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July 1973, Volume 10, Number 7.

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# TV Communications

The Professional Journal of Cable Television

**From Boat Rocking to Star Trekking – Cable’s Moving with Confidence**  
A wrap-up of the major events at the 22nd Annual NCTA Convention . . . . . 28

**The Common Carrier Won’t Take You to the Promised Land**  
Metrotel’s Lois Brown warns of the dangers of common carrier regulation . . . 32

**Start from the Beginning: An Organizational Plan**  
Getting off to a good start can make or break your studio efforts . . . . . 47

**Where Are They Going to Put It Next Year?**  
Software and hardware were well represented at last month’s cable show . . . . 50

## CATV Technician Section

**Tomorrowland’s Pay Cable Moves to Adventureland**  
Two-way demonstrations were more dazzling than the Disneyland parade . . . 57

**Cool Hand Amp Just Shakes It Off, Boss – Part II**  
A difficult problem – thermal control in CATV trunk amplifiers . . . . . 60

## Departments

Editorial . . . . . 11	Management Guidelines . . . . 26
Perspective . . . . . 12	Subscription Card . . . . . 65
Letters to the Editors . . . . 17	Product Review . . . . . 74
CATV News Briefs . . . . . 19	Classified Advertisements . . 78
Focus on People . . . . . 24	Advertiser Index . . . . . 80

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## This Month’s Cover..

Making his final appearance as Chairman of the National Cable Television Association, Tele-Prompter President William “Bill” Bresnan introduced the Tele-Prompter/Scientific-Atlanta Spacecast project during the 1973 NCTA Convention in Anaheim last June.

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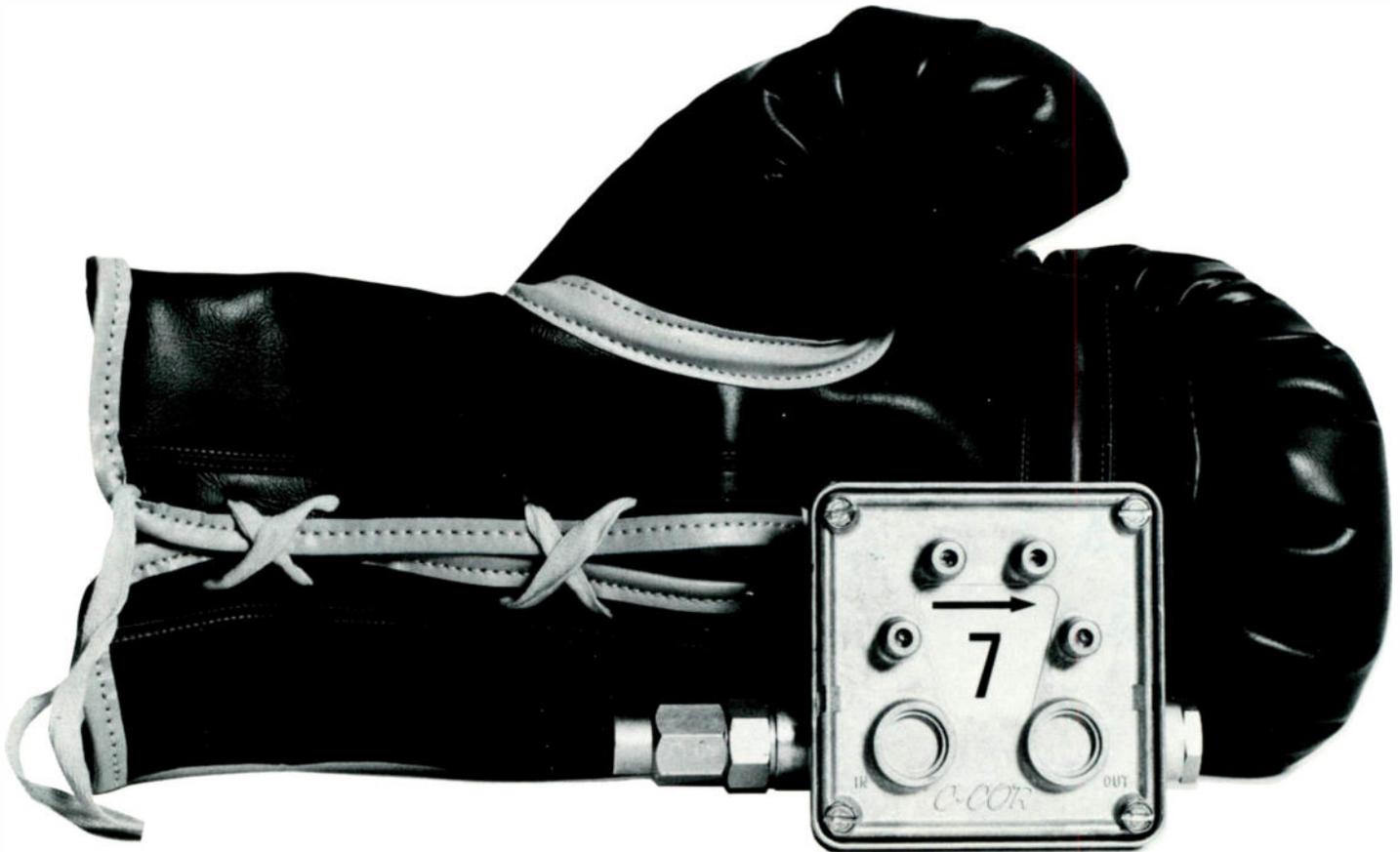
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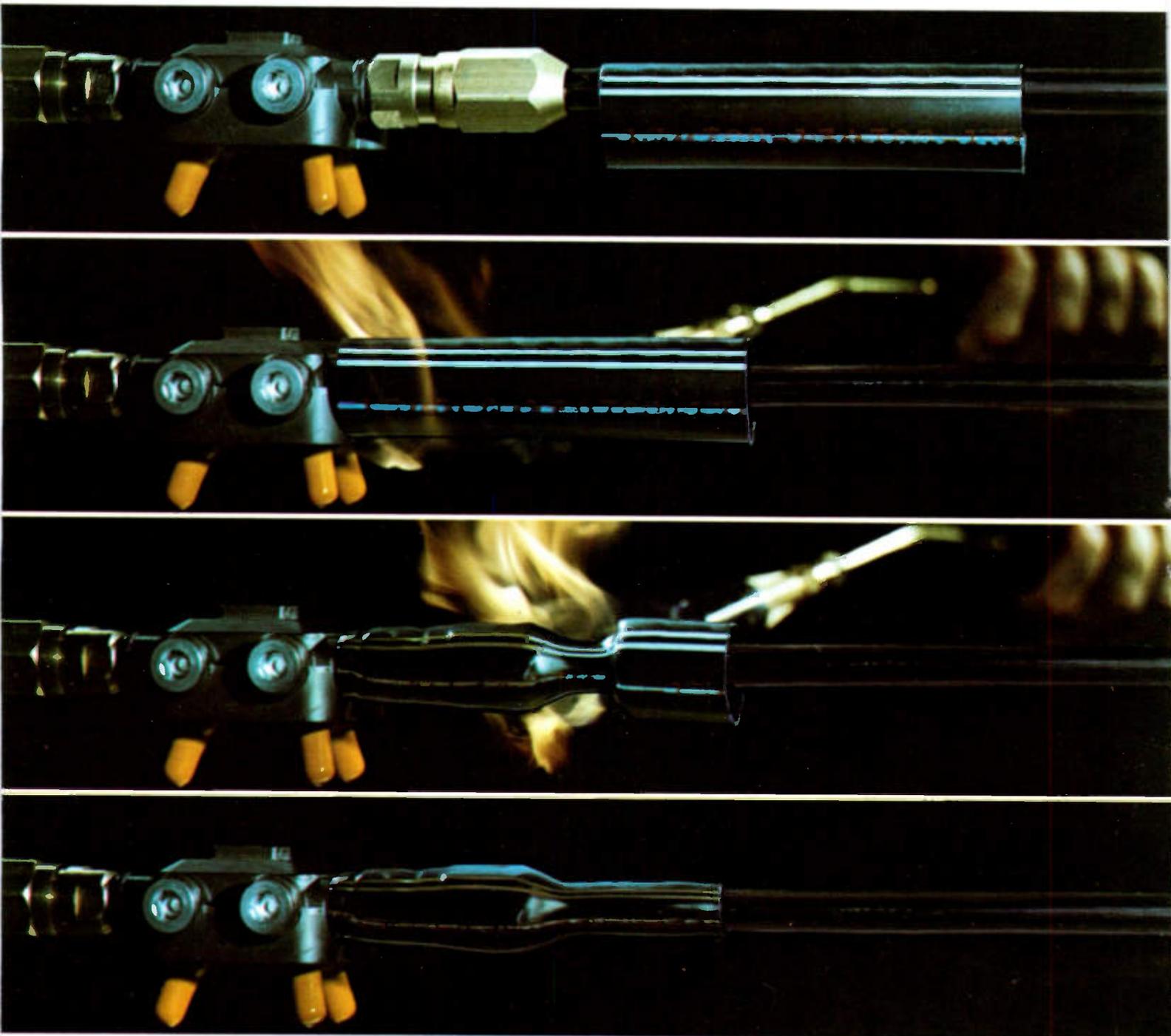
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# The TVC Viewpoint

## EDITORIAL



Robert A. Searle  
Publisher

## Battle Lines Being Drawn — Conflict in the Regulatory Arena

As one convention goer said to me last month, "It's not a three-tiered Chinese puzzle, it's a three-ring circus!"

That old shibboleth did seem outmoded when listening to, and watching, the panels on Federal/State/Local Regulatory Jurisdiction at last month's National Cable Television Association convention in Anaheim. In rooms too small to contain the sometimes heated exchanges, the battle lines were drawn between Federal, State and Local regulatory representatives . . . with the cable industry sometimes feeling like a freshly-wounded near corpse watching circling carrion-inclined feathered fowl with bright red forked tongues hanging out.

Yet, perhaps in spite of all those metaphors, the cable industry was subjected to that and more. As the New England Cable Association's Bill Kenny put it, they're "all just jumping, jumping, jumping all over us!" And as Bob Cahill, former administrative assistant to FCC Chairman Burch, noted, "Pretty soon there won't be any industry" left to regulate.

The knife wielders at the Federal level were led by the FCC Cable Bureau's Allen Cordon (in the morning) and Steve Effros (in the evening). Their Chairman, Dean Burch, cut the rug out from under their defense of the ambiguities of the Third Report and Order (Effros lamely claimed the FCC only wanted to set "flexible" standards) when, during his Tuesday luncheon speech, he dodged the jurisdictional question completely by saying, "In all candor, the Commission decided not to decide this question in the Cable Television Report and Order for the very pragmatic reason that we didn't know how to decide it."

That was made quite clear during the morning and afternoon discussions.

Winging in with the state point of view were Massachusetts' State Cable Commission Chairman Morton Aronson (morning) and Archie Smith of the Rhode Island Public Utilities Commission. Both men, Aronson the expressive and Smith the quietly efficient, are recognized for their knowledge of cable television. Using the peculiar logic of the mess state regulation has made of other industries, though he didn't, of course, put it that way, Aronson told the panel's crowded audience that state regulation is good for them and "that's just the way the real world is."

Bill Kenny, in the first *Amplifier* following the NCTA show, mentioned Smith's reinforcement of his position of "watchful supervision without rate regulation." His statements, Kenny noted, "were well received by conventioners." On the other hand, Aronson's comments "were listened to critically by those in attendance."

Representing the interests of the franchising municipalities were Morris Tarshis of the New York City Bureau of Franchises, Frank Young of the League of Cities — Council of Mayors, and William Walls, city attorney for Newark, New Jersey. Tarshis, as usual, was the most outspoken as he chose to dismiss both state and federal regulation calling them "sheer nonsense." (In the background, acting New York State Cable Commission chief Lynn Wickwire was busily trying to begin the establishment of an association of state CATV regulators.)

I'm afraid I have to echo Morris's view . . . and include more than one attempt at municipal regulation in the same context.

Also lurking in the shadows was yet another layer of regulation . . . the county. While that governmental level was hardly mentioned, the periodic growth and decline of regional attempts at government bodes ill for cable's regulatory picture. (Though cities, like Dayton, will sometimes rebel when faced with regionalization.)

After listening to all of the points of view expressed, I came to the inescapable conclusion that former FCC Commissioner and Chicago lawyer Thomas Houser's call for Federal preemption . . . and redelegation . . . was the only logical approach to the whole mess. And as Washington attorney John Kenny noted, the only realistic escape hatch from what Bob Cahill termed the "horrendous" franchising process was through Congressional action.

*TV Communications* urges full industry support for Utah Senator Frank Moss's bill (S.2015) introduced virtually simultaneously with the discussions, co-sponsored by Indiana Senator Vance Hartke, which tells the FCC that it will "have plenary regulatory jurisdiction over CATV systems." The bill also, echoing Houser's ideas, lets the FCC delegate certain regulatory functions to the states and/or municipalities.

The battle lines have been drawn . . . and it's up to the cable industry to insure the passage of the Moss-Hartke bill, or one like it.

# Perspective

on the news



Paul Maxwell  
Executive Editor

In retrospect: the National Cable Television Association's 1973 extravaganza has to be, on reflection counted only a partial success. Money and regulation remain the wolves hiding in cable's closet. The scarcity of the former and the abundancy of the latter keep cable's future clouded.

If the cable industry isn't pleading to the money-lenders, it's pleading with the plethora of greedy regulators waiting to impose further regulations on an already overburdened industry.

Neither tack seems to have been met with much wind in the sails . . . with the likes of money-lender Cable Funding planning to join instead of lend and state regulator Aronson of Massachusetts using lame excuses like "that's just the way the real world is," the weather ahead looks rough indeed.

The only thing state regulation is adding to the cable industry is one more fee to pay . . . and maybe a state, regional or national assessment to help fund court fights against arbitrary and unreasonable fees imposed by regulatory bodies.

On the other hand, NCTA President David Foster took off his life vest and came out rocking the boat. Response from his cable audience was enthusiastic . . . less so from cable's so-called "adversaries." FCC Chairman Burch had temerity to claim responsibility for already having "got cable moving."

He then washed his hands of the matter, except for copyright, leaving the determination of cable's tomorrow "in the marketplace." Note, he did that after presiding over the promulgation of the much-flawed Third Report and Order . . . which as Foster noted, has deteriorated into a nightmare called the Certificate of Compliance procedure.

In spite of all that negativism, the satellite demonstration that opened the convention points to the future with pride and confidence for cable. Credit goes to Hub Schlafly of TelePrompTer for getting it started . . . and to TelePrompTer and Scientific-Atlanta for making it happen. Carl Albert's Oklahoma countenance showed the pride of tomorrow; and if support for John Gwin's cable consortium continues to grow . . . and money is put where mouths are . . . then the industry will merit Foster's notes of confident optimism.

Immediately after the convention, however, the Warner Cable agreement to take Sterling Manhattan off Time, Inc.'s hands fell through. Though he claims he never said it, Al Stern has had to eat some words attributed to him: "If we can't make it work, then no one can."

Few awards have been as deserving as those made to Yolanda Barco and Gene Iacopi. Ms. Barco's efforts for cable communications have been well chronicled in these pages . . . *TV Communications* offers its redundant applause to the first recipient of the Idell Kaitz Memorial Award. As legislative committee chairman, Gene Iacopi did more to make cable a byword in the halls of Congress than any other man in the industry's history.

Speaking of committee chairmen and Time-Life Cable, the appointment of Barry Zorthian as Public Affairs committee chairman is appropriate. Anyone who could convince the NCTA membership he is a stalwart cable supporter while systemically dismantling the Time, Inc, cable involvement has got to be a public relations genius.

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Athena Communications Corporation has developed a low-cost system to scramble and unscramble cable TV programs called EnDeCode. The system uses a decoder (top) which can be incorporated into a converter, atop a TV set in the home. The encoder, normally located at the system head end, is placed on the TV set (bottom) for photo purposes. This patented system and a special program package will be offered to subscribers on Athena's Cable TV systems and will be made available to other Cable TV operators as well.



The EnDe-Code system provides controlled access to any CATV channel.

EnDe-Code makes it possible to encode any standard or non-standard TV channel so that standard TV sets receive scrambled pictures and no sound.

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EnDe-Code's advantages are:

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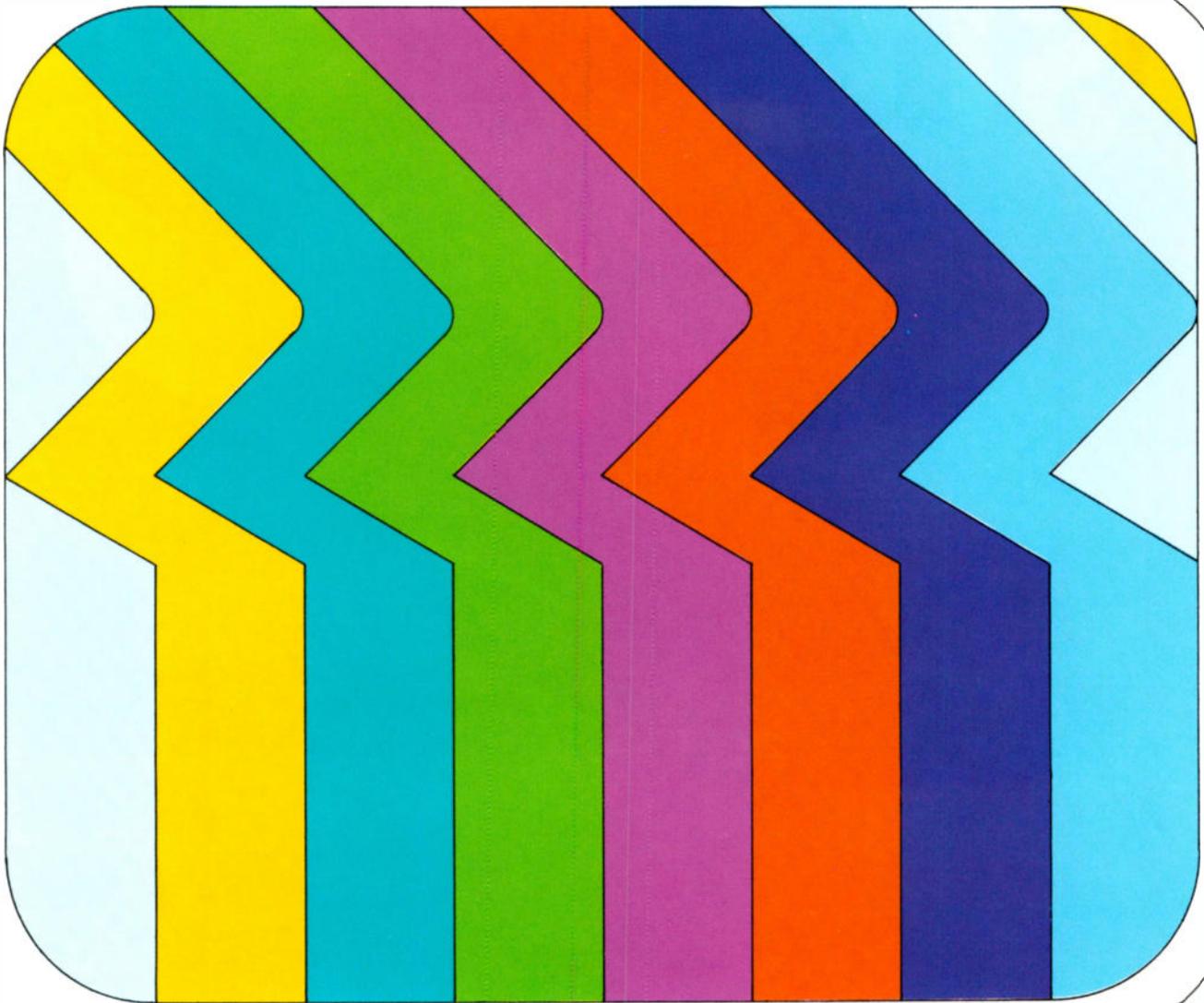
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# LETTERS

Dear Mr. Maxwell:

Congratulations and appreciation to Messrs. McCaughey and Rogness of Anaconda for the very fine and highly needed series on quantitative evaluation of reliability. I am looking forward to the balance of this series,

I'd like to suggest the addition of other heat contributing factors such as trunk and feeder AC bypass coils, fittings and internal connecting wiring.

Finally, could this series be expanded to include another much neglected area of reliability in our industry — that of common powering of trunk and feeders and the resultant confusion in the use of fuses and circuit breakers. It is unfortunate that feeder powering often affects trunk reliability.

Again, thanks for an important article.

Victor Nicholson

Staff Engineer

Cable Television Information Center

Dear Sir:

This has been an eventful year for Delta-Benco-Cascade. The pooling of three manufacturing interests to form one corporate structure has been a sizable task. In the wake of this amalgamation and the move to our new head office and manufacturing location we have experienced several production problems.

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G. A. Allard, President  
Delta-Benco-Cascade Ltd.

rvc

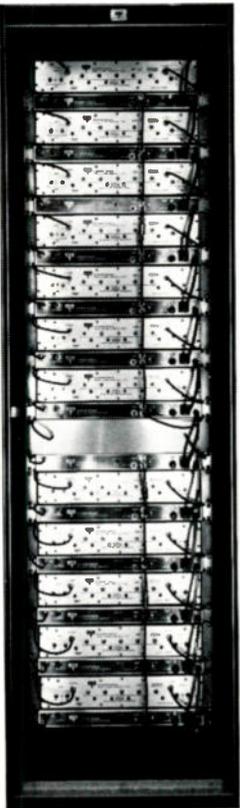
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# to be, or not to be... that is <sup>not</sup> the Question *at Ameco*

We have been, and we will be.  
But most of all, we are.

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Many unkind and untrue stories have been spread around about the question of our continuing to be. We don't expect kindness, but to know the truth is essential.

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Our products receive a wide and increasing acceptance

Our record of 100% performance is still — and always will be — intact

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# CATV News Briefs

A Summary of News from CATV, the Newsweekly of Cable Television

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**Convention Is Biggest and Best – Again:** The 22nd Annual National Cable Television Association Convention drew over 6000 people in attendance at the Anaheim Convention Center, with 173 exhibitors. The membership elected new board members, adopted the dues revision plan and heard speeches from an all-star cast. Speaker of the House Carl Albert addressed the meeting in the first satellite interconnected cablecast transmitted in the United States. President David Foster came out swinging in his address, urging the industry to come out of the “shadows and admit that we are boat rockers.” FCC Chairman Dean Burch told the assembly that his top cable priority remains “some reasonable and equitable copyright resolution,” followed by clarification of jurisdictional questions surrounding cable, determination of technical standards and the evolution of non-broadcast services. Bud Hostetter, making his first official appearance as NCTA chairman, called for “your membership, your time, your talents and ideas — in short, for your commitment.”(CATV 6/25 p4)

**New Board Members Elected:** The five new members elected to the board of directors of the National Cable Television Association are: Daniel Aaron of Comcast Corp.; Ralph Baruch, president of Viacom International; Henry Harris, president of Cox Cable Communications; Nathan Levine, executive vice president of Sammons Communications; and George O. Nichols, president of Clinton Cable TV. (CATV 6/25 p3)

**Membership Approves Dues Reduction:** The membership meeting at the convention, although poorly attended, unanimously approved the long-awaited membership dues revision plan, and also approved an association budget which will leave the association with a projected deficit of \$138,976. (CATV 6/25)

**Whitehead Urges Industry to Measure Up:** Office of Telecommunications Policy director Clay T. Whitehead in his address to the convention challenged his audience “to measure up to those who went before in other industries,” a challenge which can be met according to Whitehead, if cable’s “main concern is finding out what the public — the consumer — wants and needs.” Whitehead made no mention of the forthcoming cabinet level report on cable, nor any other major policy developments. (CATV 6/25 p3)

**Bresnan Looks at Last Year, Next Year:** Outgoing NCTA chairman Bill Bresnan reviewed the accomplishments of the last year, and made recommendations for improvements. Bresnan called for betterment of relations with the FCC and continued grass-roots political efforts. (Convention Daily 6/19)

**Smith, Barco Receive Honors:** For their continued service and contributions to the cable television

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# CATV News Briefs

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industry, E. Stratford Smith received the Larry Boggs Award, and Yolanda G. Barco won the Idell Kaitz Memorial Award. (*Convention Daily* 6/20)

**Over-the-Air STV Approved for Milwaukee:** The FCC granted the application of B&F Broadcasting, Inc. for construction of a new commercial broadcast station to operate on Channel 24, Milwaukee, Wis., and authorized the company to conduct subscription TV operations over the channel. B&F will lease a decoder to subscribers for an undetermined price, and will offer motion pictures, sports, and cultural programming on a per-program basis with charges ranging from \$.50 to \$5.00. (*CATV* 6/18 p3)

**Warner and Sterling Call Off Deal:** Warner Communications and Sterling Communications were unable to come to a final agreement on Warner's \$20 million purchase of the Sterling Manhattan cable system and two Long Island franchises. WCI officials, after scrutinizing Sterling books, despaired of putting operation in the black. Termination of the sale leaves Time-Life in cable business "for the foreseeable future." Construction plans drawn up before the sale agreement will proceed with backing of Time. (*CATV* 7/2 p3)

**FCC Opposes Changes in Freedom of Information Act:** The Federal Communications Commission has expressed opposition to a provision of a bill to amend the Freedom of Information Act. The provision would require a federal agency to make an initial determination on information requests within 10 working days. The Commission's opinions gain significance in light of its intransigence on allowing NCTA access to documents which the association feels are important in its case questioning the legality of the FCC's charges to cable systems. (*CATV* 6/2 p7)

**NCTA Urges Federal Preemption of State-Local Tech Standards:** NCTA has requested that the Commission preempt technical standards imposed by state and local regulators on cable operators. The association also filed comments with the New Jersey PUC and the New York Cable Commission requesting that both agencies delay implementation of tech standards until the FCC rules on the issue. (*CATV* 6/4 p7)

**CTIC Completes Tech Standards Study:** The Cable Television Information Center has completed its study to define technical standards for CATV systems. Standards are available for \$6.50 from CTIC, 2100 M Street N.W., Washington, D.C. 20037. (*CATV* 6/18 p10)

**Supreme Court Decision Applicable to Cable:** The U.S. Supreme Court ruled in a 7-2 decision that neither the Constitution nor federal law requires broadcasters (and presumably local origination cablecasters) to sell commercial time for statements on controversial public issues. The Court said the FCC is justified in refusing to order the sale of advertisements of an editorial nature. The Court's decision

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could be a good omen for a possible decision removing from cable operators legal responsibility for public access programming. (CATV 6/4 p3)

**Cablecom-General Sells Colorado Springs System:** Cablecom-General sold its 80 percent interest in the CATV system in Colorado Springs, Colo. to a group headed by Bill Daniels of Denver. Price of the stock is \$9,000,000, of which \$5,000,000 was to be paid in cash at closing and \$4,000,000 was to be in notes maturing 1983 through 1988. (CATV 6/4 p8)

**Myers-Oak Venture Into Cable Construction:** L. E. Myers Co. of Chicago and Oak Industries, Inc. announced formation of Myers-Oak Communications Construction Corp., a joint venture to provide CATV construction services in the U. S. and Canada. (CATV 6/2 p8)

**Money Sources: Still There, But Costlier:** The NCTA Convention financial session aired some bad news along with some good. The outlook on long term financing was termed "frightening" by some, but others declared that funding is available — if you know how to go after it. (Convention Daily 6/19 p25)

**TPT Begins Pay TV Testing:** TelePrompter Corp. began engineering tests of its pay TV system in June. Technical trials started in TPT's San Bernardino, California system, not far from Anaheim. TPT's pay cable system is being developed in conjunction with Magnavox. (CATV 6/11 p15)

**Private Funding Okayed:** The FCC authorized the Cable Television Technical Advisory Committee to solicit private funds totaling \$150,000 per year to cover some committee costs. Funds will be used for staff salaries, office expenses, travel costs and laboratory testing. (CATV 6/11 p15)

**Burt Harris Buys Triangle Interests:** Triangle Financial, Inc., a wholly-owned subsidiary of Triangle Publications, Inc., has agreed to sell its cable television companies to Harris Cable Corporation of Los Angeles in a cash transaction, according to Burt I. Harris, president of the newly-formed Harris Cable. Triangle properties include two systems serving 18 communities with 28,000 subscribers in greater Birmingham, New York and Lebanon, Pa., and 21 additional unbuilt franchises in and around Philadelphia. Harris recently established Harris Cable Corporation as a multiple system cable company. (CATV 6/11 p9)

**TCI Refinancing for Major Expansion:** Dr. John C. Malone, president of Tele-Communications, Inc., announced completion of long-term loan agreements totalling \$100 million. Proceeds will be used to

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# CATV News Briefs

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refinance \$59 million of existing indebtedness, construct new cable and video microwave systems, and conduct extensive market trials of the company's leased line voice and data microwave services. Malone said the company will continue to pursue additional long-term financing. (CATV 6/11 p9)

**TelePrompter Seeks Review of CBS Case:** TelePrompter Corporation has petitioned the Supreme Court asking a review of the Second Court of Appeals decision that cable systems are subject to copyright liability on "distant signal" programming. TPT contends the appeals court ruling ignored the findings in the Fortnightly case. (CATV 6/11 p7)

**Hardware/Software Ownership Separation Studied:** Massachusetts Cable Commission heard views at an informal meeting on the first of its three policy objectives. Evidence was heard that the separation of ownership of cable hardware and programming — in effect a common carrier designation for cable — would defeat the purposes of another commission objective: The availability of cable to all Massachusetts residents. (CATV 6/11 p9)

**Copyright Bill Appears on House Side:** Rep. Bertram Podell (D-N.Y.) has introduced a duplicate of Sen. John McClellan's copyright bill in the House of Representatives. Introduction of the bill will have little effect, but was introduced to "keep the copyright issue alive on the House side, and to put pressure on the Senate to pass the bill." (CATV 6/11 p7)

**Anaconda Wins Contract:** Anaconda won a \$2.5 million contract from Cable Media Corporation for construction of a 350-mile project in Alton, Illinois. (CATV 7/2 p3)

**Financial Developments:** TelePrompter Corporation filed application with the New York Stock Exchange for NYSE listing. If accepted, TPT would be the first cable company to be listed on the exchange . . . TeleMation president Lyle O. Keys reported \$4.2 million in revenues for the first quarter, highest in the company's history and predicted 1973 sales will reach "over \$1.9 million." . . . UA ators that they will be obliged to pay the commission 1.25 percent of their gross receipts for 1972. The levy will give the commission total capital of \$375,000, a figure substantially less than the earnings per share of eight cents . . . Ameco revenues for the nine months increased 46 percent over the same period a year ago, but resulted in a net loss of \$1,178,911 or 98 cents per share . . . Anixter Brothers announced third quarter net earnings of \$306,430, compared with a loss of \$229,367 a year ago . . . Comcast Corporation reported first quarter revenues of \$1,436,288, an eight percent increase over last year . . . Vikoa announced a "dramatic turnaround" in its profit-loss picture, reporting net income for 1972 of \$756,000, compared to a loss of \$4,314,000 in 1971 . . . Citing cable television as one of the three new areas of company growth, General Instrument's Moses Shapiro reported to shareholders that the company set a sales record for the first quarter. Net income totaled \$2,423,480, compared with \$1,356,117 last year. (CATV June issues)





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# FOCUS

## ... On People

### Systems

Justo Caffi has been named general manager of American Cable Television, Inc.'s, Napa Valley, California system, according to Bruce Merrill, president.

Covenant Cable TV, Inc., has appointed Frank Kneiser as general manager of its Millville, New Jersey system.

The officials of Hawkeye Cablevision, Inc., have announced that Bill Riley will be the Des Moines metro-area system manager.

Donald Goldman has joined TelePrompTer Corporation as business affairs counsel, reporting to in-house legal counsel Arthur Anderson.

Hawkeye Cablevision, subsidiary of Heritage Communications, Inc., has announced that Charles W. Preston will join Hawkeye as the chief engineer for the Des Moines metropolitan area.

### Suppliers

George A. Voehl Jr. has been named Northeast area sales manager for the Cerro CATV Cable Division of Cerro Wire & Cable. Voehl has been with Cerro since they began producing cable in their Freehold, N.J. plant.

The election of Jay W. White as vice president and treasurer of GTE Sylvania Inc., has been announced by Douglas L. Hamilton, senior vice president-finance and controller. White, who has been treasurer of the corporation since 1964, will continue to have overall responsibility for the treasurer's department.

William H. Lambert has been named vice president and division manager of Jerrold Electronics Corporation's CATV Systems Division. This recognition was given to Lambert based on his significant contributions to the growth of Jerrold during this past year. As a vice president, he will continue to maintain overall responsibility for the sales, products and services of the CATV Systems Division.

Desmond A. Garrity has been appointed vice president and director of corporate planning for General Cable Corporation, according to Robert P. Jensen, President.

Phil Glade has joined Anixter-Pruzan as a CATV sales representative, according to Herb Pruzan, president. Part of Glade's responsibilities will be the development of new customers nationally. He also assumes responsibility for managing the company's convention and trade show programs.

George A. Livergood has been promoted to sales engineer for C-Cor Electronics, Inc. Livergood will be selling and servicing cable systems in the Midwest with his base office located in Kansas City, Kansas.

Royce R. Busey has been named manager of Anixter-Pruzan's Southern office in Atlanta, Georgia, according to company president, Herb Pruzan.

Charles E. Auer has been appointed to the newly created position of Western Regional sales manager for the CATV Equipment & Installation Operation of GTE Sylvania Inc.



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## Management Guidelines



### How Much Do You Tell?

Another convention has come and gone and the consensus seems to be that much was accomplished at this year's annual meeting of the NCTA. Attendance continues to grow significantly and preparations are already underway for next year's extravaganza in Chicago.

Aside from the usual business of introducing products, electing directors, and discussing the industry's future, a lot goes on behind the scenes which could have serious effect on the health of your organization. For example, at a gathering like the recent affair in Anaheim, rumors are often more prominent than press releases. Some of these rumors happen to be closer to reality than others; but the problem remains that some of your key people may learn more about their own company from an outsider or "through the grapevine" than they do from you.

How much do you tell your people? This question has been asked time and again. It's obvious, of course, that everybody can't be told everything. Most managers know that it's not even necessary to burden every worker with a huge mass of unwanted details.

From the point of view of communications, information might be classified into three divisions. The first is information that the employee has to know in order to do his job properly. The next, is information he should know because he may be affected by the new development. Third, is infor-

mation that might be helpful because it could increase his general knowledge of his part in attaining company goals.

How much of the latter should be told depends largely on the individual. A man who is interested in new developments should certainly be encouraged to learn about them; but he to whom a financial statement is just a confusing list of numbers, should not have to work his way through it.

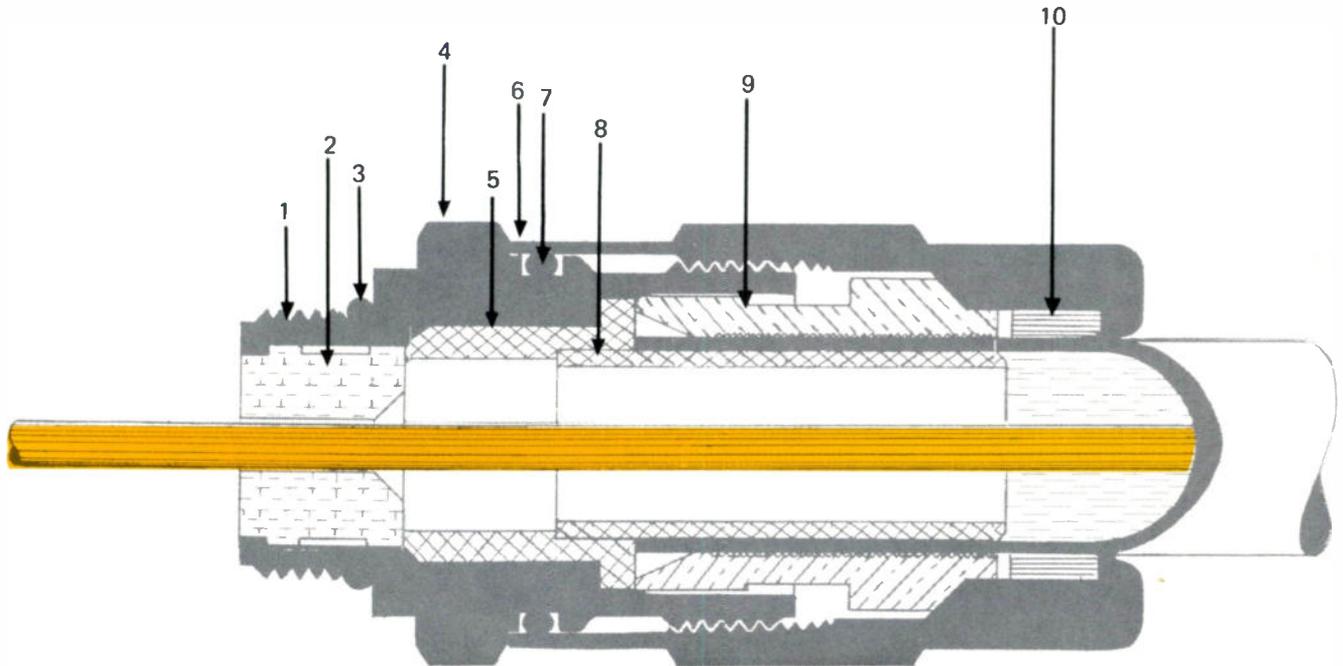
Then there is the fourth division, and that is information that the employee should not know, especially when the disclosure might be harmful to the company. Another time is when the facts must be withheld temporarily, although the full story will come out later. Other reasons are, when the data is covered by security regulations; when management's plans are incomplete and when the information must pass through channels.

These are the types of information which are essential to good relations and morale within your company. It is equally important to consider how the manager can facilitate their dissemination. Next month we will discuss how to handle the situation when an employee comes to you with specific questions.

Meanwhile, if you notice a change in someone since returning from Anaheim, it may be more than post-convention fatigue. He might have heard something through the grapevine.

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# From Boat Rocking to Star Trekking — Cable Is Moving with Confidence

**Foster came out rocking the boat; Burch and Whitehead abandoned ship; other Commissioners, state and city regulators came away duly impressed with the industry's new confidence.**

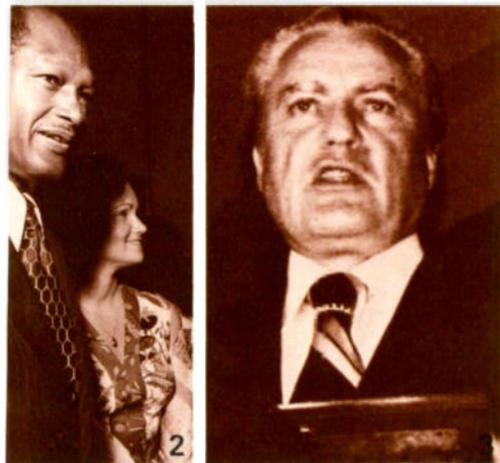
*By Paul Maxwell  
Executive Editor*

The impressive architectural sweep of the Anaheim Convention Center set the stage for the biggest news of National Cable Television Association Convention Week in mid-June: the first domestic-satellite transmission used for television . . . and cable television upstaged its older brothers in the communications media clan as a result of a TelePrompTer/Scientific-Atlanta joint effort. The TelePrompTer Spacecast Project portable receiving ground station did a better job of keynoting a convention than all the speeches in history — a fitting beginning to a fast-paced, exciting five days.

With its eyes to the Heavens, the cable exposition

took off on a mixed metaphor with NCTA President David Foster "Rocking the Boat" during his Monday luncheon speech. Foster set the tone for the week with his adventures in navigation pledging, with the industry he represents, to "have the energy and the commitment to bring our cause to success — long lasting, satisfying success." Utilizing the "elements of our program: Unity, pride and the willingness to take a risk," the Association's President came out swinging at the cable industry's declared and *de facto* antagonists.

While telling the receptive 6000+ convention attendees that the cable industry and its members



1) House Speaker Carl Albert on the Tele-Prompter Spacecast. 2) Los Angeles Mayor Tom Bradley. 3) Strat Smith. 4) Yolanda Barco. 5) FCC Chairman Dean Burch. 6) TPT's Schaffer via satellite. 7) NCTA and TPT's Bill Bresnan.

association or any member of the industry should fly off the handle and start recklessly rocking the ship of state back and forth with no aim in mind. Foster said, "When I talk about this industry as a boat rocker, I am talking about an industry moving ahead so swiftly, so surely, so confident of its destination, that the waves created by its wake rock every other craft in the communications sea."

## On Everybody's Mind . . . Pay-TV

The pay-cable TV question burst into the open and dominated the convention after the initial excitement of the satellite wore off. Optical Systems' President Geoff Nathanson set the theme by saying, "Premium cable, my foot . . . it's pay-TV!" At the lively panel euphemistically called "Subscription Services for CATV," Nathanson and fellow panel members Berle Adams, Dore Schary, Nick Mileti (President of the Cleveland Indians, Cavaliers and Crusaders), Marty Newman, Philip Hochberg, Gordon Stulberg, Henry Harris, Richard Lubic, James Ragan, William Butters, Gerald Levin, Frank Cooper and Gary Christensen (the evening and morning sessions both) held lively discussions on what is, might be and will be possible.

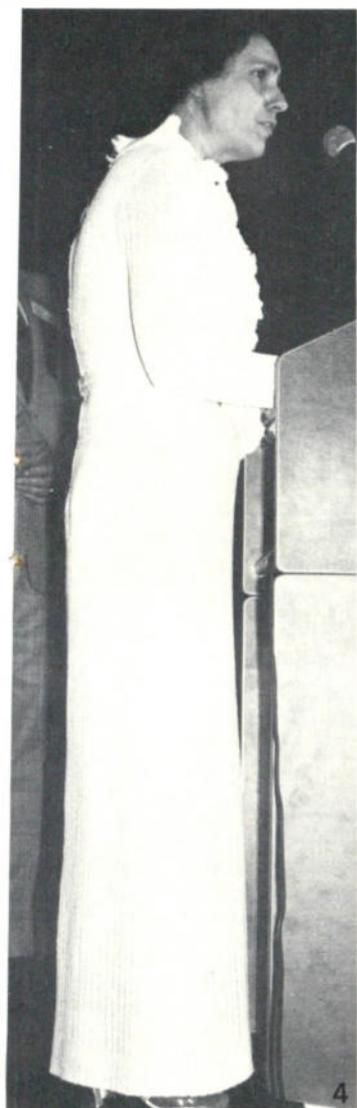
Mileti said the future is "live" sports; Newman, president of the National Association of Theatre Owners, fielded a number of hostile questions and argued forcibly for stricter FCC rules; and everyone else called the FCC's involvement "ridiculous" or "ludicrous."

Perhaps as a premature indication of pay-cable's growth, newsletter publisher Paul Kagan called a meeting of pay-TV systems, suppliers and programmers hoping to form an association without the NCTA devoted to premium programming. While response tended toward the cool, Kagan will probably try again. NCTA wasn't, however, particularly pleased.

## The Regulators Came for a Look

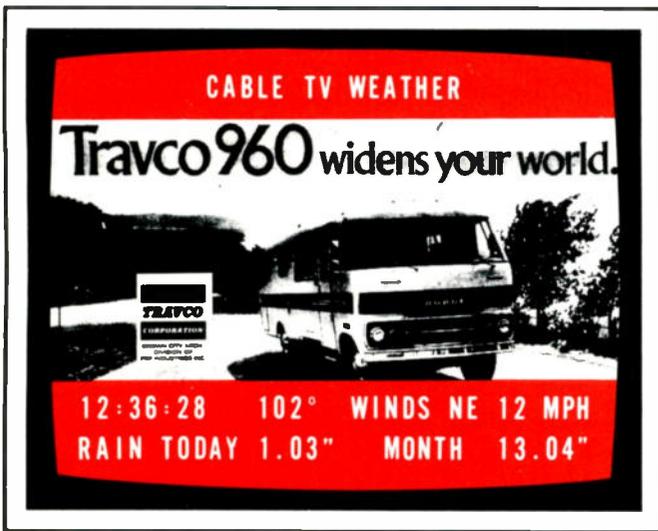
The industry's ever-present three-tiered "Chinese puzzle" boasted a significant number of observers and participants. With four Federal Communications Commissioners, Chairman Burch along with Commissioners H. Rex Lee, Ben Hooks and Dick Wiley, leading the way, federal, state and municipal regulators (including past, present and future) joined in panels or watched the proceedings with interest. Battle lines seemed to be drawn in a variety of panel discussions and speeches to cable conventioners. New York City's Morris Tarshis exhibited disdain for both state and federal regulators while New York State's Lynn Wickwire talked about forming an association of state cable regulators.

At the Federal level, Chairman Dean Burch, speaking on Tuesday, echoed to a certain extent the hopes of David Foster and the convention; but he emphasized that the whole cable ballgame would have to be decided in the marketplace. Seemingly taking credit for already "getting cable moving," Burch



should exude an aura of confidence, Foster noted that "This has not been a particularly confidence-inspiring year for the cable industry. The promise of the Third Report and Order was buried in the procedural quagmire of Certificates of Compliance. The financial community responded to our hopes with a drastic reduction of equity values. The Justice Department has threatened our possibilities for combination and cooperation with an incomprehensible attack on a most logical merger, while all of our adversaries waxed sleek and eloquent.

As a boat rocking industry, though, he did not mean, of course, that the NCTA, any other cable



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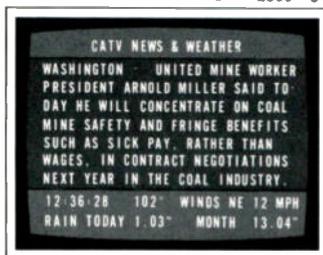
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warned the convention that the solutions to cable's problems in the future would not be found at the Commission . . . but "in the marketplace."

Office of Telecommunications Policy Director Clay (Tom) Whitehead amused his cable audience by repeating a common theme wrapped in anecdotes about some of history's greater nay-sayers and pessimists. In quoting from an 1870 study on the future of the telephone, Whitehead read, "it is unlikely that any substantial number of people will ever buy such a concept." After failing to explain just when the industry might be exposed to the infamous "Cabinet Cable Report," Whitehead closed by challenging his audience "to measure up to those who went before in other industries."

FCC'ers Hooks, Wiley and Lee repeated oft-stated themes; but Cable Bureau staffers Jack Mayer and Steve Effros were cast as Third Report and Order apologists and explainers. Former Commissioner Thomas Houser echoed much of the industry's sentiment when he called for the FCC to preempt the whole arena . . . then redelegate authority.

## Applause and Awards

Leading the list of NCTA award winners this year was deserving Yolanda Barco of Meadville, Pennsylvania . . . she won the first Idell Kaitz Memorial Award for the woman making significant contribution to cable communications. Radiant in white gown starkly outlined by the darkened stage, Ms. Barco accepted the warm applause and the recognition with a bow to medium itself.

The NCTA's first general counsel and executive director was surprised with the Association's top award: E. Stratford Smith accepted the Larry Boggs Award with a poignant note about his friendship with the late Mr. Boggs.

Recognized as the outstanding committee chairman for his work on the Legislative Committee (which started the political cablecasting, staged the legislative conferences in Washington and got involved in all aspects of the NCTA and all 51 separate legislatures), Eugene Iacopi of Nor-Cal Cablevision earned the award. Joseph Gans of Northeastern Pennsylvania TV was recognized for his tireless state and regional efforts. The Association also gave a special award to March of Dimes' Drex Hines for public service.

In one of Convention week's biggest surprises, Viacom rejoined the ranks and its chief, Ralph Baruch, was immediately elected to the NCTA board of directors. Other new directors were Nate Levine of Sammons Communications, Daniel Aaron of Com-cast, Henry Harris of Cox Cable, and George Nichols of Clinton Cable TV. They joined the recently elected regional directors (Leo Hoarty, Howard Barnett and Bill Turner).

New chairman Hostetter set the priorities for the Association's next ten-month "year": a solution to "overlapping" regulatory morass and a resolution of the copyright question. If he can do that, then cable's new confidence will be justified.

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# The Common Carrier Won't Take You to the Promised Land

**Disenchanted by broadcasting's performance over the years, concerned citizens and organizations are looking to cable for help. A consultant to community groups, Metrotel's Lois Brown warns of the dangers of common carrier regulation.**

*By Lois Brown  
President  
Metrotel Communications Inc.*

**T**hose of us with even a slight understanding of the promise of cable television realize that we are at the brink of a communications revolutions. We also know that the potential of second generation cable is so great, and the possibilities so unlimited, that none of us can accurately predict either the full range of applications or the ultimate form this new technology will take.

The Sloan Commission likens the advent of cable to the invention of the printing press, with the potential for social change just as great; the National Cable Television Association says: "The limits will be circumscribed only by technology and the capacity of men's minds".

## Becoming Aware

While not yet widely known, a variety of people and organizations are gradually aware of the impending communications explo-

sion. Educators, governmental agencies, consultants, local governments, manufacturers, minority groups, private citizens, public service organizations, individuals and the industry itself are among those planning, dreaming and speculating about this marvel that is predicted to become part of our lives.

A number of public spirited citizens and organizations are looking toward the future with some concern. Having seen broadcasting develop into what Public Cable defines as "a commodity sales-oriented, conglomerate-controlled technology", many are proposing a variety of regulations for cable television to assure that the broadcast story is not repeated, and that this time the public interest will be better served.

One of the major issues being debated is whether cable television should be regulated as a common carrier. Pure and total common carrier regulation as applied to cable TV would completely separ-

ate the ownership of the cable system from any power to decide what the cable system is to transmit. The cable operator's role would be restricted to leasing channels to others, and regulations would assure that producers and distributors could lease channels at fair and reasonable terms. The system owner could not supply any services or originate any programming himself.

## ACLU Position

Although not discussing this point, it seems that the ACLU proposal for regulation of cable systems as a common carrier does not advocate pure and total common carrier for cable, as this would mean that the CATV system could not carry existing broadcast stations without payment for channel leasing by the broadcast industry, i.e. local broadcast stations as well as imported signals would be treated the same way as



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any other "user" of any other kind, and would have to pay the cable operator to transmit the broadcast signals.

Needless to say, broadcasters would not pay cable operators for transmission, and without over-the-air broadcast signals, especially imported signals, CATV could not survive. Common carrier status would also mean setting regulations, including regulation of rates, for channel leasing.

## Advocates Fears

Advocates of common carrier see the system owner as having a monopoly — the subscriber can only purchase service from this source. They fear that the owner will use his power to exclude others from leasing channels, restrict competitive programming, or discriminate in setting fee structures, so that there will not be an open, free and competitive market. They see a need for setting rates and terms of carriage to allow everyone equal access. The

ACLU, particularly, advocates that rates should be a flat fee and would not allow rates to be based upon a share of revenue or a percentage of profit.

All of us who have become aware of the great promise of cable are looking ahead and seeing cable serve the many needs of society. We see vast changes in education, information flow, and provision of services to our citizens. We also see the dangers inherent in such a potentially important medium evolving without policies that will assure that needed services will be provided and the public interest will be placed before commercialism.

It seems that in our desire to protect the public interest, we may be forgetting that for cable to fulfill its promise, it must be allowed to develop and grow. Particularly, cable must become a reality in our urban areas.

We may also be forgetting that the vehicle that will allow our dreams to become reality is the cable industry itself. We must begin to look at the industry and

attempt to understand the underlying problems, the risk factor involved, and the experimental nature of this new medium, for unless we do so, we are simply dreaming dreams that have no basis in reality.

Certainly we must be aware of the dangers involved and attempt to resolve problems as we see them arise, but the common carrier proposal, as in the case of so many other proposals for regulations of all kinds, is an attempt to resolve a problem that does not yet and may never exist.

For cable to grow we must allow it a great deal of freedom. At this particular point in time, at the beginning of the hoped-for communications revolution, restrictions and regulations can only prevent allowing the evolution of cable to its full potential. No one really knows what that potential may be. Instead of anticipating problems, perhaps we would do well to wait and take action when problems actually evolve.

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rier regulations of cable is particularly dangerous to the industry's growth. To understand why, we have to look at where we stand now.

Right now second generation cable is hardly more than a dream. It is just beginning to come into the urban areas, where systems will be faced with finding new services and programs to appeal to subscribers who already receive substantial numbers of TV signals. Vast cash outlays will be required with limited guaranty of success and certainly an appreciable period of time before profits are seen. While a great deal of the equipment and technology exists, much is experimental, and some too expensive for immediate commercial viability.

### The Picture Now

Right now existing urban cable TV systems have had very limited success; contrary to popular belief, urban cable TV systems are not unlimited roads to immediate riches.

A capital intensive, high risk business at best, the cable operators are now faced with raising vast sums of money to finance construction of cable systems in the major markets. If we take the determination of programs and services away from the industry — the very things that will determine whether or not cable will succeed or fail — we may well be removing the possibility of this infant industry obtaining vital, long term financing.

Under the current FCC rules for cable in major markets, a certain number of channels are set aside for transmission of existing broadcast over-the-air signals, and still other channels for educational, municipal and public access use. In addition, a limited number of imported signals can be brought in from other areas.

If we were to regulate cable even as a modified common carrier, limiting the cable operator to control of fewer channels than he has now under the FCC rules, we preclude the operator from experimenting with all kinds of services to determine what the public

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wants — what will make cable sell — yet we still expect him to take the financial risk. This would certainly seem to lessen incentive for bringing cable into the major cities, as well as make financing more difficult.

The ACLU proposal appears to call for yet another form of modified common carrier, i.e. it would still allow the operator to transmit over-the-air and imported signals, but would not allow him any control over the remaining channels, thus giving him no control over the marketability of the service, while having him take all the risk, assuming long term financing would be available under these circumstances.

Proposals such as these for common carrier remind me of the Chinese binding the feet of little girls, stunting their growth so they could not walk. We expect cable to run, yet we are considering restrictions to force it to crawl.

As a capital-intensive business, cable operators must invest a great deal more to generate a dollar of income than many other indus-

tries. For first generation cable, plant commitment alone, excluding operating and other expenses, was three dollars invested for each dollar in sales. TV station investment runs about a dollar investment for every dollar in sales, and in some areas, TV sales may run ten dollars for every dollar in plant expense. Cable earnings were one-fifth the revenue of the broadcast industry, but had half as much total capital committed.

### Investment May Double

As cable comes into the urban areas, capital investment may be more than doubled. Instead of a minimum of \$80 to \$120, which is today's investment per subscriber in plant cost, something like \$450 per subscriber is anticipated to build tomorrow's major market system.

To serve 25 million homes by 1980 as anticipated, approximately 7.8 billion in capital (for construction alone, not including operating expense, program funds,

etc.) will be necessary, according to recent estimates.

Corporations generally are able to fund 60-70 percent of their requirements from internal sources. Cable will be extremely fortunate if it can generate 20-25 percent of its capital requirements in the next ten years, obviously there is a need for a vast amount of external long term financing.

The amounts of money available for private investment in new capital assets annually is not unlimited, particularly the funds for external financing. The cable industry will have to compete with all other major capital users for these funds.

Since cable is a high rise business, obtaining financing will be difficult, and not every company will be able to successfully compete for a share of this capital. An unfavorable regulatory climate will certainly make financing a great deal more difficult, in some cases virtually impossible to obtain, and thus may delay the advent of the wired nation.

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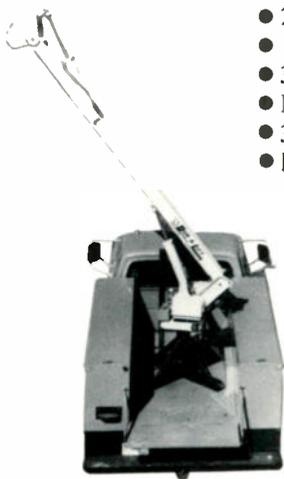
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knowledgeable cash flow projections for urban cable systems range anywhere from a minimum (and perhaps optimistic) three years up to five years before operating income equal operating expense. Long term debt retirement in many cases will not begin until the third or fourth year and the total debt payout can extend up to 12 or 14 years, and frequently not a single penny can be declared as a dividend to the system owners until a substantial portion of the long term debt has been retired.

There are many proposals to restrict the number of channels available to the operator and put control of these channels in the hands of educators, institutions, or the community.

The ACLU proposal would set up "logical functional classifications of carrier usage" with different fees for such users. Educators or other public service users might be subjected to extremely low rates.

## Let's Face Facts

The common carrier position is that there will be public service needs for a great many channels and only by instituting common carrier regulation can we assure that these needs will be met. While we all have great hopes for future educational, municipal, local and public access uses of cable, we have to face reality here, too. In the few existing new cable systems, only a limited amount of programming has resulted from access provisions.

Programming a channel is a big undertaking, and it will be a long time before even the most sophisticated local group or institution can gain the expertise necessary to assume this challenge. In the meantime, a great deal of experimentation must be done. From all indications, the cable operator is the only one at present with sufficient expertise to attempt this task. He also has the biggest stake in making it succeed.

If he realizes that there will be benefits to his system if more and more channels are used, he will be the best source of help to the

community. Of course it is also up to us to assure that he has had to promise some aid as a condition of the franchise award.

It is unrealistic to think that with the advent of cable, people capable of producing, and particularly funding the costs of programming, especially considering the vast amount of programming that will be needed, will suddenly appear and there will be a problem in the allocation of channels.

It seems we are again anticipating problems. It would also seem

that the FCC regulations, which require additional channels to be made available for educational, municipal and public access if and when these initial allocated channels are used a certain percentage of the time, would prevent the type of problem we are anticipating.

The FCC has also ruled that the franchising authority cannot require availability of more access channels until it is shown that such channels "are necessary and capable of being used according to



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an existing, viable plan". It would seem that before any group had a case for demanding additional channels for any use, such a plan would have to be developed.

With a minimum of 20 channels being mandated, and most, if not all franchise applicants today offering to build a considerably greater number, anticipating future needs, it seems that the kind of problem being anticipated will not happen for quite some time.

The basic assumption behind this argument is that cable will grow in a way consistent with the past — one system operator will have a franchise for a particular geographic area, and this operator will have a monopoly on providing services to subscribers within the boundaries of his franchise area.

To begin with, the FCC rules in the major markets also provide that there are to be leased access channels, and leased access is also subject to the expansion of access rules, i.e., when used a certain percent of the time, or channels must be made available.

A true monopoly would give the operator total control over all channels. With provisions for making channels available for other purposes and the operator not having control, he is not in a monopolistic position in the traditional sense.

Further, if cable does succeed to the extent we hope, it may well be that it will no longer be impractical for a second operator to construct a system in an already franchised area; many of the discussions at the recent Mitre Symposium would lead one to believe that someday there might well be two converters on each TV set, with different operators providing different types of services, or perhaps even competing services to subscribers.

### Wait and See

As in the case of other arguments, we simply do not know how cable will develop, and it would seem that we would be well to wait for a problem to arise

before trying to take action to correct it.

The ACLU proposes a flat fee to lease channels, as opposed to allowing the operator to charge either a share of the revenue or a percentage of profit or any other practical basis. As previously mentioned, they would set up functional classifications of users, with different regulated fees for such users.

The argument continues that the cable operator would discriminate against some kinds of users without such provisions, as in some cases he might be able to obtain 50% of the profits and if so, he would avoid educational, low income or non-profit users.

As presented, the argument seems fallacious, since if there are functional classifications of users with different rate schedules, the operator could still discriminate by showing preference for one classification of user over another, unless regulated further.

More important, however, is the need for some flexibility if we really care about local access.

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There is a great need to provide mechanisms for economic input for local people in the media. To set up fee structures as opposed to a percentage of profit would tend to make it more difficult for local groups who would have problems in raising funds for programming as it is.

It will take a long while before a leased channel operation becomes a commercially viable business, and during the period of development, flat fees as opposed to a minimum fee plus a percentage of profit would make establishment more difficult as additional capital would be required.

The FCC requires that operating rules governing leased as well as public access and educational channels to be filed with the Commission, together with an appropriate rate schedule, and rules require "first come, nondiscriminatory access".

It would seem that abuses of the type envisioned by the ACLU and others can and should be carried to the FCC for definitive action.

## Consider Rates

A further consideration is necessary in examining the proposed regulations re rates: during its initial years, the urban cable system will be operating in the red. Since we do not really know whether a sufficient number of subscribers to sustain the system will purchase cable, nor how long it will take, before they do, we cannot assume that the operator will be able to sustain this business over a period of time dependent almost solely upon subscription fees. We cannot restrict other sources of income during this initial, critical experimental period.

We must also recognize that with vast sums of money invested, the operator should be able to eventually obtain a fair return on his investment. It would seem most logical to allow development and again, should abuses occur, correct them.

Generally, the acceptance of common carrier status qualifies the carrier as a public utility, and

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with utility status comes rate regulation, including regulation of fees to subscribers. Rate regulation is also proposed by the ACLU.

## Restricts Growth

I cannot see how cable television could begin to grow and develop with a restriction on the rate structure, for all of the reasons presented in this paper.

It also hardly seems likely that in providing a new and unproven service that abuses in setting rates will occur. We are, after all, dealing with a discretionary service. Without cable the potential subscriber can still receive all the local stations.

While second generation cable is in its infancy, and so long as it is considered high risk, it would seem that there will have to be some experimentation with all of the factors affecting marketing, including rate structures.

It would also seem that a great deal of flexibility will be necessary as new services become available,

particularly since no one is really sure what those services may be.

In addition to the need to provide some incentive for prospective investors, and some promise of a reasonable return for the operator, a relatively high level of earnings is required for the type of local program production we all hope to see. (Initially, program production costs may have to be borne by the operator even while the system is in the red.) To restrict subscription fees instead of allowing them to be determined by the marketplace would be to place unfair, and at this point unnecessary burdens upon the industry.

## Regulate As Necessary

Although the basic premise of this paper is anti-regulation for the present, do not construe this position as expressing "what's good for General Motors is good for the country". That is hardly the case. While it does not seem practical or logical to impose regulations before they become necessary, it is

very necessary that we all watch developments closely, and fight to correct abuses as they occur.

It is also important that as cable comes into our communities, we demand and we get some measure of local economic input and community control as well as community support. It will be to the industry's advantage to involve the community, and provide the kinds of services we all hope to see; a few system operators may not realize this and it will be up to us to make him realize as well as to assure that in every way the public interest will be served.

The FCC says: "Cable television is an emerging technology that promises a communications revolution. Inevitably, our regulatory pattern must evolve as cable evolves — and no one can say what the precise dimensions will be".

Let's let the dream take shape and form, and the promise become reality. It is to our advantage to allow cable to develop and grow without restrictions that will hamper the promise for the future. 



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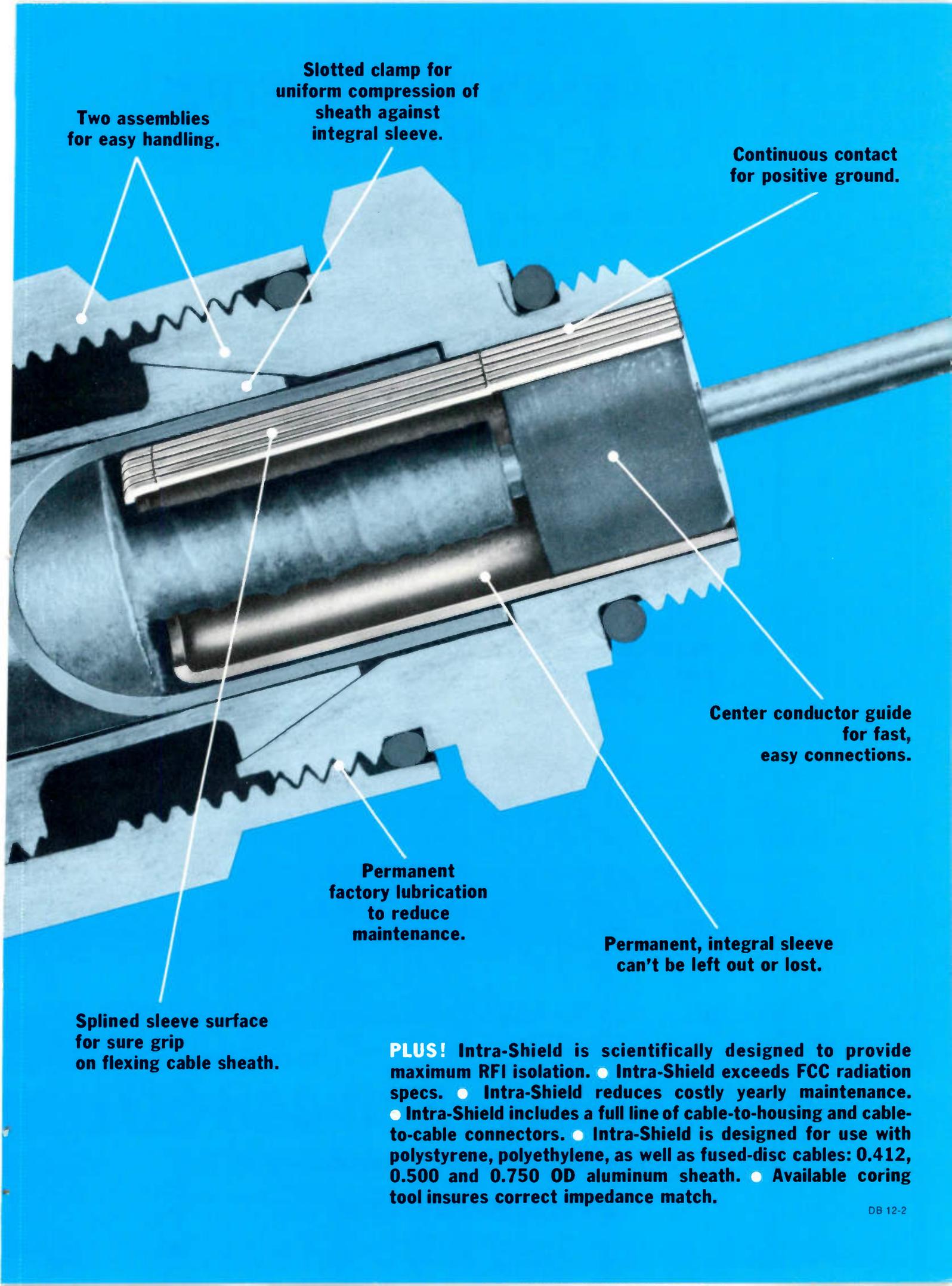
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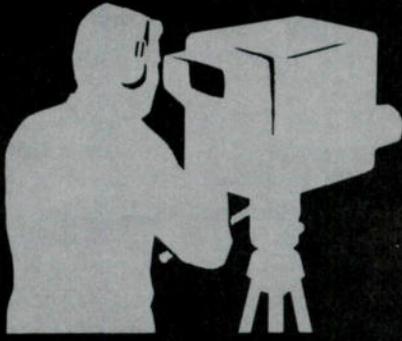
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3. The director then tells the floor manager: "Stand by in the studio."

4. The floor manager (who in many studios may be operating Camera 1), relays the director's message, "Stand by in the studio," loudly enough to alert everyone in the studio.

5. Director to VTR man: "Stand by to record," followed by the command to "Record." These commands are given at least 30 seconds before cuing the talent, to provide the necessary "black" at the beginning of each tape.

6. Director to floor manager: "Stand by to cue the talent."

7. The floor manager responds immediately by raising his hand as a cue to all personnel that the "take" is imminent.

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source). "Stand by the microphones," and/or "Stand by the audio tape."

9. The director's final command for getting the program underway is, "Cue him," "Cue the talent," or a similar term.

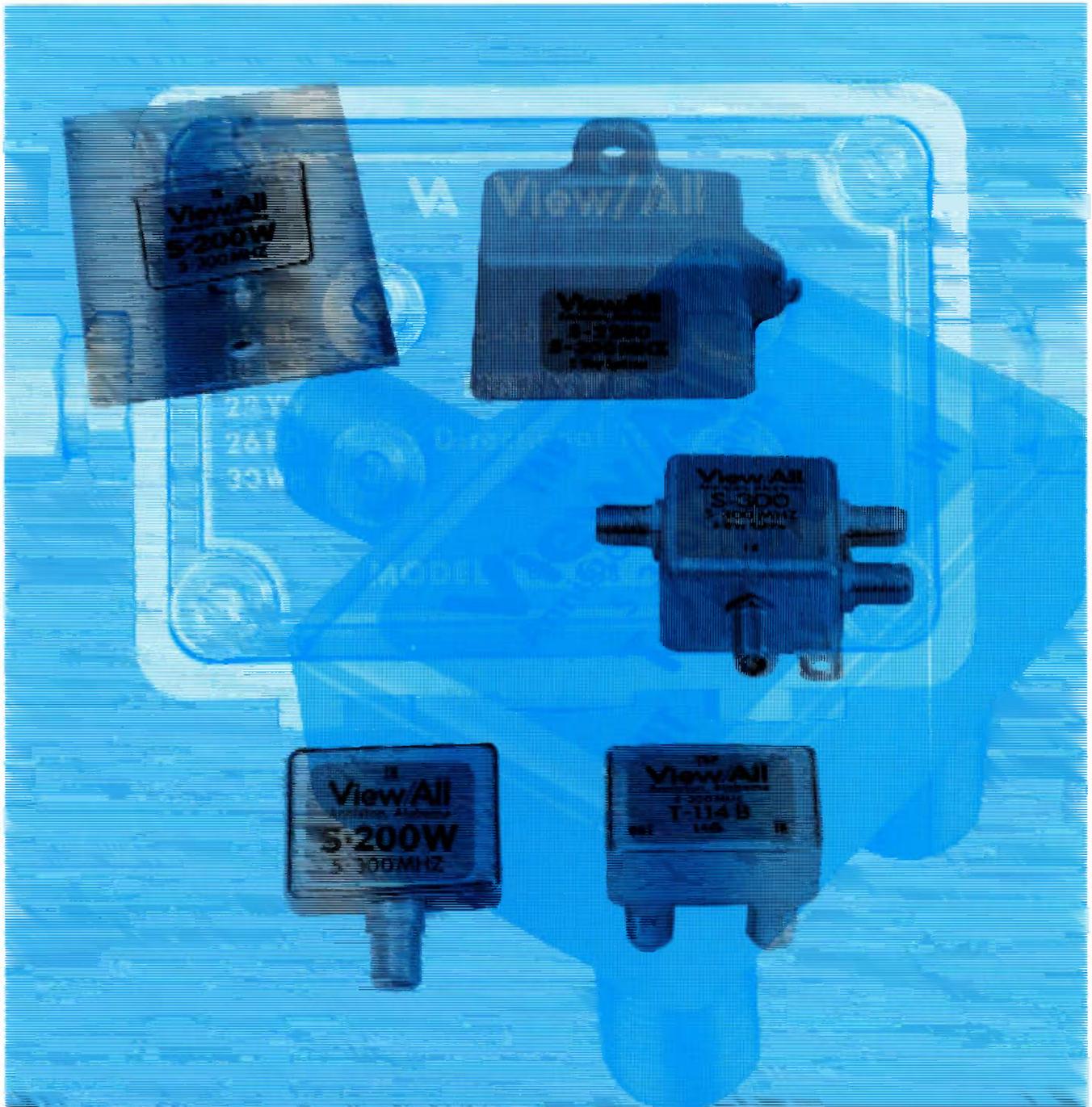
10. The floor manager lowers his arm and points toward the talent. Together, the audio man opens up the microphones, the first video source comes up, the talent performs . . . it all happens simultaneously, the result of the director's succinct verbal directions and the point of a finger.

The sequence is slightly altered for a live production, since everyone will be working to meet a strict air-time deadline. The floor must be ready and the intercom system tested for director cameramen communication, with time remaining for the director to dictate the commands that put all technicians, equipment and talent in operation at a precise moment. The command to the VTR man (number 5) is deleted for a live production, unless the program will be concurrently videotaped.

Why is a sequence so important? How can it improve program quality? Probably the most obvious, or at least the most typical, difference between the novice and the experienced director is *organization*. The professional, knowing who and what must be cued, cues them in logical order. By memorizing and following a sequence, it becomes a "safety device" . . . mistakes commonly made during the hectic pre-program time will most likely be eliminated (the VTR man *will* be cued) and everyone in the control room and studio is more self-assured. TVC



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# It Was So Big This Time, Where Will They Put It Next Year?

**Everybody talked about pay-cable—and software exhibitors were well represented. New studio equipment was everywhere, too. The big show was indeed a shopper's delight.**

*By Ruth Steinberg  
Managing Editor*

The big event is over for another year — well, ten months anyway. This convention was by far the biggest ever for the National Cable Television Association. With booth space spilling over into the halls of the Anaheim Convention Center, there was plenty to see on the exhibit floor. As expected, studio products, both hardware and software, were everywhere apparent.

## **In the Field of Software**

A lot of new faces were seen in the field of software. Video Techniques, Inc., a company that in the past concentrated on supplying closed circuit programming to theatre owners, announced its debut in the cable field. The company supplies programming to cable systems, and has recently acquired the rights to the Trenton 300 Automobile Race for distribution live and delayed to cable television systems throughout the United States. In addition, the company has reached agreements with Trans-World Productions, Telebeam, Computer TV, Home Box Office and TheatreVisioN to supply upcoming programs on their pay-TV systems.

Television News, Inc. was on hand to display its syndicated news feed for cable systems. The daily news feed consists of 15 to 20 stories from news bureaus in this country and from the Visnews Ltd. organization overseas.

Videomation, Inc., billing themselves as the full service cable company, also had lots of software programming to display. Among some of the most interesting programming — “Scene 70,” a series of music specials featuring top name rock performers; “Doc Holliday”, a down home country & western music series; “What’s Happening America”, a talk show featuring Henry Morgan as the host; “Julia Meade and Friends”, a consumer affairs oriented show; and “World on Wheels”, a series of the great car racing events around the world.

Another entry into the cable programming field was Rowland Productions. Some of the shows Rowland was offering included “The Dorothy Collins Show,” an interview show including such guests as Ginger Rogers, Allen Ludden and Celeste Holm; “The Sign of Your Life,” billed as a refreshing approach to astrology, hosted by Evelyn Rahe; and “It’s Habit Forming”, a series of 15 minute exercise shows.

The Red Eye Network introduced itself to cable with an austere report bound in business-like brown. Red Eye explains that they are a new company designed to help cable operators increase their production and profits by providing broadcast quality, specialized programming. The network provides a block of five hours of cablecasting every week. The programming block can be reshown up to five times. Red Eye classifies its programming into nine categories: Children’s World; How To Do It; Music; Human Interest; Grand Theater; Current Events;



"The 60 second color film commercial for \$150.

"A group of retailers in a Santa Rosa shopping center were staying open nights. We sold them on cable television to spread the word...and we sold ourselves on 16mm film to do the job.

"With TV newsfilm techniques, we produced a successful, inexpensive, yet professional television commercial for a \$150 production fee. 16mm film flexibility let us get footage that showed shoppers in the stores at night.

"New nighttime customers mentioned the commercial...and as a result, several of the retailers joined the cable system's portfolio of 40 regular advertisers.

"Tape? We tried black-and-white commercials on half-inch videotape, but the quality and sales impact just didn't compare with color film. And color tape was out of the question on our budget.

"Since we're required to have local origination, the 'go-anywhere' capability of 16mm film makes attracting local sponsors just that much easier.

"We've found that 16mm Eastman color film\* has given us a hit...and that's what you need in the television business."

\*Kodak Ektachrome EF film 7242

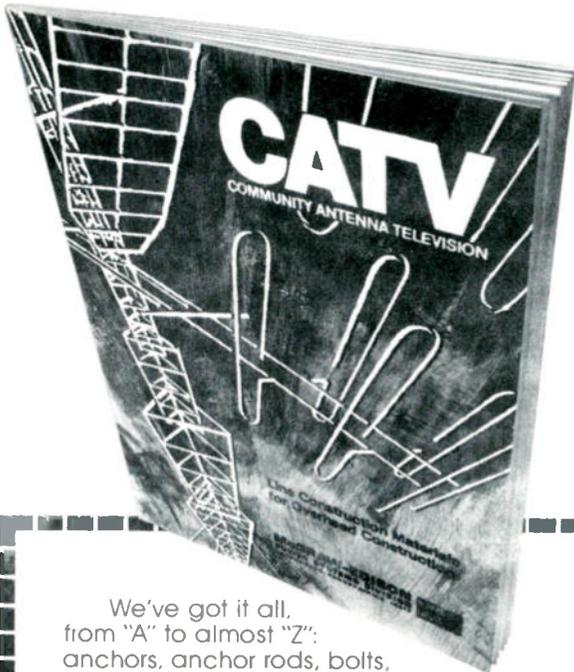
John Cardenas, station manager, Cable Vision 6 (a subsidiary of CableCom General), Santa Rosa, California; Mel Copeland, sales manager; Robert Moore, free-lance cinematographer; Frank Perez, store manager.



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# McGraw-Edison Company

Interviews; Window on the World; and Consumer Affairs.

Cable Network Television, another software exhibitor, also had a variety of programs to sell. In addition to more than 1800 American made feature length films, the company is also offering a musical instrument instruction series ("Let's Play Guitar, Banjo, Trumpet", etc.), an educational travel series called "Brother Buzz", animated short subjects, several syndicated half-hours, and a few travel-adventure specials.

## The Hardware News

Probably the most important news in studio hardware was Consolidated Video Systems' digital video signal corrector. The CVS 502 is a time base corrector which includes an EIA processing amplifier and EIA sync generator designed for use with various helical scan tape recorders. The process involves the digitizing of the entire video signal, storing it electronically in shift registers, and correcting it with references to the most useable timing signals available. The corrected signal is then converted back to the analog mode. The time base correction of helical scan video tape recorders has been largely confined to VTR's of semi-professional or professional production quality. The CVS 502 will work in conjunction with monochrome or color signals from almost any helical VTR available today.

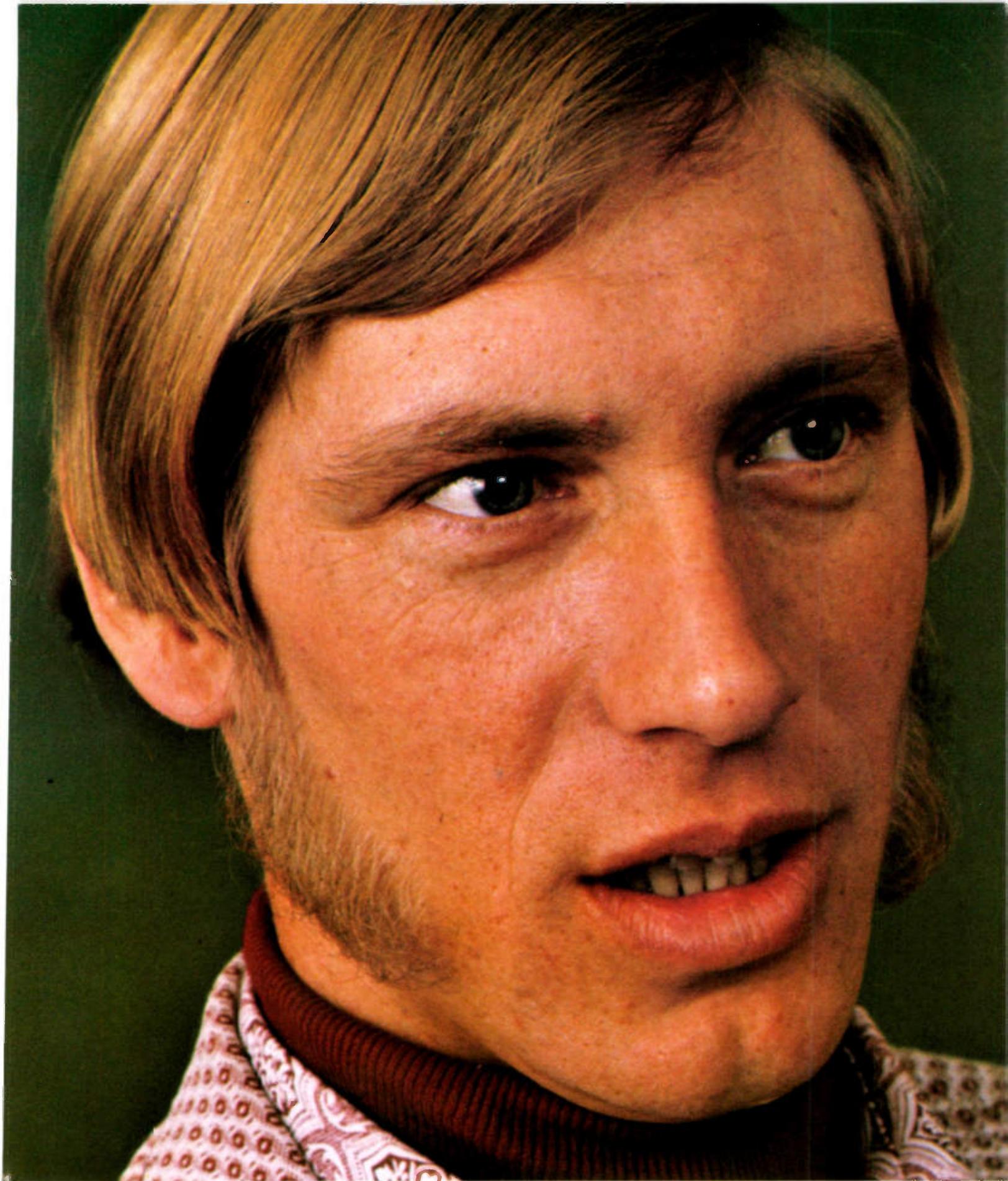
Broadcast Electronics displayed their Spotmaster 400 units. The units are offered in record-playback (Model 400) and playback-only (Model 405) versions, and are now supplied with adjustable head mounts at no extra cost.

In a large, colorful booth, Panasonic displayed virtually all of its line of video products. Panasonic products included their color VTR monitors, black-and-white and color open reel VTR, 1/2-inch, 3/4-inch, and one-inch video cassette recorders, black-and-white and color studio cameras and accessories, and mini-studio production centers.

R. H. Tyler Company displayed its color weather-scan II — "the colorful time-weather package" — at the show. The scan is equipped with color instruments that show time, temperature, rainfall, wind velocity, wind direction, and relative humidity. Two card holders are mounted on either end. The new weather scan features the Magnavox Chromavue 400 total-automatic color camera, and sells for \$5995.

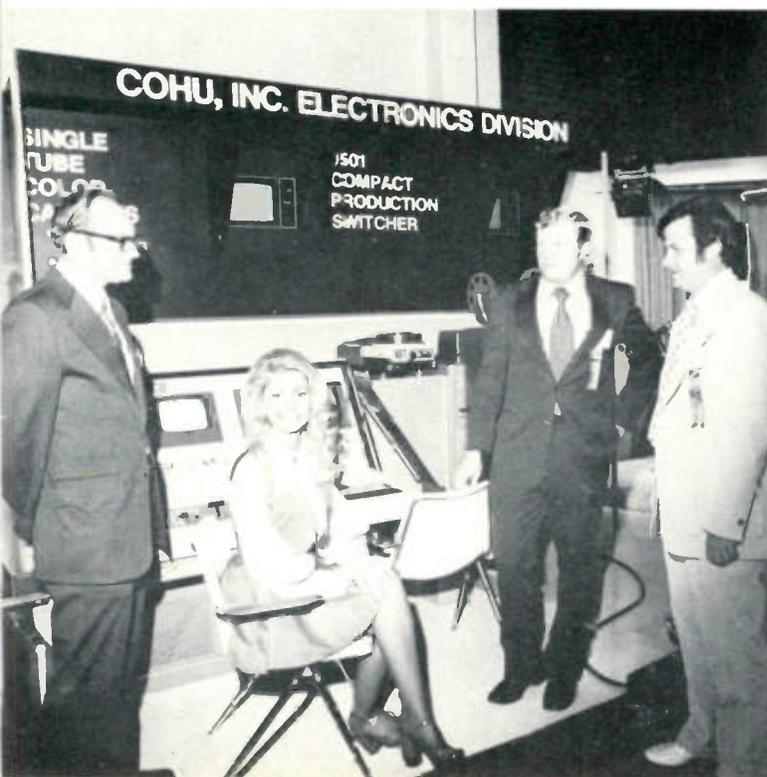
Laird Telemedia introduced the Model 5300 optical multiplexer. The unit provides a method by which as many as three separate film images may be selectively projected, for televising by a single camera. The basic optical configuration of the multiplexer permits the design of a very compact film island, yet allows sufficient space for access to the camera and projectors. The 3-input projector complement may include several variations of 16mm and "Super 8" motion picture film in combination with 35mm 2" x 2" slides.

Cohu's display consisted of their 1500 Series color film cameras. The cameras feature three separate



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mesh vidcon tubes, image enhancement, instant paint control, new optical system design, FET preamplifiers and triple action automatics to provide hands-off operation.

At the Arvin Systems booth, Don Baker from Dickson-Vasu in Hollywood, used the new Arvin color video discassette recorder to demonstrate practical techniques for direct video animation. Baker, whose professional credits include work on the Charlie Brown specials, the well-known Levi Strauss and 7-Up commercials, and the CBS Apollo animation sequences, created actual cable commercials in the Arvin booth. In addition to the animated sequences, Baker demonstrated other uses of the 300-track discassette including titling, freeze frames, and other special effects. Arvin Systems also demonstrated a new field strength meter and multi-tap.

In the TeleMation booth, several new products were being exhibited. The Models TPS-7 and TPS-7A production switchers feature full color broadcast capability, 12 special effects plus title insert, variable speed automatic mix/effects, and vertical interval switching. The TeleMation message channel is an "automatic message center" which allows such information as public service announcements, advertising messages, or photographs to be displayed automatically over its own channel, or integrated into other channel programming. The unit will handle up to 24 different message units, each measuring 3" x 5". Used as a "TV bulletin board", a system operator may switch on "message channel" to run consecutively through the entire range of 24 cards, remain stationary in any one position, or repeat-scan a given number of card slots. TeleMation's new Porta-Studio is a heavy-duty aluminum case with snap-off front and back covers which serves as a portable rack for any combination of video and audio equipment.

## A Look at Lighting

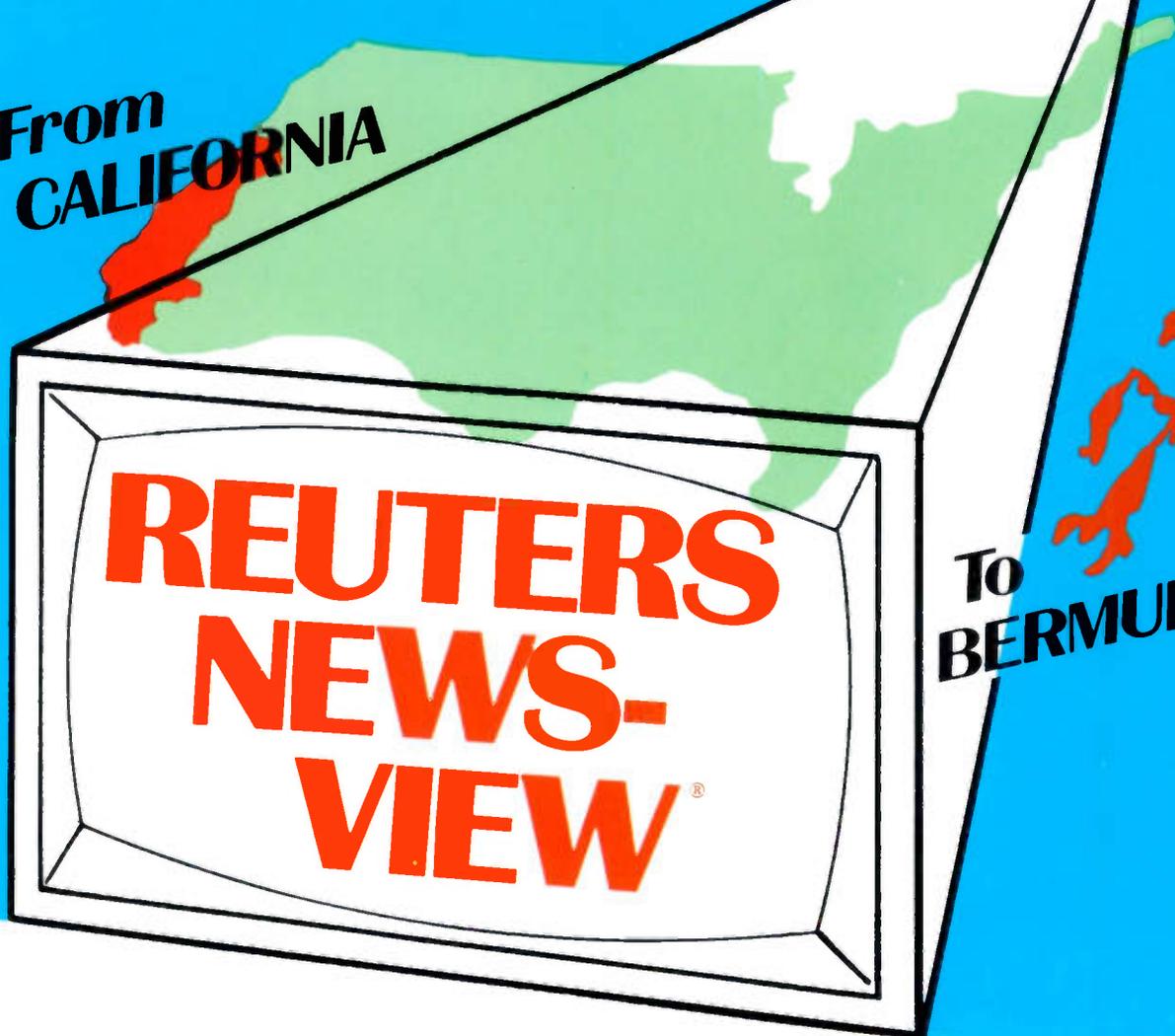
Century Strand, Inc. introduced their new modularized dimmer package, the "Dimmy" at the show. The package contains six 2.4 KW solid state dimmers with plug-in circuitry, individual circuit protection, a new filter system, front-hinged cover with safety interlock for full internal access, choice of dimmer output receptacles, input terminals arranged for any combination of power supply, and natural ventilation. The control module contains four control modules, selector switches for each dimmer channel, internally illuminated control panel, linear controls for easier operation, and dimmer to dimmer tracking. Century Strand also displayed a complete studio lighting package. Said to be functional for a medium sized studio (20' x 30'), the package is sufficient to light one major set area in addition to a news and weather set. The system includes not only lighting and power distribution equipment, but also a completely self-contained electronic dimming system.

The exhibits at this year's convention took up more space than they ever had before. It makes one wonder where they are going to put everything *next year* in Chicago.

TVG

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To its own specially designed and edited black-and-white and color news displays, known as RTR 101 and RTR 102 respectively, Reuters has now added RTR 103.

RTR 103 is produced by MSI TELEVISION, a leader in the production of weather and time data equipment. Working closely with Reuters, MSI has created a distinctive 3-color display that includes not only all the unique features and options associated with RTR 101 and RTR 102—multi-channel "write-and-wipe" display of General, Financial and Sports news, stock ticker and local display facilities—but also a signal output that enables mixing into the MSI Television DATA WEATHER system.

A keyboard terminal for local insertion of announcements is available with any of the three systems.

**RTR  
102**

For further details about REUTERS NEWS-VIEW and the services and equipment available on a lease or purchase basis, Write:

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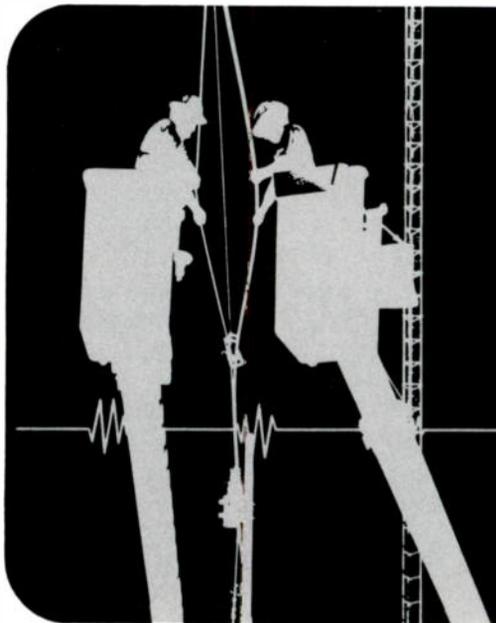
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# CABLE TV

## *Technician*

A special monthly section devoted to the cable communications technician and engineer

## Tomorrowland's Pay Cable Moves to Adventureland

**The first satellite cablecast almost stole the show, but when all was said and done in Anaheim last month, the new home terminal devices for pay and two-way were even more dazzling than the Disneyland Parade.**

*By Pat Gushman  
Associate Editor*

“Welcome to the First Annual Pay-Television Convention,” one might have said after curiously wandering from booth to booth between episodes of “Bob and Carol, Ted and Alice.” The occasion was actually the 22nd Annual NCTA Convention and Trade Show, but to even the casual observer the abundance of pay-systems and two-way equipment introduced, displayed, and demonstrated for the benefit of manufacturers, operators, investors and spies on hand, clearly pointed to what’s in store for cable.

And while most of the meetings, panel discussions, and eye-openers explored the future of the cable industry and the potential for pay and two-way cable, the hardware representatives were making their case, as they have

throughout much of the industry’s development, “We’re ready whenever you are.” The *you* being either the operator, the subscriber, or both.

Though pay-cable succeeded in capturing the cumulative interest of those in attendance in Anaheim, the most dramatic and awesome demonstration was staged as the convention officially opened with Speaker of the House Carl Albert sending his greetings and congratulations to the 6000 attendees in the first satellite interconnected cablecast. Albert’s remarks, relayed from Germantown, Maryland, to Anaheim by AMSAT-leased, Canadian transponders were picked up on the TelePrompTer-Scientific - Atlanta ground station and also carried live on the Newport Beach and Long Beach cable systems.

Following the impressive satellite cablecast, attention again focused on the inter-active home terminal devices which will make pay and two-way cable possible, not someday but tomorrow.

Jerrold Electronics led the way by introducing their new products at a Sunday Press Luncheon at the Royal Inn before the convention got into full swing. After introducing Jerrold’s new president, Dr. William Firestone, vice president Bill Lambert explained the features of the new Starline 300 Series of amplifiers with complete modular design. The inherent configurability of the Starline 300 allows the addition of plug-in modules required for each stage of any expansion process. Some of the other design characteristics include full service redundancy, monitoring services to pinpoint

failures, high RFI integrity to combat signal ingress, and remote shut-off of the return system.

Generating a great deal of excitement at the luncheon was Jerrold's new Communicom™ system, an upgradable two-way interactive communications system linking the headend and CATV subscribers to provide a wide range of added services in addition to normal CATV programming. John Sie, Division Manager of the Terminal Products and Services Division of Jerrold, explained that Communicom had been designed with four primary objectives. They are upgradability of hardware, flexibility of deliverable services, reliability in operation and maintenance, and low cost for the mass market. Major field trials will be conducted in five American and Canadian cities soon, according to Jerrold.

## Expandable Scrambler

At a luncheon Monday, (the CATV Division of Oak Industries, Inc., announced what they consider to be a major breakthrough in pay-cable. According to spokesmen, the Oak ESP (Expandable Scrambled Programming) offers an economic means for cable systems to begin long awaited construction of pay TV communities. Most significant, the concept provides for retrofit of existing Oak Varactor converters for pay programming, eliminating the need to obsolete current channel selector hardware to convert to pay TV. According to Oak, the same equipment and retrofit principle applies to two-way operation.

All that is required to begin conversion to pay-TV are Oak multichannel varactor converters. When the operator is ready for full ESP one-way pay-TV operation, he returns converters to Oak's factory, where one-way circuitry is added. Later, when the operator elects to move to two-way pay-TV, the converter is again retrofitted with Oak's Interrogatable Response System. The total cost per home to the operator for all three modules, converter, pay circuitry and two-way circuitry, is calculated at less than half of

present industry estimates of what such complete terminal equipment would cost.

## Tocom II

One of the primary concerns of Tocom, Inc., of Dallas was promotion of their Tocom II system which includes three primary elements: varying numbers of Remote Units, a Computer Controlled Central Data Terminal; and a Bi-Directional Cable Distribution System. The remote unit is a combination of a 26 channel TV converter and a Digital Transmitter-Receiver, all housed in one cabinet. Each remote unit automatically relays data pertaining to electronic inquiries from the Central Data Terminal which is capable of interrogating, receiving responses, and acting on the responses from 60,000 remote units every six seconds. The Bi-Directional Cable Distribution system may be either single or dual-trunk configuration and exhibits a forward transmission bandwidth in the 5 to 25 MHz range.

"The future is now," according to Theta-Com of California as they displayed the Subscriber Response System designated for two-way capability. The two-way communications takes place between the Local Processing Center (LPC) computer complex and the subscriber terminal which consists of a Control Console and a Modem unit. The LPC equipment can be located at the headend, at the local origination studio, or even remote from the CATV system.

## Subscriber's Choice

In keeping with the convention theme "the Choice Medium", Magnavox's Premium Programming System permits the operator to bring his subscribers special programs not available over standard television. The subscriber may be charged for each program accepted, or can be billed on a subscription basis for a series of programs. The all solid-state Magnavox premium system will operate on existing one-way cable

plants, since the need for a return link is obviated by the use of a device called IDEM™, for Interactive Data Exchange Module. This module serves as a communication switching device center for a group of up to 36 subscribers and as a collection point for billing and polling.

The subscriber's home terminal in the Magnavox system contains the MOS logic for switching, communications, and for de-scrambling of the pictures and sound normally transmitted from the headend. It also contains the rf devices which provide signals between IDEM and subscriber, and which receive and convert audio/video signals to standard VHF channels on the subscriber's own receiver. The terminal also permits key-lock switch control.

The Billing Information Read-Out Terminal is a simple mechanism for access into the Magnavox IDEM from ground level.

## Hotel System Adapted

K'Son's pay TV system, which has been used in over 40 thousand hotel rooms and has now been adapted to suit the needs of the cable operator, generated much interest in the convention center. (For a complete description of the system see the June Issue of *TV Communications*.) Allocation of one VHF channel, four midband channels, and one narrow band command channel provides the opportunity to sell four separate and concurrent premium programs to every CATV subscriber. The VHF channel carries promotional previews. Each participating subscriber is equipped with a four channel program selector capable of converting anyone of the four premium channels to a standard VHF Channel.

All in all, it was a very impressive display of hardware. And, though space does not permit us to report here on all the developments which unfolded at the exhibits, *TVC* will continue to keep its readers abreast of all the technical developments of the cable industry from satellite to converter. 

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# **Erying Arrhenius Is "One Mean..." But Cool Hand Amp Just Shakes It Off, Boss**

**Thermal control in CATV trunk amplifiers becomes more difficult—and more critical—as trunk stations become more complex. Here's a method to determine—and control—the heat factor.**

*By Owen McCaughey and Gaylord Rogeness  
Research & Development Department  
Anaconda Electronics*

*Editor's Note: In Part I of this article last month the increasing electronic and thermal complexity of the new generation of trunk-bridger stations and the increasing difficulty of cooling internal components were noted, and it was pointed out that the failure rates of semiconductor devices of the types used in the stations increase very rapidly with increasing operating temperatures. A calculation method which would permit the prediction of the operating temperatures of key internal components was outlined, based on first calculating the external surface temperature of the housing for any specified installation site.*

*The housing temperature is calculated by a heat balance method, balancing heat gains from internal power dissipation plus absorbed solar radiation against heat losses to the environment by radiation plus convection. It was shown that the sun can potentially be the largest source of heat gain under certain adverse conditions.*

**I**n the last section of Part I on the subject of the trunk station

heat balance we were concerned only with how to be able to predict the average operating temperature of the housing. That, of course, was only a means to an end, the end in this case being the ability to predict the operating temperatures of all of the key components and circuits, and to determine whether modifications in either the internal or external heat flow paths are necessary. The operating temperatures of the housings in aerial installations are determined essentially by the housing design characteristics selected by the station designer, coupled with the environmental characteristics of the installation site, all of which are effectively beyond the influence of the system technician (unless he uses a very unconventional type of installation).

With regard to the more important factor of component operating temperatures, however, the technician can have a major negative influence on the problem if he does not consistently use care in properly reinstalling modules in the housings. Particular attention must be paid to the cleanliness of

any mating thermal contact surfaces, the proper use of thermal grease or other thermally conductive material at the thermal interfaces if required by the station design, and, above all, the proper torquing of the mating surface clamping screws to their design values. Failure to do all of these things properly can result in excessive component operating temperatures and reduced reliability.

### **Actives and Passives**

At steady state, each power dissipating (active) component operates at an equilibrium temperature increment above the housing temperature such that the rate of heat dissipation in that component just equals the rate of heat transfer from the component to the walls of the housing via all of the available heat flow paths. These paths involve conductive, convective, and radiative mechanisms, with the conductive mechanism usually being the most significant internally.

If the thermal resistance of any

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of the paths is allowed to increase, the temperature of the component will rise until a new equilibrium temperature increment above the housing temperature is reached which will again permit all of the dissipated heat to be transferred to the housing via the new higher resistance paths.

Non-power dissipating (passive) components reach various intermediate equilibrium temperature levels which depend largely on

their proximity to active components.

As a general principle, the best design practice is to provide a direct, short, low thermal resistance conductive path from the junction of each active device to the station housing. Such a path should employ metal of high thermal conductivity in a configuration with large cross-sectional areas throughout the heat flow path. The number of mating surface interfaces should be held to an absolute minimum, although most designs need at least two — one between the component and an internal metallic heat path, and another between the metallic heat path and the mating surface (boss) on the housing.

A thermally conductive grease or other material should at least be used at the first interface to minimize contact resistance, which can be significant; field service problems may prevent its use at the second interface. Constant care must be exercised by the designer to ensure that no high resistance bottlenecks are designed into the heat flow paths, such as those that can occur if insufficiently large cross-sectional areas perpendicular to the heat flow paths are provided at one or more points.

While the conductive mechanism does (or should) predominate in trunk station internal heat dissipation, both radiative and convective mechanisms are always operative, and they can be enhanced, if advantageous, to further reduce key component operating temperatures.

### Coating-In and Out

The use of a properly selected coating on the inside and outside surfaces of modules and the inside surface of the housing by the designer will tend to increase the emissivity and absorptivity of those surfaces in the middle and far infrared regions of the spectrum, leading to increased radiative transfer internally. An examination of spectral reflectivity curves for surface coatings (ref. 10, for example) will show that

#### LIST OF SYMBOLS

A	= area, in. <sup>2</sup>
ACN	= atmospheric clearness number, dimensionless
B	= atmospheric extinction coefficient, dimensionless
C	= pre-exponential constant
E	= activation energy, ev
FR	= failure rate, failures/hour or failures/100,000 hours
h	= heat transfer coefficient, watts/in <sup>2</sup> °C
J	= current density, amps/cm <sup>2</sup>
k	= Boltzmann's constant, ev/°K
MTF	= mean time to failure, hours
p	= air pressure, atmospheres
P	= electrical power, watts
Q	= heat flow rate, watts
T	= temperature, °C or °K
α	= radiative absorptivity, dimensionless
β	= solar altitude angle, degrees
Γ	= altitude correction factor for solar radiation, dimensionless
θ	= thermal resistance, °C/watt
ψ	= altitude correction factor for convective heat transfer, dimensionless

#### SUBSCRIPTS

a	= air
alt	= altitude
cd	= conductive
c-h	= case-to-housing
cv	= convective
D	= dissipated
hsg	= housing
i	= i th element
ipd	= internal power dissipation
j	= junction
j-c	= junction-to-case
j-h	= junction-to-housing
p	= passive component
p-h	= passive component-to-housing
r	= radiative
s	= solar
sl	= sea level
sr	= solar radiation
std	= standard conditions
surr	= surroundings
tot	= total

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Gornik shook him off: "Aerospace, schmaerospace. What counts up the pole is how easy it installs and how long it lasts. With Cannon's SCOTTY connector I don't have to use a torque wrench, I just tighten one nut, not two. Besides, SCOTTY's neoprene gland seal beats out any O ring and cuts down on the number of times I've got to go up and down this pole."

The Chief Engineer opined that their present connectors were doing a good

enough job. Gornik agreed on the *good enough*: "I'm not knocking what we're using now, just saying that Cannon can do better. Take RF leakage, for example..."

"Can Cannon better the —60dB we're getting now?," asked the chief. Gornik grinned: "—60dB when they're new, you mean. But seriously, Cannon's technology can give SCOTTY a rubber gland or stainless steel sleeve that maintains contact better, longer, and delivers —90dB. And not just the day we put it on the pole!"

That made the Chief pause and think a bit. Gornik seized the opportunity:



"And they cost less than the others. So what about it...?" So the Chief smiled a little, and offered to give Gornik a leg up the pole.

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the coating need not be black to be effective.

The mounting of active components on internal finned heat sinks, or extended surfaces of almost any nature, will tend to increase the rate of internal heat transfer to the housing by convection, almost always at the expense of raising the internal air temperature and the operating temperatures of nearby passive components.

In any thorough program of thermal testing of a trunk station

by the manufacturer, the test engineer will, as a minimum, measure the case temperatures (or, for lower power devices, the lead temperatures) of all active components in the thermal prototype at various steady-state operating conditions. He will also simultaneously measure the housing temperature at several points, plus various other internal temperatures.

These measurements will permit the temperature difference between the housing and the case of

each active component, and between the housing and various passive components, to be calculated and plotted as a function of device power dissipation level, housing temperature level, housing orientation, and any other significant variables. Device-to-housing temperature differences are not independent of housing temperature level because of such non-linear effects as temperature-dependent thermal conductivity properties and the internal radiative transfer mechanism (proportional to the difference between the fourth powers of the absolute temperature levels of the source and sink); they are not independent of orientation because of its effect on the convective mechanism.

### Case-to-Housings

The principal result of these measurements and calculations is to permit the case temperature of each active component to be predicted as a function of its power dissipation level and the temperature level of the housing. One convenient and familiar way to present those results is in the form of a case-to-housing thermal resistance by the symbol  $(\theta_{c-h})_j$ , expressed in  $^{\circ}\text{C}/\text{watt}$ . As explained above, each  $(\theta_{c-h})_j$  is really a non-constant function of temperature level which can be most conveniently presented as a plot of  $(\theta_{c-h})_j$  vs. housing temperature  $T_{hs}$  and orientation.

### For Active Devices

For active devices our real interests, however, are in the junction temperatures, not in the case temperatures, since it is the junction operating temperature levels which determine the life and reliability of the active components, and thus the entire station. In order to get from case temperature to junction temperature we make use of the junction-to-case thermal resistance constant which is furnished by the device manufacturer for each type of semiconductor or hybrid device. The junction-to-case thermal resistance

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of each type of device is represented by the symbol  $(\theta_{j-c})_i$ , expressed in  $^{\circ}\text{C}/\text{watt}$ .

With that information, we can write an expression for the junction-to-housing thermal resistance for each active component as

$$(\theta_{j-h})_i = (\theta_{j-c})_i + (\theta_{c-h})_i, ^{\circ}\text{C}/\text{watt} \quad (4)$$

where  $(\theta_{j-h})_i$  is a function of the same variables as  $(\theta_{c-h})_i$ .

The junction temperature  $(T_j)_i$  of any active device can then be expressed as

$$(T_j)_i = T_{\text{hsg}} + (\theta_{j-h})_i (P_D)_i, ^{\circ}\text{C} \quad (5)$$

where  $T_{\text{hsg}}$  = housing temperature,  $^{\circ}\text{C}$

$(\theta_{j-h})_i$  = junction-to-housing thermal resistance  $^{\circ}\text{C}/\text{watt}$

$(P_D)_i$  = power dissipated in device, watts

In equation (5) the housing temperature  $T_{\text{hsg}}$  is calculated using the heat balance method, as described in the previous section.

The temperature  $(T_p)_i$  of selected passive component of interest can be calculated using the expression

$$(T_p)_i = T_{\text{hsg}} + (\Delta T_{p-h})_i, ^{\circ}\text{C} \quad (6)$$

where  $(\Delta T_{p-h})_i$  = passive component-to-housing temperature difference,  $^{\circ}\text{C}$

Values of  $(\Delta T_{p-h})_i$  for various passive components (or interior zones) are usually measured for various operating conditions during the tests on the thermal prototype. The value of each  $(\Delta T_{p-h})_i$  can then be plotted as a function of the one or more variables which most influence its value (e.g., the  $P_D$ 's of one or more nearby active device.)

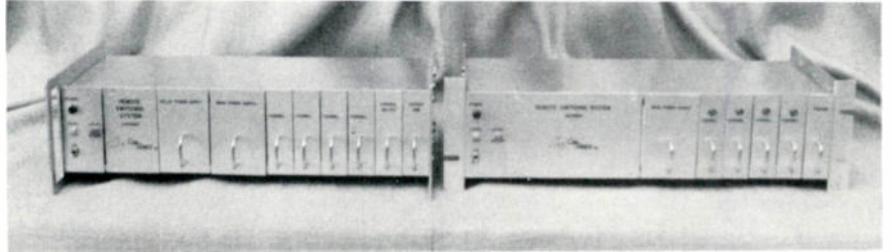
## Trunk Temp Procedures

All of the concepts for predicting operating temperature levels in trunk stations which have been described up to this point can be reduced to a fairly concise set of charts, equations and calculation procedures which will permit quasi-worst case component temperature levels to be

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Step	Procedure	Equation or Method	Result	Units
1	List site parameters for the analysis	a. Site altitude b. Site latitude c. Day of year (Requires trial and error to find worst case for site) d. Max. air temperature, $T_a$ (can be selected from summer design temperatures in Table 1 of Chapter 22, ref. 11, or from temperature maps of Ref. 12 or 13. Convert °F to °C).	----- ----- ----- -----	ft. deg N Lat. ----- °C
2	Calculate heat gain from internal power dissipation.	$Q_{ipd}$ = input electrical power to station	-----	watts
3	Calculate incident solar radiation on housing at sea level standard conditions	$(Q_{sr})_{std}$ = value from applicable Figure 7 – type plot for day of year, latitude, housing model, etc.	-----	watts
4	Calculate altitude correction factor for solar radiation.	$\Gamma = \exp \left( 1 - \frac{P_{alt}}{P_{sl}} \right) \left( \frac{B}{\sin \beta} \right)$ where: $\frac{P_{alt}}{P_{sl}}$ = altitude pressure ratio (Fig. 8) $B$ = atmospheric extinction coefficient for day of year (Table 8, Chapter 28 of Ref. 11). $\beta$ = solar altitude angle for day of year and latitude (Tables 2-6, Chapter 28 of Ref. 11)	-----	dimensionless
5	Calculate heat gain from solar radiation	$Q_{sr} = (Q_{sr})_{std} (\Gamma) (\alpha_s) (ACN)$ where: $\alpha_s$ = solar absorptivity of housing outer surface (from manufacturer's tests or estimate) ACN = atmospheric clearness number (from Figure 14.16 of Ref. 9 for site)	-----	watts
6	Calculate total heat gain = total heat loss	$Q_{tot} = Q_{ipd} + Q_{sr} = 2 + 5$	-----	watts
7	Calculate altitude correction factor for convective heat loss	$\Psi = \sqrt{\frac{P_{alt}}{P_{sl}}}$ where $\frac{P_{alt}}{P_{sl}}$ = altitude pressure ratio (Fig. 8)	-----	dimensionless
8	Calculate sea level equivalent of total heat loss for still air.	$(Q_{tot})_{sl} = Q_{tot} \left( \frac{0.50}{\Psi} + 0.50 \right)$ (assumes 50/50 convective/radiative heat loss)	-----	watts
9	Calculate housing external surface (reference) temperature for still air.	$T_{hsg}$ = Value from applicable Fig. 9 – type plot for housing model, orientation, etc.	-----	°C
10	Calculate junction temperature for each active device.	$(T_j)_i = T_{hsg} + (P_D)_i [(\theta_{j-c})_i + (\theta_{c-h})_i]$ $= T_{hsg} + (P_D)_i (\theta_{j-h})_i$ where: $(P_D)_i$ = device i power dissipation, watts $(\theta_{j-c})_i$ = junction-to-case thermal resistance of device i, °C/watt (constant specified by device manufacturer) $(\theta_{c-h})_i$ = case-to-housing internal thermal resistance for device i, °C/watt (from applicable Fig. 10-type plot) $(\theta_{j-h})_i = (\theta_{j-c})_i + (\theta_{c-h})_i$	----- ----- ----- -----	°C °C °C °C
11	Calculate temperatures of each temperature-critical passive component.	$(T_p)_i = T_{hsg} + (\Delta T_{p-h})_i$ where: $(\Delta T_{p-h})_i$ = component-to-housing internal temperature difference for component i, °C (as measured and plotted by station manufacturer)	----- ----- ----- -----	°C °C °C °C

Figure 6: Simplified Calculation Procedure for Predicting the Operating Temperatures of all Temperature-Critical Components in Aerial Trunk Stations.

# NEW

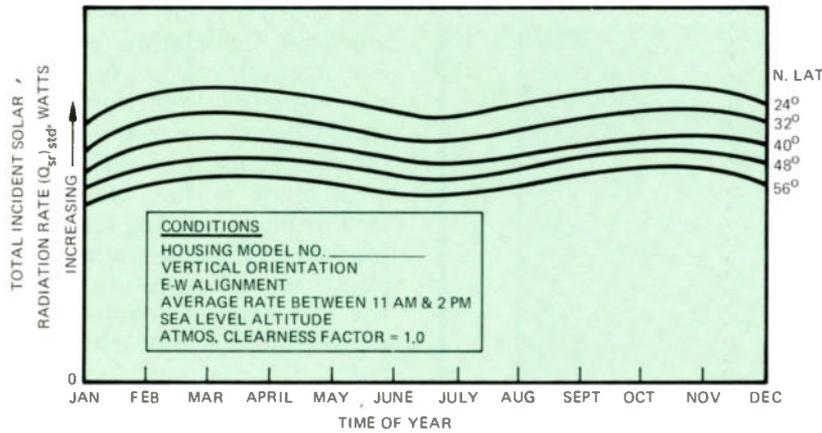


Figure 7. Three-hour Average Total Solar Radiation Heat Rate (Direct + Diffuse) Incident, at Sea Level, on a Vertically-Oriented, EW Aligned Housing of Specific Dimensions.

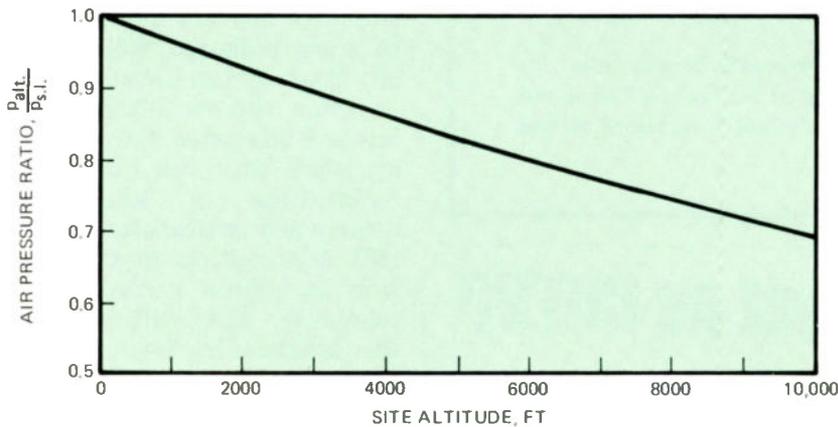


Figure 8: Air Pressure Ratio as a Function of Site Altitude (For Calculation of Altitude Correction Factors for Solar Radiation and Free Convection).

predicted for any installation site, provided that the manufacturer has first made all of the necessary measurements on a thermal prototype of the station in question. In this set of procedures the housing temperature is first calculated using the heat balance concept (equations (2) and (3) [see Part I] and Figure 5), and then temperatures of the key internal components are calculated using the internal thermal resistance concept (equations (4), (5) and (6)).

One somewhat simplified version of the step-by-step temperature prediction procedure is reproduced in Figure 6. Some of the graphs of the type required to use

the procedure are reproduced (with some scales omitted) in Figures 7 through 10. References are given in Figure 6 to where other useful charts and tables may be found in the literature.

The omitted values on the graphs of Figures 7, 9 and 10 are functions of the packaging design of the specific trunk station of interest. Those values would have to be determined from thermal tests on the station thermal prototypes by the station manufacturers, and a complete set of charts would have to be prepared from analysis of the test data.

Additional refinements can be incorporated into the illustrated



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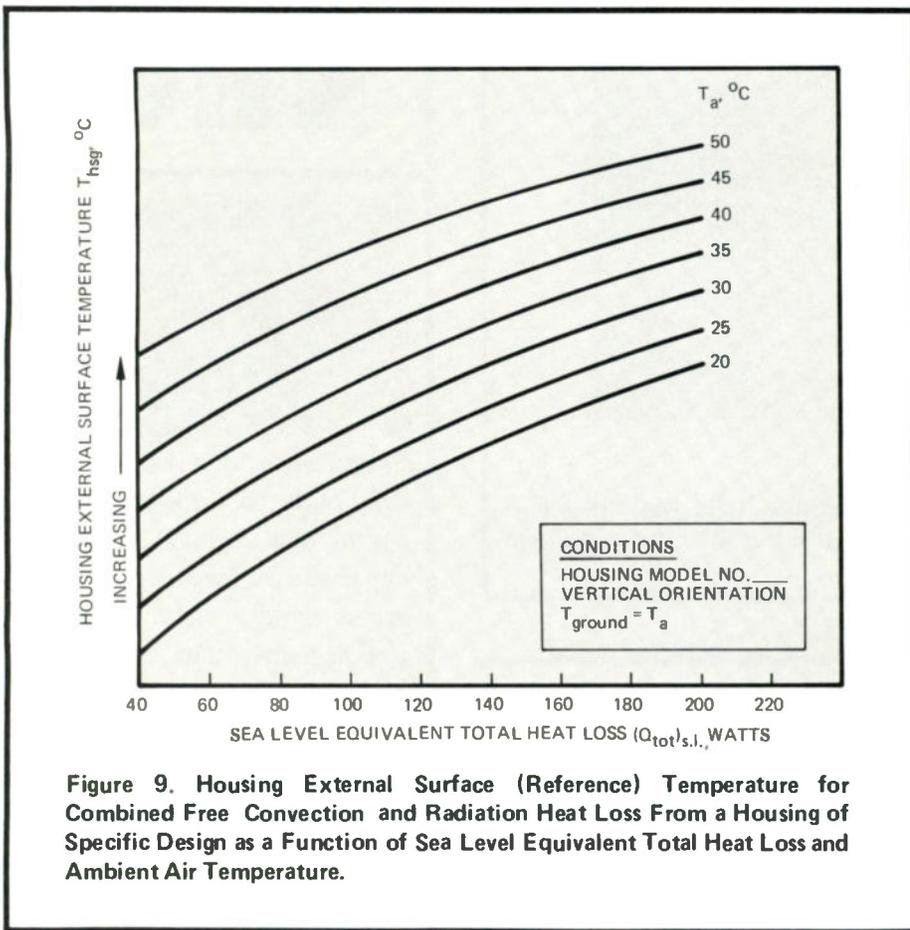


Figure 9. Housing External Surface (Reference) Temperature for Combined Free Convection and Radiation Heat Loss From a Housing of Specific Design as a Function of Sea Level Equivalent Total Heat Loss and Ambient Air Temperature.

procedure to increase the prediction accuracy, at the expense of increased calculation complexity. For example, a one refinement is the allowance for the effects of wind-driven forced convection over the housing. Another possible refinement is the calculation of two or more housing temperatures (in place of one) at each operating point as reference temperatures for the internal components, to allow for the fact that the sun heats the various faces of the housing unequally.

## Conclusion

Trunk amplifier stations are steadily becoming more complex, with more heat being dissipated within the housings. When those higher levels of dissipated heat are added to the very significant levels of solar radiation which may be absorbed by the housing in bright sunshine (up to 1-1/2 times the level of dissipated heat), the result at some sites can very well be overheating of semiconductor devices and critical circuits on hot, still days, with a resulting reduction in station performance and reliability. That will occur unless the situation has been anticipated and provided for in the station thermal design and development.

The principal factors which together determine the maximum operating temperature levels of key internal components have been listed and discussed in this article. It is noteworthy that the thermal radiation level from ordinary sunshine is a complex and highly variable contributor to the temperature rise of components in a trunk station, and that its effects need to be properly accounted for in any operating temperature prediction procedure.

An example of a temperature prediction procedure which can adequately account for the effects of sunshine as well as internal heat dissipation has been given. The proper implementation of such a procedure, however, requires extensive thermal testing and analysis on the part of the station manufacturer, including the use of controlled environmental test conditions, the use of actual or pro-

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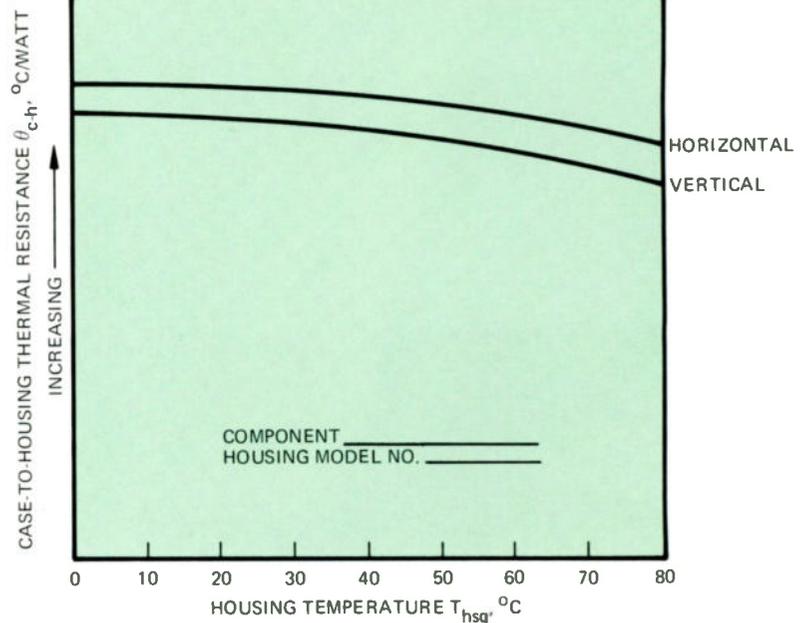


Figure 10. Typical Plot of Component Case-to-Housing Thermal Resistance as a Function of Housing Temperature and Housing Orientation.

perly simulated solar radiation, and provisions for accurate simulation of natural convection conditions. Neither bench testing, oven testing, nor cascade testing in an environmental chamber is sufficient, although all may be necessary for other purposes.

### Quasi-Worst Case

This article has emphasized the prediction of quasi-worst case thermal conditions and their probable consequences in terms of degraded performance and reliability. It should not be interpreted as implying that typical trunk-bridger station installations are usually operating under conditions of degraded performance or reliability due to excessive internal temperatures.

For the vast majority of situations it is simply a matter of good judgment for the manufacturer to develop equipment of efficient thermal design, because all reductions in component operating temperatures are reflected in better performance and higher reliability. "Marginal" reliability may be converted to "acceptable", while "good" reliability may be converted to "excellent", by means of

efficient thermal design. In addition, it is worthwhile to improve the heat transfer design of a station where feasible because improvements in one section of a heat transfer path can help to offset unavoidable or accidental deficiencies in other sections.

Only by the use of comprehensive thermal control procedures and constraints, such as those described in this article or their equivalents, can the equipment manufacturer ensure that the reliability and performance of the new generation of high performance trunk stations will not be unnecessarily compromised in any system applications. TVI

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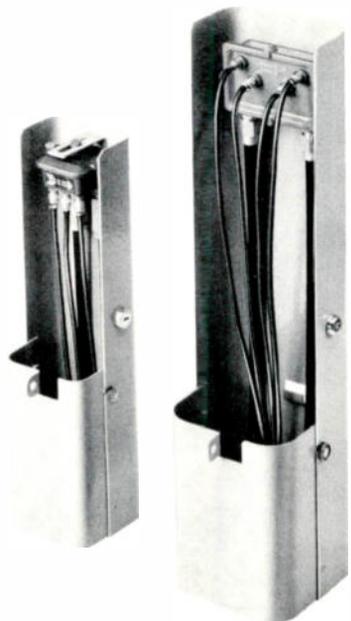
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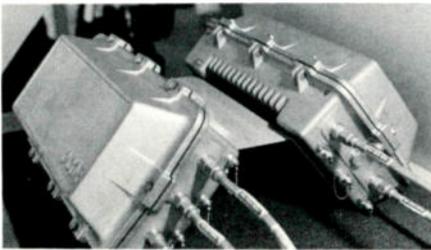


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Fung Engineering Co., has announced the availability of RF controlled channel switcher Model: RCS-573. The unit is designed for switching CATV channels for reasons of non-duplication or selective programming. The unit will sense any TV channel signal and switches the unwanted TV channel off the CATV system. The unit is all solid state and 19" rack mounted. Price is \$325.00.

## CAMERA ENCLOSURE: VICON

Vicon Industries, Inc., 55 Jericho Turnpike, Jericho, N.Y. 11753, announced the availability of their new compact Model V830H Environmental Enclosure for 2/3 inch cameras. Featuring a dual-acting hinge system which permits access from either side of the

camera, the Model also has an air circulation flow system to provide convective air circulation for cooling and anti-fogging. A heater with thermostat control and a filtered air positive pressure blower system are also available for use with the enclosure.

## CONVERTER: OAK INDUSTRIES, INC.

A remote cablevision control offering durable rotary detent channel selection, stable AFC reception, varactor tuning and jewel case consumer design styling has been introduced by the CATV Division of Oak Industries, Inc., Crystal Lake, Ill. 60014. Designated Oak's Jewel Case V-31 Converter, the competitively

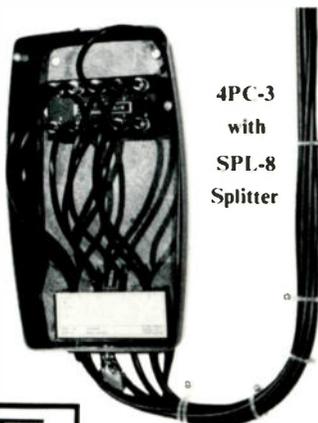


priced varactor unit is the first to eliminate fine tuning. This has been accomplished by incorporating automatic frequency control into the converter itself, something previously unavailable for remote cable applications. Offering total of 31 possible viewing channels, Oak's system permits cable operator ample room for programming. Spread over the 54 to 88 MHz and 120 to 276 MHz ranges, channels can be utilized for general programming, time, weather, news, stock quotations, local origination, or for leasing channels for sports pay TV, or other special uses. When the cantilever type cover is closed, the selector resembles a jewelry case, blending with the furniture in the home. The remote converter has 75 ohm nominal input and output impedance, 2:1 maximum input VSWR, 5 dB +/- 3 dB gain, and better than 100 dB isolation against direct pickup.

## TRACTOR-TRENCHER: DAVIS MFG.

A new tractor-trencher Road Run'r with high ground clearance, diesel engine for extra lugging power, an optional 6-way angle backfill blade and a front-mounted backhoe, has been introduced by Davis Manufacturing Division of J I Case, 1500 South McLean Blvd., Wichita, Kan. 67213. Powered by a Case G188D diesel engine, the Road Run'r is the only tractor-trencher-backfill-backhoe combination in the industry produced under the control of a single manufacturer. It incorporates integrally engineered attachments into a total digging system. With a manufacturer's rating of 57 hp, it features four-speed power shuttle transmission with single-stage hydrokinetic torque converter for transport and backfilling, and Hydra-Static drive with superior creep metering and extra lugging power for trenching in rugged, muddy and tough conditions. It moves down the road from job to job at 21 mph. The digging chain

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| 12LT-1 | Up to 12 apartments<br>1 outlet per apartment |
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Patent No. 3,610,810

## FRIBLEY ENTERPRISES

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drive is powered by a Powerband high capacity belt from the PTO which has an over-center clutch to provide added protection to the digging train when shock loads are encountered. The optional front-mounted RD-100 backhoe lets one man on one machine handle the total job — trench and dig the excavations at connecting points — with peak efficiency. The optional 6-way fully hydraulic blade finishes the job by backfilling. It angles 35 degrees either side, offsets 15" to counter side thrust and permit parallel backfilling with the wheels back from the trench bank, and tilts vertically 16 degrees for added efficiency. When the backhoe is not installed,



a moldboard extension can be added for handling larger spoil piles. Blade ends have been chamfered to reduce heel drag and to provide a cutting edge when backfilling. This 85" blade can cut 7 1/2" below grade if dozing is required. Dual augers disperse spoil to both sides of the trench for easier backfilling, and to permit digging wider and deeper trenches. Both are open end, to prevent jamming from rocks and debris. The Road Run'r trenches from 6" wide, 86" deep to 18" wide, 50" deep at infinitely variable speeds to 2000 fph. A heavy-duty crumber which serves as a shield to the digging chain and cleans the trench bottom is available. An optional rock and frost chain for year-around digging is available for work in hard, rocky, frozen ground, or in caliche, asphalt and coral. It digs to the full depth of the boom so no supplemental trencher is needed once the rock or frost layer has been penetrated, and it provides spoil dispersal. The operator's station is roomy with a profile contoured seat for added comfort. Sealed beam headlamps and a combination tail-floodlamp for night operation are available. The safety flasher is standard. Tire options include 6-ply 14.0 X 24 (r) agriculture and 14.9 X 24 (R4) Utility traction on the rear, and 7.50 X 16 8-ply rib, and high flotation 11 X 16 10-ply truck tread on the front. Four-post ROPS and seat belts to meet OSHA requirements are available.

### RIGID CABLE RELAYS: DATRON

A series of RF relays with rigid coaxial cables for direct insertion on a printed circuit board has been announced by the Electronic Specialty Division of Datron System, Inc., 18900 N.E. Sandy Blvd., Portland, Oregon 97220. The rigid cable configuration was developed, Datron said, to save space on the PC board, reduce assembly time and decrease costs because no connectors are required. The

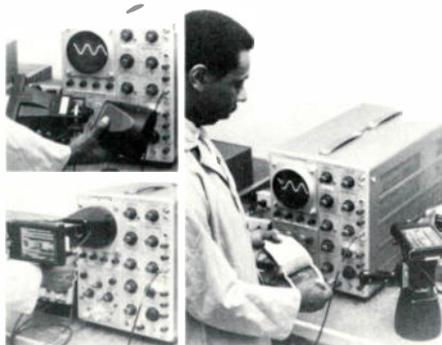
F and H series (full and half size crystal can) relays can switch signals from RF to 500 MHz, and have standard pickup power of 250 milliwatts. Contact arrangement is available in DPDT RF switching, SPDT RF pr SPDT aux. The rigid cables are custom designed for the user's particular PC board requirements. The relays also are available with flexible cables for standard installation. The coaxial relays employ Datron's resilient bifurcated contact construction and meet or exceed MIL-R-5757F specifications. Standard mounting arrangements include 2-hole flange and side bracket.

### FILM VIDEOPLAYER: EASTMAN KODAK

A super 8 film videoplayer capable of playing super 8 film over a standard television set was introduced by Eastman Kodak Company, 343 State St., Rochester, N. Y. 14650. The Kodak Supermatic film videoplayer VP-1 is designed for use in schools, business, industry, government installations and other applications to play color and sound super 8 movies over a standard color television set or closed circuit television system. Features of the video system include push-button controls, automatic rewind of the film into the cassette at the end of the film, and extremely quiet operation. Although the videoplayer can be used in the home to show home movies on super 8 film, it has been designed primarily for professional use.

### DISPLAY COPIES: POLAROID

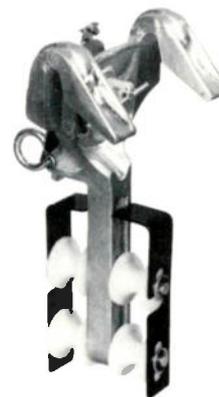
A low-cost camera for producing instant hard copies of oscilloscope displays in just 15 seconds has been introduced by Polaroid Corporation. The new oscilloscope camera is available in this country from Allied Electronics Corporation, Chicago. Called the Polaroid CR-9 Land Oscilloscope camera, the new hand-held unit weighs less than 24 ounces and costs only \$179.95 — considerably less than other oscilloscope cameras



presently on the market. Unlike most permanently-mounted cameras, a single hand-held CR-9 can easily be used with more than one oscilloscope at multiple installations. Because of its portability and light weight, the unit can easily be carried from one terminal to another. The CR-9 is designed to accept any of 8 interchangeable, light-tight hoods in

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round, square, and rectangular configurations which fit almost all oscilloscopes with 6 x 8, 6 x 10 and 8 x 10 cm graticules. The hoods quickly attach to the front of the camera, permitting only light from the cathode ray screen to reach the film. Additionally, the hoods position the camera at the correct distance from the display, assuring sharp, virtually distortion free pictures.

**DEMAGNETIZER;  
NORTRONICS COMPANY**

The Recorder Care Division of Nortronics Company, Inc., 8191 Tenth Ave. No. Minneapolis, Minn 55427, world's leading designer and manufacturer of magnetic heads

and professional recording accessories, has introduced a totally new, professional head demagnetizer which is being manufactured by Nortronics in the U.S. The new unit is designed to remove all residual magnetism from recording heads, capstans and guides. Designated Model QM-202, the new unit generates a controlled 60 Hz. magnetic field which is strong enough to effectively demagnetize without being so strong that additional residual magnetism is created. The primary function of Nortronics new QM-202 is to demagnetize active pole pieces and faces in recorder playback heads, thus preventing hiss, noise and possible eraser which can be caused by a magnetized head. It also prevents partial erasure of pre-recorded tapes. Model QM-202 features a flexible probe which will flex to reach usually inaccessible recorder/

player parts. The magnetic field radiates from the tip of this probe which is designed to contact sensitive areas without danger of physical damage. The professional head demagnetizer also features a sensitive Micro-switch™ that is activated by fingertip pressure when the unit is picked up and deactivated when it is released. Other features include an attractive, functional and unbreakable Cyclocac™ housing and convenient coiled power cord. The QM-202 is ideal for reel-to-reel, cassette and 8-track recorders and players.

**WARNING DEVICE:  
COMMUNICATIONS TECH.**

PRO TEC LITE is a new, completely portable warning device featuring an alternating 360 degree flashing light, from Communications Technology Corp., 2237 Colby Ave., Los Angeles, Ca. 90064. The unit can be placed anywhere and warn of crews at work, holes dug, cables buried, service trucks,



wrecks, stopped equipment, construction materials, new or old construction — anywhere an effective warning hazard is needed to protect personnel and property. The case is a high impact bright yellow plastic. Overall it measures three inches square by eight inches high. Reflectors are available in red, amber, or clear. It is battery-operated on standard lantern batteries, which may be purchased with the unit or separately. A sturdy metal carrying case which holds 8 PRO TEC LITES is also available as an optional part of the package. The case is designed for convenient carrying and to ride well in service trucks.

**NEW COLOR TAPE:  
AMPEX**

Ampex Corporation, 401 Broadway, Redwood City, Ca. 94063, today announced a new one-inch helical-scan color video tape for broadcasting and sophisticated closed-circuit use. It is the first high-energy type tape to use a standard ferric oxide formulation. New 170 Series video tape is designed for use with Ampex, IVC and other one-inch, helical-scan videotape recorders equipped with time-base correction. It is a compatible high-energy tape that is price competitive with cobalt-doped and chromium dioxide video tapes. With 170 Series tape, print-through and pressure demagnetization are improved over cobalt-doped tapes. In addition, use of a non-doped ferric oxide provides compatibility with existing tape libraries.



July, 1973

# Help US Help YOU

**WHITE URGES VIGOROUS SUPPORT  
IN NATO CAMPAIGN AGAINST CATV**

**By Louis Pellegrino**  
Pompano Beach, Fla.—The board of the National Association of Theatre Owners endorsed an aggressive action program at a meeting here. The program is entitled to the "operation positive" theme espoused by

factors threatening exhibitors' prospects. White indicated that NATO will carefully evaluate the entire situation as it relates to the most effective means of guaranteeing an adequate supply of screen product. He said appropriate measures will be instituted.

copyrighted, will "serve to confer prestige and attention on theatres as a separate and distinct element of the motion picture industry," it was said. 5. The presidents of the film companies will be told that exhibition venues are "a harmful practice" the release of films to TV too soon after

**AMST Intensifies  
Pay-Cable Fight;  
Vows 'Protection'**

Washington, March 27. The Assn. of Maximum Service Telecasters intensified its war on pay-cable at its annual membership meeting prior to the opening of the National Assn. of Broadcasters convention.

The AMST meeting also vowed to protect the broadcast spectrum from threatened incursions and

**NAB Warns CATV Means End Of Free TV**

National Association of Broadcasters warned, recently that cable television is trying to establish itself as a "pay version of

lation of the fact that CATV is quietly girding itself, not as a source of new program material for the subscribing American

"The time has come for CATV to stop playing games with the Commission and insisting with a straight face that it has no interest in the program resources of

**Battles  
Ahead for  
Cable TV**

**By Eileen Alt Powell  
of The Journal Staff**

Should the state of Wisconsin regulate cable television? If so, how?

What should municipalities ask through franchise agreements of those entrepreneurs who seek to turn Wisconsin into a "wired state"?

How will citizens' rights be protected in the process? The answers to those and dozens of other questions are expected to begin emerging

**Gleason Appears to Favor Government CATV**

**By Ruth Washburn**  
County executive James Gleason, on phasing again and again that he is "not committed to either side" of the question, gave a talk before the Montgomery County Press Association last Friday describing glowing possibilities for public — rather than private — ownership of a County Cable TV system.

Saying CATV is the Advisory Commission, to most important program I think 15 members will be will have had a hand with approved and a set

financial support and Montgomery County ownership of CATV would be a staggering burden financially on the county and its taxpayers in an address last week before the Washington Advertising Club.

Programs who already create said giving holds a CATV franchise for the City of

formation to citizens in about how much they re Promising citizens in their subscribers all the interested in a public owned CATV system, also about the Gleason said. As long as nothing, something. It citizens are thinking of it beyond domination of the public system, Gleason said, could contribute to possible

County efforts in public

**U.S. must guard free tv  
from cable, Taylor says**

LOS ANGELES, May 16—The time has come for government to insure that the growth of pay cable television will be supplementary and not a replacement for advertiser-supported tv, Arthur R. Taylor, president of CBS,

grams, whether games or serials, may take three years or longer to build to peak audience.

Mr. Katz attributed CBS-TV's drop to third in daytime ratings — after 17 seasons in first—10 several factors, including a con-

**Goodman says  
CATV could  
hurt free tv**

LOS ANGELES, May 8—Julius Goodman, president of the National Broadcasting Co., has voiced his fear that cable television might be misused to weaken the country's free tv system.

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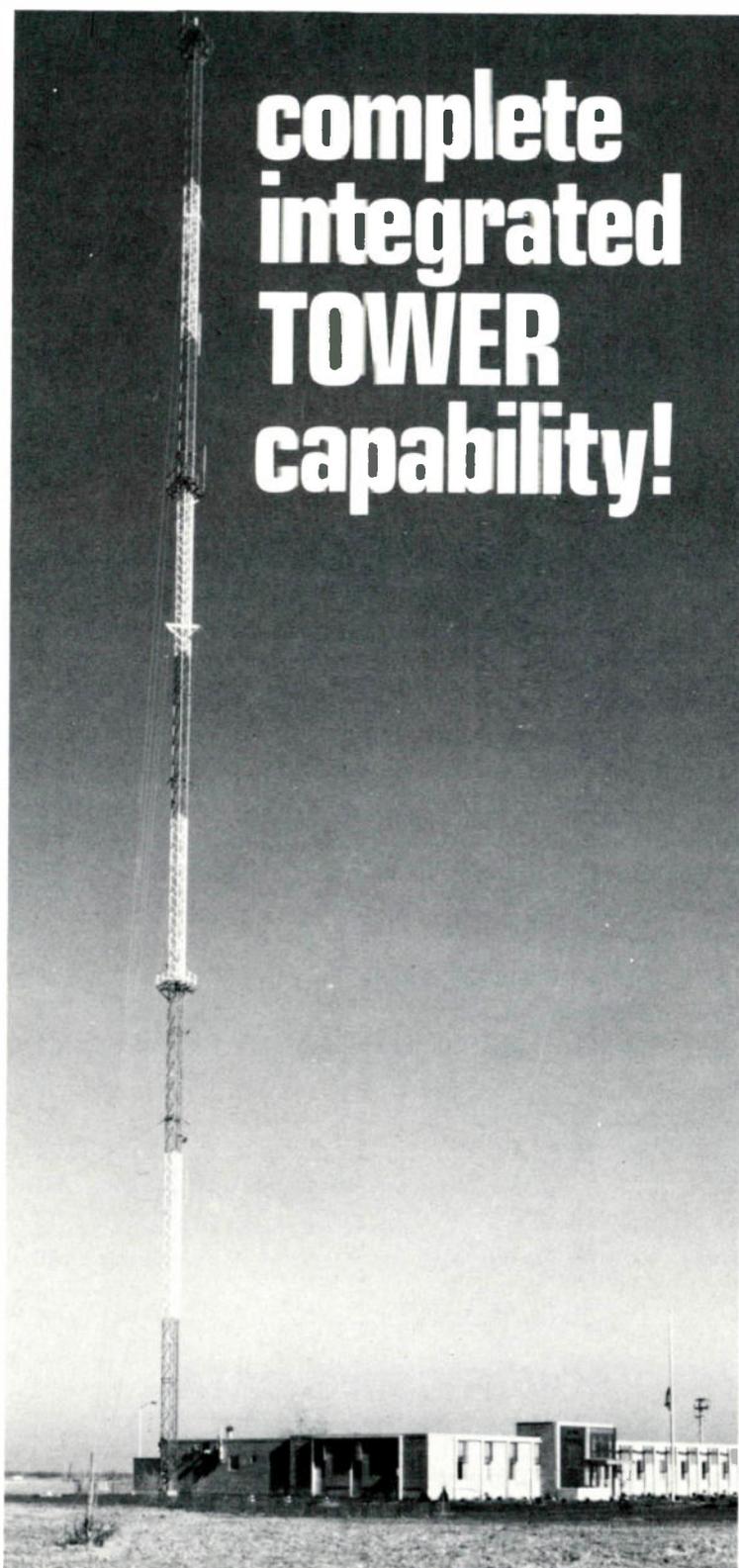
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# INDEX OF DISPLAY ADVERTISERS

AEL Communications Corp. . . . .	4	General Electric . . . . .	71
Ameco, Inc. . . . .	18	General Machine Products Co., Inc. . . . .	35
Anaconda Wire & Cable . . . . .	23	Glenronics, Inc. . . . .	70
Anixter-Pruzan . . . . .	7	Gulton Industries . . . . .	62
Athena Communications Corporation . . . . .	13	Haynes Mfg. . . . .	69
A. G. Becker . . . . .	39	ITT Cannon . . . . .	63
Belden Corporation . . . . .	C-2	Jackson Communication Corporation . . . . .	25
Blonder-Tongue . . . . .	17	Jerrold Electronics Corporation . . . . .	44,45
Broadcast Electronics, Inc. . . . .	62	Lindsay Specialty Products, Ltd. . . . .	81
Burnup & Sims, Inc. . . . .	53	LRC Electronics, Inc. . . . .	39
Cable Funding . . . . .	64	McGraw-Edison . . . . .	52
Cable TV Supply . . . . .	37	Magnavox/CATV . . . . .	46
Cadco . . . . .	59	Minnesota Mining & Manufacturing (3M) . . . . .	77
CAM Industries . . . . .	36	MSI Television . . . . .	30
Cambridge Products . . . . .	27	NCTA . . . . .	76
CATV Systems Directory . . . . .	40-42	Network Analysis . . . . .	17
C-COR Electronics, Inc. . . . .	8	Q-E Manufacturing Co., Inc. . . . .	75
Cerro Wire and Cable . . . . .	16	Raychem . . . . .	10
Communications Mktg. Consultants . . . . .	43	Repco Products . . . . .	C-3
ComSonic, Inc. . . . .	67	Reuters . . . . .	55
Consolidated Video . . . . .	14,15	Rohn Manufacturing Company . . . . .	79
Coral . . . . .	C-4	Sadelco, Inc. . . . .	34
CPS Cablevision . . . . .	75	Sod Master . . . . .	67
Delta-Benco-Cascade Ltd. . . . .	9	Southern Telephone Supply . . . . .	33
Durnell Engineering Inc. . . . .	36	State Labs, Inc. . . . .	72
Dynair Electronics, Inc. . . . .	5	Superior Continental Corporation . . . . .	61
Eastman Kodak Company . . . . .	51	T. C. Specialties . . . . .	26
E. G. & G. . . . .	38	Texas Electronics . . . . .	72
Electronic Industrial Engineering, Inc. . . . .	82	Theta Com . . . . .	3,24
Firstmark . . . . .	48	U. S. Computer Systems (Cable Data) . . . . .	31
Fort Worth Tower Company, Inc. . . . .	56	Utility Products . . . . .	73
Fribley Enterprises . . . . .	74	View-All TV Products . . . . .	49

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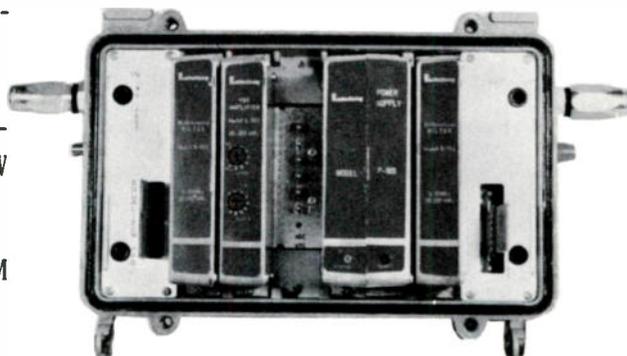
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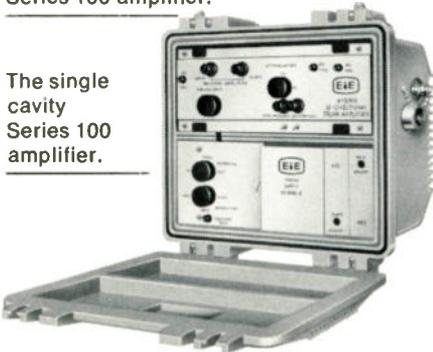
EiE is better able to meet your equipment needs than any other manufacturer.

EiE, a Division of RCA, offers a wide selection of performance-competitive, price-competitive amplifier products and head-end equipment.

Amplifier products include single- or dual-cable; discrete, discrete/hybrid, or hybrid (including reverse-port); single-ended or push-pull. Available with 50 — 300 MHz forward, 5 — 30 MHz reverse; or 174 — 300 MHz forward, 5 — 110 MHz reverse for midband split. They feature a unique thermal design, compact design, and the latest in micro-circuitry.

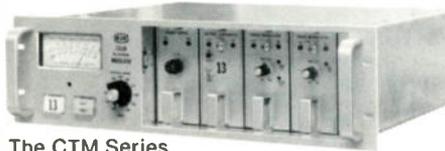


The double cavity Series 100 amplifier.

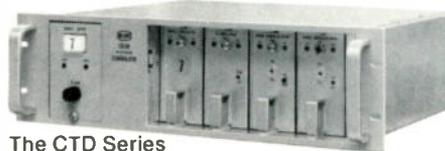


The single cavity Series 100 amplifier.

Broadcast-quality head-end equipment feature totally modular design, with full shielding and dependable beat-free performance.



The CTM Series modulator.



The CTD Series demodulator.

The A/B coaxial switch.

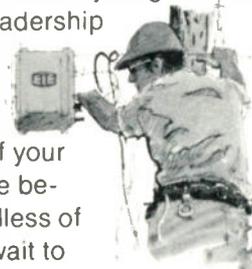


**Fact 2. EiE has unequalled expertise and working field experience with two-way systems.**

Our experience can benefit the system operator from the design stage of his upgradable system to the operational two-way stage.

Our two-way leadership assures you that potential problems are designed out of your system from the beginning, regardless of how long you wait to implement two-way operation.

Superior one-way operation is also assured, and insurance against major system redesign and replacement problems is built in.



**Fact 3. EiE takes a total systems approach to RF systems.**

We have the capability to build a total systems approach into all of our products.

The result



is total systems design integrity, with performance dividends for operators as well as viewers.

**Fact 4. With EiE, you're assured of on time delivery to specifications.**

Our production facilities assure delivery of customer orders on time to full specifications. Plus continuing post-sale support.

**Fact 5. Our new computerized system layout service could save you money.**

EiE's computerized system layout service could save you plenty in equipment and construction costs.

And it's available to you on either a bill-of-materials or turnkey basis.

**Fact 6. EiE will take full responsibility for system design and construction to contract specifications.**

We have experience in total turnkey installation. And, at your option, we'll take full responsibility for it up to and including proof of performance to contract specifications.

**Fact 7. We're investing in your future.**

Programs designed to enhance the industry's future are being conducted not only within EiE Division, but also at RCA research and advanced development laboratories.

And we're planning to underwrite extensive market tests of prototype system equipment that makes possible a host of new revenue-generating communications services.

Those are the facts. Now that you have them, let's talk.

Electronic Industrial Engineering, a Division of RCA, 7355 Fulton Ave., North Hollywood, California 91605. (213) 764-2411.

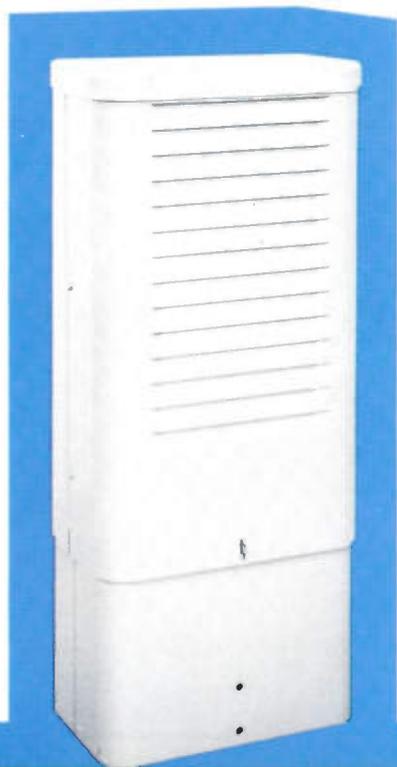


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 Quebec, Canada  
 In Canada: Write to Sales Mgr., Service Division, RCA Ltd.,



**Electronic Industrial Engineering**  
 A Division of RCA

# Above or below ground, **Repco** has a closure for your underground plant.



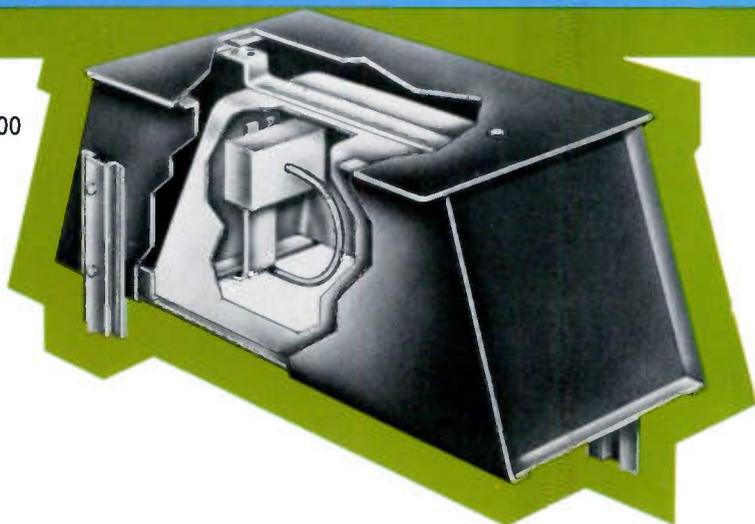
We know that no one pedestal is right for every job, so here at Repco we make a full line of closures, with profiles from 0 to 33 inches (and others in between). We build them for strength and durability. We build them for easy access, with ample working space for servicing or installing all types of electronic equipment. And we build them to show up as little as possible, because we know the less people see of our pedestals, the better they like them (and you).

#### Model CATV-1305

Above ground, we have closures for anything from the smallest of today's equipment to as many components as you'll ever install at one mounting station. All are designed to incorporate the features most-wanted by CATV operators. Models without louvers are also available for equipment not needing ventilation.

#### Model CATV-3010, 3110 and 3200

Below ground, Repco closures protect your equipment from moisture, corrosion and tampering. All are easily accessible and long-lasting. Three variations are available, depending on what type of equipment you want to install.

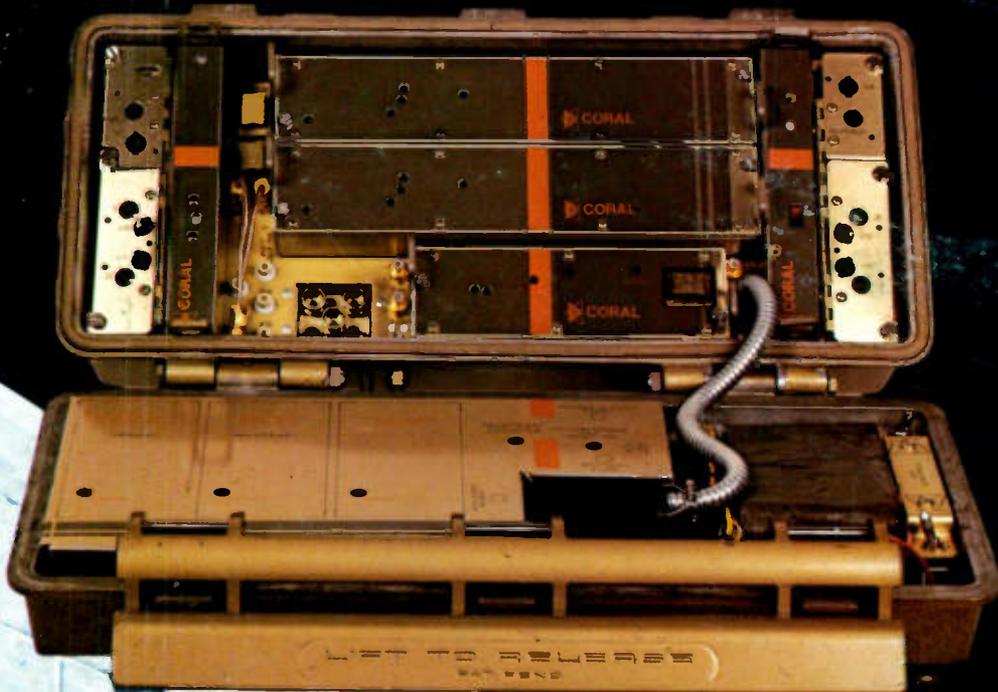


**Repco Products Corporation**

COMMUNICATIONS DIVISION

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