granted a second franchise to KAOK-CATV, Inc., a subsidiary of Time-Life Broadcast, which began to utilize one mile of leaseback plant — but found the arrangement unsatisfactory. According to KAOK, telco service was below par technically, and the financial arrangements made profitable operation impossible, so application was made for a regular pole attachment. Southern Bell had, in the meantime, placed a six-months extension on its agreement with Louisiana Cable, thus allowing them to meet the conditions of their expiring franchise with the city of Lake Charles as well as those of their expiring pole attachment agreement. In the face of a protest from

Late News (Continued)

KAOK, Southern did agree to allow KAOK to place cable on poles outside the city limits but still refused them access to poles in the city proper. It was learned later that Southern Bell itself had never been granted a franchise by the city and that Southern and Gulf States Utilities had entered a joint pole attachment agreement in 1931 which prevented either from allowing a third party on the poles without the other's permission.

At this point the Lake Charles city council stepped in and declared that Gulf States had no authority to say who was to use the poles located on the public domain, and GSU promptly gave permission for KAOK to start stringing cable. In protest to this development Southern Bell filed suit in the U.S. District Court to enjoin GSU and KAOK from placing cable on GSU poles, basing the suit on the 1931 agreement. The judge ruled in favor of Southern Bell.

The mayor and city council of Lake Charles immediately asked the judge to allow the city to intervene and ordered that utility companies were to allow franchised CATV operations to place cable on telco poles. At this, the restraining order was lifted, and construction got under way once again. Southern Bell is expected to appeal, but district court Judge Edwin F. Hunter has indicated that the appeal will probably be ineffective. ". . . this (city) ordinance is valid on its face and in my judgement this court should not interfere with its enforcement until such time as a complete hearing on the merits have been heard . . . Federal courts should practice judicial restraint in setting aside municipal ordinances merely because they are attacked," the judge concluded.

READOUT NEWS SERVICE NOW AVAILABLE



The availability of a readout news service for CATV has just been announced by Television Presentations, Inc. and United Press International. The system, labeled "Alphamatic News," provides subscribers with 24-hour world and local news as well as stock market quotations. Heart of the system is a device manufactured by RCA Victor, Ltd., known as a character generator. The character generator converts a telegraph signal to words which appear as sentences

flowing across the television set at an easily readable flow. Each line holds 42 characters. When 12 lines of copy are presented, the copy is erased (except for the bottom line) and the entire sequence starts again at the top.

JERROLD-GENERAL MERGER APPROVED BY STOCKHOLDERS

Shareholders of both firms have approved the acquisition of the Jerrold Corporation by General Instrument Corporation. The vote of General Instrument shareholders for the acquisition was 3,607,559 shares in favor of the merger and 20,544 against it. Jerrold shareholders approved the acquisition by a vote of 2,068,929 to 14,118. Under terms of the agreement between the two companies, General Instrument will issue seven-tenths of a share of its common stock for each of the 2,392,667 shares of Jerrold common outstanding. In addition to supplying CATV equipment and building turnkey systems, Jerrold has ownership interests in 18 CATV systems, plus approximately 25 additional CATV franchises in various parts of the country. General Instrument manufactures electronic systems and components, notably integrated circuits.

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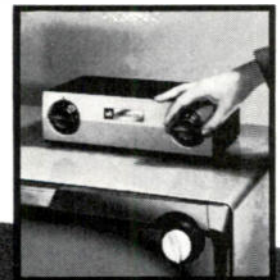
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FCC Jurisdiction To Be Considered by Supreme Court

*"Certiorari granted
No. 363 U.S. vs. Southwestern
Cable Co.*

*No. 428 Midwest Television
Inc. vs. Southwestern Cable Co.*

"The petitions for writs of certiorari are granted and the cases are placed on the summary calendar. The cases are consolidated and two hours are allotted for oral argument. Mr. Justice Marshall took no part in the consideration or decision of these petitions." The U.S. Supreme Court gave notice last week that it would review the San Francisco Appeals Court rebuff of the FCC in the now celebrated San Diego cable case. The same case is making its way through internal appeal machinery at the Commission, where the last move was an examiner's initial decision finding no evidence of any CATV effect on San Diego TV.

San Diego Case May Not Be Adequate

It is the government which wants this test. Cablemen would rather accept a limited reversal of the FCC last April in the U.S. Court of Appeals for the 9th District and try full jurisdiction somewhere else where it has been "thoroughly briefed." The seven-company cable appeal from FCC jurisdiction argued Oct. 16 in the U.S. Court of Appeals for the 8th Circuit in St. Louis would be a better test of jurisdiction, cable counselors say.

The case can be fought either on "narrow" or "broad" basis. Narrow consideration would limit arguments and conclusions to the San Diego case in particular, while a broad-ground approach would have industry-wide implications. Some feel that the San Diego case is not the best case to test FCC jurisdiction. It is felt that the jurisdictional issue would be better served by a

case designed at the outset to test jurisdiction. New petitioners' briefs, due in 60 days, followed by briefs from the respondent cable companies in the succeeding 30 days, will help determine whether the case is fought on narrow or broad ground. Of the former, Arthur Scheiner, attorney for Southwestern Cable Co., said, "I'm confident we'll win on that score, that the FCC does not have the authority to issue a so-called temporary stay without a hearing, where a CATV operator is in compliance with all the local requirements of the FCC." He explained that the temporary basis is in effect "a couple of years" and added, "that ain't temporary and it ain't due process. I'm confident that the Supreme Court will agree."

The Government Brief

The U. S. Brief said the No. 1 question is "whether the FCC has jurisdiction to regulate non-microwave CATV" and No. 2, "whether it has the power to issue an interim order maintaining the status quo pending a hearing to determine the impact on local free television of distribution by CATV of signals from other areas of the country." The KFMB-TV brief similarly placed priority on jurisdiction.

NCTA is taking the "narrow" view of the issues but conceded in its membership bulletin that "A landmark decision could result if the Court elects to consider the broad basic question of FCC jurisdiction."

Many CATV legal counsels anticipate that the Court's consideration of the San Diego case may cause it also to sit up and take notice on the Fortnightly-United Artists copyright case. This could mean direct involvement by the Supreme Court in the CATV copyright issue.

FCC Examiner Rules For CATV In San Diego

If an initial decision made recently in the San Diego distant-signal case stands, cable systems there will be able to bring in Los Angeles TV, and American Television Relay Inc. will have a permit to microwave it. This is subject to Commission final decision, however, and the inevitable exceptions that will undoubtedly be taken by interested parties in the case. It is expected to be spring before the question can be argued.

Hearing examiner Chester F. Naumowicz Jr. ordered San Diego cable limitations removed and said in his initial decision that "there is no evidence that CATV-produced competition, has had any effect whatsoever on the service offered the public by the San Diego television stations or the ability of those stations to continue offering that service."

In addition to CATV non-duplication protection of VHF network programs, Mr. Naumowicz specified protection of syndicated programs. He ordered that stations and cable systems submit a syndicated program protection agreement in 60 days, or advise the Commission that they cannot agree and the Commission will retain jurisdiction.

The examiner wrote off two touchy points. On cable program origination, he said that it probably would be similar to current local programming and, "if there is little need for such programming, there is equally little harm in it." He also questioned authority to restrict San Diego CATV on an economic basis. On UHF: "the loss of these stations' services would be virtually unnoticed by the public in San Diego."

The initial decision follows a hearing which began Dec. 12, 1966. That followed a Commission order July 20, 1966, requiring CATV systems in San Diego to confine their distribution of Los Angeles television signals to subscribers in areas where the systems had been operating on or before Feb. 15, 1966, (date Second Report and Order went into effect), with the hearing designated on CATV impact on San Diego stations.

Schildhause: Copyright Will Not Determine the Future of CATV

Some encouragement can be taken from statements by CATV Task Force Chief Sol Schildhause, who recently addressed the combined NCTA-Mid-America Association meeting in Kansas City. Although Schildhause feels that nobody really has the answers regarding CATV regulation, he feels certain that CATV'ers can "reasonably expect that the search for answers will be conducted in an environment less hostile than may have appeared to threaten a year ago." The Task Force head went on to predict that the copyright issue will continue to hold center stage in CATV legislation until it is finally resolved. He asserted that copyright legislation will have considerable effect on CATV in years to come but that it won't necessarily determine the future..."

Schildhause elucidated further on the posture of CATV before the Federal Communications Commission, relating facts that evidence improvement in the relationship: "Importantly, the Commissioners — as distinct from the Commission — already demonstrate that they are increasingly attracted by the possibilities of CATV. This is evidenced both by their interest in attending your regional meetings, and by their efforts to suggest promising paths for the cable industry. Commissioners Loevinger, Wadsworth, Lee, Cox, and Johnson all took time out from very busy schedules in order to participate."

FCC Might Okay Local Origination

"Any discussion of comforting developments must also count mounting Commission encouragement of the industry's interest in opening up its potential for originating. Fred Ford can tell you, of course, about not counting on your own assessment of how the votes will go. But within the last 10 days or so, Commissioner Loevinger again and Commissioners Johnson and Wadsworth have spoken approvingly of local origination. And if convincing the Commission is the key, that isn't a bad start.

"Now I don't think that local origination is going to solve all of

CATV's problems. Like some of you, I believe that the pitfalls are numerous..."

FCC Jurisdiction May Be Settled

"One final matter. This past Monday, the Supreme Court of the United States agreed to review the extent of the Commission's jurisdiction over CATV. What this means is that we can now look

forward to a reasonably early resolution of this fundamental question. The probabilities suggest that the Court will fully affirm the Commission's authority. This would come as no surprise to me and should not be a disappointment to you. This industry, by virtue of its very promise, invites some form of government regulation. And that promise will be more smoothly realized as uncertainties are removed. My personal view is that this will prove of long-range benefit to you."

(News continued on next page)



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Lineman Receives Valor Award

The third day of the National Cable Television Association regional in Philadelphia was a technical session, topped by a surprise award at the closing luncheon. It was conferred by Pennsylvania cablemen on line-

man Ronald Viney for heroism in a vain attempt to save Charles Whited, who died in Indiana, Pa., when he touched a high voltage line. Viney carried an ambulance attendant up the pole and supported him on his back while he tried to save Whited.

Ford Criticizes FCC

Frederick W. Ford, president of the NCTA, said that CATV relations with the FCC have reached their lowest point. In his opening luncheon speech at the regional meeting in Philadelphia, Mr. Ford went on to say that the FCC is "making one ruling after another to contain CATV" instead of trying to integrate it into the electronic mass communications. He pointed out that the Commission failed in the beginning to prepare to assert jurisdiction over cable when they did not hold elaborate hearings or conduct a "valid investigation" as was done concerning UHF, or network programming.

Among CATV grievances with the FCC, Mr. Ford listed the Fortnightly Corp. — United Artists copyright case, the Triangle Publications proposed test of cable impact in Philadelphia and the Commission's overall assertion of "negative jurisdiction to protect broadcasting". However, he was encouraged by FCC Hearing Ex-

aminer Chester F. Naumewicz's initial decision recently in the San Diego Distant-signal case. The Examiner's initial decision held that there was no evidence that CATV competition had any effect on broadcasting.

The NCTA executive told the associations that this is a "year of decision" where legislation and legal technicality are concerned. He sighted the copyright extension introduced by Sen. McClellan as an example of progress and included the Supreme Court hearing on the Fortnightly appeal as another milestone. Mr. Ford said that the antagonists who are opposing CATV in Washington are represented by 10 to 20 full-time men and that the NCTA hopes to employ a fulltime representative in the near future. Other encouraging aspects include the recent decision against a telco who refused use of poles to a CATV system in Lake Charles, La.

Commission Requests Larger Task Force Next Year

There will be 58 men and women in the CATV Task Force next year, if the FCC gets what it wants for the period starting in July. This would add 32 jobs to a present authorized strength of 26. The Commission is asking more than \$500,000 for the CATV Task Force, double its first-year budget but still a small part of a total \$24,941,000 the agency estimates it needs next year. This is up \$5,841,000 for the whole agency and includes a total 282 positions the FCC wants to add.

When Commissioners and administrative heads presented the new estimates to the bureau of the budget, examiners there were interested in the CATV backlog. They asked what percentage of cable cases under the top-100 TV market rules were older than 90 days, and the reply was around 85 per cent. They were interested, too, in the growing rate of hearings on CATV business. According to the budget plan, new legal manpower in the CATV Task Force will be assigned to hearings. At present the Task Force is restricted because of manpower, and the Broadcast Bureau substitutes as a party at most hearings.

H & B American Offers New Survey Service

H & B American Corporation and Audits & Surveys Inc. today announced formation of a joint venture in which CATV facilities will be utilized to develop innovative marketing research services for TV advertisers and broadcasters. Roy Benjamin, Audits & Surveys vice president, has been named president of the new firm, called Television Testing Co.

Television Testing is creating a computer memory storage bank to accommodate advertisers who want a more accurate assessment of a commercial's effectiveness before committing substantial sums for air time. Based upon H & B American's more than 100,000 CATV subscribers in some 25 markets, it will contain data on family and individual demographic characteristics, product usage and buying patterns.

Nevada To Regulate CATV

An attempt by the State of Nevada to regulate CATV rates was sustained last week when the U. S. Supreme Court declined to review a lower court decision refusing to enjoin the state from regulating the rates of two cable companies. The case that failed to be reviewed was Pix, Inc. vs. Allard.

Radio Hanover Case Argued

Part of a series of anti-trust and Section 214 actions by Radio Hanover (WHVR) against utility-cable interests was recently argued in Scranton, Pa. The hearing was on Radio Hanover's motion for summary judgement to compel United Telephone of Pennsylvania to get an FCC certificate of convenience and necessity for lease-back. This argument followed a weekend order by Federal District Judge William J. Nealon in the U. S. Court for

Middle Pennsylvania that he has jurisdiction in the anti-trust suit.

Radio Hanover charges that United's refusal of access to Radio Hanover's CATV operation is part of a plan to monopolize CATV and the future of cable television in Hanover.

Lewis A. Rivilin, prominent Washington attorney, also argued for Radio Hanover that the interstate limit of Section 214 was applicable. The judge denied United's motion to dismiss this.

FCC Commissioner Visits CATV System

FCC Commissioner Nicholas Johnson made his first visit to a head-end in conjunction with the New Jersey Community TV Association meeting and the NCTA Regional meeting in Philadelphia. Pete Lucchin, New Jersey CATV Assn. president and vice-president of Alpine Cable TV, hosted John-

son's visit to the Alpine plant in Pleasantville, N.J. The Commissioner was accompanied by Sol Schildhouse, CATV Task Force head, Robert Beisswenger, president, and Paul Garrison, vice-president of Jerrold Electronics Corp., and George Sisko, general manager of Washington Cable Co.

Mid-America Association Elects Officers

New officers were elected at the Mid-America meeting held recently in Kansas City in conjunction with the NCTA regional meeting for the area. The new officers are: President Ray W. Baker of Manhattan, Kansas; First Vice-president Galen Gilbert of Neosho, Missouri; Second Vice-president Hal Phillips of Blackwell, Oklahoma and Secretary-treasurer Kenneth Schuelein of Elk City, Oklahoma. Acting directors will be Bob Lewis, Bud Weir,

(News continued on page 28)

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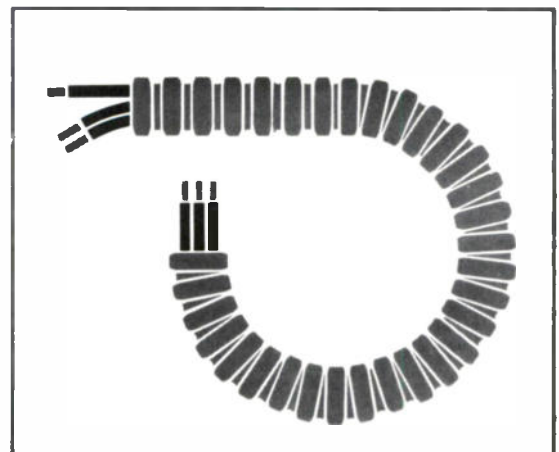
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Here's what Mr. J. B. Krumme, (left), president of Holdenville Cable Co. has to say about all-transistorized Channel Control head-end and other CAS equipment in his system:

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Fred McElroy, Weldon Johnson, Bud Williams, Galen Gilbert, Lon Preston, Kyle Moore, Jack Chaney, Bob Schmidt, and John Monroe. Grover Cobb was also elected to the board of directors pending his acceptance. Approximately 125 attended the combined two-day meeting.

CATV Popular At USITA Convention

Nearly 200 independent telephone company operators attending a special CATV session heard the United States Independent Telephone Association general counsel warn that because of CATV association efforts "independent telephone companies, like CATV's, may well be in for greater regulation". Reviewing the history of CATV regulation, former FCC general counsel, Warren Baker, noted that "the principal clamor for regulation of CATV has been based almost entirely on a request for protection from competition so as to maintain the economic viability or profitability of TV broadcasters." Claiming that the FCC has put a "wet blanket and damper on CATV," he added that "there is a serious question whether the FCC does have the jurisdiction" over cable television.

In spite of these warnings, a general theme of the session was that "the telephone industry belongs in the CATV business — or more widely defined, the broadcast distribution business of which CATV is a part," as stated by Richard A. Lumpkin of Illinois Consolidated Telephone Co. He added, "As this business develops, it will become more and more a common carrier type of operator . . ."

Another CATV session panelist, J. C. Henderson, of Rochester Telephone Company, Rochester, New York, stated that in the normal CATV system, the cable operator owns the headend facility. He suggested, however, that "perhaps the headend should also be owned by the telephone company . . ." or that the CATV trunk line should be routed directly through the telephone central office in order "to retain control" over the CATV facility.

Schildause Questions FCC Reasoning

The head of the FCC CATV Task Force has disputed FCC reasoning in a "petition for clarification" of an order for a hearing on a Bluefield (W. Va.) Television Cable Corp. request for a waiver with respect to carrying WCYB-TV, Bristol, Va. Sol Schildause said the order "departs from settled policy" on carriage. "A TV station which does not serve a particular community over the air has nothing to gain or lose from operation of the CATV system and is therefore entitled to no protection."

He noted the Commission's feeling that Bluefield's "candor leaves much to be desired" in relation to moving the headend to a position where WCYB-TV could be received. If the hearing were to lead to an order to the cable system to move its headend, the Commission would be going outside the rules to an area "not related to the underlying regulatory theory," he wrote. The petition acknowledged that the CATV Task Force does not participate in most hearings but asked for limited intervention here.

New York CATV Meet Held

The New York State Community Television Association held its fall meeting in the Otesaga Hotel in Cooperstown, N. Y. with 39 members in attendance. Mrs. Dawn Fribley of Corning was elected president, replacing outgoing Harry Levin of Iliion. Other new officers included Les Read of Tele-Prompter as vice-president, Mike Arnold of Olean as treasurer, and Larry Flinn of Vestal remains secretary.

An address was delivered by State Senator James F. Hastings, member of the New York State Public Service Committee. Senator Hastings traced the history of thought by the PSC on regulations of CATV.

FCC Upholds ABC-ITT Merger

The FCC stuck up for its own jurisdiction in the proposed ABC-ITT merger. In a brief filed in the U. S. Court of Appeals, District of Columbia and in opposition to the Justice Dept. antitrust division, the FCC said the merger would result in better programming. The Commission said, too, that the merger would not prevent other activity by ITT in national TV, networking, CATV, Pay TV and communications technology.

PCATA Elects Officers

The Pennsylvania Community Antenna Television Association (PCATA) elected officers for the 1967-68 year at their recent fall meeting held in Philadelphia, Pa.

in conjunction with the National Cable Television Association regional meeting. Named president for the coming year was Joseph S. Gans, president of the Cable TV Company, Hazelton, Pa. Vice-president is Walter A. Kinash, manager of Johnstown Cable TV, Johnstown, Pa., while the new Secretary is Jay L. Sedwick of Armstrong Utilities,



Inc. of Butler, Pa. Arthur Reagan of Valley TV Cable Co. was re-elected PCATA treasurer for another term.

Shown left to right are Mr. Gans, Mr. Reagan, Mr. Sedwick and Mr. Kinash.

Feature Films For CATV

George Leibowitz, president of Leeder Consultants, Inc., has announced the formation of a company for the distribution to CATV systems of feature films, cartoons and other local origination programming. Mr. Leibowitz stated

(News continued on page 30)

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that. "While there are now only a handful of operators cablecasting feature films, the number should expand in the very near future". Leeder Cable Services, Inc. will attempt to bring to the cable industry, programming of comparable quality to that originated by local television stations according to the company.

Cox Acquires Bing Crosby Productions

Leonard Reinsch, president of Cox Broadcasting Corporation, and Bing Crosby have completed negotiations whereby Cox acquired Bing Crosby Productions, Inc.



Crosby Productions, Hollywood, currently producing "Hogan's Heroes" for the CBS television network, will be operated as a part of the Cox program production and distribution division.

More on AMST Ex Parte

It now appears that only one AMST station involved in the American Television Relay Inc. case at the FCC was represented at the board session which planned the AMST-FCC meetings held May 9. James Monroney, Jr. was named as the only attending AMST interest. Mr. Monroney is vice-president of A. H. Belco Corp. (WFAA-AM-FM, Dallas). The FCC denied the ATR charges of ex parte saying its AMST talks were on "broad policy matters," but did agree to ask AMST for pertinent information on the meetings. Lester W. Lindow, executive director of AMST, replied that to the best of his knowledge Monroney was the only list-affiliated participant at an April 2 board meeting authorizing the May 9 meetings and that his

only participation "was to vote affirmatively" on the authorizing motion. Lindow wrote that no others on the list participated in planning the May 9 meetings.

FCC Bars Five Systems From Carrying Canadian Stations

WAGM, Presque Isle, Me., television station, recently obtained a ruling from the Federal Communications Commission to bar five CATV systems from carrying station CHSJ, St. John, New Brunswick. An appeal is now being made by the CATV operators to the U. S. Court of Appeals.

WAGM was reported as claiming it would "suffer irreparable damage" if the cable continued to carry the Canadian station's new programs that hadn't yet been shown on the American networks. The cable systems hold, in their appeal, that the FCC ruling is meaningless because many television set owners affected by the ruling can receive the St. John station independent of the cable, with even a small antenna.

A sales inducement by U. S. networks to Canadian networks is at the root of the trouble — in return for buying some programs the Canadian stations are permitted to show them ahead of the U. S.

Tenn. Association Elects Officers

The new Tennessee Cable Television Association has elected Paul Puckett, head of TV Cable Co. of Johnson City, as president. Also elected were Alvin Wood, Dyersburg as vice-president, and the secretary-treasurer's position was filled by Ken Knight of Nashville. Directors named are W. Marion Palmer, Gatlinburg, E. W. Wendell, Nashville, Jim Dowly, Union City, and Jim Adkisson, Harriman.

New England Association Sets Up Complaint Clearing Offices

The president of the Community Television Association of New England told members at their fall meeting that complaint clearing offices should be active in all four New England states by the first of the year. Richard Blais, president of Paper City TV Corp., Berlin, N. H.,

heard reports on the state centers during a two-day session recently in Concord, N. H. The centers are part of a preventive program to head off restrictive legislation. The Association has found that attempts to put utility regulation on prices often are based on subscriber gripes. Now it will field these with complaint clearing offices. The Association is also presenting the cable case to key legislators.

Ad Hoc Meets Again

While cable and copyright interests hold negotiations in New York, the ad-hoc group of cable and broadcast statesmen continue diplomatic meetings in Washington. The third ad-hoc meeting in Washington recently moved a step closer to wrapping up a package of problems they want the two industry associations to solve.

Hatch said the group is down to making "a composite picture of basic questions." He and Stern have been assigned the job of deciding which are the critical issues to the two industries. They will bring this list to another meeting the objective of which will be to formulate a report to NAB and NCTA and ask them to carry the ball.

Committeemen are thinking of legislation that will be loose enough to accommodate rapid change, and of someone to interpret it. They are "leaning away" from the copyright office, thinking the job calls for closer application to their businesses. Two subcommittees also will meet again.

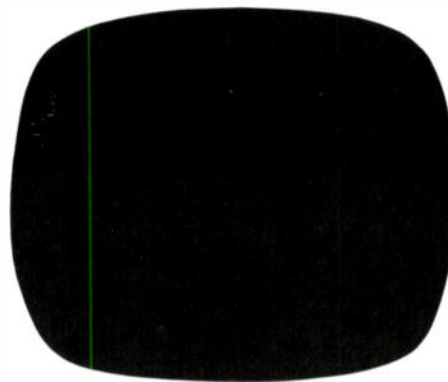
Telco Wants Leaseback Liberty

Mountain States Telephone Co., part of the Bell System, has filed a tariff change request with the Colorado Public Utilities Commission that would allow them to build leasebacks without knowing whether a franchise had been granted. The Colorado Municipal League protested this move and petitioned for a public hearing on the matter. The League complained on the grounds that the telco would then have the controlling hand over the CATV franchises instead of the individual communities.

(News continued on page 32)



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Emmy Winner to Make Film on CATV

The National Cable Television Association announced recently that it has commissioned Irving Gitlin Productions, Inc., of New York City to produce a new 16mm color documentary film on the cable TV industry. The film is scheduled to be premiered during National Cable TV Week, next Feb. 4-10. Mr. Gitlin created and produced such award-winning television properties as NBC's "White Paper" series, the "DuPont Show of the Week" and CBS's "The Twentieth Century." Among honors he has received are Emmy, Peabody, Sylvania, Polk Memorial and Overseas Press Club awards.

FCC Charges Anti-trust Against Broadcasters

The FCC recently put anti-trust conditions on license renewals in three Ohio cities. The conditions were put on companies owning broadcast stations and CATV interests in Toledo, Ohio, and Hanover, Pa. Reasons given for the action were that competing cable systems have charged that the stations' parent companies conspired with telephone companies and others to monopolize CATV in Toledo and Hanover. The FCC said no complaints had been filed against the licensees but that conditions were attached to the license renewals because court decisions adverse to the licensees might raise issues about their qualifications.

TV Critic Lands Cable TV

Veteran TV critic Jack Gould said in an article recently in the *New York Times*, that the long-range implications of cable television "threaten to jar many of the conventional assumptions that have guided broadcasting since the 1920's . . . While satellites span the continents and oceans, cable TV is down where the real action remains . . . on earth." Gould also said that the FCC has "sought to protect the financial viability of existing TV stations against the real or imagined inroads of a cable service." He went on to say that the test for cable TV may turn out to be the "proverbial story of the country

boy who wanted to make good in the big city," and that cable television is "moving from its original premise — the provision of TV where there was no TV — to the riskier area of asking a fee to furnish supplementary services."

"Cable television," predicted Gould, "does face a distinctive year of decision; it could upset the status quo in so many ways that a marathon controversy over where, how and if it should continue is inescapable."

State Supreme Court Backs Telco

The Supreme Court of the State of Maine has ruled in favor of Bartell Telephone TV Systems (Bartell Media Corp. is parent company) in their fight to build a lease-back cable television system in Waterville, Maine. The company has an agreement with New England Telephone & Telegraph (AT&T affiliate) and both Bartell and the telco have taken the stand that they did not need a CATV franchise from the city. Their contention was that New England Telephone already had a franchise and thus had the right to extend cable television services to any firm it, not the city, wanted to select.

Remote Mining Camp Gets CATV

Residents of Benson Lake, B. C., Canada are now receiving single channel reception, thanks to CATV technology. Benson Lake is a Cominco mining camp, located at the North end of Vancouver Island and is situated in a valley, approximately 14 miles from the nearest Translator. To receive enough signal to run the system, it was necessary to erect a 4 bay, stacked, 9 element channel 2 antenna, approximately 4,000 feet up a mountain from the nearest road. This was also the closest source of power for the head end pre amps. There was no existing telephone plant so the system was installed on hydro poles.

According to system manager, D. A. Shaw, "There was only one location on the side of a large mountain, that we could find any signal, and if we moved in any direction more than 80 feet, the

picture or sound would disappear." After the head-end was situated construction went smoothly and the job was completed ahead of schedule. The B. C. Cable-built system utilizes 4,200 feet of ½ inch mainline aluminum cable and 16,400 feet of ⅜ inch aluminum distribution plant.

Dept. Of Communications Gets Boost

The idea of a Federal "Department of Communications," espoused by many of late, got a Congressional boost recently at least from the standpoint of frequency allocations. Rep. Torbert H. Macdonald (D-Mass.), Chairman of the Communication and Power Subcommittee of the House Committee, threw out the idea for some 400 Electronics Industry Association members in Los Angeles. Satellite communications are going to add to the "burgeoning problem" of frequency allocation, he said, proposing: "I believe that our solution of this problem may be the development of a Department of Communications."

NCTA Intervenes In Court Cases

The National Cable Television Association asked to intervene at the U. S. Supreme Court as a friend of the Court in the copyright appeal filed by Fortnightly Corporation of the United decision. NCTA said lower court decisions, if allowed to stand, would effect "the structure of an entire industry and communications service to the public." The association offered statistics to show that CATV mostly serves small towns.

Missouri University Changes Mind About CATV

In a 38-word statement, the University of Missouri has removed a possible barrier to the approval of CATV in Columbia. The statement released by the University's Office of Public Information states that the school will neither support nor oppose CATV applications in Columbia. Previously the University had been strongly opposed to cable in Columbia and had been the prime reason for defeat of CATV proposals before the City Council. □



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Systems

Newly elected vice-president of Unicom Incorporated is **William Stone**. Mr. Stone joined Unicom in 1965 as chief engineer of the corporation.

The new system manager for Cable-Vision of Lafayette, Calif. is **John R. Penwell**. The system is under the management of Malarkey, Taylor and Assoc. of Washington, D. C.

B. M. Tibshirany has been named district manager of cablevision systems in Darlington, Florence, and Marion, S. C. according to Cosmos Cablevision Corporation.

John H. Taylor will be the new manager for the system in Columbia, Tenn. The announcement was made by Middle Tennessee Community Antenna Television, the parent company.

Max Hertweck will manage the CATV system in Decatur, Alabama which has recently been purchased by TeleCable.

Suppliers

The stockholders of Scientific-Atlanta, Inc. elected **J. Leonard Reinsch** as a new member of the board of directors at their annual stockholders' meeting recently. Mr. Reinsch is president of Cox Broadcasting Corp., a major MSO through its subsidiary, Cox Cablevision.

John D. Couturie, vice-president and treasurer of the Hughes Aircraft Company, has been elected a member of the board of directors of the TelePrompter Corporation.

John J. Aylward has been promoted to vice-president of marketing for Amphenol Corporation's Cable Division, Chicago. He had been marketing manager.

H. F. Krapf has been named to the newly-created position of vice-president, sales and engineering for

Diamond Power Specialty Corporation, Lancaster, Ohio.



Bruce Walters



H. F. Krapf

Bruce Walters has been elected vice-president of manufacturing for the Anaconda Astrodata Co. Mr. Walters was formerly vice-president, and a member of the board of directors for Ameco, Inc., Phoenix.

Bobby Redden has been appointed general manager of Systems Construction Corporation, a subsidiary of Entron, Inc. Mr. Redden will be responsible for all CATV construction activities of Entron.

Superior Cable Corp., Hickory, N. C. has announced the appointment of **Lester L. Key** to the position of facilities engineer. In his new position Mr. Key will be responsible for planning, engineering, and estimating and supervising all construction projects and plant expansion projects.

John G. Thompson is named manager of manufacturing planning and control in a recent announcement from Ameco, Inc. Mr. Thompson was formerly with Motorola Military Electronics Division.

David Gorman has been transferred to the commercial marketing department of the American Electronic Laboratories, Inc. He will be responsible for sales in the broadcast equipment division.

Barton Kreuzer has been appointed division vice-president and general manager, RCA Broadcast and Communications Products Division. Mr. Kreuzer comes from the Astro-Electronics Division where he was also division vice-

president and general manager. He replaces the retiring Chas. H. Colledge.

William Patsuris has been appointed northwest regional sales manager for Memorex Corporation, Santa Clara, Cal.

Beekman V. Beavers of Clinton, Connecticut has been named manager of materials and scheduling for Whitney Blake Co.

Edwin R. Levine, formerly of General Electric Company, has been named senior field engineer for Philips Broadcast Equipment Corp., manufacturer of Norelco broadcasting equipment.



Edwin R. Levine



Walter Richman

Walter Richman has been named district sales manager for the New York-New Jersey area by JFD Electronics Co., Components Division.

John C. Wieggers has been appointed Southwest regional sales manager for Memorex Corporation, Santa Clara, Cal.

Herbert M. Holzberg, formerly of Ampex Corporation and Radio Corporation of America, has been named northeast regional sales manager for Philips Broadcast Equipment Corp.



Herbert M. Holzberg



J. William Black

Measurement Control Devices, Inc. of Philadelphia has announced the appointment of **J. William Black** as sales manager for commercial products. Mr. Black will be in charge of sales planning, supervision and promotion for commercial instruments manufactured by MCD.

Hillet Spanget has been appointed director of purchasing for the Vikoa Cable Plant at Freehold, New Jersey.



George James

Donald V. Oetjen

Donald V. Oetjen has been named general sales manager of Diamond Power Specialty Corporation, Lancaster, Ohio.

Professional

George James has been appointed administrator of the National Cable Television Institute, a recently-formed firm which will offer correspondence study courses for CATV technicians. James formerly held positions with Vikoa, Inc., UNIVAC, Entron, Inc., Ameco, Inc., Brown Engineering Co., General Electric Co., and Philco Corp.

The NCTA has announced the appointment of James R. Palmer as chairman of its technical training committee for 1967-68. In this capacity, Mr. Palmer will be responsible for developing and providing educational materials in the field of CATV and the development of technical manpower training for the industry.

Buford Marsh has recently been appointed business manager and circulation director for Communications Publishing Corp. Marsh comes to CPC after nine years with Friden, Inc.

Robert Scherpenseel was elected technical vice-president of the Pacific Northwest Community Television Association during sessions in Portland. This group is composed of members from Washington, Oregon, Idaho and Montana. Scherpenseel is district manager for Northwest Video.

Lee Anne Newman has recently joined the staff of TV Communications magazine as editorial assistant. Miss Newman will assist in production of the monthly journal and TVC's two annual CATV directories. □

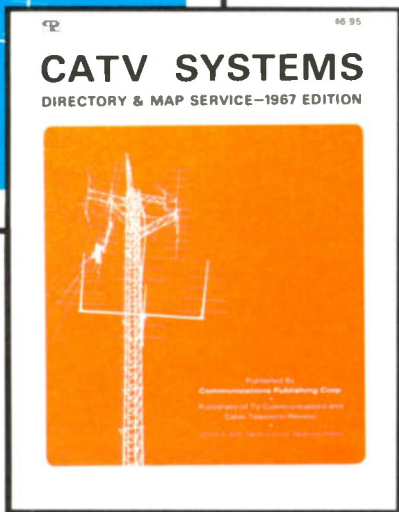
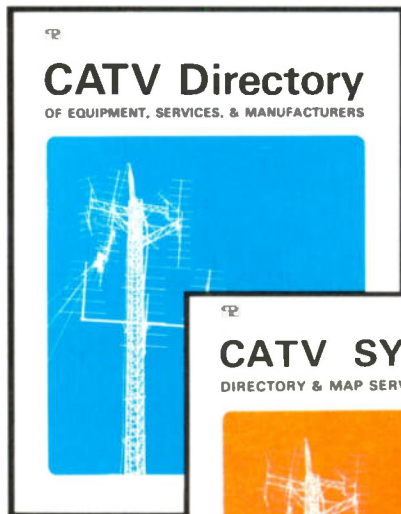
System Sales

Decatur, Ala. — TeleCable Corporation recently announced the purchase of Decatur Cable TV, Inc. from American Cable TV. The system will now be known as Decatur TeleCable. The acquisition brings to seven the number of systems operated by TeleCable.

Blythe, Calif. — It was announced recently that Blythe TV Company, Inc., (owned by NCTA president Fred Ford), has been sold to Continental Transmission Corporation, an independent telco.

International Falls, Minn. — Continental Telephone Co., St. Louis, Mo., has purchased the International TV Cable Corp., International Falls, Minn. it was jointly announced by the two firms.

Boise City, Okla. — Roger Wooten from Stratford, Okla. purchased the Boise City system from Everett Mahaney and Otis Gross of Guymon, Okla. □



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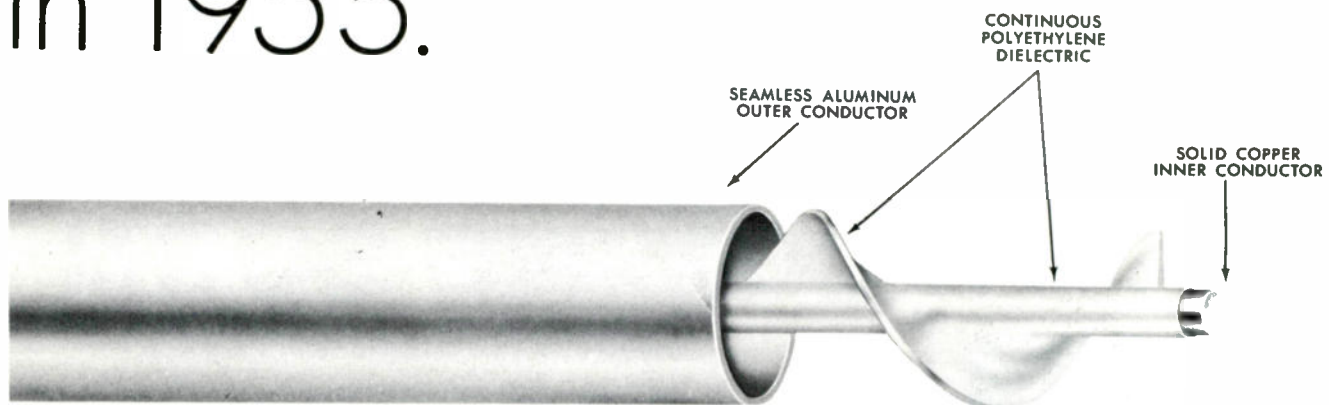
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Modified SECAM Color System For Originations with Sony VTR's

By Jan van Hemert
National Service Manager
Industrial Division, Sony Corp. of America

Color originations on cable systems, at present, are not considered economically feasible in even the largest communities. But the cost of color cameras, for instance, is steadily being reduced, and is expected to reach the \$5,000 to \$10,000 bracket in the near future. The availability of low cost color VTR's is therefore of increasing importance to system operators interested in extensive cablecasting operations. The possibility of getting pre-taped color programs (from outside sources) for origination on CATV systems is an additional and immediate cause for interest in color videotape units priced within the budgets of larger CATV operations. Mr. van Hemert's article on the subject therefore takes on considerable value to many cablecasters.

The modern CCTV helical scan video recorder has excellent monochrome capabilities, however, the composite NTSC color signal is rather difficult to record because of its complex composition.

The I and Q signals, which are matrixed from the red, green and blue signals, modulate a 3.58 Mc subcarrier in a balanced modulator. In this circuit the carrier is eliminated, leaving only the sidebands. The 3.58 Mc oscillator input to the Q modulator is shifted 90 degrees with respect to the oscillator input of the I modulator. In this fashion the I and Q signals can be transmitted simultaneously, without loss of identity. The composite colorplexed NTSC signal consists of the luminance signal (Y) and the 3.58 Mc chrominance signal (C) is a measure of the saturation of the color, while the phase determines the hue (see Figure 1).

Slight imperfections in the stability of the reproduced video signal — resulting from tape speed and head drum motor speed variations — have little effect on the monochrome picture. Unfortunately, we cannot tolerate these slight instabilities when recording and reproducing a NTSC color signal since these instabilities effect the phase of the chrominance signal, thereby distorting the colors. Even in expensive quad-

head machines, sophisticated color correction circuits are required. The Sony EV-200 and PV-120U helical scan recorders have a video response of approximately 3.5 Mc, a little short of the 4.2 Mc required for the composite NTSC color sig-

nal. Because of the difficulties mentioned above, manufacturers have resorted to different recording techniques. Sony decided to use a modified SECAM system.

SECAM versus NTSC

The SECAM system, as developed in France, is based on NTSC concepts and, therefore, the two systems have much in common. Both systems use a monochrome, or luminance signal, to maintain black and white compatibility. The I and Q signals, or color difference signals (R-Y) and (B-Y), amplitude modulate a 3.58 Mc carrier in the NTSC system. However, in the

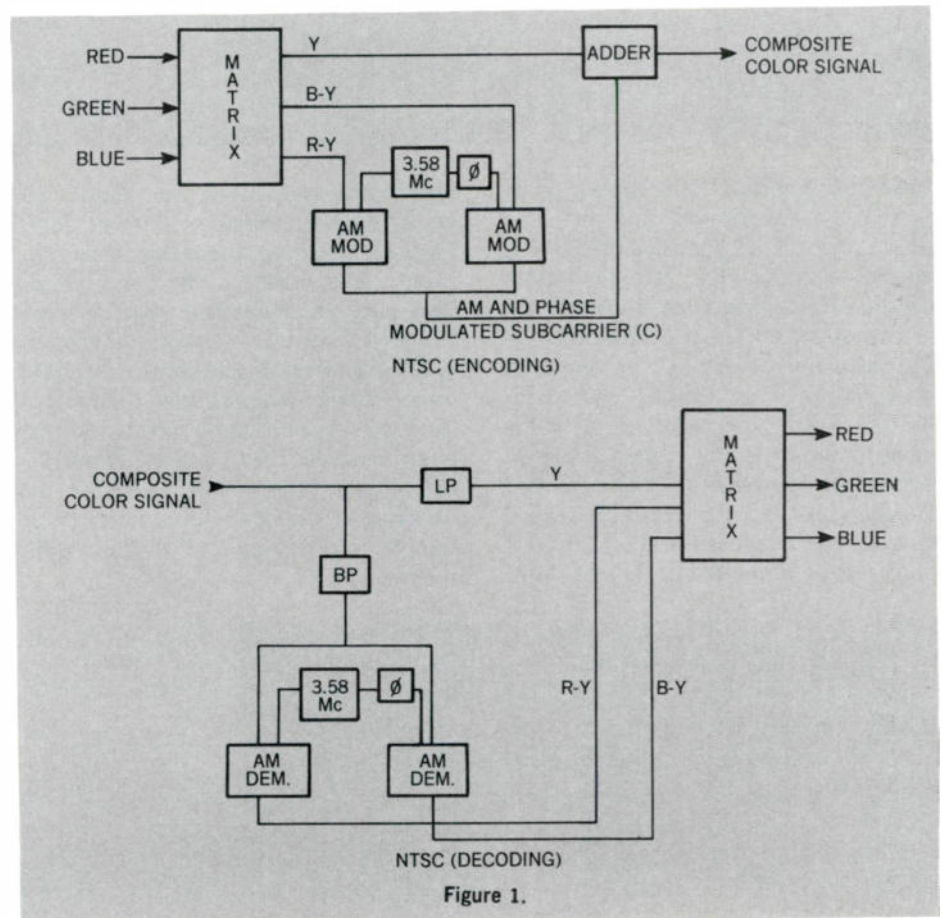


Figure 1.



Figure 2.

SECAM system the color subcarrier is frequency modulated. The (R-Y) and (B-Y) signals are transmitted sequentially. An electronic switch alternately routes one signal or the other to the FM modulator. The alternation occurs at the line rate. To provide proper switching sequence in the receiver a color recognition or index signal is transmitted at the end of the vertical blanking period. In order to reconstitute the primaries, red, green and blue, the sequential (R-Y) and

(B-Y) signals must be made to occur simultaneously. This is done by means of a decoding arrangement, containing a 64 usec delay line and an electronic switch (see Figures 2 and 3). In actuality each color difference signal is used twice, once when transmitted directly, and the second time after having been delayed 64 usec. Theoretically, this will result in some reduction of vertical color resolution but this is virtually undetectable by the eye.

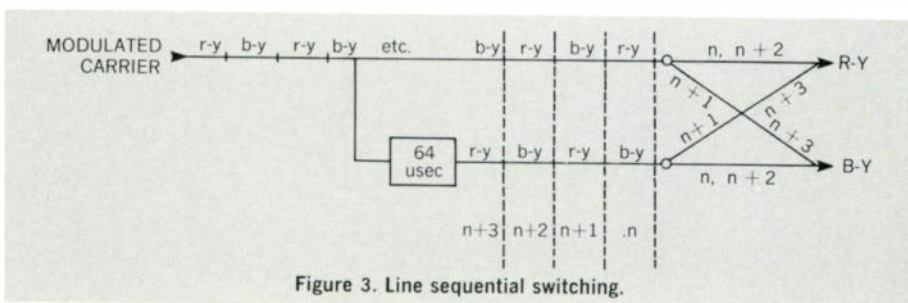


Figure 3. Line sequential switching.

Before it is added to the Y signal, the FM modulated subcarrier is passed through a shaping network. When the subcarrier is deviated in either direction, the amplitude increases, as indicated in Fig. 4. In the decoding process the subcarrier is passed through a filter which has the opposite response of the filter shown in Figure 4. This technique improves the signal-to-noise ratio for the more saturated colors (high deviation) and at the same time reduces the subcarrier visibility in the monochrome picture for unsaturated colors (low deviation). For 625-line systems, as used in Europe, the subcarrier frequency is approximately 4.43 Mc.

As far as the results are concerned, one can say that the NTSC and SECAM signals are virtually indistinguishable. The SECAM system has the advantage of being

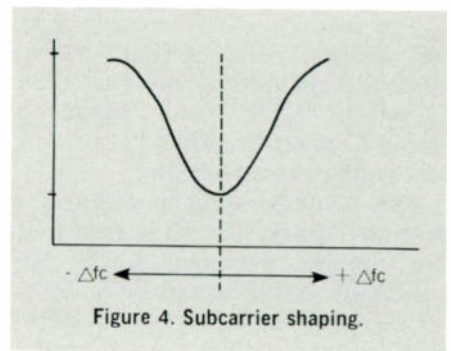


Figure 4. Subcarrier shaping.

relatively insensitive to tape recorder instabilities and because of the sequential color transmission, excellent separation is maintained between the (R-Y) and (B-Y) signals.

Modified SECAM system for EV-200 and PV-120U

The Sony color adaptor (CLP-1) is designed to accept a standard NTSC color signal. Figure 5 shows the operation of the adaptor. The incoming NTSC signal is first decoded into Y, (R-Y) and (B-Y) signals. The Y signal is then fed to an FM modulator which is deviated between 4.7 Mc (sync tip) and 7 Mc (peak white). The color difference signals are alternately routed to another FM modulator with a center frequency of 1.25 Mc. The outputs of both FM modulators are mixed together and then fed to the record amplifier in the recorder.

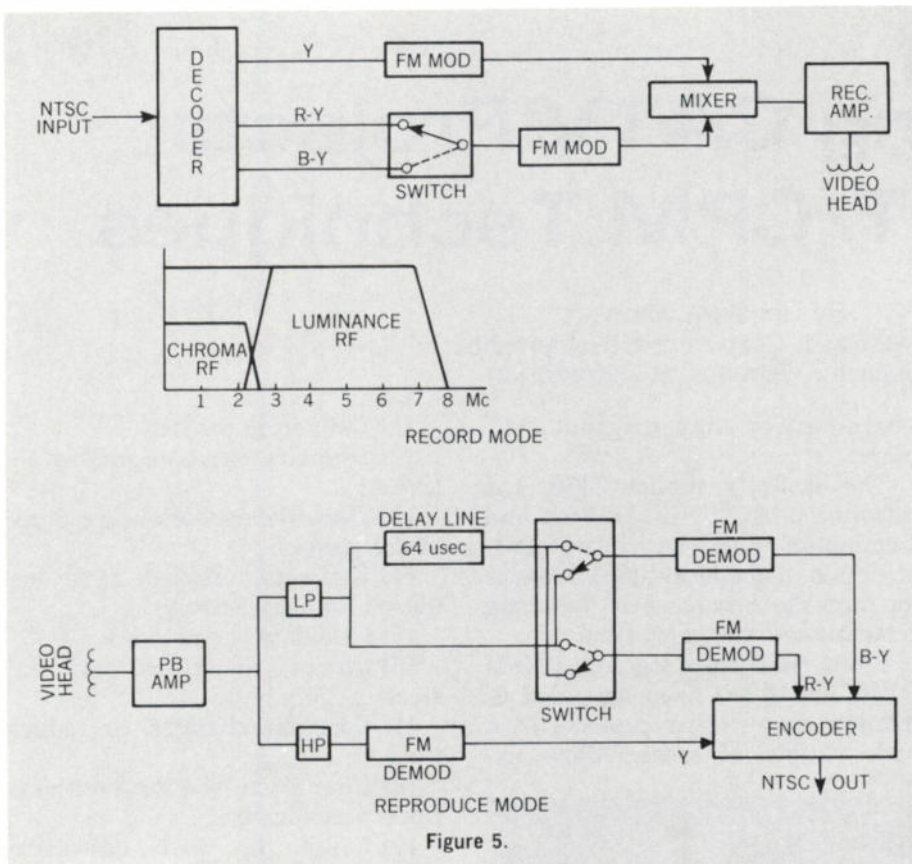


Figure 5.

Since the lower frequency range is allocated to the color FM signal, significant improvements have been made in the signal-to-noise ratio. In reproduce mode the composite signal is picked up by the heads, amplified in the playback amplifier and separated by means of a high pass filter and a low pass filter. After demodulation, the Y, (R-Y) and (B-Y) signals are re-encoded to the NTSC format.

The modified SECAM system as used in the Sony recorders has the following advantages:

- (1) The standard black and white EV-200 can be used with minor modifications.
- (2) There is tape compatibility between standard and color machines as far as the monochrome picture is concerned.
- (3) Hue variation, which is observed in other systems due to time base errors, is completely eliminated.
- (4) The system is available at low cost.
- (5) All color circuitry is contained in a small adaptor.

Applications for CATV

In the CATV field, as well as in

many other fields, local color pro-

gramming has been severely limited by the high cost of color equipment. The color adaptor described in this article shows that good quality color can be recorded and reproduced on relatively inexpensive helical scan recorders (\$3500-\$9000). The high price of color cameras — in the order of \$60,000 — presents another barrier to local programming at the present time. However, a few color cameras have recently appeared on the market in the \$25,000 to \$30,000 price range. The writer is convinced that color cameras will appear on the market in the \$5,000 to \$10,000 range within one year. Also, as far as the CATV cablecasting operations are concerned, it must be borne in mind that pre-recorded tapes with color programs could be made available through dubbing centers, a number of which are now in operation. The Sony dubbing center in Jamaica, New York, is probably the largest in the U. S. Here dubbing can be performed from film to tape or tape to tape, color or black and white, for different tape formats, ½", 1", or 2".

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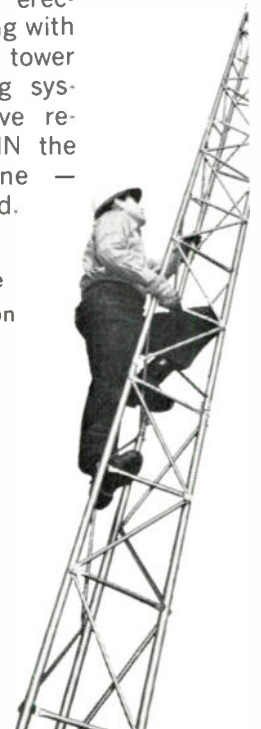
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Managing CATV Projects With PERT/CPM Techniques

By Donald C. Stewart
 Director of Corporate Development
 Superior Continental Corporation

PERT/CPM has had a key role in the timely completion of such diverse projects as EXPO '67, the Xerox "2400" copier, and a Broadway play. Many projects in the CATV industry, both in system construction and operation, and in equipment manufacture could also benefit from use of PERT/CPM.

PERT (Program Evaluation and Review Technique) and CPM (Critical Path Method) represent a family

years earlier than original estimates.

The basically similar CPM was introduced in 1957 by DuPont and Remington Rand to control construction of chemical plants. It was an immediate success in reducing construction cost and time.

From these two starting points PERT/CPM has been extended to manage many other projects in a wide variety of areas. Many ex-

- (1) Define the project
- (2) Identify the component activities
- (3) Draw the network — a picture of the project
- (4) Estimate elapsed time required for each activity
- (5) Calculate the network
- (6) Identify the critical path and slack
- (7) Consider changes to reduce time
- (8) Reanalyze the project network periodically
- (9) Follow up with corrective action

We will apply these steps to a CATV system to illustrate the procedure.

(1) The project is the construction and startup of a new CATV system.

(2) In an actual application this project would probably have several hundred component activities. Our simplified demonstration project is assumed to have only the following seven activities:

Obtain the franchise, make a signal survey, obtain financing, hire the employees, choose a turn-key contractor, construct the system, and sign up subscribers.

(3) We now can draw the network to visually indicate the relationship between these activities. Many people find it easier to draw the network by starting at the end or goal of the project and then working backward by adding

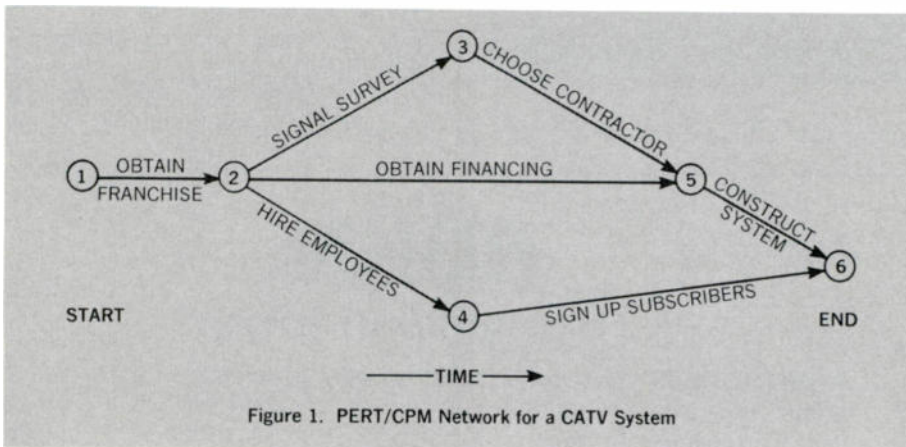


Figure 1. PERT/CPM Network for a CATV System

of relatively new tools for effectively planning, scheduling and controlling projects. A project is defined as a task or job with a definite start and a definite end, made up of many component activities, for which completion time and cost are important.

Historical Development

PERT was developed in 1958 to manage the Navy Polaris Missile Development Program, after traditional project management methods proved inadequate. It received a large measure of the credit for completing the Polaris Missile two

tensions and refinements in the basic system have also been developed so that now any user can select the features best suited to his individual project and problems.

How to Use PERT/CPM

The basic concept of PERT/CPM is straightforward. Most applications go through the following steps:

Activity	Event No.	Time Estimate
OBTAIN FRANCHISE	1-2	20 WEEKS
SIGNAL SURVEY	2-3	3 WEEKS
OBTAIN FINANCING	2-5	8 WEEKS
HIRE EMPLOYEES	2-4	4 WEEKS
CHOOSE CONTRACTOR	3-5	3 WEEKS
CONSTRUCT SYSTEM	5-6	16 WEEKS
SIGN UP SUBSCRIBERS	4-6	6 WEEKS

Figure 2. Time Estimate for Each Project Activity

(This article is based on a talk presented at the 16th Annual Convention of the National Community Television Association, Chicago, Illinois, 6 - June 28, 1967.)

the necessary predecessor activities. For example, before we have an operating CATV system we must construct the system and also sign up subscribers. Before the system can be constructed, we must choose a turnkey contractor to do the work and also obtain financing to pay for it.

The resulting project network is shown in Figure 1. Each activity is represented by an arrow or line running from one event or numbered circle to another. An event is defined as a point in time at which certain activities are completed. An activity is a job requiring time

add up the times for the three possible paths: event numbers (1)-(2)-(3)-(5)-(6); (1)-(2)-(5)-(6); and (1)-(2)-(4)-(6). In a large network with several hundred activities, it is often more efficient to use a computer program to calculate the various paths.

(6) The *critical path* (1)-(2)-(5)-(6), requires the maximum time of 44 weeks (20+8+16) for project completion. The concept of the critical path is the heart of PERT/CPM technology. In most projects the critical path contains only about 15% of all activities. These are the activities upon which most

(c) Parallel activities

We now re-examine our network, concentrating on the critical path, to search for ways to save time. For example we could reduce construction time if the contractor went on an overtime basis or added an additional crew. These changes will probably cost more money. We are in the common PERT/CPM situation of weighing a time versus cost tradeoff. Another way to reduce time is to completely eliminate certain project activities on the critical path. This choice involves a time versus risk tradeoff. The Polaris Program managers chose the calculated risk of eliminating certain prototype and testing activities to save time. In our demonstration project none of the critical path activities can be eliminated.

For the third time saving possibility, we try to restructure the network so that we can work on two critical path activities at the same time rather than sequentially. In our example we could start to obtain financing (2)-(5) before we received the franchise (1)-(2).

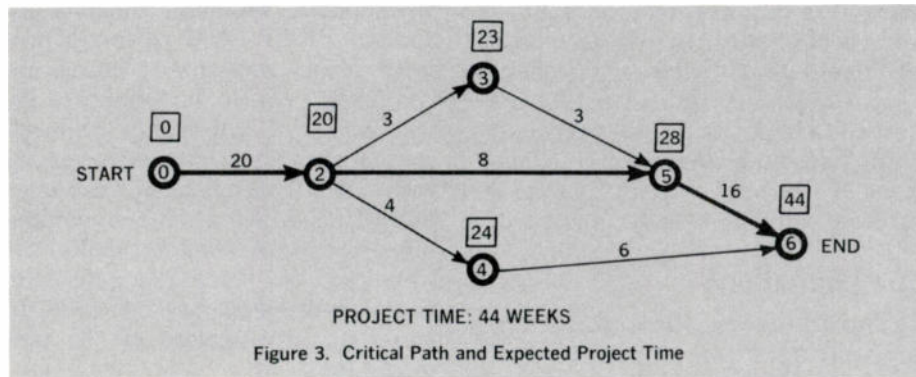
Various alternative time saving changes can be considered in a revised project network developed. Many PERT/CPM users report that from 50% to 70% of the total benefit is obtained from pre-planning and analysis of the project before work actually begins.

(8) Periodic reanalysis of the project network is necessary to reflect changing conditions and new problems. In our project it will be appropriate to record actual progress and review project estimates every two weeks.

(9) PERT/CPM provides information but it can not take corrective action. The project manager can use PERT/CPM as a "Dew Line" or early warning system to identify upcoming bottlenecks and their effect on project progress. Based on the new information he can take appropriate action to speed progress and control cost.

Extensions and Variations

Our demonstration has outlined a rudimentary version of PERT/CPM. Users have built up a number of variations and refinements to handle additional requirements.



and the application of labor or other resources. It is identified by its starting and ending event number. The events are numbered sequentially by starting at the beginning (1) and working toward the end (6).

(4) A most important step in PERT/CPM is to obtain realistic time estimates for completion of each activity from the person with the most knowledge of that particular activity. In many cases the person making the estimate will be expected to perform the activity within the time called for. Time estimates should initially be based on a normal work week and should allow for other jobs which must also be done at the same time. Figure 2 lists our project activities with the "best guess" time estimates obtained for the completion of each one. Note that each activity is now labelled with its start and end event number.

(5) Calculation of the network is now possible. This step is essentially a matter of adding up the cumulative time paths for each possible path from the start to the end of the project network. In our demonstration project, it is easy to

attention must focus. In Figure 3 the critical path is emphasized by a heavy line.

The boxed number above each event indicates the estimated elapsed number of weeks to that point. These numbers can be readily converted to calendar dates when the date of the starting point is known.

Note that activities not on the critical path have *slack* or extra time available. For example activities (2)-(3) and (3)-(5) could be delayed as much as 2 weeks without affecting project completion time because they are not on the critical path.

(7) Often the initial estimates predict a project completion time which is unacceptable. Let us assume that our management requires that the CATV system be operating in 40 weeks rather than the estimated 44 weeks. In PERT/CPM language we have project slack of minus four weeks. We are four weeks behind before we start! There are three ways to reduce the expected project time:

- (a) Add resources
- (b) Eliminate activities

Many of these systems are designated by acronyms such as PERT/cost, RAMPS, PRIME, LESS, TRACE, etc.

Because the PERT technique is often applied in R & D type projects with a high degree of technological uncertainty, three time estimates for each activity are secured rather than only one. Each activity time is estimated based on optimistic, most likely, and pessimistic rates of progress. The weighted average for the expected activity time is then calculated. The probability of project completion by any specific date can also be computed.

CPM is applied predominately to construction type activities where the time and method for each activity are well known but cost is the dominant factor. In CPM a time estimate and a cost estimate are secured for each activity with normal scheduling, and also with "crash" conditions of 100% overtime and premium prices for expedited delivery of supplies, etc. Time-cost trade-offs can then be made to "buy time" at minimum increased cost. The Defense Department has also added the cost factor to the original PERT, applying the designation PERT/cost.

Several other system refinements have emphasized the management reporting aspects of handling information about large complex projects with many participating contractors.

These extensions have clearly expanded the usefulness and applicability of PERT/CPM. However it is strongly urged that working familiarity with the basic system be gained before using the more complicated refinements.

Advantages of PERT/CPM

The major advantages from the use of PERT/CPM include the following:

- (1) Complete the project
- (2) Reduce completion time, often 15 to 25% of the original time estimate.
- (3) Reduce cost, often also from 15 to 25%. Cost savings are generally achieved through avoidance of costly "100% crash" programs which put all activities in a project on overtime at premium costs

although only a small percentage of them are actually "critical path" activities.

(4) PERT/CPM fixes responsibility for each activity. It conveys a sense of responsibility to the person performing each activity and it also pins down the responsibility for completion.

(5) PERT/CPM forces people to plan and counteracts the natural human tendency to procrastinate rather than to plan.

(6) It encourages management by exception in focusing on the critical path.

(7) The network is a picture of the project and is extremely effective in communicating status and bottlenecks to management and to others. It is also an excellent tool to justify more resources needed to expedite project progress.

(8) The time and cost implications of alternative approaches to a project can be readily analyzed.

The Limitations

The following limitations are probably most important to recognize in considering use of the system.

(1) PERT/CPM is a tool — not a substitute for management action.

(2) The analysis must be updated periodically over time rather than only performed once at the start of the project. Most of the few reported "failures" of PERT/CPM result directly from misunderstanding of these two facts.

(3) The basic concept of PERT/CPM is quite simple, but application on a large project may be complex. It also tends to cost somewhat more than other planning methods.

(4) PERT/CPM is difficult to apply to several simultaneous projects using the same resources.

In spite of these limitations, most users report definite advantages and satisfaction with its use.

Range of Applications

PERT/CPM has been applied to a very wide range of large and small projects in many areas. A few users will be mentioned to indicate the breadth of application.

The construction industry is a major user of PERT/CPM. For example, EXPO '67 in Montreal controlled \$750 million in construc-

tion projects with 150 CPM networks. CPM has received a large part of the credit for completing more than 200 buildings, bridges, and a subway line in the relatively short period of three and one-half years. The new sports stadium in Atlanta was also planned with CPM. In this case a premium price was paid for accelerated construction in order to be ready for a major league baseball team a year sooner.

Most of the major chemical companies such as DuPont, Union Carbide and Olin Mathieson have applied CPM to construction and maintenance projects.

The research and new product development field has successfully applied PERT/CPM to many projects. Xerox was able to accelerate its "2400" copier introduction by one and one-half years through control of the development program with PERT. Additional resources including substantial overtime schedules were used to make the time saving. The major auto companies have also applied CPM to speed up introduction of the new model cars.

The Federal government has been an enthusiastic user of PERT/CPM ever since the success of the pioneering Polaris Program. Now PERT/cost is required in bidding and performing many major DOD and NASA contracts.

The accounting and electronic data processing functions have made wide use of PERT/CPM. For example, Anaconda Aluminum and Collins Radio compressed the time necessary for accounting closing through analysis of their procedures with PERT networks.

PERT/CPM has also been applied to a wide variety of miscellaneous projects. A kidney transplant operation was planned on a PERT network. The Broadway play "Morganna" was PERTed and involved approximately 250 activities such as renting the theater, printing tickets, and preparing the sets. One man planned the move of his family to a new house on a simple CPM network, including such activities as stopping the milk at the old house, getting electric service turned on, etc. Management consultants have used the technique to plan and control consulting engagements. Contractors have

advertised their use of CPM as an indication of their competence and efficiency.

CATV Industry Applications

As can be seen by the above sampling of applications, the possible uses of PERT/CPM in CATV are limited only by your own ingenuity. CATV system construction is an obvious application and several systems are currently using PERT/CPM. Extension and rebuilding of systems would also be amenable to the technique. Superior Cable has applied CPM in the planning and construction of new production facilities. Turnkey contractors could use PERT/CPM in bidding and in controlling jobs in progress.

Promotional programs to sign up new and additional subscribers and campaigns to obtain CATV franchises are other possible uses.

The equipment manufacturers in the CATV industry could also consider PERT/CPM to control new product development and introduction. There are undoubtedly many other projects in your own work which can benefit from the application of PERT/CPM.

How to Get Started

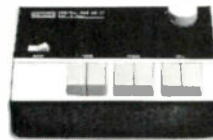
At this point you may well ask, "Well, this all sounds fine but what do I do now?" The first step should be to read a little more on the subject in order to gain some confidence with it. There have been many articles published in technical, professional, and general business publications. The major computer manufacturers also have good manuals available. Several organizations including the American Management Association offer seminars in PERT/CPM techniques.

The best way to evaluate PERT/CPM is to try a project. It is suggested that you choose a project which is of immediate importance and responsibility to you. It is recommended that you start with a simplified approach until you gain some experience with the basic concepts. At that point you can choose, based on your own needs, whether to go into more sophisticated extensions such as computer analysis, multiple time estimates, or cost as well as time estimates.

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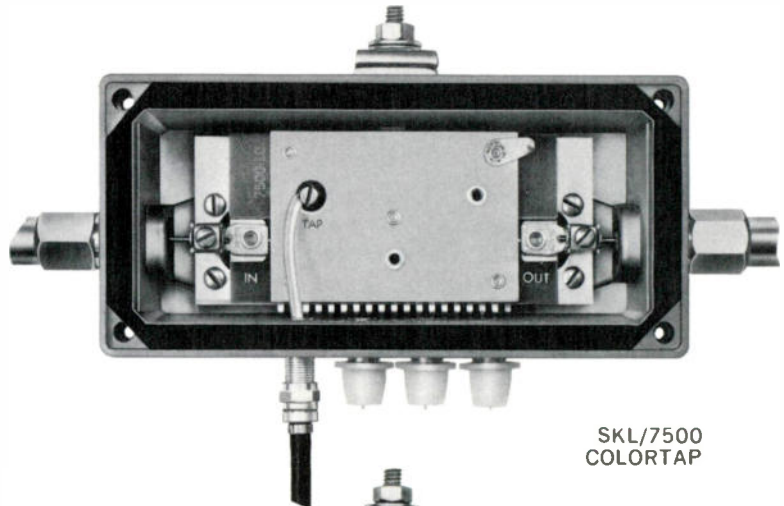


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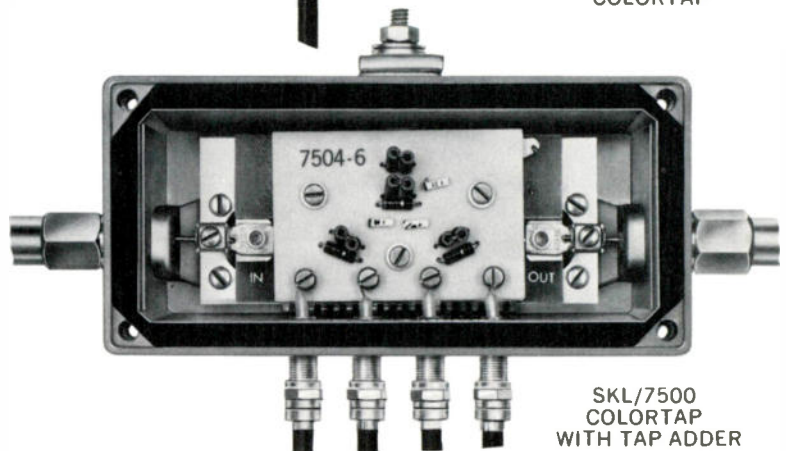


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S SCIENCE —

As cable television standards become more stringent, we have intensified our research in the underlying science. Network analysis, semi-conductor physics, amplifier design, information theory, noise and distortion studies are among the subjects of our current computer-aided investigations. SKL's advances in CATV engineering in no small measure reflect the company's location within the largest electronics complex in the world, close to the university center of the Northeast.

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Door-to-Door Techniques For Selling More CATV Drops

By E. T. Goeller
General Sales Manager
National Trans-Video, Inc.

The concluding definition of marketing is to have the right product, in the right place at the right time, for the right people at the right price. From its inception, a CATV system meets all of these marketing prime objectives. The only thing wrong with the capsule description of the marketing function is that it does not include Webster's definition which is the act of selling in a market.

Just because a product or service, such as a CATV system, is available, does not mean that people are going to break down your door to buy, as you already know. Someone must perform the act of creating awareness; of explaining to individual prospects exactly what is in it for him; exactly what he is going to get for his money.

Certainly there are a great many systems that are saturated and virtually no sales activity is required. This is simply a matter of no cable, no TV, in those particular communities. In these areas, initial marketing procedures were sufficient to get the job done.

Direct door-to-door selling, therefore, is needed in those systems where problems exist that have had a negative or discouraging effect on prospective subscribers. You are painfully aware of these problems, so I do not intend to remind you of them.

The point I want to make is that door-to-door selling is one of the most effective means of overcoming many of these obstacles to add subscribers. An informed customer is generally a good customer. He pays for his service, he stays with the service and he enjoys all of the advantages of the service. He is convinced that what he is getting is worth the pennies a day he pays for it.

Where does the organization of a door-to-door sales force begin? First, you must define in detail what you have to sell and put it down on paper. This will be the basis for what will become the sales talk for your sales people. Second, you must recruit people. At first glance, with all of the conversation and publicity given to the shortage of skilled labor and disinterested white collar workers, one could get frustrated at the mere thought of trying to find ambitious and intelligent people to sell cable service. This is not nearly as difficult as it may seem once you know the procedure. Thus, you must develop a recruiting procedure or program; one that is designed to be effective.

In our firm's recruiting manual, as an example, we have included sample ads for our system managers to use and advise them in which category of the classified section of the newspaper to place them. We carefully

avoid the word "sell", and place these ads in categories other than "Salesmen Wanted". In this way, we draw presentable, unskilled women who want to work while the children are in school, or retired people who are active, alert and very intelligent who want to work just a few hours a day or evenings. And believe it or not, we have several really fine young salesmen who are school teachers, department heads in manufacturing plants and graduate school students who need supplemental income and work like professionals. All together, in our seventeen systems, we have three full-time sales managers and over forty part-time and full-time sales people. Last year these people sold a total of 19,000 new connects with promotion support. We retained 52% of these connects.

8 D Thursday, August 11

Male or Female
HELP WANTED

Sample Ads

"MEN AND WOMEN TO WORK FULL OR PART TIME"
Above average Earnings in dignified work explaining Cable TV to interested prospects. No experience necessary. We will train you. Please call 800-8000 for an appointment.

RESTAURANT MANAGEMENT FOR COUPLES
Managers wanted for restaurants. Excellent wages and benefits.

13 D Thursday, August 11

MISCELLANEOUS

"TIRE OF OLD BILLS? HAVE TIME ON YOUR HANDS TO EARN EXTRA MONEY"
Men and Women needed to work full or part time explaining Cable TV to interested prospects. No experience necessary. We will train you. Please call 800-8000 for an appointment.

WAITERS AND WAITRESSES
Positions now available at the new POLYNESIAN
Apply in person. Must possess valid driver's license. Highway access from the new center.

SMITHSONIAN RESEARCH CENTER
Seeking for experienced individuals.

Keep a Record of Your Good-Pulling Ads for Future Reference

D. Recruiting through Walk-ins
Men who are aggressive and eager to get ahead are constantly looking for opportunities to take on more responsibility and improve their financial position. Give serious consideration to the man who calls on you to learn about the possibilities with NTV, Inc. The job of selling can have definite appeal to men or women who want to make better use of their abilities and free time on a part time basis.

E. Recruiting through State and Local Unemployment Offices
A bimonthly call to someone in these offices that you have made it a point to know, to remind them that you are always looking for good people, keeps your system name alive in their minds.

Shown above is a page out of National Trans-Video's Recruiting Manual which includes sample ads used to find local door-to-door sales personnel, along with basic instructions on effective recruiting.

The third step is to develop a sales training manual. This manual should not only tell sales people what they are selling, but also how to go about selling it. Our manual outlines seven steps to successful selling and concludes with a "canned" or prepared sales talk. Our system managers and sales managers are furnished with a supply of these manuals in order that each sales person will have his own copy to refer to during and after the training period.

Along with this manual, the managers and sales managers receive a separate sheet containing instructions of how to use the training manual. They *must* take the required time to fully train these people or disaster strikes. And, recruiting efforts will have been in vain, because an untrained salesman will not be successful (and will soon leave). The converse is true for well-trained people. Your good image, created by good public relations work, can be seriously harmed by untrained people giving incorrect information which results in misunderstandings.

I certainly am not trying to discourage you from building an adequate door-to-door sales force. Rather, I am trying to impress you on the importance of properly training the people you select. Proper training is all-important. Good sales people are not born, they are made by thorough training and by sufficient motivation to plan their work and work their plan.

Nature is on your side to make a door-to-door sales force the most effective means of adding subscribers. It is a well-known fact that television is such an effective sales media (as are personal calls by sales people with good visual sales aids) because the average person remembers only 10-15 percent of what he *hears* and 30-35 percent of what he *sees* — but will remember 60-70 percent of what he *both sees and hears* at the same time.

If you have done all of this diligently and you still do not obtain the results you wish, further training of your sales people will be needed. You will have to tell them the story of the door-to-door salesman who retired at 35 years of age after working hard for only 10 years. He went to Florida and bought a \$350,000 home. One day he was asked how he did it. He replied, "It all depended on where I was. I sold only the most expensive vacuum cleaners the Hoover Company made. If I was in a middle class neighborhood, when the housewife came to the door, I simply stated that I was selling something that her neighbor said she couldn't afford. When I was in a wealthy neighborhood and the lady of the house answered the door, no matter what her age, I merely inquired if her mother was at home. It worked every time." □

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The Basic Elements of Good Cablecasting Technique

This article, prepared by the staff of TeleMation, Inc., is designed to assist the CATV operator who is just beginning—or considering—the production of live or recorded public service programming on his system. The ability to produce good cablecasts is dependent not only on the operator and equipment capability, but also on the manner in which they are integrated with each other. The information contained herein is presented in the simplest form, in basic terms, and relates to brands of equipment commonly used in CATV originations (naturally most techniques apply equally to other brands of equipment). However, the "basic approach" should not be underestimated . . . If all the fundamentals are followed closely, the result will be good public service cablecasting.

Initial Set-Up

- (a) Assemble the tripod and dolly. Mount the camera.
- (b) Snap on the viewfinder. Connect the single cable from the viewfinder to the appropriate socket on back of camera.
- (c) Remove the black plastic plug from the camera lens mounting aperture. Remove caps from the lens and screw the lens firmly into the camera.

Camera Adjustment and Focusing with 10:1 Zoom Lens

- (a) Connect the power cord to a 117 volt, 60 cps outlet. Turn the camera on by rotating the BEAM control clockwise. Allow three minutes for warm-up.
- (b) Select a lighted object about 15 feet from the camera and keep the camera view on this object for the following adjustments.
- (c) Set the viewfinder CONTRAST and BRIGHTNESS controls to 80% maximum clockwise rotation. Place the camera TARGET switch in the MANUAL position. Rotate the lens zoom to maximum wide angle (15mm). Set the lens iris to f/2.8. Set the camera controls: BEAM to about 1 o'clock; TARGET, 10 o'clock; FOCUS, 10 o'clock.
- (d) At this point adjust both the **mechanical focus** (screwdriver adjustment located to the right of the FOCUS control) and the **electrical focus** for maximum sharpness observing the viewfinder picture.
- (e) While adjusting the optical and electrical focus (Step d), the TARGET control should be reset for "sufficient" picture contrast. Also, reset the BEAM control to a point just beyond (clockwise) where maximum detail in the white portion is observed.
- (f) Change the lens zoom to maximum telephoto or close-up (150mm). Adjust the optical focus (lens) for best picture detail. Repeat Step e if necessary. Also, repeat Steps d and f for possible added sharpness.
- (g) The picture should now remain in focus through the complete zoom range of the lens (minimum lens-to-subject distance, 6 feet). Should the lens-to-subject distance change, it will be necessary to reset **only** the optical focus with the lens zoom at the telephoto position.

- (h) The TARGET switch may be operated in the MANUAL or AUTOMATIC position, depending upon various scene lighting conditions. The operator should preview the scenes watching for best overall picture contrast while changing scenes. It may be necessary to re-adjust the TARGET control slightly as the scenes are changed.

Camera Precautions

- (a) The vidicon tube life will be extended if the BEAM and TARGET controls are operated at minimum settings (counter-clockwise) consistent with good pictures. This can be achieved by good scene lighting and operating with the lens iris "opened up" (toward f/2.8) as much as possible consistent with the required depth of field. The focus for the lens increases as the iris is closed (toward f/22).
- (b) **Never** point the camera directly at the sun or at a quartz-iodine light. Permanent damage to the vidicon tube may result. When transporting, remove the lens from the camera. Cap the camera lens aperture and place caps over the lens.
- (c) Read the General Electric Instruction Manual for the camera — especially pages 5 and 6.

Zoom Control

- (a) Direct, fast control of the zoom lens is made by the small pin handle which screws into the midsection of the lens barrel. There are three possible points for locating the pin handle. Use whichever is most convenient for you.

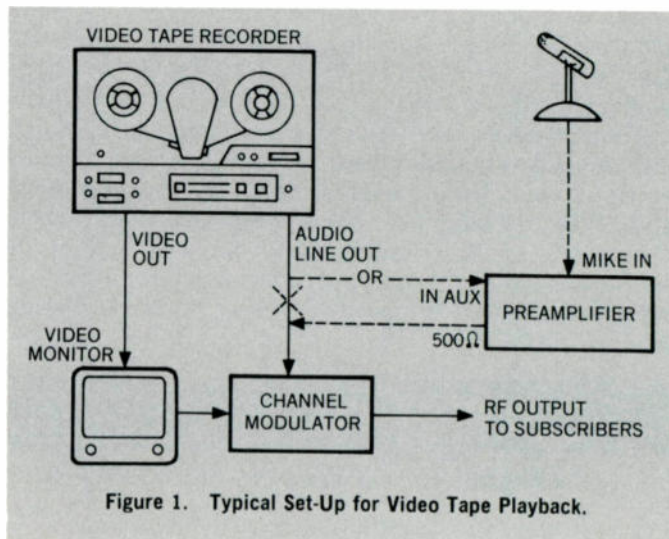


Figure 1. Typical Set-Up for Video Tape Playback.

- (b) Geared-down, slow control of the zoom lens is made by the use of the crank. The crank is engaged by pushing-in (toward the barrel center). Disengage the crank when using the pin handle.
- (c) For best cablecasting, avoid excessive and fast zooms.

Video Tape Recorder

(a) The Ampex Instruction Manual is very comprehensive and should be studied carefully before operation.

(b) The nominal video input level required for the recorder — and the desired video output from the camera — is 1.0 volt peak-to-peak. This can be measured with an

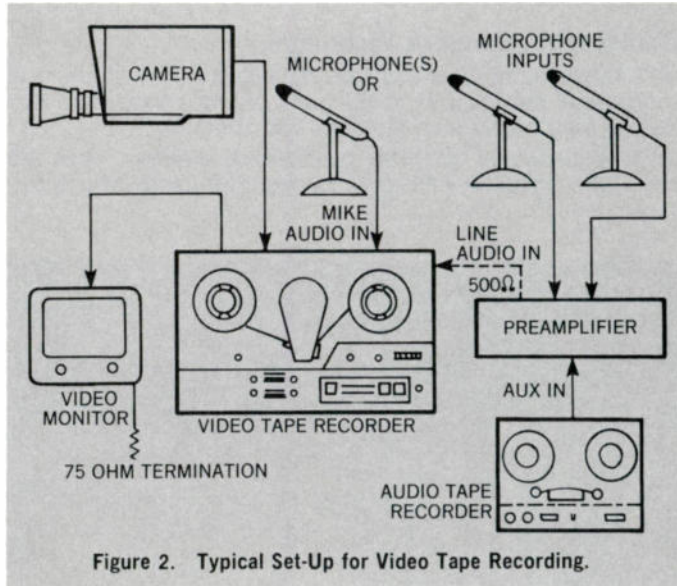


Figure 2. Typical Set-Up for Video Tape Recording.

oscilloscope or estimated by use of the video monitor. Using the monitor, set the contrast and brightness controls to approximately 90% of full clockwise rotation. The video input level to the monitor (from the camera) should be set

for good picture contrast. The TARGET control on the camera adjusts the video output level of the camera (input level to the monitor). Be sure that the monitor input **terminates with 75 ohms** — or if it has a “looping” input, terminate the loop through jack with a 75 ohm terminating plug.

(c) When recording, maintain the VIDEO RECORD LEVEL near 100% on the level meter and AUDIO RECORD LEVEL peaks near 100%.

(d) The video output impedance is 75 ohms and may be connected directly from the VIDEO OUT terminal to a channel modulator 75 ohm terminating input.

(e) The audio output level is 0.5 volts at 1000 ohms unbalanced. The LINE-AUDIO OUT may be connected directly to a channel modulator 600 ohm balanced or unbalanced input.

(f) Refer to “BOGEN RTP-1/TURNER S-58 INTER-CONNECTIONS” for complete audio input instructions.

(g) When a microphone phone plug is inserted in the MIC IN, the LINE IN is electrically disconnected. **These two inputs cannot be used simultaneously.**

NOTE: Although the VR-6000 has an RF modulated output (MOD OUT) for channels 2-5, it **does not have any audio modulation capability** and therefore cannot be used for head-end operation of a CATV system. For monitoring purposes, the MOD OUT may be connected to a television receiver, although video monitoring is still preferable.

Microphone

(a) The Turner microphone is a lavalier type, to be worn around the neck. This has the advantage of freeing the hands and assuring good “mike technique,” since the distance it is held from the person’s mouth is fixed.

(b) It may also be used as a desk microphone with the optional desk stand. The omni-directional pick-up pattern is ideal

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for use with several persons. The mike should be located at equal distances from each person and preferably not more than three or four feet from any one to avoid excessive background noise pick-up.

(c) The microphone has been modified to enable high or low impedance operation by simple switch selection. The switch is on the microphone. When positioned toward the red dot, the output impedance is low; away from the red dot is high impedance. Refer to "BOGEN RTP-1/TURNER S-58 INTER-CONNECTIONS" for complete instructions.

RTP-1 Preamplifier/Mixer

(a) The RTP-1 preamp may be used for several different applications:

(1) It allows the S-58 microphone to be operated at low

(b) Avoid objectionable shadows and "hot-spots" where too much light is focused on a given area. Evenly diffuse the light over the entire set unless special effects are desired. NOTE: The four lights draw nearly 30 amps total at 110-120 volts (2-1000 w., 2-650 w.). Be sure that adequate AC wiring and fuse capacity is provided for the lights and all other studio equipment.

Cablecasting Camera Technique

(a) Camera panning is best accomplished with a medium to wide angle setting (15 to 50 mm) of the zoom lens. Pan slowly. Avoid too much panning and zooming.

(b) Use close-ups often for good visual effects — but not too "tight" or home TV receivers may not display the entire view.

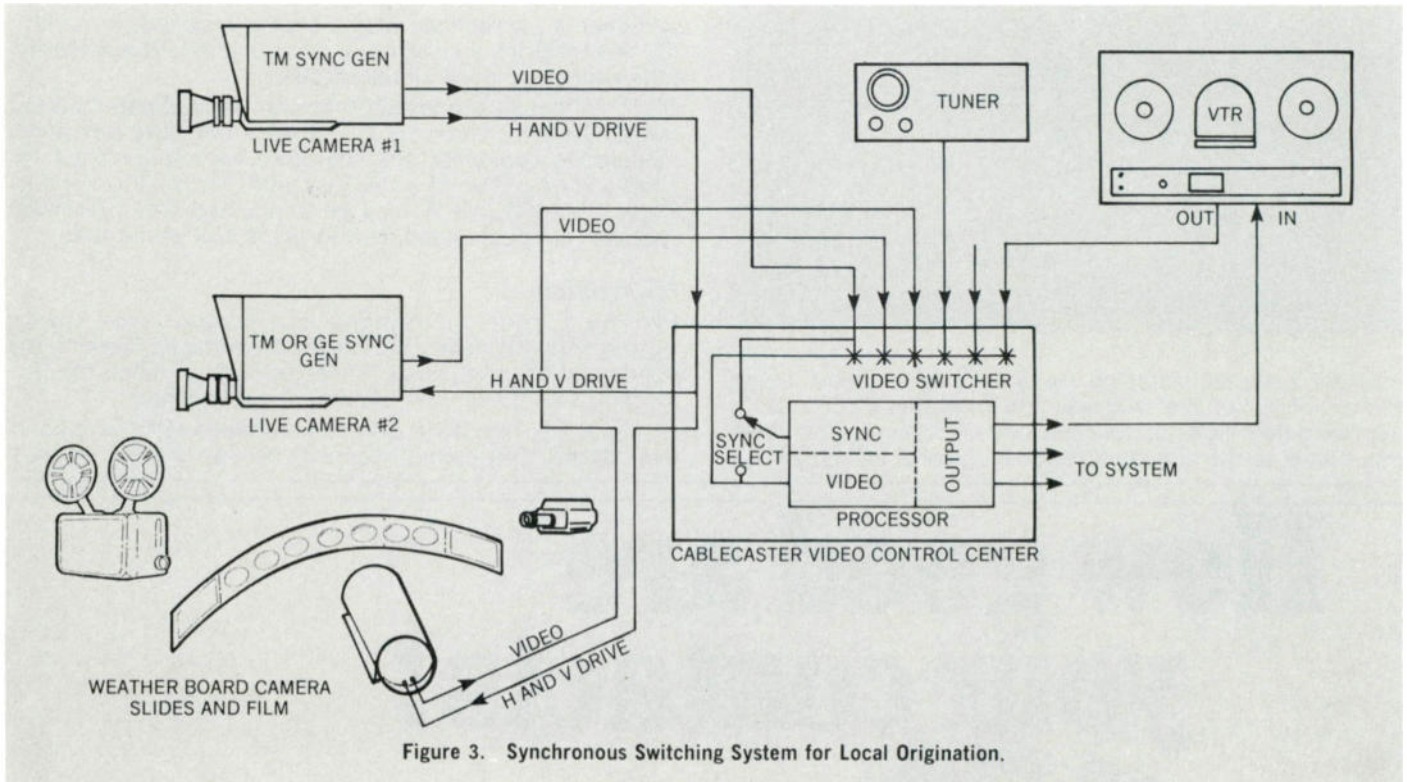


Figure 3. Synchronous Switching System for Local Origination.

impedance when a cable length over 25' is required.

(2) It allows two microphone inputs plus a program input (i.e., FM turner, tape, etc.) to be mixed and controlled separately for VR-6000 recording or direct live feed into the channel modulator.

(3) A pre-recorded audio track from the VR-6000 may be mixed with a live narrative during playback and fed to the channel modulator.

(b) The "500 OHM" balanced line output **must be used** to connect to the VR-6000 "DIRECT AUDIO IN" line input — or to a channel modulator 600 ohm balanced or unbalanced input. A six-foot 2-conductor cable with two circuit phone plug and spade lugs is supplied with the TeleMation system package for this purpose. This cable length could be increased up to several hundred feet if necessary without excessive hum or noise pick-up.

(c) Refer to "BOGEN RTP-1/TURNER S-58 INTER-CONNECTIONS" for proper use of the RTP-1 microphone inputs.

Lighting—Quartz-Iodine Kit

(a) The Fill/Base lights are usually placed to the set front at low to medium height. The Back/Key lights are usually to the sides and shining down.

(c) Always "establish" the overall scene before moving in for a partial scene close-up.

(d) Dolly the entire camera for appealing perspective changes. Dollying is an excellent technique.

(e) Avoid bright reflections of light from objects such as chrome, glass, etc. Be very careful not to focus on the set lighting.

(f) Avoid close-up scenes with "back-lighting" such as stadium lights. If direct back-lighting is unavoidable in some scenes, be sure to operate the camera TARGET switch in the MANUAL position. The AUTOMATIC position regulates the target control to the brightest object in a scene, leaving the balance of the scene nearly black. Also, vidicon image "burn" will result if a direct back-light remains in the scene too long at one point.

(g) Rehearse all scenes, camera positions and lens settings prior to a "take."

System Design - Interconnection

(a) The attached system diagrams indicate various operating situations. The professional components will permit a wide range of other possible system designs depending upon specific requirements. □

Crimp out signal failure for the life of the cable.



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Paving the Way for a Painless System Conversion

By John Monroe
Vumore Co., Manhattan, Kansas

While there are a great many lowband CATV systems in operation in the United States, more and more of the older plant owners are giving serious thought to adding more channels and updating their systems. Some will do it piecemeal a little at a time out of monthly income, putting up new cable with their present staffs. Others will sign contracts with suppliers whereby the entire job is done rather speedily. Some operators will elect to use their present cable and as much of their present plant as possible. Others will strip down to the bare strand and dispose of the old gear the best way they can. Multiple owners and operators can move the lowband equipment to locations which, because of a scarcity of stations will never go allband. Considering that old equipment brings very little on the open market, this is the logical method for handling it.

Obviously when you build a new system you have no subscribers or their habits to concern yourself with. Not so with an operating system. If you have been in business for a number of years, your patrons have pretty much become accustomed to what they can expect from the cable. They know, perhaps, that channel twelve comes in on channel two and has been that way for five years.

In one of our operations we installed new cable and amplifying equipment. We put up new antennas and bought new head-end gear and were set to go from five channels to nine. We did quite a bit of advertising and thought that everyone in town knew of our plans. We thought we had fully informed our subscribers of the changes to come and that they would immediately know that channel twelve

would no longer be on channel two on their set but would now be where it had always belonged; on channel twelve. Then, one night we closed down as a lowband system and opened up the next morning as a modern allband plant. When the phone started ringing, we suddenly learned that about two thirds of our subscribers were wondering what we had done with their channels. We kept answering the phone and we kept up our advertising campaign and before too long practically everyone knew where to find their favorite station.

On our next conversion job we decided to benefit from our earlier experience and do things a little differently. Also, we were planning to use existing cable which consisted of ½" aluminum trunk and plastic jacketed feeders. We had made exhaustive tests to determine the loss characteristics at the various channels but we couldn't be sure about the feeders in all locations. We had been operating this system as a five channel lowbander for several years and we knew we could keep them happy if we continued to give our subscribers the same service while we changed out amplifiers. This we did, changing out one or two amplifiers a night after the stations were off the air. We continued this and went through the entire plant changing out line equipment and installing line extenders to carry the new allband signals. There was no disruption of service and very little inconvenience.

Prior to changing out the amplifying equipment we had installed microwave receiving facilities and had the four additional channels ready at the head-end site. Then, after the entire system had been converted to allband we merely

added the four new channels to the high band, leaving the original channel set up intact. Our reasoning was that if any part of the system, such as abnormally long drops were attenuating the high channels too much we wouldn't be depriving our subscribers of their normal fare. We had carried out an advertising campaign to let the people know of our additional channels and we also asked them to call in if any trouble was encountered with the new stations.

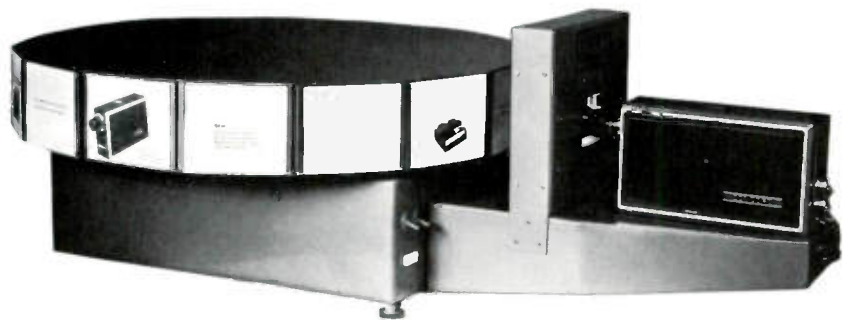
Our feeling is that most people who get used to finding a station on a certain spot on the channel selector won't relish the idea of looking for it somewhere else. There may be cases where the system operator will be forced to shift the channel number to satisfy the television station but any change should be made only after an extensive educational process has been completed. Direct mail is very good for this. You can write your subscribers a letter and enclose your new channel card. If you are importing signals into your community chances are that you will be bringing them stations they have not had, so the channel number is not very important. If you bring in channel four and put it on twelve on your new allband system, the subscriber will get used to it and he couldn't care less. But if you move twelve from its accustomed spot on four you'll hear about it. Your motive for going allband in the first place is to provide more channels. You can accomplish this by adding the new stations to the high band and you can keep everybody happy. Of course, if you can add four new stations on channels 7, 9, 11 and 13, your system and the subscriber's will be happier. □

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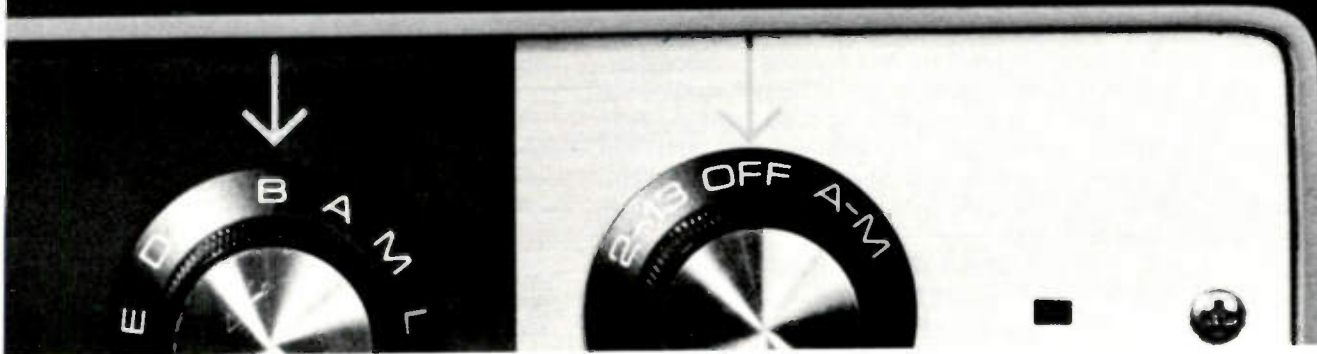
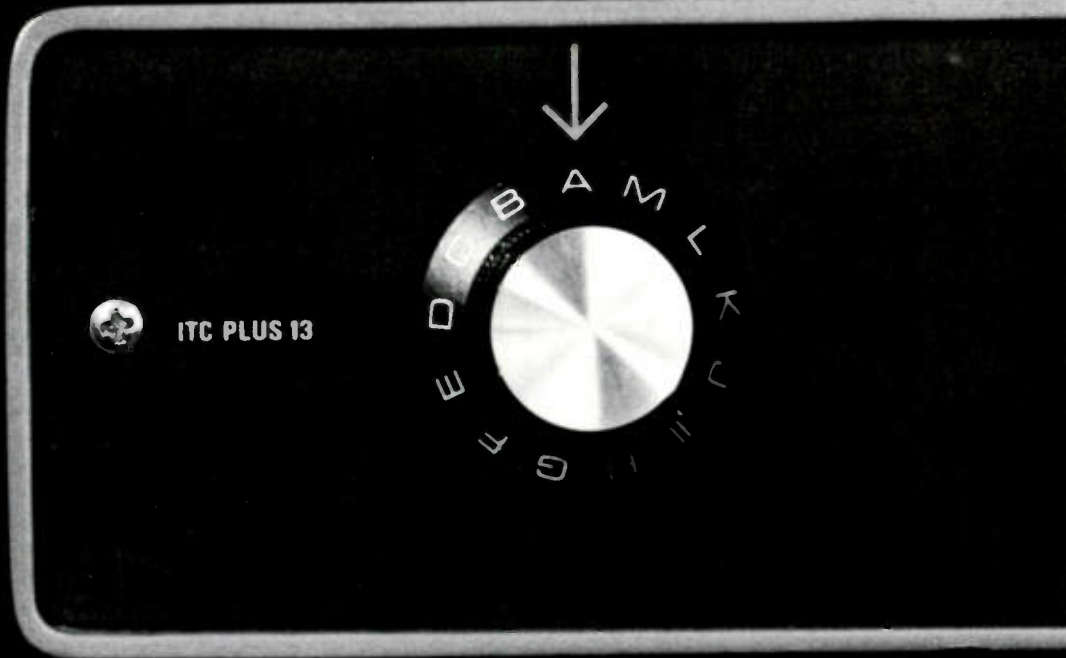
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Security versus Ambition: What Motivates Your Employees?

By D. Michael Ganley

The theory has been advanced that people in business can be differentiated into two primary types. The greatest number of these people we may call, for lack of a better term, of the "Employee Tendency". This is in no way meant as a slur, but rather as an objective analysis of the motivation of this type of person. For particular and usually very valid reasons, or because of environmental pressures, these people seem to be characterized by a constant pursuit of security; anything which threatens this goal is shunned. This may include such things as increased responsibility, job evaluation based on results, the advocacy of a particular or perhaps unpopular opinion, and so on.

The other primary type we may define as having the "Managerial Tendency". The motivational factor uppermost here is an unremitting ambition. The wellspring of this can be any of a multitude of causes: fear of poverty, desire to be a "somebody", a hunger for power — all of these and more may play a part.

These divisions have no regard for the present relative positions of the individuals. Quite conceivably a vice president can be of the employee type, while the janitor can be of a managerial persuasion.

If we accept this theory as correct, and also assume that a certain number of people are to be found in the grey area, moving from one category to the other, at any given time, then the way in which we may elect to handle our employees becomes much less difficult.

For instance, we may interpolate that the employee category worker will welcome increased job op-

portunity combined with higher compensation, but only to a given point. This may be termed his threshold of security. If, because of his general competence, management insists on putting more of a load on him, they may well find themselves with a botched job, a missing employee, or perhaps both.

On the other hand, the managerial oriented person can be stymied by the sin of omission rather than commission. He must be analytically recognized for what he is — a driven man. Basically this drive is ego-centered, but with judicious guidance it can be directed toward company aims. If men of this type possess a security threshold, it's usually too high to be practicably usable.

However, if this type of employee is not given his head, if he is not allowed as much room to move as cipline, in short, if he is not allowed to grow, one of two things will happen. He will either leave for greener pastures, or gradually metamorphose into the employee category.

These particular categories have absolutely no bearing on educational achievement, save where an individual's ambitious horizons may have been broadened by increased knowledge.

One adjunct to this discussion is the "Diamond in the Rough" syndrome. This is the managerial-bent installer who wants to be system manager. Time and experience usually take the place of education here, and the person moves from one plateau to another, not being aware of the one above that at which he aims until he has reached it.

It is not possible to objectively

survey these attributes as being good or bad; on one hand the employee tendency limits a man's career. In return it provides a certain feeling of security and a distinct separation between the business and home life.

The managerial tendency, while being a very valuable attribute in business, requires more than a little of a man. Broken marriages, fatherless children, yachts rusting by the pier, and ulcers provide mute testimony to the terrible power of unbridled ambition. This is not to say that an acceptable balance between work and home cannot be reached, but unfortunately in far too many cases it is not. While the condition may be, in the long run, bad for the individual, it is corporately beneficial. (It is a salient point, however, that managerial types have historically characterized their condition as a "glorious misery".)

Like everything else, these categories are an everchanging thing. As a managerial type becomes older and material things affect him less, he may gradually move from one category to the other, or, again, he may not. A young married employed type who at 25 would not dream of spending more than 40 hours away from his bride may, at 35, with the children's college to think about, be an odds-on favorite in the rat race.

It is easily seen therefore, that your mental classification of people into one of these types or the grey area in between can give you a very valuable clue to their future performance, capabilities, and limitations.

It has been found that the employee type generally is rather vocal about his job feelings, and

there is nothing wrong with this. The managerial type, on the other hand, has perforce been compelled to take on a certain protective coloration, because ambition is so often met by suspicion. Usually these people can be recognized by their almost limitless assumption of responsibility; in fact, it is not rare to find in some companies a junior clerk doing work for several superiors that is well above his nominal station in the organization, and often he is willing and eager for more.

One personnel manager finds that these types can often be recognized by the way in which they answer the employment application's simple question, "Where do you want to be in 10 years?" They get caught between the pillars of saying "Chairman of the Board," and being regarded as either insane or too ambitious to be reliable, or saying "office supervisor," and being hired into a company that has actual promotional opportunities of just that magnitude.

One difficult aspect to the proper care and feeding of the managerial type employee is the fact that his virtue of ambition often gives rise to the disease of impatience. While he may have the proper attitude toward the more lofty job to which he aspires, he may not yet possess the mechanical tools necessary to insure his competence — but don't expect him to realize this. It is up to his immediate superior to continuously see that these shortcomings are realized and rectified; it is also valuable for a superior to recognize that the best way to rise above the crowd is to have people pushing from below.

To take an example pertinent to CATV, let's suppose we are manager of a group-owned system with a chief tech, 4 technicians, and 2 permanent installers. Let us further suppose that the chief tech, while competent in his area, is not managerial oriented. The technicians have two among them of a managerial bent, and one of the installers is likewise inclined. We, as the manager, would like to go into the home office as a regional director; we believe this might be possible in 6 months to a year's time *if* we have a competent replacement. With this in mind, how

do we proceed without damaging anyone's toes unduly?

The installer is no great problem; we can encourage him towards greater technical training with an eye towards promotion to technicians. In the interest of fairness, the chief technician should be appraised of the possibility of managership, likewise, and separately, the two technicians. Increased formal education in a local college or by correspondence might be suggested. The trying out of wings may be promoted by judicious assignment of projects.

When the time comes, there may well be hard feelings; however, if the appointment has been made on a fair basis, judging on all factors of a man's performance, these can have little justification. Everyone had his chance. You may lose a man because he was bypassed, but you would probably have lost one and probably more anyway; and this way you are going to the home office with what you believe is the best appointment possible to back you up. Sure, it would have been easier to merely up the chief tech and replace him with the senior tech, but as a regional director your comparative judgment of employees is going to play a large part in your overall job suitability.

The most important factor in the above situation is that you promise nothing except the opportunity to complete. Some readers might say at this point that competition between employees could be a destructive factor. However, if the manager acts the part of the referee properly, it can be more a force that binds the organization together, than one that splits it asunder.

We may conclude, therefore, that an understanding of individual motivation is a most important factor in management.

What we have discussed here is only a theory, (and a highly controversial one, at that) but it can, and does, provide a measure of guidance in that most difficult area of human relations, the comparative judgment of people. Cable television is a business that requires managers who are sensitive to the desires and motivations of people; their employees and associates as well as the system's subscribers. □

A Proposal On...

Testing Pilot Programs

By Arthur Gusow
Director of Marketing
Broadway Maintenance CATV

One often reads of TV producers bemoaning the fact that so many of their pilot programs are hard to sell to sponsors and networks. On the other hand, sponsors and networks wail that they have to cancel too many new programs mid-season because of poor ratings.

Now we in the CATV business are in a position to help the TV producers, the networks, the sponsors, and most importantly, our subscribers, both old-timers and potential new ones. The plan, as I envision it, would be simple, economical, and of substantial promotional value to system operators.

The nation could be divided into a number of geographic areas, with a test system selected for use in each such area. Viewer response would be via postpaid return envelope which would go directly to the interested firm.

It would seem desirable that the system operator educate his subscribers to the testing program either by mail, closed circuit channel, radio, or newspaper advertising. Such notification of the time, date, and channel of each test showing could also stress that they, the TV audience, now had the opportunity to influence the industry as to the type of programming presented to the public. Naturally the advantages of securing a CATV connection could also be stressed in such advertising.

The advantages realized by this method of testing programs would be substantial. All economic levels are included, thus providing a true cross section of the nation. Furthermore, the viewer's choice is made in the home situation, without unusual distractions or outside influences. And the test results should provide the testing firm with powerful proof, one way or the other, as to the value of the program in question.

It is time, in this writer's opinion, to initial a dialogue between our industry and that of the program producers, sponsors, and networks. The possibilities of program testing via CATV will undoubtedly receive increasing attention both inside and outside of our industry. □

The Background and Status of CATV Industry Regulations

"The principal clamor for regulation of the CATV industry comes from the TV broadcasting industry . . . based almost entirely on a request for protection from competition . . ." This statement is one of the key points made by Warren E. Baker, Counsel for the United States Independent Telephone Association, in the report published below. His comments constitute a simply stated, but comprehensive review of CATV regulation to date. And, although prepared for telco personnel, this report is an excellent primer (or review) for anyone interested in the background of cable television's regulatory status. It was presented originally at the 70th Annual USITA Convention recently held in Las Vegas, Nevada.

There has always been a degree of regulation of CATV operators, albeit largely on the basis of requiring an operator to obtain a franchise to utilize the streets and rights-of-way to string cables and in some instances to erect poles. This local regulation has become increasingly more detailed, both in prescribing the kinds of service which must be made available, the time limits of construction and the fees which must be paid the local community for the privileges granted. Nevertheless, the real expansion in regulation which has occurred is that imposed by the Federal Government, essentially through the Federal Communications Commission.

FCC Regulation Of CATV

The principal clamor for regulation of the CATV industry comes from the TV broadcasting industry. While couched in language of protecting the public interest it has been based almost entirely on a request for protection from competition so as to maintain the economic viability or profitability of TV broadcasters. To understand the present status of regulation, it is worthwhile to examine briefly the about face in this area which has taken place at the FCC in the last ten years.

In 1958 the Commission examined CATV with respect to application of its Title III jurisdiction (radio licensing) and concluded that it was doubtful that any of those provisions could be interpreted to reach CATV systems. *Frontier Broadcasting V. Collier*, 24 FCC 251 (1958). A year later the Commission examined both its

common carrier jurisdiction under Title II and its broadcasting authority under Title III and concluded that it had no jurisdiction over CATV. *CATV and TV Repeater Services*, 26 FCC 403 (1959). Three years later the Commission started a reversal of its position by attacking the problem from the opposite end.

In passing upon an application for microwave licenses for the purpose of relaying programs to CATV systems, the Commission concluded that public interest findings could not be made unless the microwave licensee required from the microwave's CATV customer certain protections for the benefit of the broadcasters. *Carter Mountain Transmission Corp.*, 32 FCC 459 (1962). This "public interest" technique of indirect regulation was sustained by the Court of Appeals (D.C.) 321 F.2d 359 (1963) and a petition for certiorari was denied by the Supreme Court, 375 U.S. 951 (1963). Once the court had sustained this indirect regulation of CATV, the Commission extended its jurisdiction to all CATVs served by microwave facilities. *First Report on CATV Regulation*, 38 FCC 683 (1965). Initially the regulations merely required carriage of all local TV stations and non-duplication of their programming.

In 1965 the Commission took its next step and asserted jurisdiction over the CATV industry *not* utilizing microwave facilities. Its *Notice and Inquiry* was issued in 1965 and its Second Report and Order came out in February 1966 (2 FCC 2d 725). In the *Second Report and Order*, the same kind of regulation relating to local carriage and non-duplication of programs of local TV were issued. In addition, however, a new concept — restrictions on importation of distant TV signals — was inserted. A brief summary of the elements of regulation now invoked by the FCC is therefore in order.

In order to protect TV broadcasters, who unlike the CATVs, would serve the broad rural areas as well as the more heavily populated areas, the Commission issued regulations covering three areas. First, it was made mandatory that a CATV carry on its system all local TV signals. This was so that subscribers to CATV would not be weaned away from the local TV signals by the better quality of pictures carried on the system. Second, the CATV systems were required upon request to protect local TV stations against duplication of their programs. This was designed to protect the audience of the local station. These two were allegedly

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tive prices. Unique to you, yes. But not to us. That's exactly what we've been doing for over 20 years for a constantly growing number of telephone, CATV, power utility, and industrial firms.



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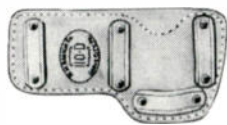
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to protect TV broadcasters against unfair competition. The third — and perhaps the most restrictive — form of regulation is that relating to importation of distant signals. This is also the most recent. Here the protection against importing signals from a long distance, even though such signals did not duplicate local programming, was simply to protect the local TV station against competition which might dilute its audience. Having been precluded from competing for audience by using signals duplicating the local stations, CATVs were beginning to utilize the programming of major independent stations which because of location in large markets had an economic base enabling them to program in competition with some network programming. Restrictions on importation of distant signals could not be based on unfair competition but only on dilution of market and potential risk of local broadcasting survival. In contrast to the earlier regulation, this area was found to be a potential rather than a definite harm to free broadcasting.

The first two forms of regulation have been fairly standardized. That with respect to distant signal importation is now in its developmental stage. The Commission in its *Second Report and Order* in effect created certain procedural devices which inhibit the importation of distant signals. With respect to the top 100 markets in the U.S., the Commission flatly precluded importation of distant signals without a hearing in which the issues would be whether the importation proposed would threaten the viability of existing stations or stations applied for yet to be built.

With respect to markets other than the top 100, the Commission required that notice of importation be given and a period of 30 days pass during which parties could file objections to such importation. It provided, however, that upon the filing of an objection to the importation of a signal, the signal could not be imported until after the Commission has ruled on the pleadings. The Commission, of course, had provisions for waivers as it does in all its rules. The effect of the distant signal regulation, of course, has been to create a flood of petitions for waivers by CATVs and a flood of objections to operations by broadcasters seeking protection from competition. The real result has been long term delays, if not outright denial, of the bringing in of distant signals. The Commission has been expeditious only in processing cease and desist orders to preclude the expansion of CATV activities. It has granted a few waivers of the mandatory hearing provision but it has denied or failed to act on the overwhelming majority which have been filed. It is not surprising, therefore, that this expansion of regulation by the Commission is being challenged in court actions.

Some of the first cases to reach the courts were appeals from cease and desist orders directed against CATV activities within the top 100 markets contrary to the CATV rules. Seven of these cases have reached the Court of Appeals for the District of Columbia. The Commission's cease and desist orders have been affirmed in two cases, *Buckeye Cablevision v. F.C.C.*, Case No. 20, 274 (D.C. Cir. June 30, 1967) and *Booth American Co. v. F.C.C.*, 374 F. 2d 311 (D.C. Cir. 1967). One has been dismissed by agreement of the parties. *Jackson TV Cable Co. v. F.C.C.*, Case No. 20, 468. The

remaining four are still pending, *TeleSystems Corp. v. F.C.C.* (Case No. 20,387), *Back Mountain Telecable, Inc. v. F.C.C.* (Case No. 20,642), *Township of Kingston v. F.C.C. and United States* (Case No. 20,643) and *Borough of Dallas v. F.C.C. and United States* (Case No. 20,644); the last three of which have been consolidated by the Court.

Three cases (two involving the same action) are also pending in the Court of Appeals for the District of Columbia where the FCC's refusal to issue a cease and desist order against a CATV system has been appealed. *Springfield Television Broadcasting Corp. v. F.C.C.* (Case Nos. 20,683 and 20,732) and *Cedar Rapids Television Co. et al v. F.C.C. and United States* (Case No. 20,783).

Two cases that reached the Court of Appeals for the Ninth Circuit had stemmed from petitions to review FCC decisions which designated for evidentiary hearing the question of the effect of CATV operations in the San Diego area upon TV broadcasting and the public interest. On April 28, 1967, that Court stated that the Commission had no jurisdiction to issue temporary orders limiting the CATV activities in the San Diego market (pending evidentiary hearing on the CATV proposals in that top 100 market). It vacated and set aside portions of the Commission's order designed to effect such limitations.

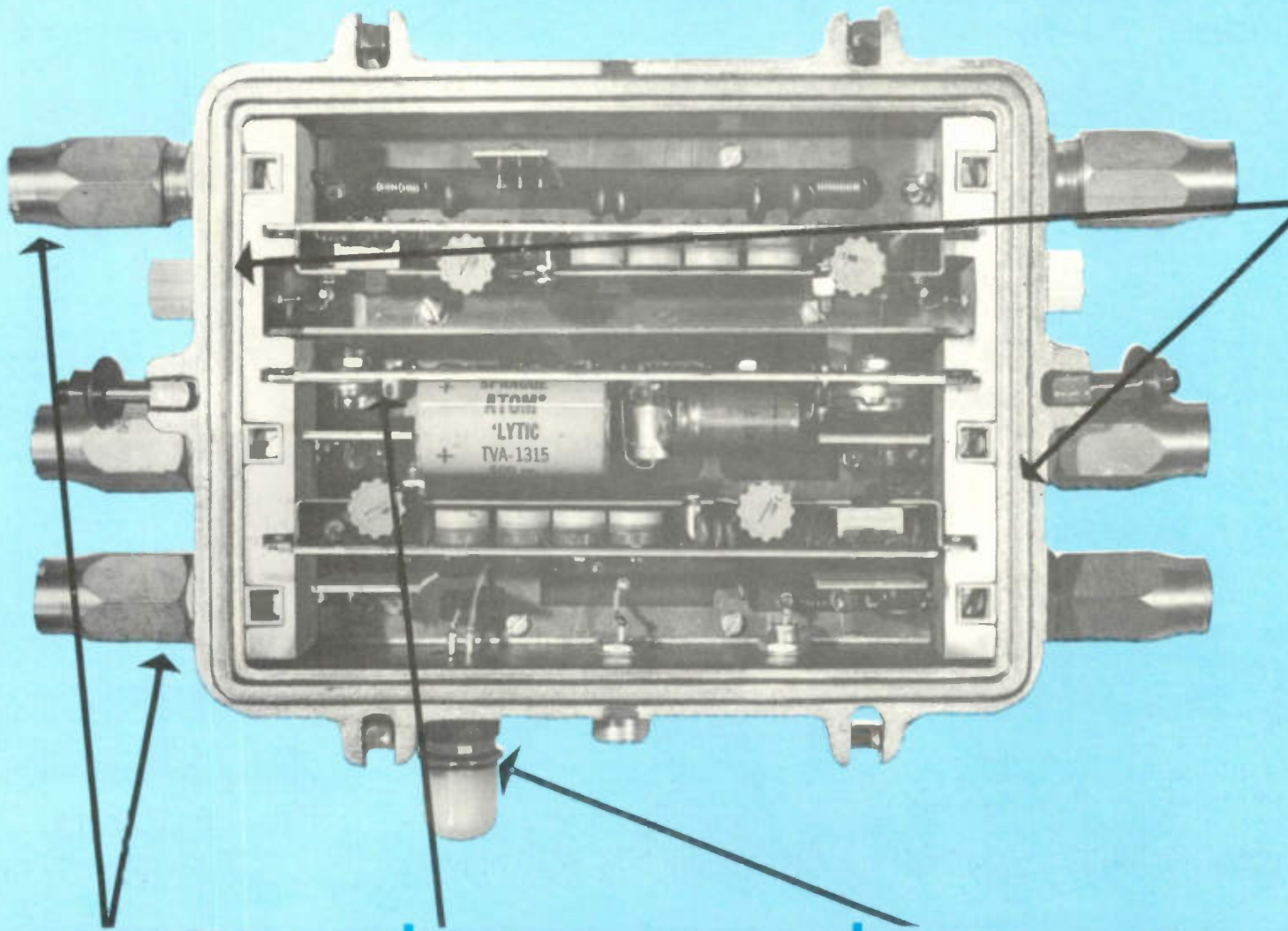
The Court also refused at that time to review the other matter that had been raised by the parties. *Southwestern Cable Co. v. United States*, 378 F. 2d 118 (9th Cir. 1967). The FCC and the Department of Justice have filed a petition for certiorari with the U.S. Supreme Court in an effort to overturn this blow to its CATV rules.

The basic rules of the FCC contained in the *First Report and Order* and in the *Second Report and Order* are being directly challenged in the Court of Appeals for the 8th Circuit. The lead case in that Circuit is *Black Hills Video Corp. and Midwest Video Corp. v. F.C.C. and United States* (Case No. 18,052). Four other cases, two of which were originally filed in the Court of Appeals for the District of Columbia, have been transferred there and consolidated with the initial case. Regardless of the outcome of this case, it is expected it will be the subject of a petition for certiorari to the Supreme Court. If the jurisdiction of the Commission is sustained, the CATV industry will appeal it. If it is denied, it is likely the FCC will seek certiorari, just as it has the case from the West Coast. Nevertheless, the Commission is actively continuing to enforce its rules and sustain its jurisdiction in this field.

Copyright Regulation Of CATV

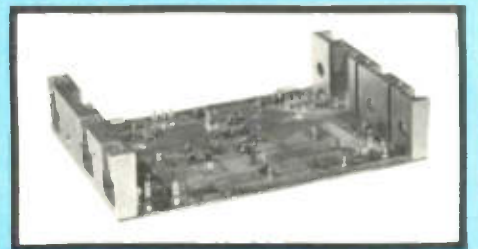
On another front a regulation of CATV is impending solely because of a court decision with respect to copyrights. In the *United Artists* case, determined first by Judge Herlin (*United Artists Television, Inc. v. Fortnightly Corp.*, 225 F. Supp. 177 S.D. N.Y. 1966) and sustained later by the Second Circuit Court of Appeals, 377 F. 2d 872 (2d Cir. 1967), it has been held that the carrying of television programs picked up off-the-air and distributed over a CATV system is a publication within the meaning of the Copyright Act and thus that

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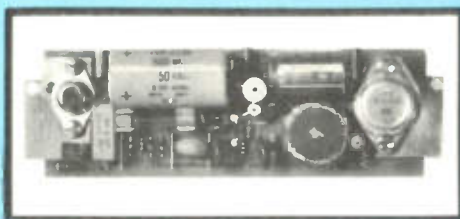
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Accurately calibrated accessory test probe contains AF attenuation and DC isolation components, so level measurements are no longer subject to amplifier test-point variations. The same probe is used with all amplifiers in the system, to eliminate variables and allow operation to exact specifications.



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New "switching mode" power supply module maintains constant efficiency and constant output through a 22-32 volt AC input range. Excess supply voltage is not dissipated as in conventional supply, but is "switched off" during part of the AC cycle. It draws only the current needed, reducing power consumption, lowering operating temperatures, and extending powering range and capability.



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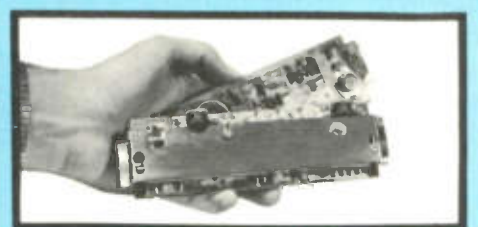
Cascade's exclusive Temperature Level Control responds to a sensing Thermistor, epoxy-potted in new Mil-spec Amphenol fitting. Probe is readily changed, but always completely weatherproof.



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FEBRUARY '68**

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	CETA-2/25 TRUNK AMPLIFIER	CEBA-2/19 BRIDGER (Lo-gain)	CEBA-2/27 BRIDGER (Hi-gain)	CETC-2/25 ++ COMBINATION AMP	CETD-2/35 TERMINAL DIST.
Output Capability (Maximum*)	+55dbmv	+48dbmv	+48dbmv	+48dbmv (bridger)	+48dbmv
Maximum Gain	28db	21db	30db	12db	38db
Operational Gain (Recommended)	25db**	up to 19db	up to 27db	up to 10db	35db
Frequency Range $\pm 1/4$ db	50-220 MHz	50-220 MHz	50-220 MHz	50-220 MHz	50-220 MHz
Gain Control Range @ Channel 13	6db tilt comp. 0-3-6db pad	6db [flat] 0-3-6db pad	6db [flat] 0-3-6db pad	6db [flat] 0-3-6db pad	6db [flat] 0-3-6db pad
Tilt Control Range @ Channel 2	5db	4db	4db	4db	5db
Insertion Loss	- - -	1 1/2db	1 1/2db	- - -	- - -
Input Return Loss	18db	18db	18db	18db	20db
Output Return Loss	15db	15db	15db	15db	15db
Bridger Return Loss	- - -	15db	15db	15db	15db
Noise Figure†:Hiband Loband	10db 8db	21db 19db	21db 19db	10db 8db	12db 10db
Power (average @ 65°F)	210ma @ 22VAC min 160ma @ 32VAC max	230ma @ 22VAC min 175ma @ 32VAC max	250ma @ 22VAC min 190ma @ 32VAC max	410ma @ 22VAC min 300ma @ 32VAC max	220ma @ 22VAC min 165ma @ 32VAC max
Recommended Input: Ch.2 Ch.13	+13dbmv +10dbmv	+21dbmv +26dbmv (min.)	+17dbmv +18dbmv (min.)	+13dbmv +10dbmv	+13dbmv +10dbmv
Recommended Output: Ch.2 Ch.13	+25.5dbmv +35dbmv	+38dbmv +45dbmv	+38dbmv +45dbmv	+38dbmv (bridger) +45dbmv (bridger)	+38dbmv +45dbmv

Dimensions: 9 1/2 x 7 x 3 inches [24.2 cm x 17.8 cm x 7.6 cm]. Weight: approx 5 lbs. [2.275 Kilograms].

*Twelve carriers, no visible cross-modulation with operational tilt. †Aligned for full cable equalization.

**Level automatically controlled by temperature-sensing thermistor. ++For trunk amplifier specifications, see CETA-2/25.

All specifications subject to change without notice.

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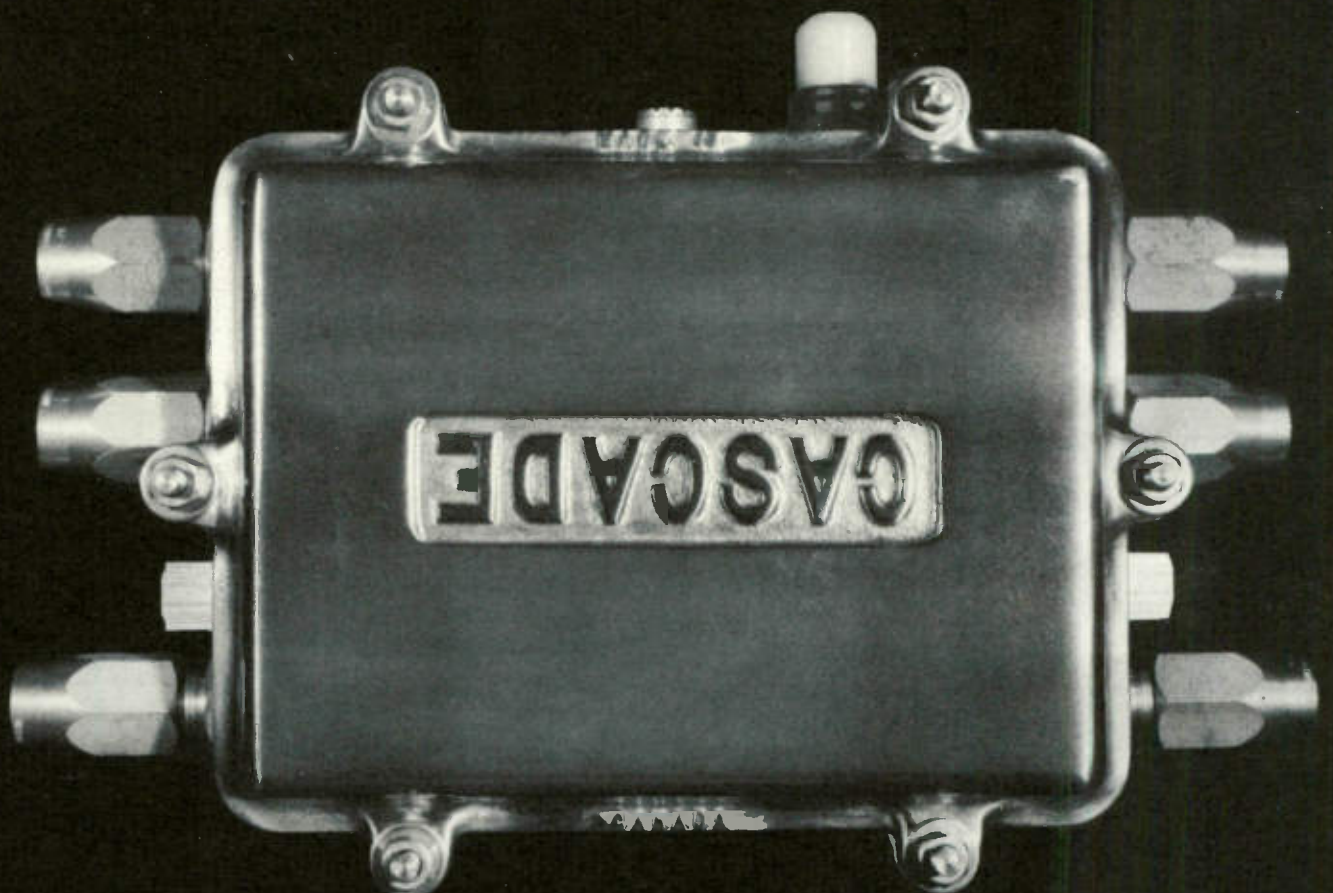
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such carriage or performance without a license is an infringement of copyright. This decision, like others which have a profound economic effect on any industry, is being challenged before the Supreme Court. The CATV industry, which lost both the lower court and Court of Appeals decisions, has requested by petition of certiorari that the Supreme Court exercise its discretion and review this case. If certiorari is denied or if after certiorari is granted the Supreme Court sustains the basic holding of the lower court case, which in my view is the most likely course, CATVs will become liable for copyright fees and will have to either through their own collective efforts obtain some blanket licensing or obtain some legislative relief to provide the same.

Since numerous proposals to revise the copyright laws were being considered by this session of Congress, efforts were made to include proposals which would affect the liability of CATVs. Among the proposals were some offered by the broadcasting industry which would have had the effect of regulating other aspects of CATV business. This was an area belonging to the Commerce Committee, not the Judicial Committee, and an inter-committee squabble was used to stop the proposed bill. As a result, no definitive action has been taken in this field. Whether CATVs will obtain some exemption by legislation and whether as a price for such exemption CATVs will be subjected to additional regulation is unknown. The Potential however is there.

CATV Demand For Regulation Of Telephone Companies

Primarily through complaints filed by its associations, both national and regional, the CATV industry has instigated a large scale FCC investigation into the telephone industry's involvement in CATV. The investigation instituted involves not only the terms, conditions and reasonableness of the rates and regulations contained in tariffs of telephone companies for channel services which the FCC has asserted are within its jurisdiction, largely because of Section 202 (b) of the Communications Act, but an inquiry into the pole attachment policies of telephone companies and the question of whether telephone companies are obligated to obtain certificates under Section 214 of the Act for any construction of facilities to be used in providing channel services to CATV systems. See for example 6 FCC 2d 434, Docket 17098.

The investigation is at the outset limited to the Bell Telephone System operating companies, the General Telephone System operating companies and the United Telephone operating companies. However, the decisions in this investigation will clearly have applicability to every independent telephone company that provides services for a CATV system. Because a decision with respect to the Section 214 question could have such a profound effect on the activities of telephone companies, i.e., whether they would first be required to obtain from the FCC authority to construct facilities, the Commission at the instigation of the CATV industry separated this issue from all others and set it for an expedited hearing. The hearings were completed in early summer and briefs to the Commission were filed on October 2 with reply briefs filed on October 23. An

oral argument before the Commission will be held at a date yet to be established.

Since this is an expedited proceeding on the basic issue, a decision is likely before the first of the year. It is not unlikely that regardless of which way the decision goes it will be appealed by somebody to the courts. From the standpoint of the CATV industry a decision in its favor, that is supporting its contention that no telephone company can construct cable facilities to distribute CATV signals for an operator even if requested and pursuant to a tariff without first obtaining a certificate under 214, makes available to them an important delaying tactic. They could on the one hand delay a competitor using tariff services of a telephone company from getting into a business while at the same time getting into business by their own construction which would not require such certificate. A decision by the Commission on the other hand sustaining the telephone company's position that these are local facilities not subject to a Section 214 certification would mean that telephone companies are free under tariffs to provide service to one or all CATV operators who desire to utilize such services and not be foreclosed from providing complete communication services within their exchange areas

An ancillary question which is of serious import to all telephone companies is the assertion that the decision of the FCC in the *Capital City* case was only half right. This case found that when a connecting carrier provided a local loop to a broadcasting station, this service because of Section 202 b) of the Act became subject to regulation by the FCC, *Capital City Telephone Company*, 3 FCC 189 (1936). The Commission also held, however, that this did not cause the connecting carrier to lose its status as a connecting carrier. The argument now being made is that the second of these propositions is incorrect and that when a telephone company provides cables in a distribution facility for a television-received signal, it becomes subject to the FCC's jurisdiction and it does lose its status as a connecting carrier, thereby becoming subject to Section 214 of the Act.

The most serious aspect of this particular problem is that the Common Carrier Bureau of the Federal Communications Commission has now adopted the argument.

Should this recommendation of the Common Carrier Bureau and of the CATV industry be adopted by the Federal Communications Commission and be sustained by the courts, most every independent telephone company will soon be subject to every aspect of federal regulation, including all tariff filings, accounting filings, report filings, and obtaining authorization under 214 for any facility to use in connection with interstate communications. While, of course, we believe that such a reversal of a decision which has been approved by Congress would be illegal, the ability of the Federal Communications Commission to completely reverse its decisions of 1958 and 1959 as to its lack of authority over CATV operators does not lend much comfort to the belief that this profound change in the status of the independent telephone industry may not come about. Telephone companies, like CATVs, may well be in for greater regulation. □

FINANCIAL REPORTS

Scientific-Atlanta, Inc. and its consolidated subsidiaries have reported net sales of \$2,609,503 for the first quarter of the fiscal year ending Sept. 30. The same period last year showed net sales of \$2,557,743. Net profits for the two periods respectively were \$53,175, or \$.07 per share, and \$51,423, or \$.07 per share. The company shows a decreased order backlog of \$2,750,000

Ameco, Inc. has announced earnings for the fiscal year ended June 30, 1967. The report showed a net loss of \$2,591,220 on net sales of \$5,451,663. This compares with net earnings of \$276,970 on net sales of \$11,904,394 for the same period ending June 30, 1966. Net loss per share was listed as \$2.16 as compared with a net earnings per share of \$.23 last year. Also announced were first quarter consolidated net sales of \$1,648,096 and a net loss of \$46,308, or \$.04 loss per share on 1,200,000 outstanding shares on the fiscal year beginning July 1, 1967. This compares with sales of \$2,126,379 and a loss of \$103,920, or \$.09 loss per share on the same number of shares the prior year.

Cox Broadcasting Corporation reported net earnings of \$1,392,998, equal to \$.49 per share, for the three months ending Sept. 30. This represented an increase of 14 per cent over earnings of \$1,217,208, or \$.43 per share, a year earlier. Operating revenues in the 1967 third quarter totaled \$11,359,203, an increase of 23 per cent over revenues of \$9,209,078 in the corresponding months of 1966.

Raytheon Company reported nine months earnings of \$19,058,000 for the first nine months of 1967 as compared with \$15,442,000 for the same period last year. Per share earnings were \$2.90 showing an increase over last year's figure of \$2.36. Sales for the recent period

were \$692,951,000 compared with the \$529,894,000 for last year.

Storer Broadcasting reported that its after-tax earnings for the nine months ending Sept. 30 were \$5,430,550, or \$1.30 per share, compared to \$8,025,851, or \$1.93 per share for the same period last year.

Avco Corp. reports sales of \$509,223,517 and per share income of \$1.59 for the nine months ending Aug. 31. This compares with sales of \$416,312,138 and per share income of \$1.64 for the same period last year. Net income for the two periods respectively was \$22,435,300 and \$22,716,604.

General Tire and Rubber reports a per share earnings of \$.85 as compared with \$2.05 last year for the nine month period ending Aug. 31. Net sales for the two periods respectively were \$711,282,089 and \$710,766,690. The company showed a net income of \$15,034,000 for 1967 and a net income of \$35,299,000 for the same period last year.

Mountain States Tel. & Tel. has reported per share earnings of \$.42 for the three month period ending Aug. 31. Per share earnings for the same period last year were the same amount. An increase in operating revenues was shown - \$134,841,508 as compared with \$127,573,908. Net income was slightly less for the 1967 period - \$20,720,828 - as compared with \$20,787,306 for 1966.

General Instrument Corp. reported a six month share earnings at \$1.28 as compared with \$1.13 for 1966. During the 6 month period ending Aug. 31 sales totaled \$95,098,715 for 1967 and \$75,405,319 for 1966. Net income for the two periods respectively was \$4,858,996 and \$3,193,399. The figures for 1967 reflect all mergers and acquisitions while the figures for 1966 do not. □

Calendar

JANUARY 12-13. The Rocky Mountain Cable Television Association annual meeting will be held at the Holiday Inn in Albuquerque, New Mexico.

JANUARY 22-23. The NCTA Executive Committee meeting will be held in Washington, D. C.

FEBRUARY 4-10. National Cable TV Week.

MARCH 18-20. The NCTA Board of Directors meeting will be held.

MARCH 24-26. The Southern CATV Association spring meeting will be held at Callaway Gardens in Atlanta, Georgia.

APRIL 4-5. NAEB Region II conference will be held at the Atlanta Cabana Hotel/Motel in Atlanta, Georgia.

JUNE 3-5. The NCTA Board of Directors will meet. Location to be announced.

JUNE 30 to JULY 3. The NCTA 17th Annual Convention will be held in Boston, Massachusetts, at the Sheraton-Boston Hotel.


State Legislative Sessions

U - undetermined
L - legislative days

Alaska	Jan. 22 - U
Arizona	Jan. 8 - Mar. 11
California	Feb. 21 - Mar. 25
Colorado	Jan. 3 - June 30
Delaware	Feb. 6 - 30 L
Georgia	Jan. 8 - Feb. 17
Hawaii	Feb. 21 - Mar. 25
Kansas	Jan. 9 - Feb. 8
Kentucky	Jan. 2 - 60 L
Louisiana	May 20 - July 20
Maryland	Jan. 17 - Apr. 26
Mass.	Jan. 3 - U
Michigan	Jan. 10 - U
Mississippi	Jan. 2 - U
New Jersey	Jan. 9 - U
New Mexico	Jan. 16 - Feb. 15
New York	Jan. 3 - U
Oklahoma	Jan. 2 - 90 L
Pennsylvania	Jan. 2 - U
Rhode Island	Jan. 2 - Apr. 2
S. Carolina	Jan. 9 - U
S. Dakota	Jan. 2 - 30 L
Virginia	Jan. 10 - Apr. 9
W. Virginia	Jan. 10 - Feb. 9



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That's why Xerox has turned to the immediacy of a Sony Industrial closed-circuit TV system. Company officials feel that the audio-visual environment offers unique opportunities for training, engineering, research, employee relations and overall exchange of intra-company information.

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We're equipped to handle all of your CATV construction. When you want turnkey construction, recommend American Matador to your manufacturer. We know you want an experienced company, ready to help you meet your goals.

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December 1967

TV Communications

CATV Technician



CATV Technician cover photo courtesy of Ameco, Inc.

CA-TVI, Real or Imagined • CATV and the Spectrum Analyzer • New CATV Product Reports

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DECEMBER'S CATV PROBLEM SOLVERS from PRUZAN

In December, as in every month of the year, Pruzan will provide the answers to supply problems for more and more CATV systems. The reasons are plain. The combination of knowledgeable people and an almost fanatical intent to ship every order on the day it is received means tops in service. Add big Pruzan inventories, covering the widest range of materials in the industry, and you have the key to keeping costs down and construction on schedule . . . while providing uninterrupted service. Like the idea? Find out for yourself. Call Pruzan today.

Equip your crews for the safest possible working conditions during the winter months.

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Heavy-duty galvanized "A" frame construction, designed so it will not fall over in the wind. Flag holder welded to the side. 18" sq. panel; can also be furnished to read "ABEL CABLE WORKING."

GMP #7358 \$16.00 each
16" Red Fluorescent plastic flags w/staff & stay: \$1.50 each

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Aluminum "Stop" and "Slow" Sign Paddles. 14" round type w/hardwood handle: \$5.00 each.

TRAFFIC CONES



Order the original "Glo-Cone." 18" high made of red fluorescent plastic with a weighted base to prevent tipping. 28" leader cones also available from stock.

18" Glo-Cone \$2.20 each
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PRUZAN COMPANY believes that the safety and comfort of the CATV lineman, and the adequate warning and safeguarding of any individuals who may come in contact with construction projects, are absolutely essential for successful CATV operation. Adequate safety procedures not only prevent accidents, but impress upon the local community the earnest desire of the CATV system to be a good citizen and a productive member of the community.

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Mid-Band CA-TVI... Real or Imagined Problem?

By Philip D. Hamlin
Electronic Consultant

(Editor's Note: There is considerable controversy in the cable television industry at present over use of mid-band frequencies for 20-channel systems. This article by CATV veteran Phil Hamlin expresses his view on the subject of possible interference to aircraft navigation radio resulting from use of mid-band frequencies between 108 and 118 MHz for CATV distribution. These views are in sharp contrast to those expressed by Archer Taylor. (Chairman of NCTA's Engineering Subcommittee) in the article "The Search for CATV Technical Standards" (TV Communications, November, 1967, page 86). The free exchange of views is vital to development of technical standards within our industry; TV Communications will welcome comments from all other interested parties on this or similar subjects.)

Some years ago, the local oscillators in portable radios, operating a few feet from the "OMNI" Antenna of Airliners, were found to give misleading readings. Since the signal from the Omniranges came from distances up to 250 miles, the theory has complete credibility.

Come now many eminent CATV Engineers, who should know better, to tell us signals of the same or lesser magnitude than a portable radio local oscillator may cause interference with airliners when radiated from approximately the same distance as the desired signals.

In other words, we are asked to believe that an amplifier operating at 23 millivolts output at 109.25 mcs into a temporarily loose fitting, a broken cable, or some other condition that would permit some small amount of it to be radiated, may cause a tragedy by guiding an airliner into the source of *this* signal . . . or to any point other than the point toward which the pilot thinks he is flying!

As a pilot and a consultant to a scheduled airline, I take exception.

First, the Special Radio Technical Committee of ICAO anticipated every conceivable interference and the approved ILS, VAR, and VOR installations withstand all but the most powerful interference, and even that does not render them useless. Second, the theory that 7 microwatts of inefficiently radiated energy, containing the wrong kind of intelligence, can compete with 200 watts of energy, radiated with maximum efficiency and extreme directionality, is just too much to swallow!

Since the theory that 7 microwatt energy in the VHF Navigational Range area - 112 to 118 - can reach 6 to 7 miles vertically and up to 250 miles horizontally to interfere with reception used for en route navigation, is to ridiculous for discussion, let's concentrate on the real "bogey man" which is the ILS *lateral* guidance system.

The Instrument Landing System consists of Localizer Unit and a Glide Path Unit which operates a horizontal needle and keeps the pilot on his desired descent path by showing him to be above or below, when he wanders from the desired path. It operates at 332 to 335 Mc's and is hardly concerned with our 7 microwatts at 109.25.

The "Localizer" is a vertical needle and it indicates the aircraft's lateral position with respect to the desired course. Although controlled by "phase comparison", the intelligence *is* radiated at 200 watts, with high directionality, in the 108.3 to 112 Megacycle band.

What safeguards are "built-in" to the system? First, unless absolutely static free reception on the communications channel is available, the landing is not authorized (although many pilots can and do land through a background of audible "sync buzz"). Second, any component failure or dangerous interference becomes immediately apparent, and here again, many airline pilots live with such interference and make safe landings.

To relate the power of a CATV radiation to the normal, constant interference in a typical city, let's examine Seattle and its Seattle/Tacoma Airport ILS. From the north landing south, the aircraft receives a Localizer Signal of 111.5. Approaching from the south to land north, the frequency is 110.3.

In the actual flight path from north to south is a cluster of three 1000' towers, carrying 100 KW at 67.25, 100 KW at 77.25, and 316 KW at 175.25 — channels 4, 5, and 7, and all within a few blocks of hilltop.

Obviously the 2nd harmonics of these stations are of no concern, although allowable radiation would make the seconds about 500,000 times as powerful as our 7 microwatts. What can and does affect aircraft navigation and communications are the fundamentals; first by overdriving RF stages and second, by producing "beats" either in the RF stages or in surrounding metallic oxide objects that re-radiate.

One such beat is the 108 megacycle difference between 7 and 4. Another is the 114 between 7 and 5, but these are just two. Less than a mile from the



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"cluster" is Channel 9, with 224 KW. This produces 110, teaming up with Channel 5.

What are the consequences? They vary, according to weather and whether Channel 9, an Educational, happens to be operating. The Localizer Needle, a phase-comparison device, "bends" to the right landing from north to south, and coming in from the south to the north, it "wiggles" throughout the entire approach.

Assessing the seriousness of this interference is difficult. A marginal pilot, or one inexperienced in the phenomena, could have an accident. While in the "soup", a pilot has no alternative but to assume the "wiggles" are due to wind shifts and faithfully rack his enormous jet - or Piper Cub - to line up with each erratic movement of the vertical pointer.

The danger comes at "minimums": 200' for an inter-continental Boeing jet or its equivalent. With the "ragged edge" at 200, the "sink rate" puts the crew at 150' before they can possibly switch from instrument to visual control, and then they find themselves "close in" at 202 knots straight down the runway, but with the attitude of the aircraft "cocked" as much as 15 degrees from the last "wiggle" or "bend". Since following that course would never put the aircraft on the runway, some violent action is necessary to correct the course and put it on before time runs out.

To determine public relations of these interference sources, who operate legitimately and whose existence in the spectrum is governed by the FCC and justified by the service they render, I asked a veteran Captain who flies the Seattle-Tokyo run some questions.

Does he ever hear a buzzing sound on communications frequencies? "H—, yes!" When? "Near every city . . . Near Seattle, when working Approach Control on 119.5, the 'buzz' gets unbearable over Whidbey Island" (he is directly above or adjacent to the "cluster" at this point). Does he know what the interference is? No, he just assumes it's some other service on the ground, testing.

The same Captain confirmed the "wiggles" approaching from the south, and told how intermittent weather

ABOUT THE AUTHOR



Phil Hamlin built his first system in early 1949, using RCA 630 TS modified turners, and serving a "shaded" area of Seattle via private property easements. In 1950, he obtained a franchise by copying the Fire Alarm Franchise of 1907, substituting the wording "coaxial cable" for "wires." His Seattle system was granted the first

telco pole contract west of the Mississippi. Phil was a Jerrold distributor until March, 1953. Following formation of Jerrold-Northwest, of which he was a stockholder, he managed that firm until February 1957. Since that time, Hamlin has been involved in the manufacture of high fidelity equipment in Japan under the Hamlin brand. He is currently developing equipment which is manufactured in Japan for the American CATV market.

conditions that permitted visual ground contact during an approach often contradicted the Localizer and made them wonder.

TVI in the aircraft band is a fact of life. In approximately 1500 hours of small plane piloting, I have never approached a city free of "sync buzz" if it had a TV station. Recently, in the cockpit of a Lockheed Hercules military air carrier flying from Seattle to Viet Nam via Travis Air Force Base (California), Anchorage, Shemya, Tokyo, Clark Field, and Saigon, I heard "sync buzz" at every city including Saigon, where we operate Channel 13 as an Armed Forces station!

TVI in the aircraft band, from a 7 microwatt source fed to an open or shorted line is totally impossible. Ruling out the use of the 108 to 120 Megacycle spectrum for mid-band use shares the logic of restricting bicycles from highway use because their weight might destory the surface!

The real worry is the mobile services. Police, fire, and emergency services count on reliable communications with received signals of less than a microvolt.

Many users of mobile communications find receivers useless in the vicinity of TV stations, whether from harmonics, beats, or paralysis of inputs from sheer power. It is not uncommon to experience the same interference driving along a cable system. In fact, a real test of your system's "tightness" can be accomplished by peaking a field strength meter to a 150 Mc band mobile transmitter, connecting the FSM to the last amplifier by RG59, and then driving under the system while making "test transmissions". □

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CATV and the Spectrum Analyzer

By I. SWITZER,
Associate Technical Editor

In the past, newly developing electronic services have started with time-based instrumentation, measuring waveforms, and subsequently have adopted spectrum analysis techniques as systems became more complex. CATV — a young, rapidly developing giant among these services — was, by its very nature, forced into spectrum analysis at its onset. The best known and most widely used test instrument for CATV applications is the field strength meter (FSM), which is really a manually scanned spectrum analyzer. Starting with the FSM, the spectrum analyzer (SA) and its operating principals are evolved. A commercially available SA will be described, its advantages and limitations explored, and applications detailed.

The common FSM is a heterodyne receiver capable of tuning the frequency band of interest, usually 54 to 216 MHz, with a meter for indicating the input RF voltage. The block diagram for a typical CATV FSM is shown in Figure 1.

The RF stage provides RF pre-selection and amplification. The IF amplifier may have a center frequency of 25 MHz and will usually have a 3 dB bandwidth of 600 KHz. The local oscillator and RF amplifier are ganged together for tuning. The detector usually provides a peak detecting function and output is indicated. Image rejection is provided by the RF stage. Range selection is provided by input attenuators or IF gain controls or a combination of both. Range selection is necessary since the indicating meter will usefully cover a range of only 20 dB at a time. Some FSM's have

expanded range on the indicating dial, but this restricts the meter's use when a wide dynamic range is not desired.

An FSM could be converted into a spectrum analyzer by providing an automatic mechanical drive for the tuning mechanism, and displaying the detector output on an oscilloscope whose horizontal drive was synchronized to the tuning. This would provide a CRT display of signal strength against frequency. Such mechanical displays are impractical for high speed repetitive use and some electrical equivalent is desirable.

Varactor diodes could be used to provide electronic tuning in an FSM, but it is very difficult to build an RF stage that can be electrically tuned and that will track with an electronically swept local oscillator. Elimination of the RF stage reduces stage sensitivity and makes the receiver

susceptible to spurious image responses. Thus an FSM without an RF preselector stage may have its local oscillator at 75 MHz when tuned to a 50 MHz signal (IF 25 MHz). It will be equally sensitive to a 100 MHz signal. It will be impossible to distinguish whether the noted response is from a 50 or 100 MHz signal at the input.

The image rejection problem can be overcome by using a very high IF frequency. If a 500 MHz IF is used with a local oscillator sweeping from 500 to 800 MHz, the receiver responses will be 0 — 300 MHz and 1000 — 1300 MHz. Since the 1000 to 1300 MHz sensitivity is not likely to be a problem in CATV applications we have a useful receiver — with a few additional complications. IF amplifiers for 500 MHz cannot be built with the narrow bandwidths needed for CATV work. Narrower bandwidths are obtained by additional conversions to lower IF's using fixed frequency local oscillators. Thus we may go progressively to IF's of 65 and 10.7 MHz and achieve bandwidths of 5 KHz and lower. This resultant instrument is an electronically swept spectrum analyzer.

While there are several available spectrum analyzers that could be used in the CATV industry, one instrument *specifically designed* for such applications is the Nelson-Ross Mark I CATV Analyzer. This analyzer features complete frequency coverage in one scan, 60 dB display dynamic range, 75 ohm input impedance (type F connector), video (600 kc) display capability, logarithmic, linear and square law vertical scales and ± 2 dB overall flatness. The block diagram is given in Figure 2.

The sweep generator controls sweep width and center frequency,

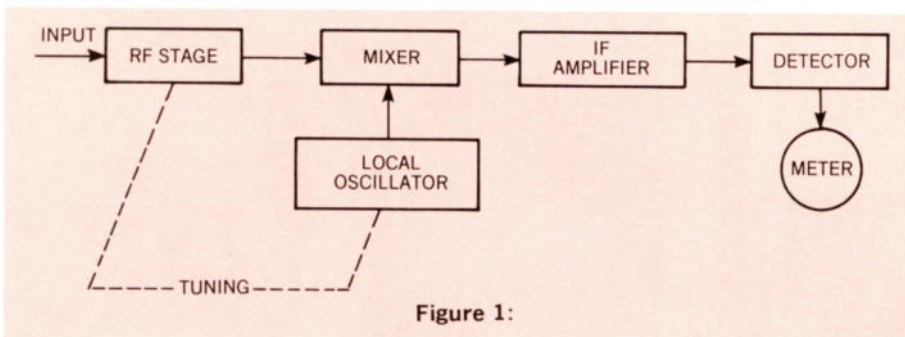


Figure 1:

thus controlling center frequency and dispersion (tuning range). It also controls the sweep repetition rate. Receiver bandwidth is controlled in the 10.7 MHz IF amplifier. This amplifier normally has a 600 KHz bandwidth, but it can be restricted to 5 KHz by switching in a crystal filter. Logarithmic response is also provided at this stage by means of a front panel control. Square law and linear response can also be selected. The video amplifier provides the required drive for the vertical deflection system of the associated oscilloscope. A variable IF gain control is provided along with a step attenuator between the 65 MHz and 10.7 MHz IF stages.

Some general characteristics of the spectrum analyzer should be considered before discussion of specific applications.

Advantages of the SA

The SA gives a sweep frequency display. It shows everything that is going on in a given frequency band in a single oscilloscope display. In maximum dispersion, it displays the whole spectrum from zero to 300 MHz. In its narrowest dispersion mode it displays a 600 KHz segment of spectrum across the full width of the oscilloscope. It can also be operated in a "zero" dispersion mode. In this mode it acts as a regular receiver, displaying the demodulated video on the oscilloscope, subject to the bandwidth limitations of the IF and video amplifiers (600 KHz maximum bandwidth) and the hori-

zontal sweep provided by the sweep rate control.

The SA has a wide dynamic range in a single display. Signals that differ in amplitude by as much as 60 dB can be readily observed in the log mode.

The SA has resolving power comparable to the ordinary FSM when operated in the "wide" mode, and has very much greater resolving power (narrow bandwidth) when operated in the narrow (5 KHz) position. Narrow bandwidth operation permits separation of carriers, beats, etc., that are very close together; just how close depends on their relative levels. If they are about the same level, they would be just separated if they were 5 KHz apart. If they are of different levels, they will have to be more widely separated since one carrier will tend to disappear into the "skirt" of the other. Resolving power is still much greater than that of the ordinary FSM.

The SA has optional log, linear or square law response. In log mode, the vertical deflection is proportional to the log of signal amplitude, thus giving a display that is linear in decibels. In linear mode display is proportional to amplitude of signal input. In square law mode, display is proportional to signal power (square of amplitude) thus accentuating differences between signals.

The SA oscilloscope display can be photographed (Polaroid is preferred) for permanent reference and record, or recordings can be made on X-Y recorders using auxiliary output jacks which are provided.

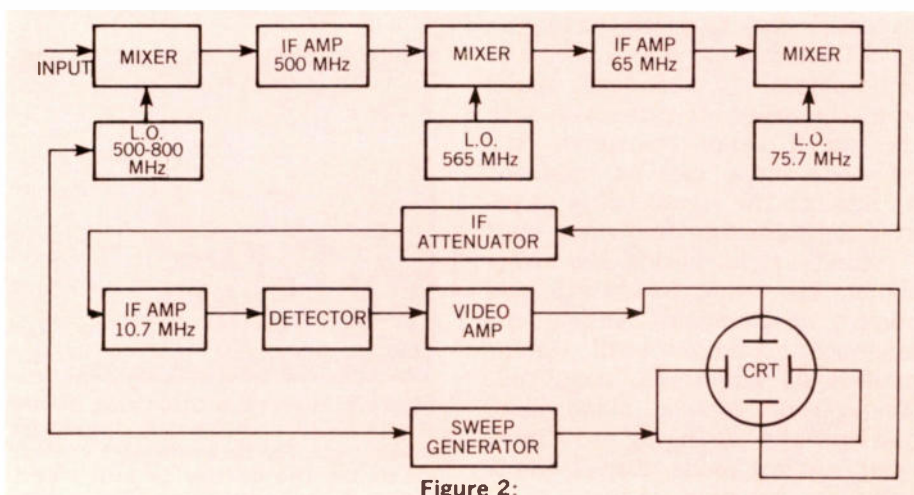


Figure 2:

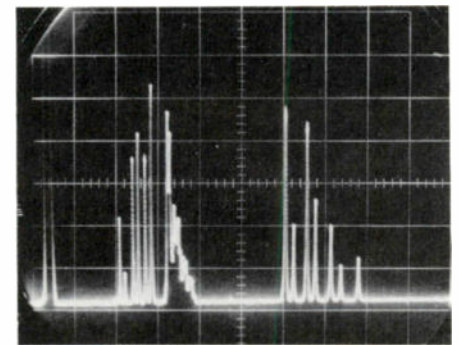


Figure 3: 300 megacycle scan of output of allband antenna in the New York City area. The large signal at left is zero frequency. Channels 2, 4 and 5 can be seen between 2nd & 3rd graticule lines. The FM band is immediately to the right. Channels 7, 9, 11 and 13 are visible between the 6th & 8th graticule lines. Note poor response to channels 2 & 13. (Linear display).

Limitations of the SA

The SA has high noise figure and low sensitivity. Having no RF stage and a high frequency IF the noise figure is set by the mixer loss and the noise figure of the 500 MHz first IF amplifier.

The SA is subject to overload problems. The mixer generates distortion products — harmonics, intermodulation, and cross modulation products, comparatively easily. It will overload at far lower levels than the familiar FSM's.

The SA is difficult to calibrate for absolute readings. Gain depends very critically on sweep speed, particularly at narrow bandwidth and wide dispersion. The SA permits comparison of standard reference and an unknown signal for both frequency and amplitude.

Applications of the SA

(1.) *Swept Field Strength Meter for System Checking:* Checking and setting CATV systems requires tuning the FSM back and forth and remembering or writing down levels for the various channels of interest. This procedure can be simplified by use of the SA. The SA will display all the channels in an all band, low band, or sub low/low system simultaneously. Use "wide" bandwidth for this application and set dispersion and tuning to display the band required. Calibrate the SA with any available reference generator. In the log mode, the analyzer will have a 10 dB/cm vertical calibration. The

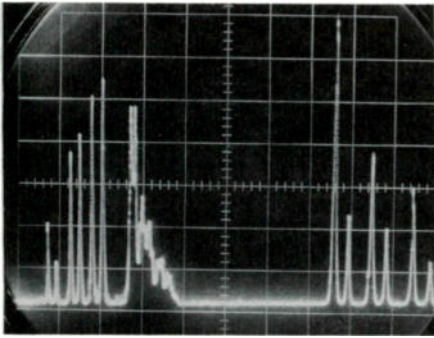


Figure 4: Same signal as in Figure 1 with analyzer dispersion reduced to 180 megacycles eliminating unnecessary upper & lower portions of the display. Note increased resolution. (Linear display).

SA used should be checked for flatness across the band to be sure that it meets the manufacturers specification of plus or minus two dB. This can be done by feeding a good quality sweep generator into the SA. With the SA at a low sweep speed, note the envelope displayed. In log mode, the maximum peak to valley difference should be 0.4 cm (4dB). Greater sensitivity to level differences can be achieved in the linear mode. Adjust IF gain for suitable vertical deflection and check against reference source.

The SA displays all the carriers, picture and sound, at the same time, and the effects of adjustments of amplifier gain and tilt controls are readily observed. In the "wide" mode (600 KHz) the SA is not sensitive to changes in sweep speed and shop calibration at the start of the day can be relied on through the day. The oscilloscope power supplies are quite well regulated against line voltage variations. While the wide bandwidth mode

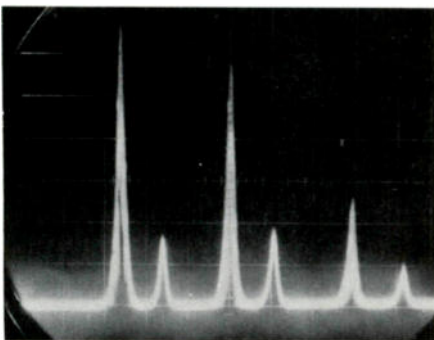


Figure 5: 6 megacycle/cm scan of channels 7, 9 and 11. Relative levels between carriers can be measured using I.F. step attenuator, will yield 7 picture: 0 dB, 7 sound: -10 dB, 9 picture: -1 dB, 9 sound: -9 dB, 11 picture: -7 dB, 11 sound -4 dB. Levels may be calibrated to dBmv (see text) (Linear display).

does not give maximum sensitivity, it guarantees immunity against changes in sensitivity and resolving power caused by changes in sweep speed. Check to see whether displayed amplitude changes with sweep speed. Use slowest speed which gives readable display (flicker level tolerable) and which does not reduce displayed amplitudes. The narrow bandwidth position reduces sensitivity drastically — in wide dispersion for all band display, 180 MHz sweep, and with 15 sweep per second sweep rate, the sensitivity is reduced by about 17 dB and the apparent resolving power reduced almost 50 times, i.e. effective resolving power becomes almost 250 KHz. The wide band display for setting or checking systems does not need the narrow bandwidth.

(2). *Precision Field Strength Meter*: RF levels can be very

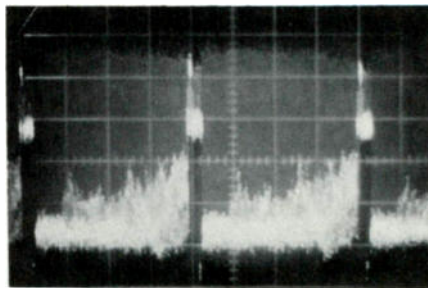


Figure 6: Video display (0 mc/cm dispersion) showing two frames of video. This setting provides V output signals suitable for inspecting sync pulses, etc. (Linear display).

accurately measured and set by using the SA as a "transfer standard". Select a hybrid splitter for balanced outputs (a high speed RF switch is handy for this). When sensitivity is not a problem, an adder can be made from two 20 dB attenuators and a tee. Use the splitter, to mix the signal from the reference generator with the signal being measured. The reference signal can be "walked" up against the signal being measured, by adjusting frequency until it stands right beside the other signal. Use wide bandwidth and narrow dispersions. Adjust the reference generator until signals have equal amplitude. Amplitude comparisons can be made more sensitive by changing to linear or square law mode. Signal amplitude can be read from level of

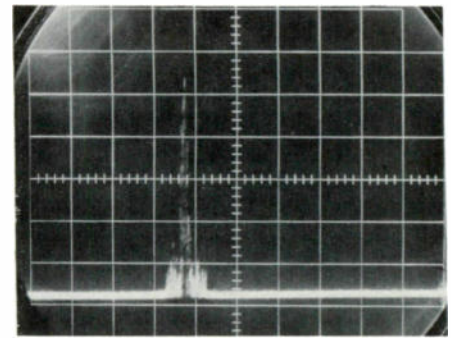


Figure 7: High resolution, low dispersion display - 5 kc resolution coupled with 60 kc/cm dispersion permits identification of FM multiplex transmission. Note grouping of low level modulation around multiplex sidebands (Linear display).

reference generator. Frequency can be determined by tuning the reference generator until it lies right over the signal being checked. Beat effects will be small since the SA is presumably being operated with signal inputs at levels that cause minimum distortions. Signals can be compared in this way to small fractions of a decibel.

Be careful to watch for sweep speed effects. This should be minimal in "wide" band mode. Check for these by seeing whether sweep speed has any effect on amplitude of reference and test signals. Signals with wide band modulation, i.e. wide compared to SA bandwidth, are subject to sweep speed effects. Effect can be minimized or eliminated by using narrow dispersion, slow sweep speeds, and wide bandwidths.

(3). *Reception Interference*: The great resolving power of the SA in its "narrow" band mode makes the instrument very useful for tracking down interfering carriers. Dispersion can be narrowed down to a width of one or two channels.

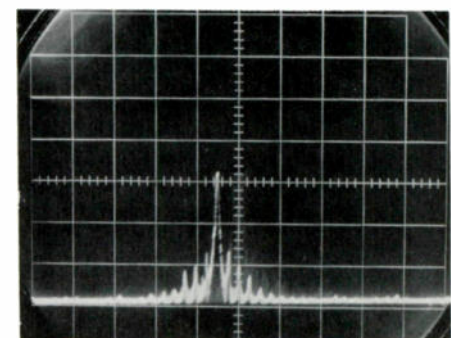


Figure 8: High resolution Log display shows 15.75 kc sidebands around picture carrier. The first sideband, while 20 db below the carrier is still clearly visible. (Log display).



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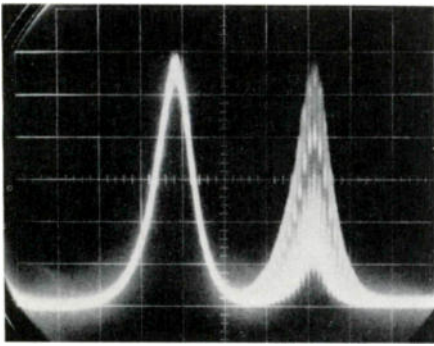


Figure 9: The spectrum analyzer as a transfer standard. The CW signal on the left was inserted via a power divider to calibrate the peak signal level of the video carrier on the right. When the two signals have been made equal the level may be read off the signal generator (Linear display).

The picture, sound and color carriers on the desired channel are easily identified. Interfering carriers, provided they have reasonable separation from desired carriers are easily identified.

A pre-selector of some kind is useful for this application. The pre-selector limits the input signals to the particular band of interest. This prevents generation of undesired distortion products within the SA which may be undistinguishable from the interference being studied. Simple passive band pass filters may be used for this purpose. Better results are obtained by use of an external receiver like a "Channel Commander" or a TV demodulator. The SA is connected to the IF of the receiver being used as the pre-selector. The SA scans the IF output of the pre-selector. The pre-selector is then tuned to the channel being examined. For applications requiring continuous tuning of the spectrum not provided by a TV demodulator tuner, an FSM may be used with adaptation to permit plugging the SA into the FSM IF. The SA then scans the 600 KHz IF of the FSM. This restricts examination to a 600 KHz "window" at a time, but it does permit continuous tuning within the main tuning range of the FSM.

Narrow dispersions and slow sweep rates should be used to preserve SA sensitivity and resolving power. Co-channel carriers are very difficult to resolve. They are separated by only 10 or 20 KHz from the main picture carrier, and unless they are of exception-

ally high amplitude they get lost in the "skirt" of the main carrier. Interfering carriers spaced more than 100 KHz from desired carriers can usually be observed. They can then be tracked back through the system and their sources usually identified. A case history will illustrate:

A CATV system complained of intermittent color "drop out" on Channel 2. Extensive equipment substitutions failed to turn up the problem. The SA was connected to the head-end "Channel Commander" output. It was noted that a spurious carrier appeared quite close to the color carrier intermittently, causing "drop out". This was traced back through the "Channel Commander" with the SA. It was identified as a near-by police transmitter on a frequency quite close to the IF color frequency. This "Channel Commander" had poor RF pre-selection on Channel 2. The police transmitter "bullied" right through the tuner into the IF where it interfered with the color carrier. Once the problem was identified it was easy to fix by adding a high pass filter in front of the "Channel Commander" to improve its RF selectivity. The continuous scanning of the SA permitted the technician to spot the intermittent offending interference. It would have been almost impossible to find in any other way.

Pre-selectors and preamplifiers considerably improve the performance of the SA by restricting its input to the portion of the spectrum of immediate interest.

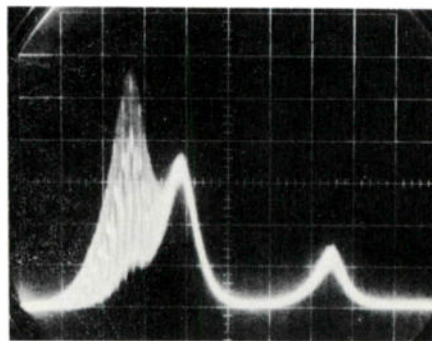


Figure 10: Interfering carrier as seen on the spectrum analyzer. A high level CW signal is interfering with the video portion of the channel under analysis. This signal will be clearly visible on the picture as a "herringbone" type of interference pattern (Linear display).

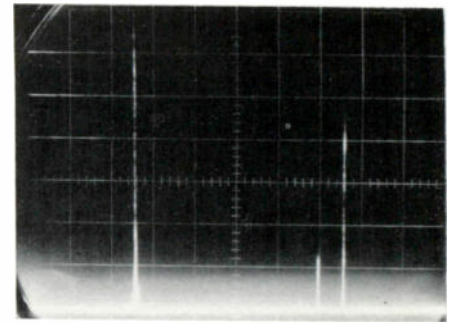


Figure 11: Interference located by means of high resolution examination of an individual channel. An interfering signal can be clearly seen between the sound carrier and color subcarrier (Linear display).

This prevents harmonic distortion products and intermodulation products from showing up in the spectrum being studied. The problem is common to all SA's that use "wide open front ends".

The SA can be checked for internally generated distortion products. In order to check whether a particular product noted on the screen is valid, or is internally generated, use an external step attenuator. Reduce input signal level by 10 dB. If the displayed level changes by more than 1 cm (10 dB) the input signal level is too high and should be reduced. All or part of the observed signal was being generated internally. It should also be noted that external pre-selectors in the form of tuners (Channel Commander, demodulators, FSM's) are also subject to overload distortion and should be checked in the same way. By careful choice and adjustment of pre-selectors it is possible to distinguish beats and other spurious carriers over a 60 dB dynamic range. Such measurements have been made with the SA in connection with checking for spurious beats in tests of amplifier output handling capability.

Since narrow bandwidths are commonly used in this application, it is worthwhile at this point to discuss effect of bandwidth and sweep speed on sensitivity and resolving power.

Very narrow bandwidth IF's take some time to respond completely to changing frequencies. The effect of too fast a sweep for a given IF bandwidth is to reduce displayed amplitude and to increase effective bandwidth (reduce

resolving power). Figure 12 can be used to calculate this effect.

In the Nelson-Ross CATV Spectrum Analyzer, the wide position is so wide that effects are negligible at normal sweep speeds. The narrow bandwidth position is subject to these effects. It is recommended that the narrow position be used only at lower sweep rates and narrower dispersions which will reduce effect on sensitivity and resolving power. Use of a long persistence phosphor (P-7) in the oscilloscope, facilitates use of slower sweep speeds. In extreme cases it may be desirable to use storage type oscilloscope (H-P 141A) and modify the SA for lower sweep speeds.

(4). *Checking Amplifier Overload and Distortion:* The SA can be used to check amplifier overloads and distortion by displaying the broad spectrum of beats and distortion products caused by serious amplifier overloads. These are generally easy to distinguish from the normal modulation sidebands observed in a working CATV system. Care should be taken, as noted previously, to control the SA input level to prevent internal generation of distortion products. With careful use of preamplifier/pre-selectors, distortion beats on what should be blank carriers can be observed to a -60 dB level. Harmonic beats can also be dis-

played if care is taken with use of pre-selectors.

Cross modulation products are very difficult to display. The SA is a frequency domain instrument. The frequency domain manifestation of cross modulation is the appearance of AM modulation sidebands on a carrier that should be free of modulation sidebands. Sideband levels are normally 6 dB down from main carrier, plus the depth of modulation. Thus a carrier with -40 dB cross modulation will have a spectrum in which sidebands are $40 + 6 = 46$ dB down from main carrier. Present cross modulation testing techniques call for sensitivities in the range of -40 to -90 dB. This means that sidebands in frequency domain will be 46 to 96 dB down. This exceeds the dynamic capability of the spectrum analyzer. The situation is further complicated by the fact that present cross modulation testing techniques call for use of 15.750 KHz from main carrier. This sideband soon is lost in the "skirt" of the main carrier. Modulation frequencies of more than 100 KHz would be more readily observed but would still suffer from the 60 dB dynamic range limitation of the SA. Cross modulation up to about -50 dB with modulating frequencies of 1 MHz or so could be checked with the SA.

Harmonic distortion products in

a sub-low/low system could be observed to a -55 to -60 dB level by careful use of pre-selectors to prevent generation of distortion products within the SA itself.

(5). *Checking Modulation Spectra:* Spectra of various modulations are not generally of interest in CATV systems except possibly as an aid to identification of spurious carriers. Use of narrow bandwidth, narrow dispersion modes will display modulation spectra and permit identification of modulation type (FM or AM) and some information on modulation bandwidth.

(6). *Checking Spurious Outputs:* The wide display range and continuous scanning of the SA permits easy checking of amplifiers and other system components for spurious outputs. Be sure to check for possible internal generation of spurious responses, and use pre-selectors if necessary. The 60 dB dynamic range of the SA permits easy recognition of low level spurious outputs in presence of stronger main signals. Undesired local oscillator radiation is also easily checked and measured with the SA.

(7). *Signal Reconnaissance and Field Strength Recording:* The wide scanning nature of the SA makes it suitable for signal reconnaissance work. A broad band antenna and preamplifier would be desirable. All carriers in the band of interest would be displayed. Signal strengths could be recorded by using a data camera capable of sequential frame data photography. The camera would be set to photograph the SA screen every minute or at desired intervals.

A standard reference level signal can be mixed in with the test signals to provide continuous calibration. The log mode permits recording a wide dynamic range of signal levels, and the continuous scan display would permit recording of differential fades between channels, and between sound and picture carriers. Intermittent interfering carriers would also be recorded, depending on their relationship to the interval of the data recording camera. Signals from several narrow band antennas and preamplifiers could be combined for simultaneous display on the SA. □

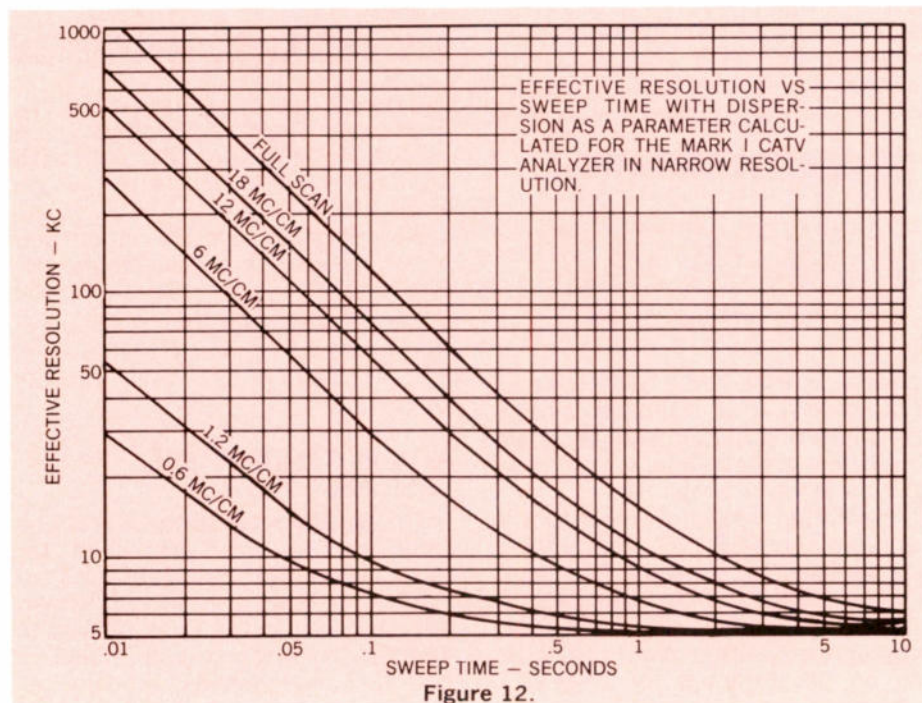


Figure 12.

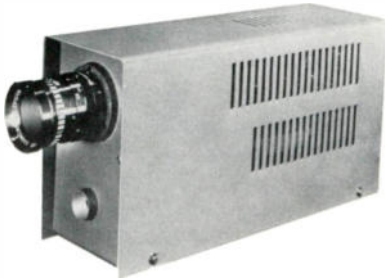
PRODUCT REVIEW

NEW COMPONENTS FOR CABLE TELEVISION SYSTEMS

VIKOA ADDS PRODUCTS

Vikoa, Inc. has announced development of the firm's modular 20-channel equipment. The solid-state Futura 20 series will add the capability of eight more channels in mid-band between FM and Channel 7. The frequency range 126 MHz to 174 MHz was chosen by the manufacturer to avoid the interference from frequencies used for aircraft communications and navigation, at 121 MHz. The manufacturer states that operators currently using Futura equipment can upgrade it to accommodate 20 channels by plugging a Futura 20 module into existing housings.

Vikoa has also added a new vidicon camera to its line. The solid-



state unit, (designated Model ST-903), provides 350 line resolution according to the manufacturer and features 4000 to 1 automatic light compensation. The ST-903 can be switched to either a video or an RF output and comes complete with a standard 1" lens and a Class A vidicon.

For further information on these new products contact Vikoa, Inc., 400 Ninth St., Hoboken, New Jersey 07030.

NEW CABLE FROM TIMES WIRE

A new center conductor fabricated in aluminum with copper coating is now being offered as a standard feature on Times Alumifoam coaxial trunk line cable type JT-1750. The new feature is said to provide stabilization of contraction ratios between center and outer conductors achieved through the use of the same metals. (Outer conductor is

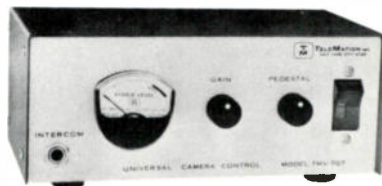
also fabricated in aluminum). In addition, the new development affords lighter cable which is said to be easier to handle and to materially reduce the incidence of "pull-out".

Development of a new 1/4" seamless aluminum-tube sheath drop cable has also been announced by Times Wire & Cable. The cable offers a 15% reduction in attenuation, according to the manufacturer, and has radiation protection comparable to that previously found in Times Alumifoam trunk and feeder cable with the use of matching connectors. The new cable also features a vinyl jacket which is said to be cold-resistant, and to allow greater low-temperature flexibility.

For further information on these new products contact Times Wire & Cable, 358 Hall Avenue, Wallingford, Connecticut 06492.

NEW TELEMATION PRODUCTS

A new camera control unit, designated TMV 707, was recently introduced by TeleMation. According to the manufacturer the unit is capable of upgrading most industrial cameras to EIA and broadcast specifications. The controller is designed to distribute power, drive pulses, intercom, and tally voltage to the camera. It includes three source-terminated video outputs, with sync



optional on each and a built-in video level meter. The intercom circuit can be used with headsets or as an amplifier system when operated with an external amplifier.

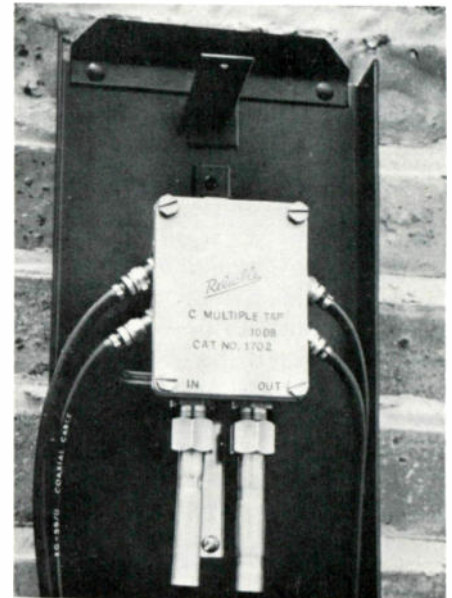
TeleMation has also recently introduced the TMP-205 non-duplication switcher, which permits control of up to twelve output channels in one-minute increments. The drum, programmed with rubber buttons, can be programmed for a week's programs. A split-minute program-

ming feature permits carriage or deletion of local station breaks. Timing accuracy is given as plus or minus 0.2 sec. The switcher is rack-mounted in a standard 19" rack and occupies 15 3/8" vertical space.

For further information on these new products contact TeleMation, Inc. 2275 South West Temple, Salt Lake City, Utah 84115.

UNDERGROUND MULTIPLE TAP

A new underground multiple tap has been introduced by Reliable Electric Co. The unit, labled Type C is a four-way tap and is furnished in six values of coupling from 10 to 35 dB. Standard "F" type connectors are furnished with each unit for the service drops. According to the manufacturer the unit has a minimum input return loss of 20 dB with



a minimum tap return loss of 16 dB. Frequency range capability is given as 50 Mc through 220 Mc, with nominal impedance stated as 75 ohms.

Reliable also recently announced a new grounding block, labled No. 1710.

For further information on these new products contact Reliable Electric Co., Franklin Park, Illinois 60131.

NON-METALLIC CABLE LASHING

The development of a non-metallic cable lashing "wire" has been announced by General Machine Products. The lashing is labled Nylash and is made of Du Pont Dymetrol. The new lashing material is said to feature higher strength and longer life than metal wire. It is both rust

and corrosion proof and, because it is non-metallic, is said to be electrically resistant rather than conductive. According to the manufacturer it is resistant to failures caused by vibration or "dancing" often found in high wind conditions. Nylash stretches slightly while lashing, and is said to return to its original length after lashing.

For further information on this new product contact General Machine Products Co., Inc., Old Lincoln Highway at Pennsylvania Turnpike, Trevoise, Pa. 19047.

SINGLE-CHANNEL AMPLIFIER

A new AGC single-channel VHF amplifier, the Powerdrive, has been announced by Blonder-Tongue Laboratories, Inc. The unit is especially designed for use in master TV systems where input signals are low or where long lines must be driven. According to the manufacturer, the Powerdrive is an ideal head-end building block because of its high gain (60dB min) and output (6 volts). The adjustable AGC action of the unit is said to provide stable uniform output and to eliminate the need for separate high-gain and output amplifiers. The Powerdrive

also features a -20 dB input monitor jack, a -40 dB output monitor jack, and two outputs which provide for loop-through mixing.

For further information on this new product contact Blonder-Tongue Labs, Inc., 9 Alling St., Newark, New Jersey 07102.

NEW AMPEX RECORDERS

Ampex Corporation has introduced two new compact videotape recorders, a closed circuit studio production model with monochrome electronic editing and a portable model. The new recorders are compatible with each other and with previous Ampex videotape recorders using one-inch-wide tapes. The Model VR-5000, priced at \$995,



weighs 62 pounds. Frequency response for the unit is given as 30 Hz to 2.5 MHz; horizontal resolution is

250 lines. Video signal-to-noise is given as 40 dB minimum.

The VR-7800 is designed to meet the requirements of industrial and educational closed circuit studio production. It is equipped with



monochrome electronic editor and an automatic tension servo. When used with an optional processing amplifier, it is said to meet FCC requirements for monochrome broadcasting. Prices range from \$9,500 to \$16,500 depending on features. The two units operate at a tape speed of 9.6 inches per second, a writing speed of 1,000 i.p.s., and offer one hour of playing time as well as stop motion.

For further information on these new products contact the Ampex Corporation, Consumer and Educational Products Division, Elk Grove Village, Illinois 60007.



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The future of the educated cable technician knows no limits. And for the technically minded man who is determined to do something about his future, NATIONAL CABLE TELEVISION INSTITUTE offers that individual the opportunity for his dream to come true. There is today, an acute shortage of technical labor. If you have self-discipline and determination . . . NCTI can provide you with the knowledge that will help you immediately in this fast-moving industry. But be ready . . . write today for additional information about NCTI and its full-range of courses; CATV Installer/technician, General Electronics & Communications, CATV Chief Technician, CATV Field Engineering, and Microwave Field Engineering.

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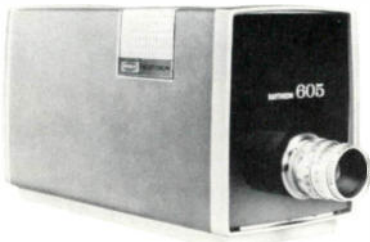
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 Firm _____ Title _____
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NEW RAYTHEON VIDICON CAMERA

A new transistorized vidicon camera has been introduced by Raytheon Company. The unit, designated Model 605, features a 1" f/ ¼ lens and three operating controls. It employs a 525-line random interlace and has a resolution of 650 TV lines, (9 MHz bandwidth), according to the manufacturer. Both



video and modulated RF output are standard. The \$600 unit also features a contrast range of 10 shades of grey.

For further information on this new product contact Raytheon Learning Systems Company, 475 South Dean St., Englewood, N. J.

SCREEN SPLITTER

A special effects generator designed primarily for use in CATV, ETV and industrial television systems is now available from Tele-

Mation, Inc. The TSE-100 Screen Splitter mats pictures from two synchronous sources into a single video image. Horizontal split screen, vertical split screen and corner inserts are possible, using either composite or non-composite video

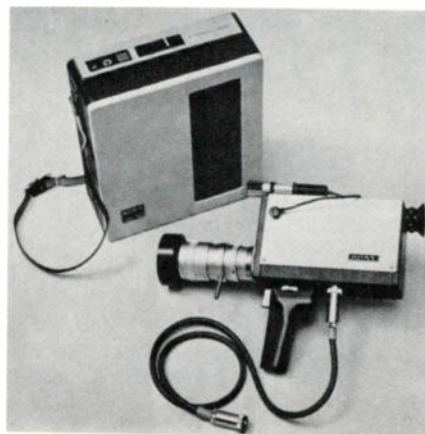


sources. According to the manufacturer the TSE-100 and two television cameras can operate with industrial 2:1 interlace or full EIA broadcast scanning standards. The RC-100 split-arm horizontal and vertical wipe control is also available for remote control of the unit.

For additional information on this new product contact TeleMation, Inc., 2275 South West Temple, Salt Lake City, Utah 84115.

PORTABLE VTR

A new portable videotape recorder has been introduced by Sony Corporation. The unit, designated Videocorder Model DV-2400, utilizes standard ½" tape running at 7½ i.p.s. and works in conjunction with Sony's Model DVC 2400 camera. Tapes made on the DV-2400 can be played back on any Sony 2000 series Videocorder. The unit weighs 12



lbs. and has a recording time of approximately 20 minutes with a 5" reel. The DVC-2400 camera features a top-mounted dynamic microphone and a trigger to operate both camera and recorder. A standard 20 - 80 mm, F-2.5, C-mount, zoom lens is utilized on the 4½ lb. unit along with a miniature viewfinder. Both camera and recorder are solid-state and battery-operated.

For further information on these new products contact Sony Corporation of America, 47-47 Van Dam St., Long Island City, N. Y. 11101.

ECONOMY WEATHER CHANNEL

Vikoa, Inc. has produced a new economy weather channel originator for use in CATV systems and closed circuit TV systems in hotels, motels and schools. Called the Climatecaster, the new unit telecasts time, date and weather, plus six advertising, public service or news messages. It consists primarily of a Vikoa ST 1000 vidicon camera focused on a rotating mirror. The mirror, which is the only moving part in the unit, picks up successively the following six positions: a clock, a thermometer, a humidity indicator, a barometer, a date indicator, and a six-sided rotating card holder which



accepts photos, drawings, diagrams and lettering. All of the weather instruments come complete with outdoor sensors. All lighting is internal and the camera can be detached from the Climatecaster for local origination or general studio use. The solid-state camera is said to provide 500-line resolution and 4000 to 1 automatic light compensation. Output is 1.5V peak to peak video or can be switched to RF, tunable channels 2 thru 6. It comes complete with a Class A vidicon and a standard one inch lens.

For further information on this new product contact Vikoa, Inc., 400 Ninth St., Hoboken, New Jersey 07030.

VTR CLEANING EQUIPMENT

The Texwipe Company is now marketing an audio-video cleaning kit designed to clean the critical areas of magnetic tape equipment and other electronic components. The kit contains 600 4" x 4" disposable cloths and one 16 ounce aerosol can of "Freon" TF solvent. The can has a removable extension nozzle to pinpoint the spray. The kit lists for \$23. For further information on this product contact Texwipe Company, Hillside, New Jersey 07642. □

A CABLE CAROL

By Chris Evans

HARK! THE TELEPHONE IS RINGING,
SOMEONE'S GOT A SERVICE CALL.
STOP THAT GOSH DARNED AWFUL SINGING,
GRAB YOUR METERS, ONE AND ALL.
IN YOUR TRUCKS AND OFF YOU GO NOW,
POP YOUR CLUTCHES, FOLLOW ME.
OOPS! I NEARLY HIT A SNOW-PLOUGH,
WHAT A PLACE TO PLANT A TREE!

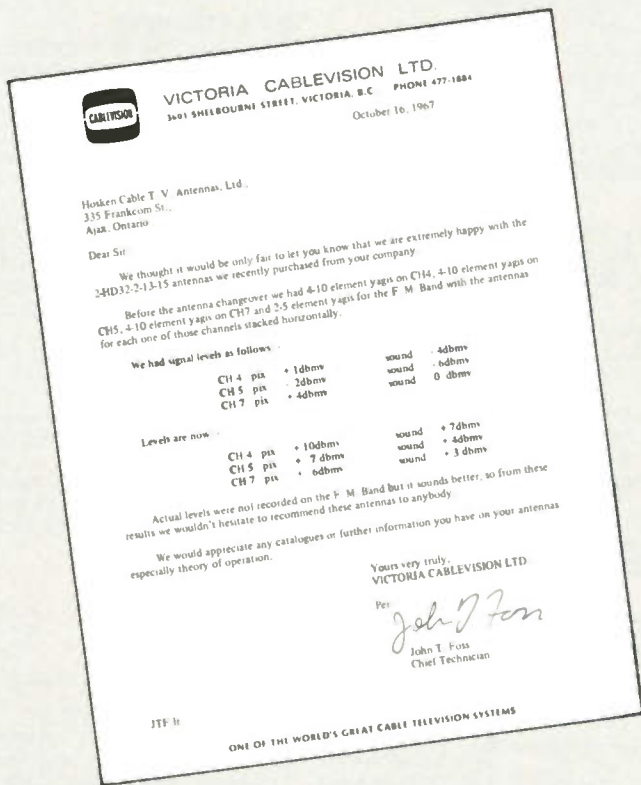
UP TO HERE IN SNOW AND ICE, BOYS,
TO A HOUSE WE NOW MUST GO.
CHRISTMAS REALLY AIN'T SO NICE, BOYS,
WHO THE HECK SAID "HO-HO-HO?"
IN WE GO WITH FLASHLIGHTS BLAZING,
LIKE THE LADY OF THE LAMP.
"AIN'T NO TROUBLE ON YOUR CABLE,
LADY, IT'S YOUR R.F. AMP!"

GUARDIANS OF THE HI AND LO BAND,
AND THE SUB-LO'S IN BETWEEN,
SERVICEMEN, WE ALL ON GUARD STAND,
KEEPING SIGNAL CLEAR AND CLEAN.
FIELD-STRENGTH METERS AT THE READY,
UP-CONVERTORS FULL OF POOP.
LINE EXTENDERS HELP US OUT SOME,
WHEN THE SIGNAL STRATS TO DROOP.

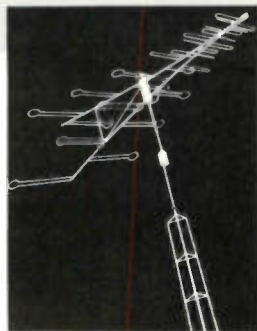
SO HAVE A MERRY YULETIDE SEASON,
WITH SOUND AND PICTURE CLEAR AND BRIGHT,
AMPLIFIERS NEED NO REASON,
FOR POPPING OFF AT DEAD OF NIGHT.
KEEP THEM HIGH AND CHANGE THEM OFTEN,
(NOT TOO HIGH OR THEY'LL CROSS MOD)
GUARD THE TRUNK AND NEVER SOFTEN,
CROSS YOUR FINGERS, PRAY TO GOD.



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27 Taber Road, Rexdale, Ontario, Canada

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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 \$4.00. Classified rate to commercial advertisers is \$30.00 per column inch (2 1/4" col.). Deadline for all classifieds is 1st of preceding month.

OPPORTUNITY WANTED

Manager of two cable systems, experienced in system construction and local programming (live, VTR and film) desires opportunity for greater responsibility with multiple system operation or equity position with smaller company, East Coast. Harvard, MBA; U.S. Naval Academy, B.S. Write Dept. T121, TV Communications.

CHIEF TECHNICIAN

Large CATV system in major Canadian city requires Chief Technician for supervisory duties of service and maintenance personnel. Must be completely familiar with Jerrold equipment including the Low Sub concept. Reply giving complete qualifications, references and experience to Dept. T122, TV Communications.

WANTED

Large corporation currently owning systems seeking additional CATV properties. Interested in current systems with 500 to 4,000 subscribers or franchises. Large amount of capital available. Reply Dept. T123, TV Communications.

CATV CONSTRUCTION

Company operating on Nationwide Basis needs experienced CATV Field Engineers, Technicians, Splicers and System Layout Draftsmen. Should be willing to relocate. If you seek top pay and benefits and an opportunity for rapid advancement, write or send resume of background and experience to Dept. T124, TV Communications.

COLOR IT GREEN . . .

the cash, that is, that we pay for photos of CATV subjects. TV Communications pays \$20 for any color photo published as the magazine's front cover subject. All photos and negatives will be returned on request, and credit will be given to the photographers whose photos are published.

Photos may include any subject matter related to the cable television industry, and may be submitted in the form of positive transparencies (2 1/4" square or larger) or as color prints (please include negatives with prints when possible).

Send materials (carefully packaged) to Milt Bryan, Assistant Editor, TV Communications, 207 N. E. 38th Street, Oklahoma City, Oklahoma 73105.

TECHNICIAN-ENGINEER

Major CATV company operating in Ontario, Canada has a position for a Chief Engineer, Chief Technician and other engineering staff. We require experienced people used to large system operation, in all its phases. Send full resume and your requirements to General Manager, York Cablevision, 93 Penn Drive, Weston, Toronto, Canada.

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Complete system serving Napoleon, Ohio, two years old, approximately 35 miles, fully operational. Financing available. Reply Dept. T125, TV Communications.

CATV ENGINEER

Technical administrator required in corporate headquarters office of one of the largest and most well known multiple system owners. This position requires experience and competence in all phases of CATV system engineering, construction, operation, and performance evaluation. Familiarity with microwave system is desirable.

The work will consist of participating in the administration of all the technical phases of multiple CATV system operation. There is the opportunity to contribute to very interesting and technically advanced projects presently in process or planning.

This is basically a NON TRAVELLING job although occasional trips will be required. This is a job in New York City.

This position should appeal to a field engineer who is strong technically and TIRED OF TRAVELLING.

This company is totally engaged in the cable television field and is not an offshoot of a broadcast, telephone, publishing, etc. business.

Send resume to:

TelePrompter Corporation
50 West 44 Street
New York, New York 10036
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DISTRIBUTORS WANTED

CATV distributors wanted for "F" fittings and wall plates. AVA Electronics and Machine Corp., 416 Long Lane, Upper Darby, Pa. 19082.

FOR SALE

RCA TK15B television camera, head only. Incomplete. Good for replacement parts or could be rebuilt. Mobile Radio Co., 413 NE. 38th Terrace, Oklahoma City, Okla. 73105.

WANTED

Going cable system and/or AM-FM radio station, East Coast. Full details first letter to Dept. T104, TV Communications.

CASH FOR CATV PHOTOS

TV Communications pays \$20 for color photos used on the magazine's front cover. Any CATV-related subject matter considered; send color transparencies (2 1/4" square or larger) or color prints (with negative if possible). All materials returned on request. Send to Milt Bryan, Assistant Editor, TV Communications, 207 N.E. 38th, Oklahoma City, Oklahoma 73105.

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Jerrold's new Channel Commander II has everything you would look for in a solid-state single-channel processing unit—and then some. For vivid color, for superb black-and-white TV at every subscriber location, start with Commander II's at your head-end.

This completely modularized head-end unit processes and controls any single VHF input channel (2 through 13) and delivers it either as any standard VHF channel (including the original input channel) or as any special VHF channel required by a 20-channel distribution system. Spurious beats are at least 60 db down. Fast-acting IF AGC is keyed to horizontal sync reference. Oscillators are 100% crystal-controlled. Completely compatible with any CATV system head-

end, Commander II also features modular construction for easy maintenance and all solid-state circuitry for reliable, economical operation.

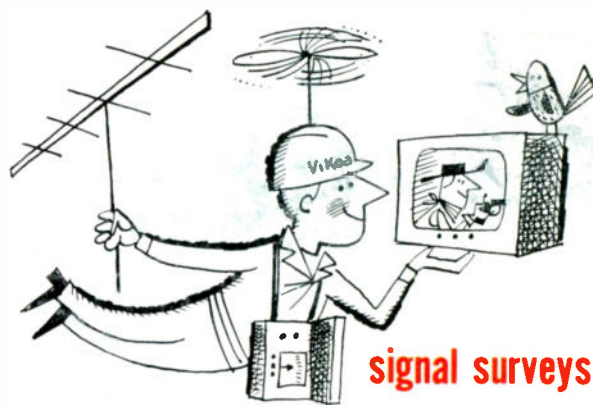
Commander II's compact modular construction includes five active modules, only one of which (either the input or the output module) needs to be replaced to change functions. The whole unit takes up only $5\frac{1}{4}$ " of vertical rack space when mounted in a standard 19" rack.

New Commander II's will be rolling off production lines in December. Get your order in now to insure early delivery. Write or call CATV Systems Division, Jerrold Electronics Corporation, 401 Walnut Street, Philadelphia, Pennsylvania 19105. Phone 215-925-9870.

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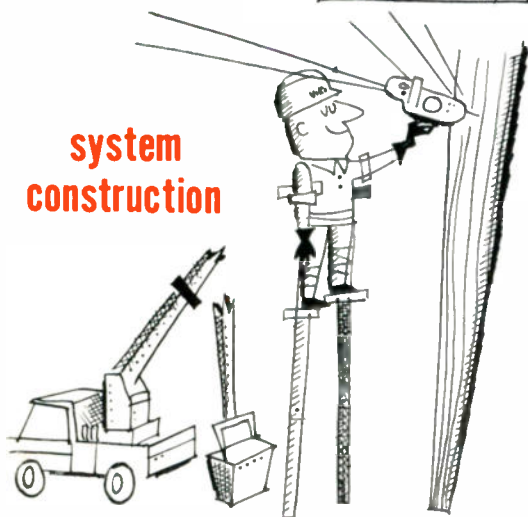
**most advanced, reliable
 cable and equipment**



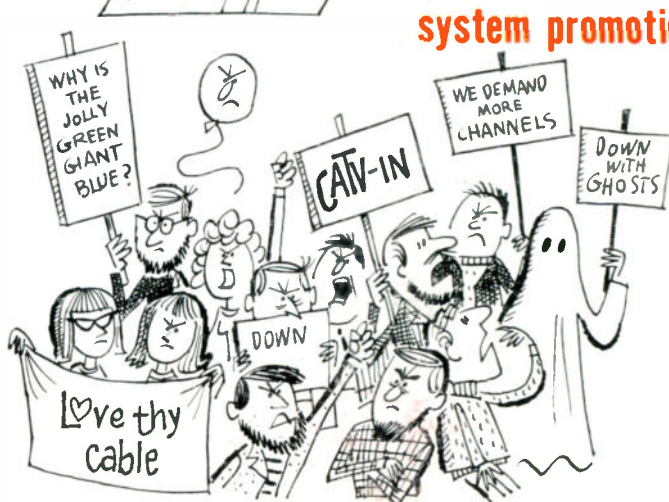
strand map surveys



system design



**system
 construction**



system promotion

and...we give you service after the system is turned on!



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