

**CPC**

July 1970

# ***TV Communications***

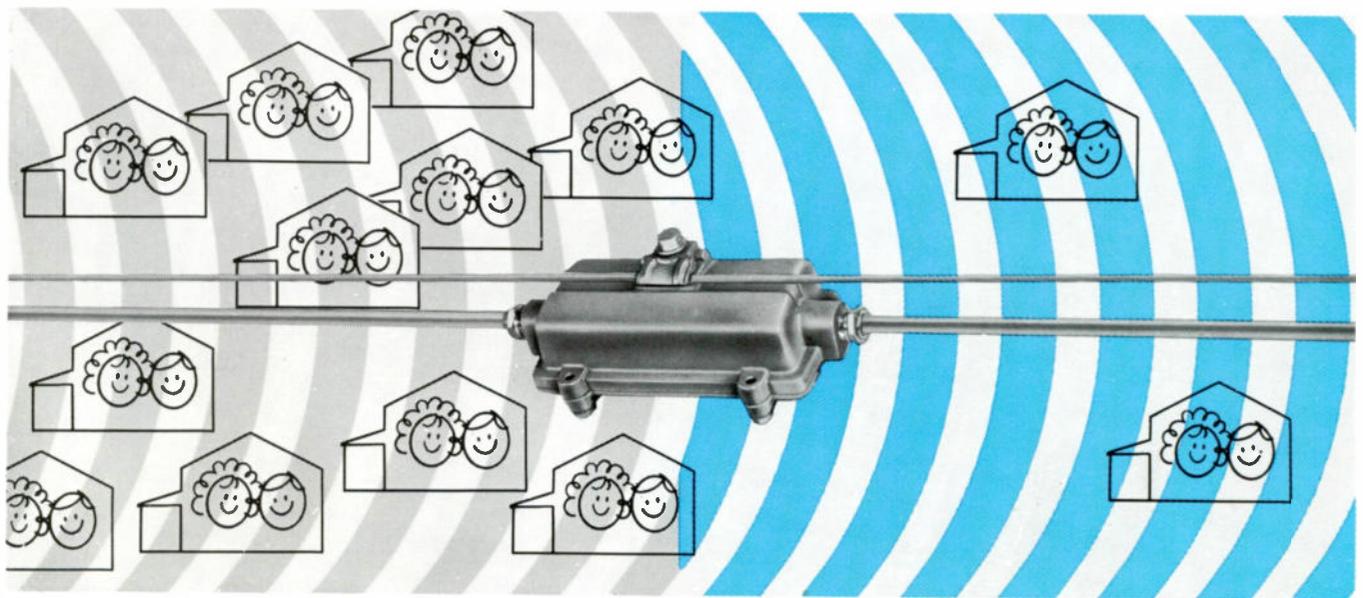
The Professional Journal of Cable Television



**In This Issue...**

**1970 Convention Report  
Basics of Studio Patching  
New Products Reviewed**

# Add subscribers who live beyond your feeders

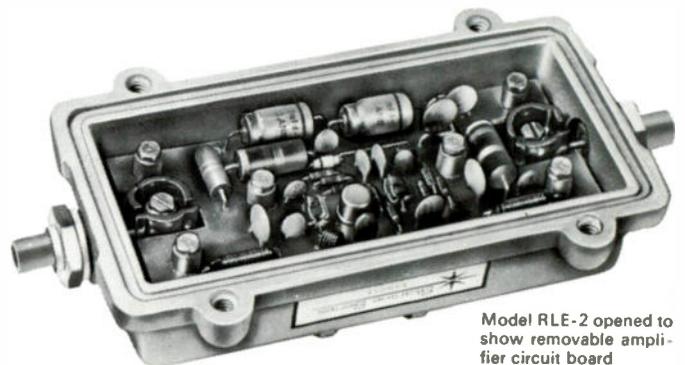


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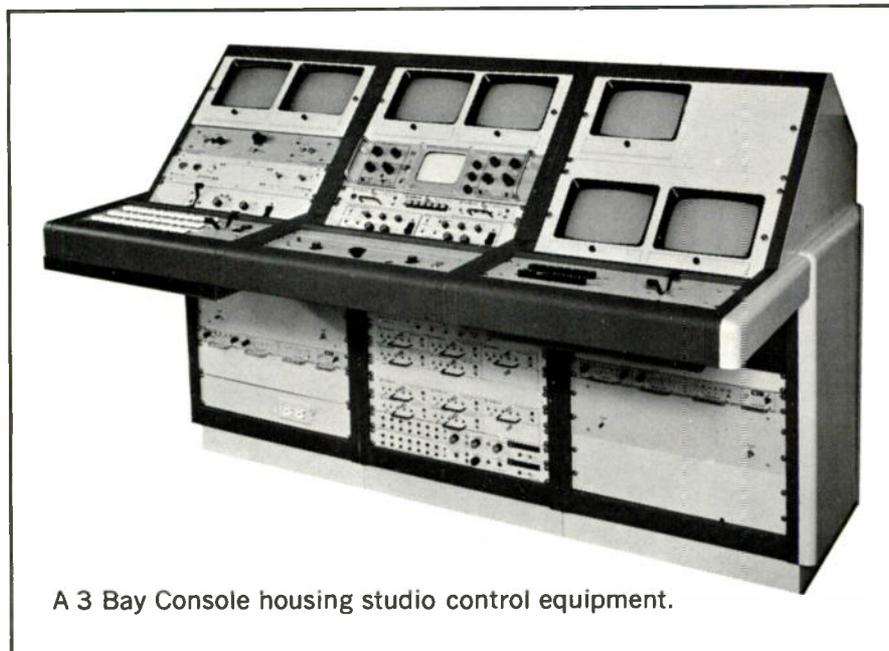
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# TV Communications

The Professional Journal of Cable Television

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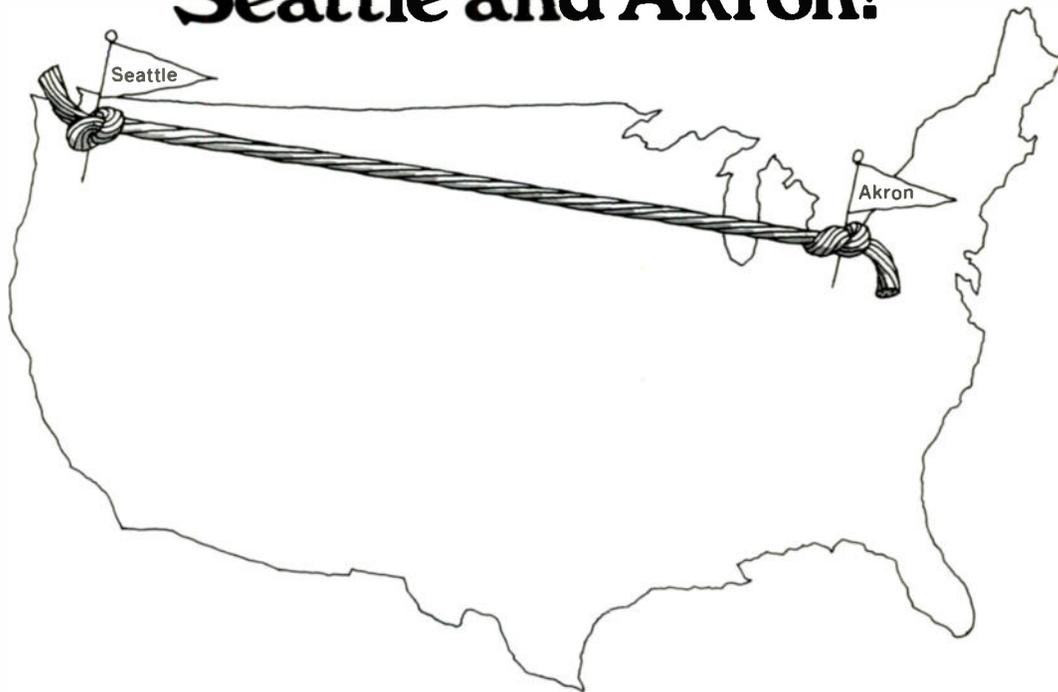
Patrick T. Pogue



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# The TVC Viewpoint

## EDITORIAL



**Robert A. Searle**  
Editor

## CATV: Jack the Giant Killer?

*Fact Number One:* Cable TV has vast potential. *Fact Number Two:* That potential *will* be realized. *Fact Number Three:* It is uncertain whether today's industry owners will enjoy the benefits of that potential.

Men of imagination will develop the cable communications industry of tomorrow. Now that a thaw of the cable freeze seems imminent, cable can grow — in the hands of those who now own it — or in the hands of imaginative men as yet unaware of its potential.

Today's owners have one advantage: They were there first. They should be the first to realize and invest in the opportunities of tomorrow. Tomorrow, many giants will be anxious to move into cable, and competition for the cable stakes will be hot and heavy.

Most cablemen are holding their breath while awaiting the final jell of the Commission's decision on the Public Dividend Program. But some have already heaved a sigh of relief and leaned back in their rockers to await the decision — which Burch has said will not harm CATV as it exists today. *They simply aren't worried* — as long as their current business is not affected.

Guilty of the same kind of unimaginative thinking are those who think the proposed rules are like a handful of magic beans which will be planted to automatically result in a harvest of golden eggs for all cablemen in the business today.

No regulatory scheme will insure automatic success for today's industry

owners, although it may make the success of cable communications nearly certain. It takes flexible men of vision and stubborn will to keep up with an exploding industry, and those unwilling to assume this role might as well get out now or run the risk of missing out on tomorrow's profits.

Think of it for just a moment. If the FCC limits new franchise fees to two percent, competition for franchises will take on a whole new hue. The name of the game won't be how much you're willing to pay the city, but how much service you're willing to give the public. With strong service orientation, countless new services will pop up and become widespread within a decade.

If Minneapolis and Tulsa and San Diego subscribers are getting special services, it won't be long until subscribers in Mankato and Ponca City and Palm Springs are demanding the same things. And the small to medium-sized system operator who is not geared to grow, will be overbuilt by any of dozens of tough-minded competitors who are willing to provide extra services — along with standard television reception — at a good profit.

If you as a businessman are not service-oriented, and anxious to give your subscribers what they need, it's time for a change.

Don't wait until you hear the rattle of competitive gunfire in the distance. The only way to kill the giants you'll face in the future is to be quicker, smarter and tougher. And the time to start muscle-building is now.

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

## ATTENUATION IN DECIBELS PER 100 FEET

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

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# Perspective

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## on the news



*B. Milton Bryan  
Executive Editor*

Recent Commission move to formalize Public Dividend Program is encouraging. Although an undetermined time still lies between the proposal and its birth as a regulatory force, cablemen can take heart that it will become a reality in some form or other.

As the proposal evolves, it will probably include more severe demands on the large top-market cable systems destined to come into existence. At the same time, pressures and costs to smaller systems in the top markets and on existing systems is likely to actually decrease.

Commissioner Burch has indicated his intention to avoid damaging the existing CATV industry. Smaller systems will probably be exempt from the 5% public broadcasting support provision, for instance.

At the same time, increasing pressure will be brought to bear regarding the industry's role in the top markets, where 89% of the nation's viewing public awaits cable. Someone will have to "pay the broadcast piper," and it will probably be those who venture into the big, high stake markets.

Recent broadcast lobby moves are symptomatic of an industry which is panicked. The Free Television News Bureau is about the least rational move NAB has ever made regarding CATV, but it shouldn't be taken lightly. As CATV's muscle develops, look for even greater show of strength from broadcasters, who will be even harder to get along with now that it's tougher for them to get a piece of the cable pie.

The result of cable growth should be a better television product for the viewing public. Networks and fat V's will be forced to invest more of their burgeoning profits in more meaningful programming. CATV has been hailed as the knight in shining armor who will replace the programming dearth with succulent television, rich in content and diversity. Problem is, about all CATV has to offer at the present time is a technology which will make this possible.

The CATV industry as it exists today has neither the background nor the money to come up with vast programming improvements in the immediate future. Improvements, if they are to come, will have to come from existing sources at first, and CATV will be just the catalyst to foster the healthy competition which will in turn spawn new programming fare.

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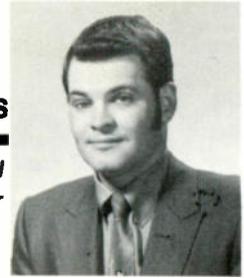
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## Management Guidelines

D. Stuart MacPhail  
Managing Editor



### Planning Your Future

Very few people can predict their futures with any degree of certainty. However, you can take some of the mystery out of the future by following the steps outlined below. They won't guarantee instant success, but they can help put you on the right track.

Begin by following these simple steps. First, analyze yourself, then appraise your opportunities. Realize which elements you can control and which ones you can't, then formulate a plan of action.

One of the difficult and most important factors in trying to design your future is honest introspection. You must analyze your wants, as well as your capacities and aptitudes. And don't kid yourself.

Deciding what you want out of your job means deciding what you want out of life, and which of your goals the job can provide. Consultants find that most managers list these among their important needs; *respect from others, freedom from unwanted change, new knowledge and understanding, power and authority, independence, self-expression and above all, challenge.*

After you decide whether you are getting what you want out of your job, and what more you want, your desires must be modified by your abilities to reach these goals.

The ability to get along with others and get things done through them is most important for managers, probably more important than mental ability, experience and drive. However,

it takes a combination of all these in varying degrees.

In appraising your opportunities, try to learn all you can about the duties involved in any job you might be in line for or which you think you are capable of. This may seem obvious, but many a manager after he is promoted, finds that his new position includes functions not apparent from the outside. They may call for adjustments in work habits, new knowledge or great patience in dealing with conflicting personalities.

No matter how effective you seem to be in your job, your success and progress are ultimately determined by your boss according to his own method of evaluation. He may, of course, be helped in this evaluation by recommendations and opinions from colleagues. But the final decision is up to his judgment. Therefore, understanding the personalities and policies of your superiors is a necessity.

Once you have analyzed yourself, decided on your goals, appraised your ability and potential, and estimated the opportunities that seem to match your abilities and interests, start moving toward these goals.

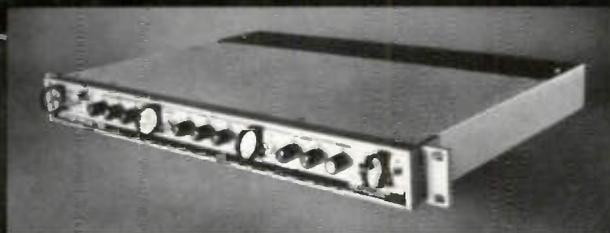
Finally, make sure your work goals are consistent with your life goals. If you can succeed in doing this, you will be well on your way to success. Next month . . . tips on *accurate communication* to improve the effectiveness of the communications manager. 

# Color Calisthenics?



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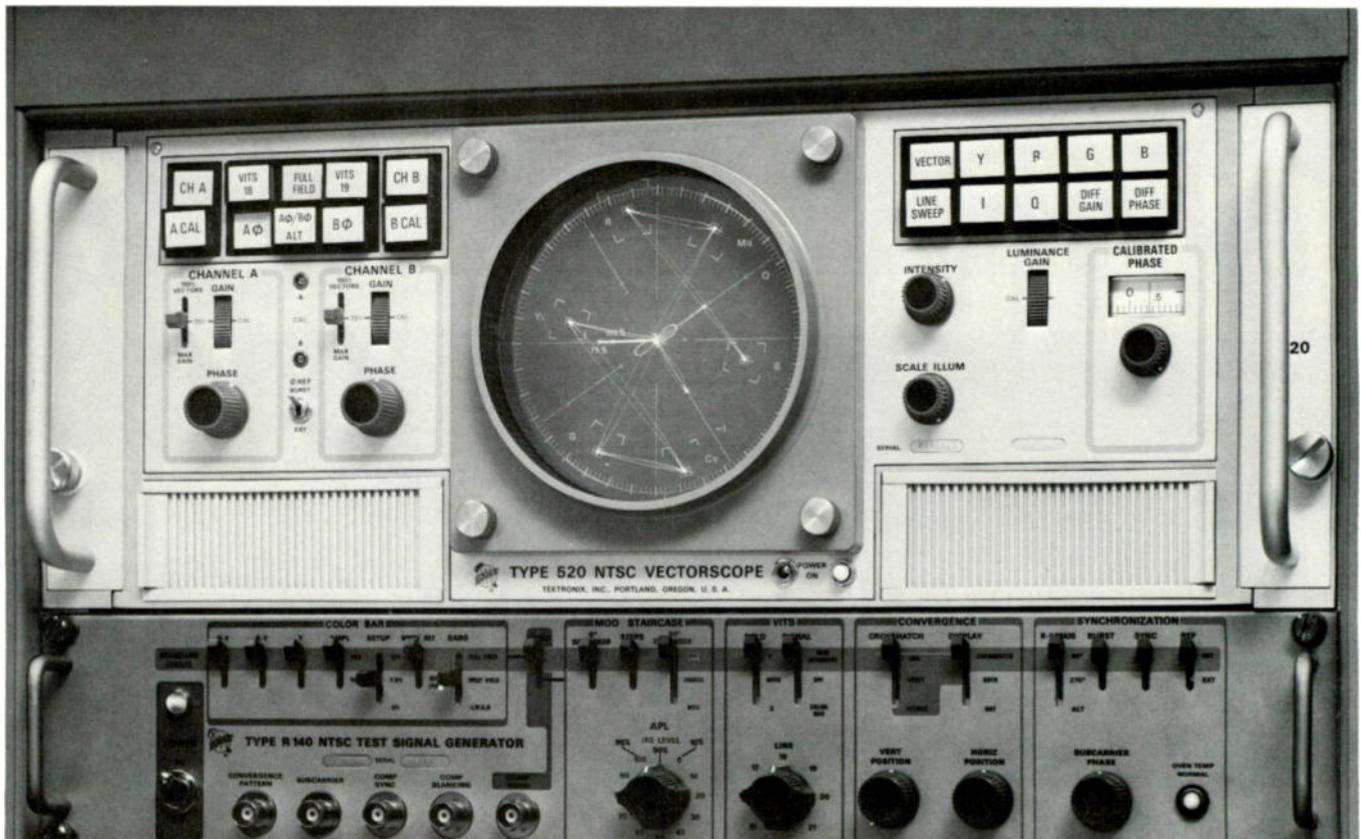
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## FCC PREPARES CATV REGULATIONS PACKAGE

The FCC at "Late News" press time had just completed preparation of its sweeping package of CATV regulations and proposals.

The prime area of dispute was the "CATV Public Dividend Plan," which won approval of the Commission, with some modifications. But the proposals will not be adopted as rules or even as interim procedures. They will simply be proposals.

### Commissioners Divided on Issues

A total of seven documents were issued. A 4-3 split was the vote count on the controversial portions, such as the "public dividend plan." Opposing Chairman Dean Burch and his majority were Commissioners Robert Bartley, Kenneth A. Cox, and Robert Wells. Joining Burch and the majority were Robert E. Lee, Nicholas Johnson, and H. Rex Lee.

Only two of the documents embody effective rules — and they will be restrictive in nature. All the Commission plans that might meet with favor in the cable industry are simply proposals. As is well known, proposals sometimes are not adopted at all, or are adopted in vastly different forms, or languish for years before any action at all.

### Dividend Plan: Issued as Proposal

The CATV public dividend plan has been issued as a proposal. It follows the essential form as reported earlier including seven-tenths of one percent of a system's CATV revenue be paid for copyright liability on distant signals. For each distant signal, another seven-tenths of one percent would be levied to encompass all educational signals imported.

The document does suggest, however, that it might not be high enough a copyright scale and also notes that the amount is subject to readjustment. The proposal retains the idea of UHF stations inserting commercials locally in distant signals, but suggests that CATV systems share substantially in the cost of such insertion. The initial proposal was that the UHF stations bear the cost.

The plan also retains the requirements that 5 percent of the CATV systems revenue go to support the noncommercial Corporation for Public Broadcasting.

Technical standards include requests for comments on 20 and 40 channel CATVs, the extent of two-way communications that should be required in new systems and a possible requirement that all CATVs provide local channel and program facilities within its franchise area.

### Same Market TV Out of CATV

A final rule was adopted banning television station ownership of cable in the same market and banning all network ownership of cable.

The Commission proposes to ban newspaper and radio cross-ownership of CATV systems in the same market. It will also seek to limit total number of systems and the total number of subscribers that any one CATV owner may have.

The petition to reconsider the Commission's earlier rule that large cable systems be required to originate programming beginning January 1, 1971, was dismissed by the Commission. It will, however, extend the effective date of that date to April 1, 1971. It also will apply pay television

# Late News (Continued)

rules to any programs carried by CATV systems that require per-channel or per-program payment. Along with the television station and ownership ban, these rules are the only firm action by the Commission in the documents proposed for consideration.

An inquiry will also be begun by the Commission into the complex snarl of federal-state relations and regulations of CATV. FCC did, however, propose a two percent maximum franchise fee.

## KANSAS HIGH COURT THROWS OUT WICHITA FRANCHISE

The Supreme Court of Kansas has issued an unusual decision invalidating the CATV franchise for the city of Wichita.

The court, in handing down its decision, emphasized the word "unreasonable" and listed five points of objection to the franchise. The five points were:

1. City cannot enact unreasonable ordinances under guise of police power.
2. Municipality has no authority under police power to regulate business of a private commercial enterprise arbitrarily and unreasonably under the guise of promoting public health or public welfare of a community.
3. Ordinance regulating public streets may be sustained under municipality's police power, but the regulatory provisions chosen must be reasonably designed to accomplish the purpose and have a rational relationship.
4. Ordinance which empowers officers of a city to issue a CATV system franchise or refuse such franchise at will is arbitrary and void.
5. Ordinance which attempts to force a private commercial enterprise to submit to regulation as a public utility before it can do business in the city is unreasonable and void.

The Supreme Court decision overturned a previous district court decision on the case filed by Community Antenna Television of Wichita, Inc., against the City of Wichita, Kan.

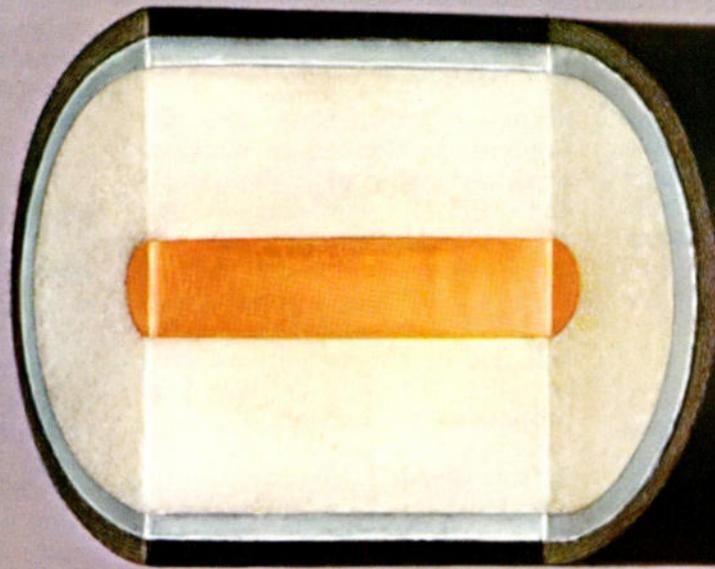
The high court said that "we find nothing in the business of a CATV system which would reflect on public health or morals. What the system brings into the home is first broadcast by an authorized broadcasting company. We do not believe that the requirements and provisions in the ordinance . . . have any rational relationship to the use and rightful regulation of the city streets."

The court specified—speaking of the ordinance—that it deals "more with the management of the internal affairs of the CATV system, which for our review here must be considered as a commercial enterprise. We are also of the opinion that the ordinance puts it in the power of the city commission to grant or refuse a franchise at will," said the court decision.

## 20-YEAR NYC FRANCHISES BEFORE CITY BOARD

The City of New York has disclosed details of the twenty-year cable television franchise contract that it proposes to award to Manhattan Cable Television and to TelePrompTer, authorizing the companies to construct and operate a "broadband communications facility" in Manhattan. In addition to CATV service, the companies are permitted to offer "burglar alarm, data or other electronic intelligence transmission, facsimile reproduction and home shopping" services.

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## FCC Takes Tentative Steps On Limiting Ownership of CATV

FCC in an all day meeting June 11, took a giant step toward the eventual adoption of a new package of CATV rules. The Commission scheduled another meeting and final approval and issuance of the package was not expected for another couple of weeks.

### Signals Not Discussed

Tentative Commission votes were taken on ownership limitation and technical standards, though the distant signals provisions of the "CATV public dividend plan" were not discussed.

The crucial tentative decisions

hinged on ownership and the Commission decided to ban network ownership of cable systems and forbid television station CATV cross-ownership in the same community. It was decided that a similar cross-ownership ban on newspapers and radio stations will not be adopted immediately as rules but will be issued as proposals for comment.

### 3 Years Given

The network and television ownership ban will be effective retroactively with current owners given 3 years to dispose of con-

flicting interests. Trades will be acceptable to the Commission.

Such ownership rules have been under consideration since late last year.

Multiple cable ownership will also be the subject of rulemaking proposals. Several different possibilities for restrictions will be suggested by the FCC. Ideas will be invited on limiting the number of systems, number of total subscribers and area concentration of ownership of any single CATV owner.

## CATV To 'Breathe Better' Under Rules Says Burch

At a hearing before the Senate Appropriations Subcommittee, FCC Chairman Dean Burch spelled out his philosophy on the regulation of cable television programming.

After he mentioned new CATV rules to the subcommittee chairman, John O. Pastore (D-R.I.), who is also Chairman of the Senate Communications Subcom-

## meetings

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- ✓ conference
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## Cypress, Harriscope Merge

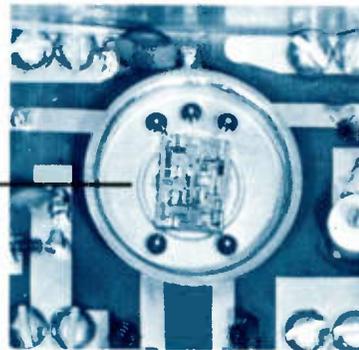


The contract joining Cypress Communications Corp. with Harriscope Cable Corp. has just been signed by (seated left to right) Burt I. Harris and Leon N. Papernow, president and chairman of the executive committee, respectively, of the newly-combined firm. Shaking hands with Papernow is Richard C. Memhard, president of Shelter Resources Corp. Also shown are directors of Cypress, Thomas M. Curtin and Thor W. Kolle, Jr.

# Introducing Century 21

The CATV Industry's  
First Hybrid Integrated-Circuit  
Push-Pull Amplifier.

Here's the heart of it!



High quality and improved reliability of hybrid thin-film amplifier (shown actual size) meets stringent requirements of today's wideband cable communications systems. The RF microcircuit in hermetically sealed package provides superior operational characteristics in trunk, bridgers, distribution and reverse amplifier applications.

Enter: The age of sophisticated thin-film circuitry for CATV cable systems!

How do you design quality service into large, elaborate metropolitan cable systems? . . . quality that keeps subscribers satisfied?

One of the best places to start is with the amplifiers. Anaconda Electronics did. And, the result is this new hybrid IC, Century 21 Amplifier.

At its heart is the industry's first application of thin-film, microcircuitry designed specifically for cable communications.

The reason why an IC amplifier delivers better quality signals than conventional amplifiers is that thin-film hybrid microcircuits make it possible to incorporate as much sophistication, or circuit complexity, as is absolutely necessary for the best possible performance with optimum reliability or repeatability.

Anaconda Electronic's use of advanced IC techniques in the Century 21 results in a minimum number of discrete components thus affording a high reliability factor in each unit.

The totally modular Century 21 is basically a high-performance,

unidirectional, push-pull CATV amplifier, but designed with optional two-way transmission capabilities.

This new amplifier not only provides excellent stability and repeatability, but it offers the broadest bandwidth of any cable communications amplifier available today.

For the best built-in quality throughout your cable system, no matter how large (or small) get all the facts about Century 21, the new one from Anaconda Electronics — first in IC technology.

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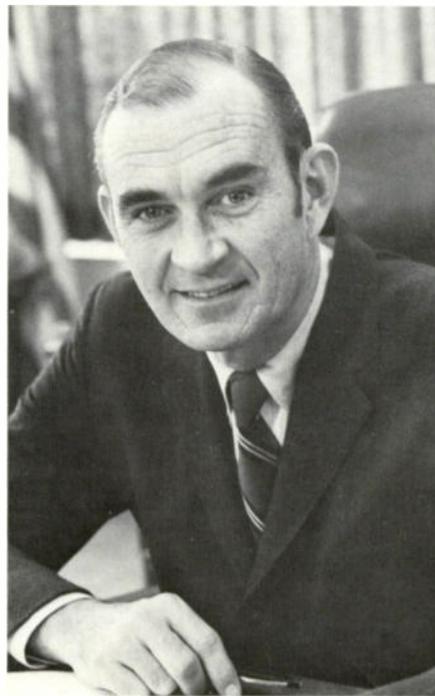
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mittee, Pastore asked how FCC could protect regular television outlets from having their programming pirated by CATV networks and shown to the public for a charge.



*Burch: says its too early.*

Burch said that the Commission would not let that happen, but he stressed that it is too early to try to impose severe restrictions on cable programs. He pointed out that only one major city, New York City, is currently wired. He indicated, however, that FCC eventually may limit programming on cable operations much the same way it proposes to do so on subscription television.

He said that the new rules under consideration would allow CATV to "breathe better" without hurting commercial television. "Although these proposals do not constitute final action," Burch told Pastore, "I believe it is significant in demonstrating that real efforts are being made by the Commission to address itself to a major policy issue which must be resolved without further delay."

Burch, whose new but vigorous chairmanship was praised by Pastore, asked for the full \$24,900,000 budget originally set out for the FCC in the administration's request to Congress. The House took \$175,000 off that total.

## H & B, TPT Stockholders Approve Merger Plans

Stockholders of both TelePrompTer and H&B have overwhelmingly voted approval of the merger plans of the two firms. Once the Federal Communications Commission and the Securities and Exchange Commission also give their approvals, the "new" company's existence as by far the largest CATV system operator will be finalized.

Shareholders of both firms met in New York City. TelePrompTer holders voted 1,003,505 shares in favor of the merger, 2,098 against. H & B stockholders voted 4,562,970 for the merger, 20,848 against. TelePrompTer will be the survivor.

## CCTA Entertainment



*Introducing Canadian Radio and Television star Eleanor Collins at the Cascade-Welsh Group Party given during the Canadian Cable Television Association Convention is Stan McKelvie of Cablevision Systems Consultants.*

When you invest in amplifiers for your cable television system, you'll find many competitive manufacturers who will engineer a system that is "spectacular" in the number of amplifier units they'll install on your cable. They need all those amplifiers to do the job! Not so with C-COR.

C-COR engineering reduces the number of amplifiers . . . and thus the number of problems. HTP/HTP — half the parts, half the problems. With a C-COR system, you get the greatest signal fidelity even on the longest cascade. This means improved reliability and lower maintenance cost . . . all with a picture that is stable throughout your system.

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dB to go that specific distance with lower noise and less distortion. This makes it possible to operate the longest trunk to meet any performance standard.

C-COR bridging amplifiers, with an output capability of 6 to 10 dB above those commonly used, provide maximum efficiency for the distribution portion of the system. The higher operating level increases the feeder length and drastically reduces the number of line extenders — reducing maintenance cost and operating problems.

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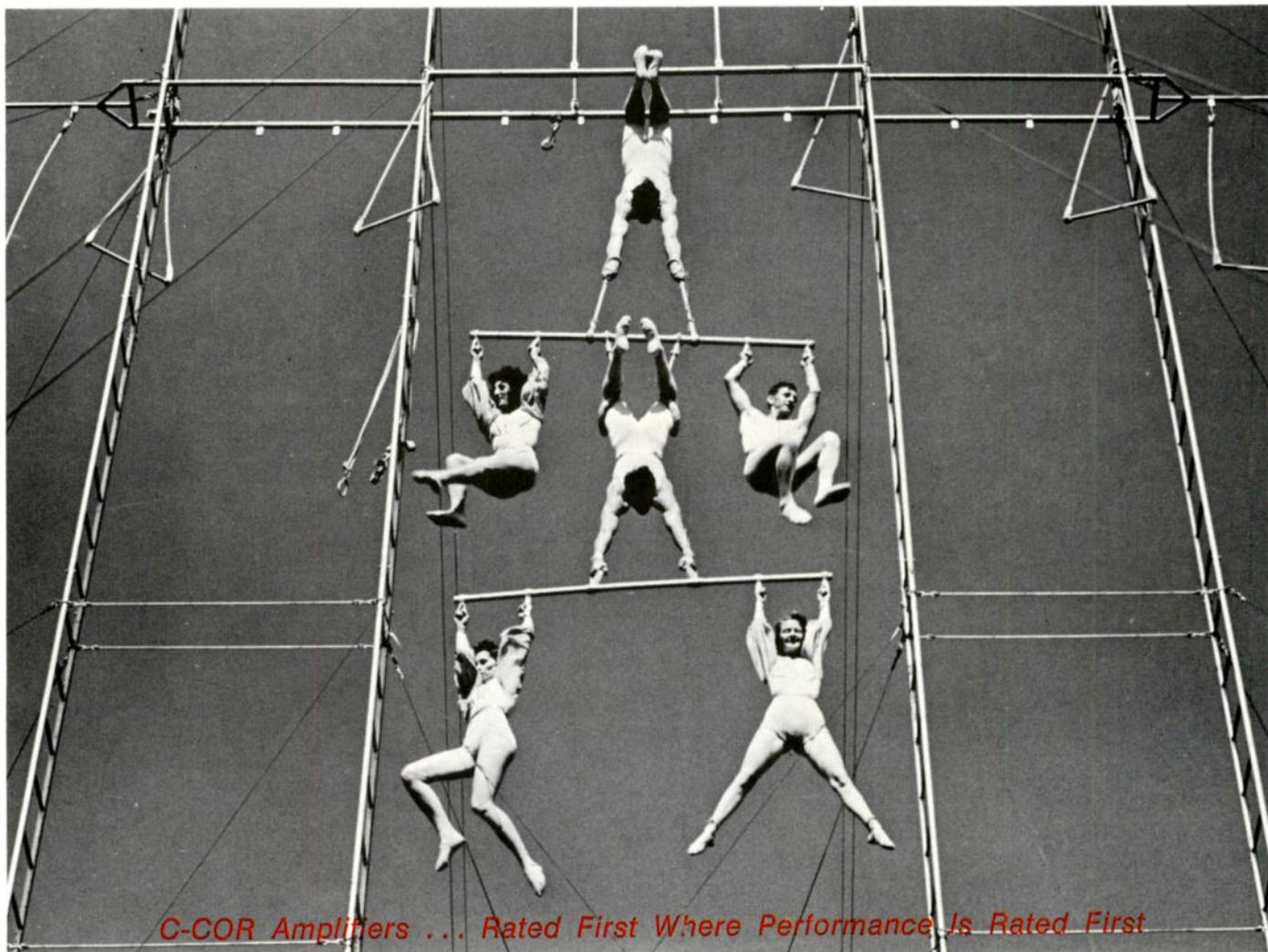
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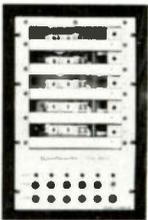


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Ten/70  
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- The classic 500C
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- Stereo models
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- Five-Spot (5-cartridge deck)
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Versatile Five-Spot

### Cartridge Tape Accessories

- Tape cartridge winder
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Tape Cartridge Racks

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- Degaussers (head demagnetizers & cartridge erasers)

- Telephone answering accessory
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- Head cleaning fluid
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Company officials said they expect no opposition from either the FCC or the SEC; nevertheless, estimates are that the government approvals would come no earlier than this month.

### Illinois-Indiana Meeting Is Legislative Success

Slanted toward legislative progress in the states of the Illinois-Indiana CATV Association, the annual meeting of the association took on additional sparkle with an unexpectedly large turnout of state legislators at the meeting.



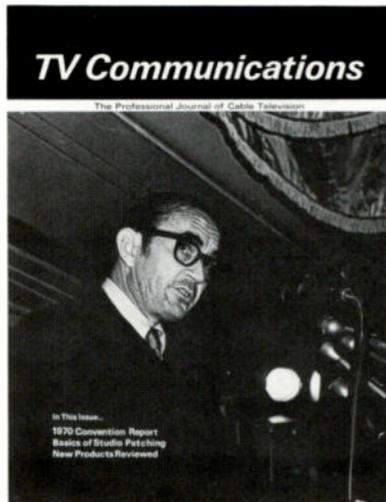
Adler: speaks to cablemen.

Discussion on a recently defeated bill which would have placed CATV under jurisdiction of the Illinois Public Utility Commission was the main topic of conversation at the meeting held in Springfield, Ill. Election of officers and a list of notable speakers rounded off the three days of meetings.

All state representatives from Illinois were invited to attend the meeting and 89 of the state solons were counted in attendance. The association membership was particularly proud of the turnout in addition to its effective lobby which resulted in the defeat of a recently-introduced PUC bill.

The bill was held in the House Municipalities Committee and not delivered to the floor for a vote. The PUC bill would have repealed a two-year-old Municipalities Bill which granted cities the right to franchise and tax CATV systems, and in addition would have given the PUC the right to regulate the industry.

New officers elected in a last-day business meeting are Chuck Younger, Quincy Cablevision, Quincy, Ill., president; and Phil Aston, Lafayette Cable TV Co., Lafayette, Ind., vice president. New second vice president is Al Stelk, Kankakee Cable TV, Kankakee, Ill., and new secretary-treasurer is Doug Phillips, Flora Cable TV, Flora, Ill. New directors for the upcoming term are Don Johnson, Rock River Cablevision, Sterling, Ill., and George Nichols,



### This Month's Cover...

The Honorable Dean Burch, Chairman of the Federal Communications Commission spoke to cablemen on the afternoon of the final day of the 1970 NCTA Convention. Received with a standing ovation, he told the audience, "The time is now right for a breakthrough for your industry." When one newsman queried him about the speech's implications for big city cable, he told the reporter to look for CATV service in the major U. S. cities "very soon." The hopeful expectancy of his speech typified the spirit of CATV's "coming of age party." 

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Quinton Cable TV, Quinton, Ind.

First day sessions of the annual meeting featured Ralph Demgen speaking on "Copyright and CATV," John Guinn discussing "Choosing Our Course in Origination," and Ed Schaffer talking on local regulation of CATV.

Featured guest speakers were Don Taverner and Bill Adler of NCTA, who spoke on the state of the industry and what cablemen should do to improve it.

### **NCTA Endorses Federal Preemption of CATV**

NCTA's board of directors has endorsed in principle "federal preemption of the field of CATV regulation consistent with the orderly growth of the cable TV industry."

The action, which approves the recommendation of the NCTA Regulatory Research Committee, was in response to increased state action in the field of public utility commission regulation.

NCTA President Donald V. Taverner said that the action doesn't change the NCTA position on copyright.

### **Comments on Political Time May Include NCTA**

Democrats have taken several actions on the political front that may have profound impact on television and, more and more, on CATV.

The House Democratic caucus generally rallied around Senate-passed legislation that would revoke the equal time law for Presidential and Vice Presidential candidates and would put a spending limit on television time buying in political races. Candidates would be limited to seven cents per vote for that office polled by their party in the previous election.

Representative Torbert Macdonald (D-Mass.) and his Communications Subcommittee, or perhaps the Parent House Commerce Committee chaired by Representative Harley O. Staggers (D-W.Va.), will hold hearings on

the measure. Republicans are expected to oppose the bill, partly because their party is in much better financial shape than the Democrats and wouldn't mind being able to buy up huge blocks of air time if opponents lacked similar money.

NCTA may very well be asked to testify at the hearing, and Congressmen are aware that cable operators have often allowed political candidates to appear on their local channels. They are interested in what charges may eventually result and how costs can be kept down.

In a related action, the Democratic National Committee has asked FCC for a declaratory ruling that the television industry cannot deny responsible political groups the right to purchase commercial time for the purpose of fund solicitation and discussion of public issues.

### **NCTA Appoints New Assistant to President**

Larry D. Bowin, 26, has been appointed assistant to NCTA President Donald V. Taverner.

He has been assistant to the president of Metropolitan Pittsburgh Educational Television for the past two years. That was the post filled by Taverner before he joined NCTA, so in effect Bowin is simply retaining his slot with the new NCTA president.

"At NCTA," the official announcement of the appointment said, "Bowin will be responsible for the implementation of special projects and association activities not normally handled by the various NCTA departments. He will also assist in the management and administration of NCTA office activities and concerns."

The new NCTA staffer, who is married and has one child, holds a B.A. in Communications Arts from the University of Cincinnati, an M.A. from Ohio University, and has credits toward a Ph.D. in Communications Arts.

Taverner said of Bowin that "he brings to NCTA and the cable industry a strong background in education, television production, management and organization." **rv**



## Another distinction for Akron, TVC, and Kaiser CATV!

Long-famed as the world's rubber products capital, Akron, Ohio, will soon have another claim to fame . . . one of the world's largest and finest CATV systems □ TeleVision Communications Corporation (TVC), holder of the Akron franchise, chose Kaiser's new Phoenician XR (Extended Range) Series for this 1,300-mile dual-cable installation after careful evaluation. The "XR" Series incorporates the latest in push-pull



techniques, and is capable of carrying up to 32 TV channels plus FM on each cable. □ This is the largest CATV equipment order ever placed for a single location! Which backs up what we've been saying all along: From the smallest system to the largest, Kaiser CATV can provide "just right" equipment of latest design and highest reliability. □ If you're thinking small or thinking big, think first of Kaiser CATV.

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# FOCUS

... On People

## Systems

John F. Gault has been named vice president, marketing of American Television and Communications Corp., according to Monroe Rifkin, president. Formerly president of Commonwealth Cable Television, Inc., Gault will now headquarter in New York City for Denver-based ATC. In his new position he reportedly will be primarily responsible for the development and implementation of marketing programs to acquire new cable television franchises and to broaden the firm's subscriber base.

Community Tele-Communications, Inc., an operating division

of Tele-Communications, Inc., has promoted J.C. Sparkman to the position of general manager, according to W.R. Brazeal, executive vice president. Previously district manager at large for the firm, Sparkman will now assume responsibility over administration of the firm's existing CATV properties. He joined the company in May, 1969, from the Jerrold Corp., where he served as national sales manager, MSO.

Garden State TV Cable, operator of an 11 video channel system serving Vineland, N.J., has appointed Arthur D. Heiny as general manager, according to William Bauce, vice president of the Reeves Cable Division of Reeves Telecom Corp. Heiny was

most recently vice president and general manager of Valley Cable TV, a Time-Life affiliate, which operates a 143-mile cable complex located in western Pennsylvania.

## Suppliers

Joseph H. Pascual has been promoted to the position of plant manager of the Essex International, Inc. Communications & CATV Division facility in Decatur. Pascual was formerly manager of production and inventory control. He joined Essex in March, 1966, after having been associated with Anaconda Wire and Cable for 10 years.

Gordon E. Halverson has been promoted to the CATV Sales Department of the Pruzan Company. He has been an assistant purchasing agent with the Seattle firm since 1969. Prior to joining Pruzan, Halverson was a buyer in the Boeing Company Aerospace Division for more than three years.

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Mr. Gault



Mr. Sparkman

The Finney Co., manufacturer of Finco Antennas, Bedford, Ohio, has announced the appointment of Tore B. Nordahl to the newly created position of chief engineer, Electronic Division. Prior to his new position, Nordahl held senior design engineering positions with Kaiser CATV, HTV Systems, Inc., and systems engineer with TelePrompTer Corp.

Cal-Tel Construction Co. has announced the promotion of Bruce Lukkarila to the position of engineer manager. In his new position, Lukkarila will be responsible for strand mapping, system design, alignment of electronics and proof of performance. He was formerly with Bakersfield (Calif.) Cable TV where he was in charge of engineering and construction.



# LEVEL HEADED?

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# The 1970 Convention: CATV Has Come of Age!

The following wrap-up report, along with the Trade Show reviews on pages 44 and 54, reflect the vitality of the 19th annual NCTA Convention.

“So many have committed so much in the likelihood of your success. Your faith in your own future should be renewed.”

The words are FCC Chairman Dean Burch's, spoken on the afternoon of the final day of the NCTA 19th Annual Convention. And they summed up well the mood of hopeful excitement which infected the over 5,000 cable people meeting in Chicago.

Chicago was definitely “where the action was” in CATV. The new technology on display, the prestigious visitors on hand and the full and solid ranks of cable operators all testified to the commitment which Chairman Burch noted.

The exhibit floor was constantly busy, filled with cable people eager to see the advanced, new design equipment. Two-way displays, ranging from understated simplicity to elaborate set-ups, attracted throngs. So did the local origination booths where operators could try out everything from a time-weather machine to a full color studio.

Long-time cablemen such as Charlie Clements, vice president of Tele-View, looked around the Palmer House and could only grin thinking of the forty or so cable

people present at the first annual convention in Pottsville, Pennsylvania. One measure, small perhaps, but significant, of the distance the industry has come in the past two decades was the guest list at the 1970 show. For the first time in its history, the CATV industry welcomed the chief executive officers of such industrial giants as Anaconda, Kaiser Industries and Essex International.

## “Some Kind of Magic”

If some of the “family familiar-



ity” is missing from the 1970 CATV industry, it has been replaced with a sense of fully mature professionalism. Yet the faith of the few gathered in Pottsville has been kept by the many gathered in Chicago. “You people have something on your side which nobody else has . . . some kind of magic,” said Dr. Eugene Rostow, Yale law professor who headed the President's Task Force on Telecommunications.

Rostow's address to the Convention emphasized — as did all of the speeches — the tremendous promise and potential of cable communications. Herbert G. Klien, White House Director of Communications, reflected a similar attitude in his address. “The name of the game,” he said, “is innovation. Your industry can go in many directions . . . but it depends on you.” And NCTA president Donald V. Taverner, in a vibrant keynote address, said, “My confidence in this industry has never been firmer, my optimism never higher.”

In a message spiced with his usual dry humor, Taverner reminded CATVers that, despite the very real problems they have had in the past, the past must be used to build on, — not to live in.

He spoke of the FCC, and pledged his personal assurance that the Commission leadership "does not want to either damage or destroy the existing industry."

### "The Time is Now Right"

But of all the words spoken at the Convention, the most encouraging by far were those of FCC Chairman Dean Burch. He was welcomed with a standing ovation . . . and concluded his speech to another.

"I do not come here as a saviour of your industry," he said. Yet his caution failed to dampen the enthusiasm of his audience which heard for the first time ever from an FCC Chairman: "The time is now right for a breakthrough for your industry."

But if those were words never before heard, Burch had others even more inspiring and far more concrete: "It is time — indeed, past time — to act on distant

*FCC Chairman Dean Burch (opposite page) encouraged operators with an address in favor of CATV.*

*NCTA counsel Marjorie Reed (below) casts her ballot in the CPC straw pole.*

*Taking part in a panel on broadcast/CATV relations were a number of well-known CATV and broadcast attorneys (upper right).*

*Irving Kahn receives the Larry Boggs award (center left).*

*New NCTA Chairman Ralph Demgen addresses cablemen (center right).*

*Operators were well entertained at the Tuesday evening banquet by three excellent acts and the Norm Krone orchestra. (below center).*

*Herbert Klein, Director of Communications for the Nixon Administration, (lower right) addressed cable operators at Tuesday's luncheon.*



signals. We owe it not only to you, but to the American public."

Again and again throughout the Convention the same sentiment was repeated many times: CATV has come of age, and cable people have their faces to the future, demanding of themselves and others that they meet the challenge of cable communications.

The mood was typified perhaps by an incident on the final day of the convention. A panel discussion on "The TV Receiver-CATV Interface" was in session with representatives from several of the leading receiver manufacturers among those at the speakers' table. Part way through the presentation, Sruki Switzer, Chief Engineer for Maclean-Hunter CATV in Toronto, asked permission to interrupt.

"You are telling us," he said, "all of the things you *cannot* do for us! I've been unable to get the tuner I need — no manufacturer has been willing to make that investment. Our firm has, therefore, committed a half-million dollars to get that tuner developed

ourselves. But willing to invest or not — whether you think you can meet our challenge or not — in the next years, you are going to *have* to meet our challenge. *We* will be dictating to *you* the standards!" And, amid applause from the audience, he left the meeting.

### The Issues Have Changed

Some of the issues which were so burning at the conventions in Boston and San Francisco got scarcely a nod from this year's convention-goers.

For example, during the session, "Broadcasters Look at CATV — And a Response," the broadcasting representatives (John Summers, chief counsel for NAB, and Martin Firestone, counsel for ACTS) presented the hard-line broadcast position with no quarter given. Yet the response from the audience after the presentations was almost casual. More than one listener spoke up to point out that a substantial number of broadcasters *are* CATVers. And one member of the audience

remarked, "I've been a broadcaster for years, and these arguments against CATV remind me of nothing so much as the old futile arguments that radio made years ago against the upstart television.

The panel on telcos, utilities and power companies which played to a standing-room-only crowd last year drew a fair audience again this year — but an audience without the same adrenalin level this time. Far more real concern was in evidence at the session on labor unions — a subject which only a few years ago didn't even rate a mention.

Interest in broadband services also reached a new high. A full-length management session chaired by Archer Taylor of Malarkey, Taylor and Associates treated such cable applications as distribution of electronic mail, meter reading and shop-at-home.

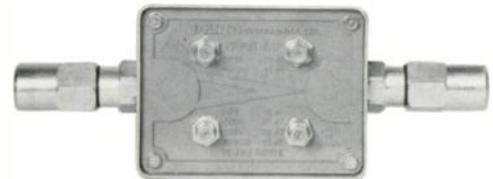
Appropriately, the man who for many personifies the concept of broadband cable communications was honored with the Larry Boggs Award for outstanding service to the CATV industry... Irving B.

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10	3.0	3.5	34	30	24	20	20	18	19	18	18	18	23
20	0.5	0.8	42	41	22	21	20	20	20	20	18	18	23
35	0.5	0.7	58	57	23	22	22	18	21	21	27	25	35

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Kahn, president and board chairman of TelePrompTer Corp.

New England cable operator Al Ricci—a long-time favorite on CATV Convention stages—made the presentation to Kahn. “This year’s recipient of the Boggs Award,” said Ricci, “burst upon the industry like an atomic bomb a decade ago. Now, it has never been considered particularly pleasant or desirable to be in the impact area of a bomb. In this instance, the experience for many of us was, initially, a staggering one.”

“Once we had determined, however,” Ricci continued, “that the gentleman was indeed for real... that he had come prepared to go the distance... we began to appreciate him... a man recognized as one of the industry’s spokesmen, his words heard from Wall Street to Washington.”

Wall Street was listening to CATV—and vice versa—at this 19th Convention. A number of investment bankers and brokers stopped by to visit, some to stay. Considering the number of men in the audience whose interests are tied to public companies, a session on taking cable firms public was particularly timely. Although the panelists spoke cautiously about today’s market, and although considerable comment about the depressed Dow Jones was heard around the tables; no sentiment but optimism was expressed concerning the cable market.

## Sales Better for Everybody

And despite the tight money situation, more than one operator went on a buying spree in the exhibit area. A vice president of one of the leading manufacturers commented: “Sales are better this year than they’ve ever been—better for everybody, not only our company.” And another manufacturer’s manager, relaxing in a hospitality suite after midnight, reflected with considerable satisfaction that he couldn’t even staff his booth with enough people to handle the crowd that day.

Even the annual membership meeting had an element of the unexpected. Ed Allen, nominated

by petition for the office of secretary, and Bob Weary, nominated by petition for a directorship, won over opponents proposed by the official nominating committee... an event which lent strength to nominating committee chairman Beisswenger’s plea for reform of the nominating process.

Ralph Demgen, choice of the nominating committee for national chairman, was also the unanimous choice of the membership. Praised by retiring chairman Bill Adler for his dedication to the cable television industry, Demgen gave ample evidence of his feelings in a fervent “inaugural address.” He challenged the men and women of cable television to join NCTA, to work for NCTA, and to unite in pursuit of their goals... to give proof of Don Taverner’s statement in his keynote address that “One of our greatest resources is the quantity and quality of leadership in this industry.”

John Gwin, elected vice-chairman of the association, was also honored at a final-day luncheon with an award for the best committee leadership work in the past year. Gwin had served as Legislative Committee chairman. Claude Stevanus, nominee for treasurer, was also elected unanimously to that office by the membership.

Seven new directors were chosen, six of them to fill three-year terms and one to fill a one-year term left vacant by the resignation of Fred Lieberman. The full-term directors are: Polly Dunn, Columbus (Miss.) TV Cable Corp.; Eugene Iacopi, Television Signal Corp. of San Francisco, Calif.; Lawrence “Duff” Kliever, Peninsula Cable Corp.; Bruce Lovett, American Television and Communications; Bruce Merrill, Ameco; and Robert Weary. Bill Karnes of Trans-Video was elected to the one-year term.

Also elected to the board was Robert Behringer, vice president and manager of Kaiser CATV. Selected in a separate meeting of the NCTA Associate Members, Behringer will represent that group on the Board for a one-year term.

This 19th Annual NCTA Convention can only be summarized

as a source of immediate, exciting promise for the cable industry. This obviously upbeat note was dynamically spurred by FCC Chairman Burch’s words on Wednesday; but was also already clearly evident in the enthusiasm over many facets of cable technology. Two-way transmission, auxiliary services, cablecasting hardware and software, and advanced concepts in system management and marketing all received unprecedented interest from cablemen. For those who have been associated with CATV for any number of years, it was dramatically apparent that CATV has indeed come of age! TVC

## Pioneers Club Honors Five

The CATV Pioneers Club chose five new members and honored the new additions to the CATV elite at a pre-convention party held at the Chicago Playboy Club last week.

Selected to the Pioneers Club were: Warren Fribley, Corning, N.Y.; Ralph Shepler, Elkins, W. Va.; Sam Haddock, Moscow, Idaho; John Morrissey, Durango, Colo.; and Beverly Murphy of NCTA staff, Washington, D.C.

Fifty Pioneers were in attendance this year, with the addition of the five new members.

The CATV Pioneer Awards program was founded in 1966 by TVC publisher Stanley M. Searle, and now operates as an independent fraternity of “old-timers” in the cable business.

## FOR FURTHER COVERAGE...

The July 27th edition of CATV Magazine will provide expanded photo coverage of the 1970 NCTA Convention.

Also, next month’s edition of TVC will cast the spotlight on software offerings available to the industry, with an emphasis on those companies present at the Trade Show.



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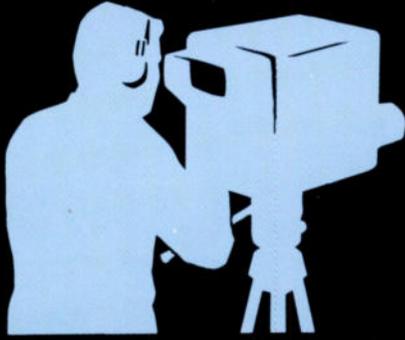
Across the country, Collins microwave systems are

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# STUDIO

*Technology*

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

## Patching Your Way To Greater Flexibility

This two-part article on patching and switching provides basic insight into multiplying the usability of your expensive origination equipment.

*By Jack A. Rickel*

Both patching and switching allow the CATV operator to connect any number of inputs to any number of outputs, thereby increasing the flexibility of his origination system. This article discusses the relative merits of the two systems.

### Part I — Patching

Patching has been around since the late 1800's when a telephone operator sat facing rows of switch jacks. By taking a cord with a plug on each end, she could interconnect any two of the jacks. Each jack represented either a

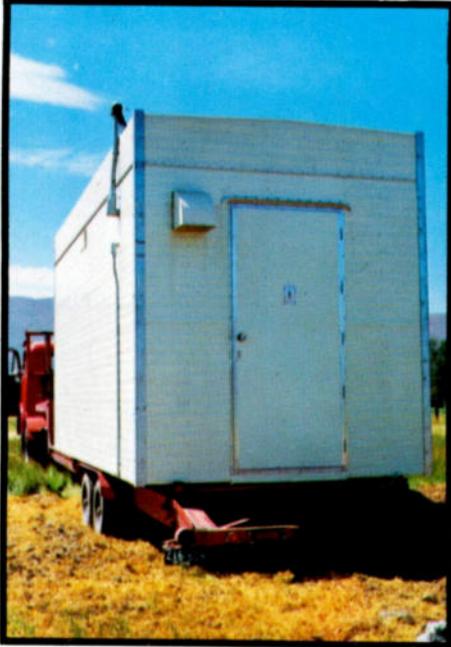
subscriber of an outside line to the rest of the world so that she had almost complete flexibility in connecting any one in the system to anyone else. We say *almost* complete flexibility since her interconnections were limited by the number of cords she had and the outside calls were limited by the number of outside lines available.

When radio developed, it too, utilized audio signals like the telephone and jack panels were employed to give the control room engineer maximum flexibility in interconnecting various pieces of equipment. In radio and

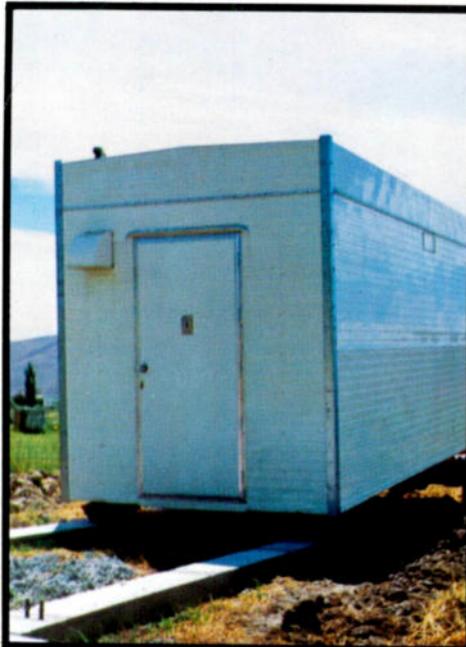
TV terminology, these jack panels are called "patch" panels, but their operation is basically the same. Any microphone, record player, telephone line or audio tape recorder can be interconnected by means of a patch panel and patch cords to any output such as appropriate mixer inputs on the audio mixing console, or to monitor amplifiers and speakers, or to the transmitter.

The same techniques were used for the audio equipment in the TV control rooms when television came into existence. Later video patch panels were developed which allow the control operator

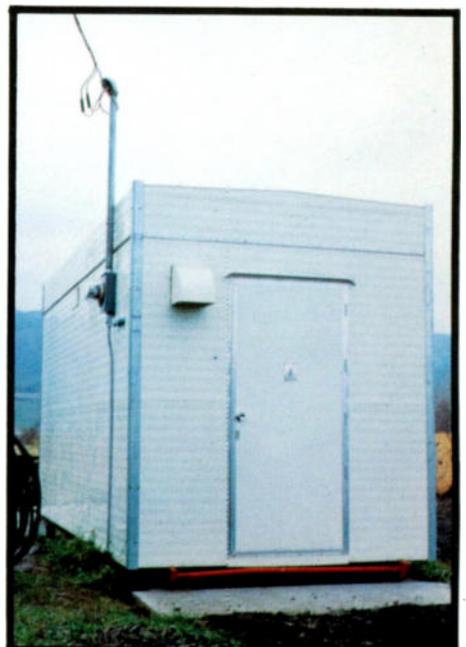
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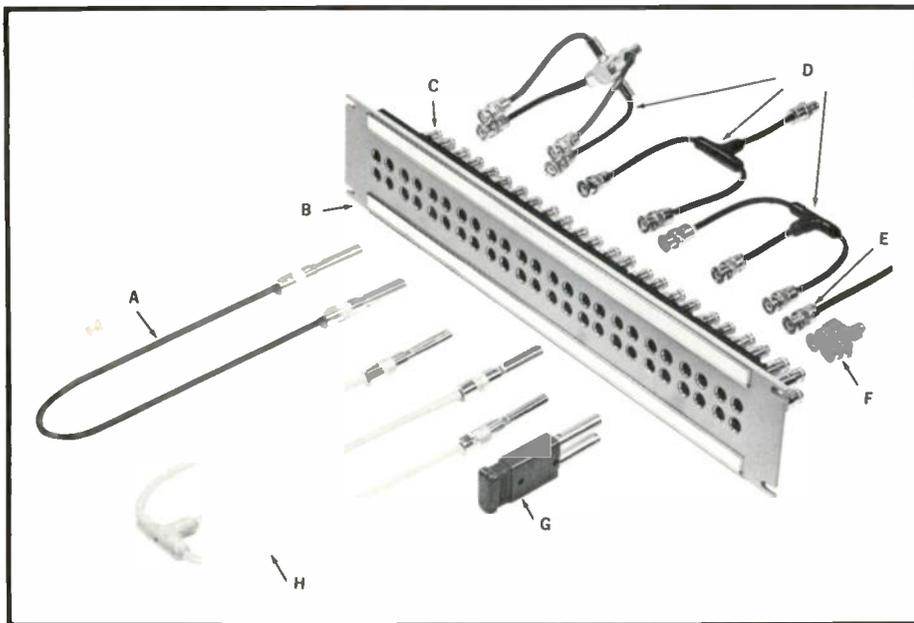


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to patch video just like audio. We'll discuss this a little later in the article.

In general, both audio and video patch panels can be described as a panel designed to fit a standard 19" rack with rows of holes across it into which are fitted jacks. Connections to and from pieces of equipment are connected to the rear of the jacks.



The above photo courtesy of Trompeter Electronics, Inc., shows (A) patch cord, (B) patch panel, (C) jacks, (D) parallel networks, (E) coax twinax triax cable connectors, (F) fixed parallel network, (G) looping plug, and (H) parallel network.

Patch cord plugs can be inserted into the jacks through the front holes on the panel. The holes are designed in pairs either side by side or one above the other for easy identification. If they are located one above the other it is common practice to designate all the top holes as inputs and the bottom holes as outputs. We'll see why in a moment. Let's assume for a moment that a certain signal generating device is always connected to a certain amplifier. The signal generating device output would be permanently wired to the top jack and the amplifier input permanently wired to the bottom jack; they may now be interconnected in three ways:

1. A normal patch cord can be patched from the top hole to the bottom one making the normal connection between the two devices.
2. A "looping plug" may be

used to interconnect the two. A looping plug usually consists of two plugs mounted in a block of insulating material to space them the right distance apart to fit the top and the bottom hole at the same time. Wiring inside the block connects the two plugs so that when it is inserted between the top and bottom holes a normal interconnection

is made between the two devices.

3. A third method is called "normal-through" and the input and output jacks are wired together on the rear of the panel to make the normal connection. This method requires nothing to be plugged into the hole at all. Insertion of a patch cord actuates extra switch contacts on the jack and the normal-through connection is broken and it can be patched like any other patch panel.

Naturally the purpose of any patch panel is to allow any input to be changed to any output. This might be for normal operation, or it might be to isolate or bypass a defective unit for emergency or maintenance purposes. The neatest in appearance of the three types of patch panel is the "normal-through," since there are no patch cords or looping plugs in it, unless you wish to bypass

something. Naturally this is the more expensive of the three types.

## Audio Patch Panels

Audio patch panels come in a variety of configurations and sizes. Early patch panels were made of heavy slabs of bakelite while today's panels may be made of either phenolic or aluminum. The jacks themselves have either palladium or silver contacts, and can be had in anything from two basic contacts to ones which switch up to six circuits. They come in two conductor and three conductor styles. Size of patch panels vary from a single row type with 26 jacks or 13 pairs, to a double panel with 52 jacks or 26 pairs. Multiple panels can be mounted one above the other to give any number of total jacks. So far we have been discussing standard jack panels with 1/4" jacks. There are new miniature jack panels with smaller diameter jacks and it is possible to buy a single panel with 96 such jacks on it or 48 pairs.

Audio patch cords are obtainable in length from 6" to 10' but the more common ones are 2 or 4 feet long. They may have a single plug on each end with two conductors on each plug or three conductors on each plug. Or, they may have double plugs on each end with two or three conductor plugs on each leg.

Telephone terminology has stuck to the contacts on these plugs and they are called "tip," "ring" and "sleeve." The two conductor types look like ordinary phone plugs with the sleeve being the brass barrel just ahead of the handle. The sleeve gets its name from the contact sleeve around the hole in the jack into which the plug is inserted. The tip is the rounded end of the plug and it is insulated from the sleeve by a spacer. A three conductor plug has a second short sleeve (or "ring") just ahead of the main sleeve also insulated from both the sleeve and tip by insulating spacers.

Audio circuits can be wired either balanced, or unbalanced on a patch panel. If unbalanced, the center conductor of the audio

cable can be connected to the tip and the shield of the cable to the sleeve. Thus a two conductor plug can carry the entire circuit. If the plug is to carry a balanced circuit the plug must either be double or it must be of the three conductor type. If double, one side of the balanced line is connected to one tip and the other side of the balanced line connected to the other tip with both sleeves connected to the shield. If a three circuit plug is used, one side of the line can go to the tip, one to the ring and the shield to the sleeve. Balanced wiring is preferred to reduce hum pickup, but the devices to be patched must be capable of balanced operation.

Audio jack panels and patch cords are made by a number of companies such as ADC, Switchcraft and Western Electric. Prices for patch panels start as low as \$10 each and can run to several hundred dollars. Patch cords are usually six to ten dollars each.

## Video Patch Panels

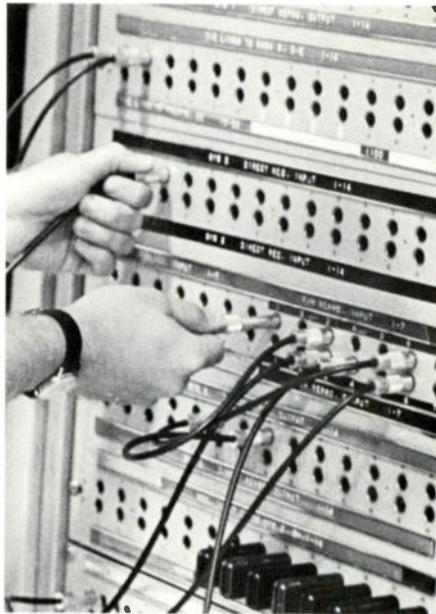
Video patch panels consist of a phenolic or aluminum 19" rack panel with rows of holes behind which are mounted the video jacks. These are usually gold plated to minimize high frequency losses and are generally quite attractive. Depending on how they were manufactured, connections to the rear of the jacks may be made by directly soldering the center conductor and shield of the coaxial cable to the jack, or the rear of the jack may be made to fit a BNC or a UHF coaxial connector. The jacks are made to maintain the concentricity and impedance of the coaxial cable and so are the patchplugs.

Like audio patch panels the video patch panel usually has a top and bottom row of holes with the input on the top and the output on the bottom. A patch cord may be inserted in the top and bottom holes to complete the circuit, a video looping plug may be used, or the video patch panel may be designed for normal-through operation.

Standard video patch panel sizes may range from one with 12 jacks to one with 52 jacks

mounted on it. Any number of these can be stacked one above the other if additional circuits are required.

Video patch cords are made from coaxial cable and the plug looks like a stepped sleeve or tube, with the center pin mounted concentrically. Standard lengths are 6, 12, 18, 24 and 36 inches long, although special lengths are



*Photo of rack mounted patch panels courtesy of Trompeter Electronics.*

available. Looping plugs are also available, but the wise system owner would consider buying video patch panels in a normal-through configuration since a large number of either video patch cords or looping plugs become quite expensive.

Video patch panels and their accessories are available in 50, 75 and 93 ohms. Make sure you order 75 ohms for normal television use.

Video patch panels are handy if you wish to change the way your system is interconnected from time to time. For example, let's suppose that you only have a six input switcher/fader and you have eight possible inputs you could feed to it. All eight input devices could be brought up to the top row of jacks on the video patch panel and the six switch inputs could be brought to six of the bottom jacks. Then by patch cord any of the eight inputs could be patched to any of the six inputs.

Video patch panels are fairly

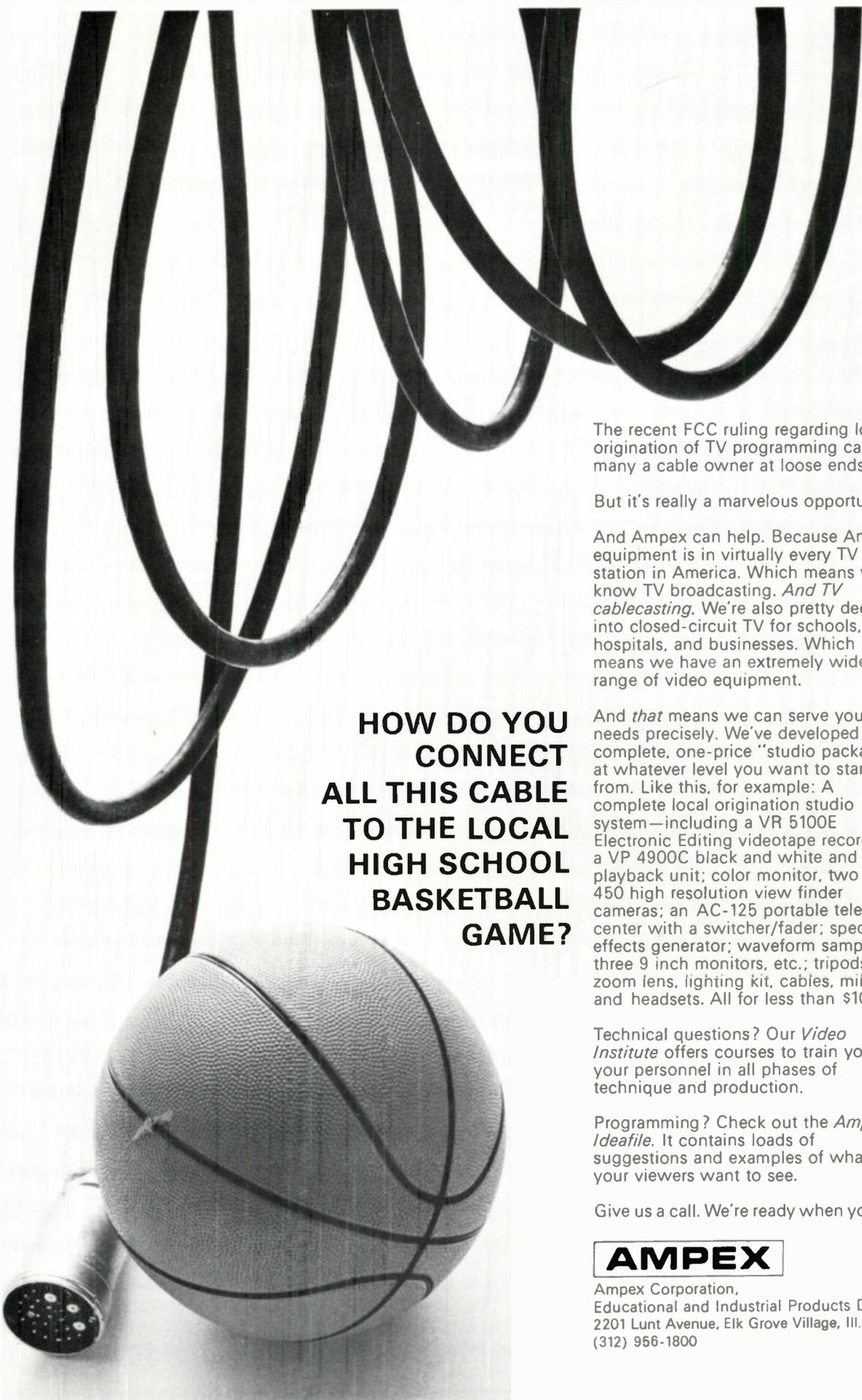
expensive and may cost several hundred dollars each. Principal suppliers of video patch panels at the moment seem to be Trompeter Electronics, Inc. and Cooke Engineering Company.

You can build your own video patch panel by mounting a number of BNC or UHF female coaxial connectors, and use the mating male plugs on each end of a short piece of coaxial cable as a patch cord. However, a word of caution here: neither BNC or UHF connectors are a true 75 ohm impedance and the mismatch may cause some high frequency losses.

Audio and video patch panels do have some disadvantages. Patching is usually used on a one-to-one ratio with one jack to the device input and one to the output. This makes it difficult to take the output from one device and feed several others. Of course, one can arrange to have distribution amplifiers associated with a patch panel, but then it takes two jacks for the input if it has a looping input and four more jacks for the output, just to accommodate one distribution amplifier. If you do not have normal-through panels, it is possible to leave the device unterminated if a patch cord or looping plug is not left in the jacks. If both high level and low level audio are brought to the same patch panel, it is possible to get feed-through from one to another if they are not physically isolated. Even though there are designation strips on the patch panels to identify the jacks it is possible to patch an output in where an input should go.

Finally, in television work if patch panels are used, one must have audio panels for the audio, and video patch panels for the video, and they must work together. The appropriate audio must be patched to go with the proper video or you have the picture from one source and the sound from another. Inexperienced operators will find it difficult to keep all those little holes and their function clear.

Next month we'll discuss switching and see how switching, particularly crossbar switching, can eliminate many of the problems of patch panels. 



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## Studio Notebook

answers to program problems



By Ken Lawson  
TeleMation, Inc.

**QUESTION:** From Jack Williams, Manager, Tele-Prompter of Liberal, Kansas. What is the best arrangement for video monitors?

**ANSWER:** Video monitors have two primary uses: (1) to check the quality of video signals; and (2) to assist in directing the program.

### CHECKING THE SIGNAL QUALITY

The first place a CATV program director will recognize such signal problems as noise, instability, loss of sync, streaking, or vidicon tube lag is usually on a video monitor in the control room. As soon as this is detected, the problem should be studied more closely on a waveform monitor, and adjustments in the camera or video recorder can be made.

There is a great temptation to adjust the horizontal, vertical, brightness and contrast controls of the video monitor to make a relatively bad picture look better in your control room. These adjustments have nothing to do, of course, with changing the quality of signal delivered to the modulator and home TV receivers. You may overdrive the video gain of the system to improve the appearance of the picture on the monitor, but succeed only in introducing audio buzz or flashing in the RF system. The level of signal delivered to an RF modulator is critical, and the video monitor is a poor test.

### CONTROLLING THE PROGRAM

The typical CATV cable-casting system has two live cameras, a video tape recorder, a film chain and automatic time, weather, and news for program sources. There is, in my opinion, a natural priority scale for video monitors for each of these sources.

The most critical combination of monitors is as follows: Have a monitor for each live camera. You essentially create your programs from these. A preview monitor is needed to "cue up" other sources. A program monitor gives a continuous check on the source which is going to the modulator or VTR.

The next monitor to add would be special effects monitor, since there is considerable adjusting between camera sources before the picture is ready to switch on line.

If a large proportion of programming is videotape replay or film, monitors for these sources become the next in priority.

The best placement of monitors in the control room console, from left to right, is as follows: camera 1, camera 2, preview, program, special effects, film and VTR. In a single man operation when one waveform monitor is used, it is best placed under the preview or program monitors. When a video man is used, the waveform monitor is best placed near the camera control units. The video production switcher should be placed below the program monitor.

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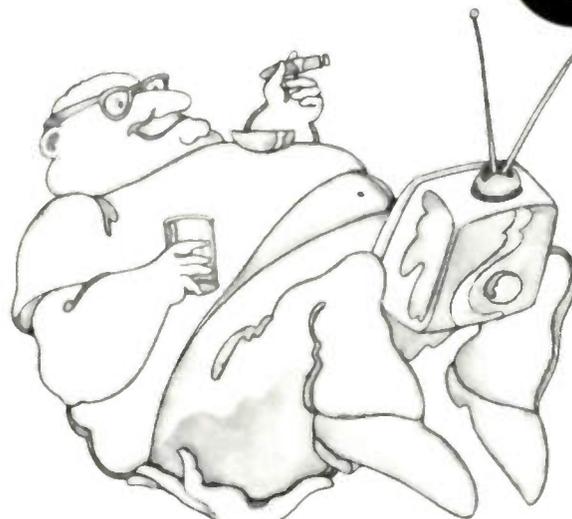
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# NCTA Trade Show Review: Equipment for the Studio

Displays of cablecasting gear took up much of the Trade Show space this year. So much to see. . . so much to consider. But, what do you really need for a successful origination studio?

*By Jack A. Rickel  
Communications Consultant*

The glittering array of lights, cameras, monitors, video tape recorders and pretty models left little doubt in anyone's mind that the theme of this year's NCTA exhibits was origination.

A few old timers were in evidence, but for many of the companies represented, it was their first time to exhibit at NCTA. A few of the newcomers readily admitted they weren't sure they understood what it was the cable originator wanted. Nor, for that matter, did many of the cable operators themselves. To the system operator who was just getting started in origination, it must have seemed complex, confusing and expensive. Some exhibitor booth personnel were friendly and helpful. Others ranged from hard-sell hucksters, through highly technical engineer types that talked over the heads of many of the attendees, to some who displayed complete indifference.

Color origination equipment was widely displayed and the results were generally excellent. Most of the pictures were being produced under almost ideal conditions. The system operator who buys one of these color systems and expects to obtain the same brilliant colors and snap when operating under his own conditions, would do well to remember (a) light levels were high on many of the exhibits or models being televised in color (some of them as high as 250 foot candles) and (b) several of the color cameras were fitted with expensive zoom lenses.

To enhance their apparent brightness and color

fidelity, some of the color pictures were displayed on professional color video monitors costing in excess of \$2,000. The smarter exhibitors mounted these monitors in areas of subdued lighting so that brightness and contrast controls could be adjusted for optimum operation.

Color cameras generally fell into two price ranges: the modest price range of \$7,000 to \$10,000 and the lower end of the professional broadcast camera range of \$29,000 to \$35,000. Norelco provided one exception with a three-plumbicon color camera in the \$21,000 to \$27,500 range.

In the modest price range, there were many companies offering color cameras such as Sony, RCA, IVC, GBC and Shibaden.

There were only three companies showing the higher priced color cameras, Ampex, Commercial Electronics and General Electric. The Commercial Electronics camera used three SEC tubes which incorporate image intensifiers and produce correct color with light levels as low as 5 foot candles. It sells for about \$35,000.

Sony had developed a three input, one output optical multiplexer for their DXC-5000 viewfinder color camera. It eliminates the necessity to remove the zoom lens and substitute a fixed lens for film use. The camera is mounted on the multiplexer and an adapter lens converts the zoom lens to film use. The camera complete with camera control, cable and



*Jack A. Rickel, president and principal stockholder of Jack A. Rickel & Associates, has designed and supervised installation of nearly 100 television studios. He has served as a consultant to CATV systems in Pennsylvania, Nevada, Alabama, Virginia, Minnesota and California.*

*Mr. Rickel designed the first color, dial-access system for the National Military Command Center at the Pentagon. He has served as a communications consultant for the Air Force and for the White House.*

*From this wealth of communications and studio design background, Jack Rickel serves TV Communications magazine as a regular Contributing Editor. His articles on the basics of CATV studio equipment and design appear each month.*

zoom lens costs \$8,500. The multiplexer and adapter lens costs \$1,450.

Video tape recorders varied from a new little ½" tape unit that did an excellent job of recording and playing back color video for \$1,200, to full broadcast compatible 1" recorders priced as high as \$18,000. Among those manufacturers represented were Ampex, GBC, IVC, Shibaden, Sony and Diamond.

Switchers were displayed by Central Dynamics, Dynair, Computer Image Corporation, Telemet, Tele-Mation, Riker Maxon and RCA. Dynair has a nice little vertical interval switcher-fader, the VS-150A that has three non-composite inputs. It sells for \$750. Computer Image has a more elaborate version in the same price range. Trompeter Electronics has an interesting combination video patch with tally lights and a matrix switch that offers the flexibility to do almost any video switching requirement.

Black and white cameras ran the gamut from \$300 self-contained units to two-piece systems in the \$7,500 range. One of the best looking new cameras was the General Electric TE-26. It will accept any vidicon, automatically adjust itself over a 20,000:1 light range, operate with internal 2:1 sync or external EIA, and produce a true 800 line resolution picture. Its price? Less than \$1,500 (\$1,460 to be exact). A lower priced unit of the same family, the TE-33 carries a price tag of only \$600. Norelco has a nice looking single plumbicon black and white viewfinder



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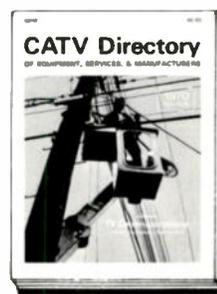
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camera for \$7,500. This includes a zoom lens with automatic iris, camera control and cable.

Camera mounting equipment, lenses, monitors and video processing equipment appeared pretty much unchanged with no striking innovations.

Catel does have a new modulator line in which the adjacent channeling filters are an integral part of the unit rather than items of equipment to be purchased separately. AV Systems, new to the CATV industry, displayed a complete portable studio and new film chain.

The present situation in CATV origination brings to mind the early days of educational and instructional television when the educator did not know what he wanted and the suppliers and manufacturers



Gene Schneider, GenCoE, Inc., joins other cablemen in an inspection of local origination gear at the RCA display.

did not know what it was the educator wanted to do with it. A lot of systems didn't work properly and a lot of money was spent unwisely. The same thing could happen to cable originators.

If you're a cable operator planning to originate, get some design help from someone who understands your needs, your financial position, the peculiar requirements of your environment, and the equipment offered by all companies. Every system and its needs are different and you are no exception. The few dollars spent for expert guidance can save you untold grief and expense in the future.

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## Scientific-Atlanta

# A State-of-the-Art Review: Expanding Cable Capability

If the CATV operator is to expand as a "cable communications entrepreneur," he must first understand the technology behind two-way and multi-channel operations. Part 2.

*By I. Switzer, Chief Engineer  
Maclean-Hunter Cable TV Limited*

The following thoughts (and those for next month's installment in this series) comprised a paper presented by this author at the 1970 International Convention of the Institute of Electrical and Electronics Engineers (IEEE). CATV development is hampered when limited to twelve channels. This article and the one next month seek to appraise the various approaches to multi-channel transmission systems.

## UHF Cable Transmission

As we look toward more than 12-channel systems, it is natural to investigate the possibilities of further adaptation of the television broadcasting system into cable transmission systems. The broadcast system, after all, has 82 channels available, 12 channels in the VHF band (54-216 MHz) and 70 in the UHF band (470-890 MHz). Cable systems may ultimately be successfully operated using those transmission channels. The following advantages and disadvantages may be cited:

1. There are a growing number of home television receivers equipped to receive these channels

without any modification or adaptation.

2. These channels are presently allocated to television services. Signal leakage into or out of the system would not affect other services.

3. 70 of the 82 channels are available in a single octave (470-890 MHz). This eases some of the system amplifier problems.

### DISADVANTAGES

1. The UHF tuners on most home receivers are very inconvenient to use. It is difficult to find and identify any particular channel. With a large number of channels, closely spaced, this becomes an even greater problem.

2. Many UHF equipped receivers will not handle adjacent channels at UHF in a satisfactory way. The basic selectivity is provided in the receiver IF and this is identical to selectivity at VHF frequencies, but the UHF tuners usually have inadequate RF selectivity and are prone to "front end" overload problems when handling adjacent channels. Local oscillator radiation from the antenna terminals may be excessive, and image rejection inadequate. These are all factors in considering reception of a large

number of contiguous channels. The FCC recognizes these shortcomings in UHF receivers by careful separation of channel allocations with regard to sound image, picture image, local oscillator radiation, IF beat, and intermodulation interferences. UHF tuners will need considerable improvement to make them suitable for use on a multi-channel UHF cable transmission system (See Table I).

3. Cable losses at UHF frequencies are very high. Cable attenuation at 890 MHz is almost exactly double the loss at 216 MHz. A typical large system today has about 1,000 dB of loss at 216 MHz between the head-end and the farthest subscriber. At 890 MHz this loss would be almost 2,000 dB! (Some losses do not increase for UHF frequencies, e.g. losses in splitters, tap devices, etc.). Assuming that 20 dB amplifier spacing remains practical at these frequencies, about 100 amplifiers in cascade would be required. Single octave operation could be employed for the UHF section of the amplifier. This would eliminate second order distortion problems, but third order problems in the form of cross-modulation and intermodulation

would still be a severe problem, particularly since the amplifier loading has been increased. An increased number of TV channels is, after all, the whole intent of the system.

4. Equalization problems in a cascade of 100 amplifiers at UHF frequencies would be very severe. Any repetitive deviation from ideal equalization becomes a very serious problem. Errors in equalization can cause some channels to be very high in level, causing overload problems; while others may be simultaneously low in level, causing noise problems. The more amplifiers in cascade the



Hamlin MCC-100 set top converter.



TPI Gamut 26 set top converter.



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more serious the equalization problem, and the more difficult the effective control of equalization.

5. UHF amplifier technology is not yet available for this purpose. UHF and microwave amplifier development has not generally concerned itself with the ultra-linearity requirements of cable TV. Amplifier output capability would have to be derated almost 10 dB from present expectations to handle a 70 channel load. A cable system using UHF distribution would require amplifiers with very stringent performance specifications.

6. Cable and connector technology would have to be devel-

oped to permit construction of large scale systems that would operate to these frequency limits. Although small UHF distribution systems have been demonstrated in Europe with as many as 8 amplifiers in cascade, and UHF is being distributed in single amplifier systems in individual buildings on this continent, it seems unlikely that UHF distribution will become a practical technique for multi-channel TV distribution on a large scale within the next 5 years.

### Extended Band UHF

The use of VHF frequencies (generally below 300 MHz) which

can be separated into 3 bands for consideration.

#### BELOW CHANNEL 2

Eight TV channels could be stacked in the space from 6 MHz to 54 MHz and another channel might be carried at baseband in the space below 6 MHz, but most cable systems might prefer to reserve this spectrum space for reverse direction (two-way) transmission.

The space below 54 MHz uses more than three octaves to provide only eight TV channels. Many aspects of transmission technology problems are compounded in multi-octave systems.

#### BETWEEN CHANNELS 6 AND 7

The FM broadcast service

Table I: UHF Station Separations, FCC Regulations\* (Channels 14-83).

Type of interference	Channel separation†	Required mileage separation‡
Co-channel	0	Zone I, 155 miles Zone II, 175 miles Zone III, 205 miles
Adjacent channel	±1 (6 mc per sec)	55 miles
Sound image	±14 (84 mc per sec)	60 miles
Picture image	±15 (90 mc per sec)	75 miles
Local oscillator	±7 (42 mc per sec)	60 miles
I-f beat	±8 (48 mc per sec)	20 miles
Intermodulation	±2 through ±5	20 miles

\* The station separations are based on the use in television receivers of the following intermediate frequencies: 41.25 mc per sec for the sound carrier; 45.75 mc per sec for the picture carrier.

† Channel separation indicates the difference in the channel numbers of the interfering and desired stations. Example: a station on channel 43 may be interfered with by a station on channel 57 (= 43 - 14), due to the sound-image responses of the receiver. Such stations must be separated at least 60 miles.

‡ The zones indicated for co-channel separations are defined in Table 2.12. The separations for the other forms of interference apply to all zones.

are not allocated to television broadcast services is another possible approach to increased channels. VHF broadcast television services occupy the following bands:

Channels 2-4      54 - 72 MHz  
Channels 5,6      76 - 88 MHz  
Channels 7-13    174 - 216 MHz

These twelve channels use only 72 MHz of the 300 MHz available. An upper limit of 300 MHz has been chosen as a dividing line above which electronic technology for amplifiers, tuners, etc. could be expected to be significantly different from current practice.

The spectrum space below 300 MHz which is not occupied by the twelve standard VHF TV channels

occupies 88-108 MHz and this spectrum space is usually used for FM radio services in cable systems. The band 108-174 MHz has room for eleven TV channels. The band 108-118 MHz is used in "radio service" by aircraft navigation services (VOR and localizers).

Some fear has been expressed that leakage from cable systems carrying TV channels in this frequency band might cause interference to these navigational services. The issue has not been firmly resolved and there has been no regulatory guidance from government on the question. System leakage on any frequency not assigned to broadcast television service could conceivably cause

interference to radio services and there is some question as to how one grades various radio services in order of "holiness."

There certainly does not seem to be any trouble of significant magnitude from the millions of local oscillator signals from home FM radio receivers which radiate into this band. Room can be found in this band for at least seven or eight additional channels.

#### ABOVE CHANNEL 13

There is room for fourteen additional channels in the space between channel 13 and the arbitrary limit of 300 MHz which we have placed on this type of operation.

#### ADVANTAGES

1. A significant number of additional channels can be added within the technical constraints of presently available VHF technology. Extension of system bandwidth to 300 MHz increases cable losses only 17% over those at 216 MHz. This increase can be handled by improvements in cable design currently available, e.g. air core and polystyrene foam cables. The number of amplifiers in cascade is increased only modestly, or not at all if we use somewhat improved cables. The increase in amplifier loading, while appreciable, is not beyond present expectations of amplifier development. Present amplifier technology should be applicable to the needs of this kind of service.

2. There is good expectation that TV set tuners and set-top converters derived from TV tuners will be readily adaptable to adjacent channel operation in this frequency range.

#### DISADVANTAGES

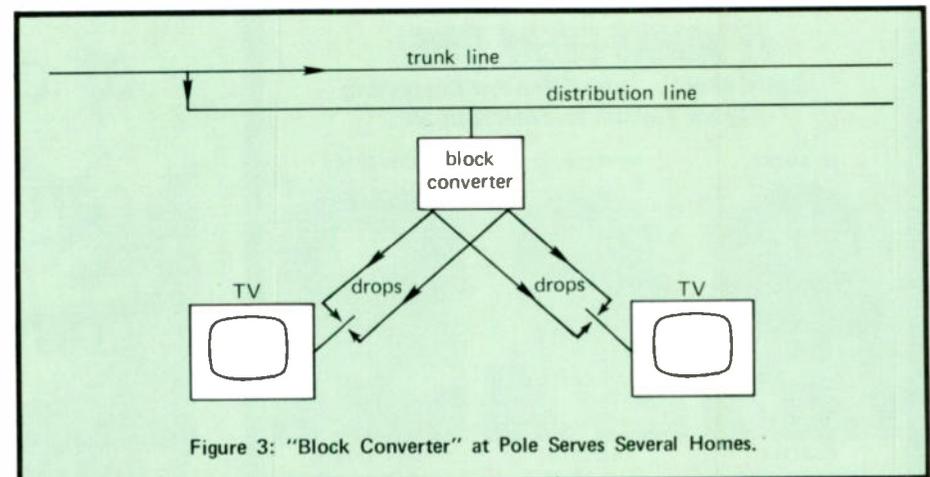
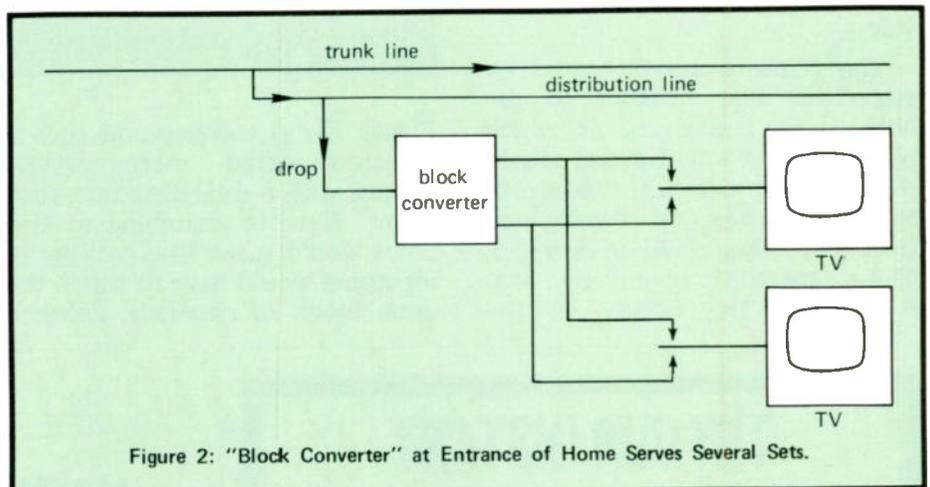
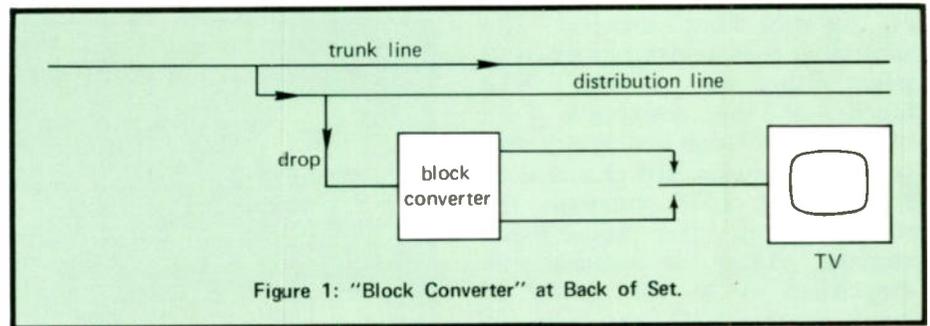
1. The VHF broadcast channel allocations were planned to be free of second order harmonic and intermodulation problems (except for minor problems between channels 6 and 7), and free of image and local oscillator problems in the receivers. Use of additional non-standard channels makes these considerations into formidable problems.

2. The ordinary household receiver is not equipped to receive the additional channels. The various forms of adaptation and conversion to make these addi-

tional channels receivable can be very costly.

3. Interference to or from other communications services due to radiation into or out of the cable system can become a problem.

system the required converter is usually placed on top of the receiver. The converter is a double conversion system which converts the desired cable channel to IF (usually standard RV IF, 41-47 MHz) and then converts the IF to



### Conversion Systems for Extended Band VHF

A number of variations of these systems are possible. They vary mostly in the position of the required converter.

In a single-cable, extended-band

a standard TV channel for the subscriber's TV receiver. The subscriber uses the tuner on the converter instead of the tuner on his own receiver. The tuner mechanisms in the converter are usually derived from standard VHF tuner designs.

A "block" converter may be used (see Figure 1). This usually takes seven contiguous channels at a time from the "mid-band" (118-174 MHz), or from the "super-band" (above 216 MHz), and converts them to the "standard" channels 7-13 for reception on the subscriber's receiver. The subscriber uses a selector switch to select either the "normal" 7-13 block, or the converted 7-13 block. Some block converters convert the non-standard channels to a block of UHF channels for reception on the subscriber's receiver. There is considerable skepticism as to the ability of many home UHF receivers to receive a contiguous block of UHF channels in a truly satisfactory way.

The block converter could be placed at the entrance to the home (see Figure 2), at which point it could serve several sets in the home by means of dual drops to each receiver, or remote controlled switches could be installed. These switches could be controlled by DC signals on the

service line.

The location of the converter can be further moved up the system by incorporating it in the subscriber service tap unit, which taps the distribution line just outside the subscriber's home (see

separate drop is run to each receiver in the home.

The block converter can be moved still further up the system — to the bridging amplifier. Block converters at this point drive dual distribution cables, and

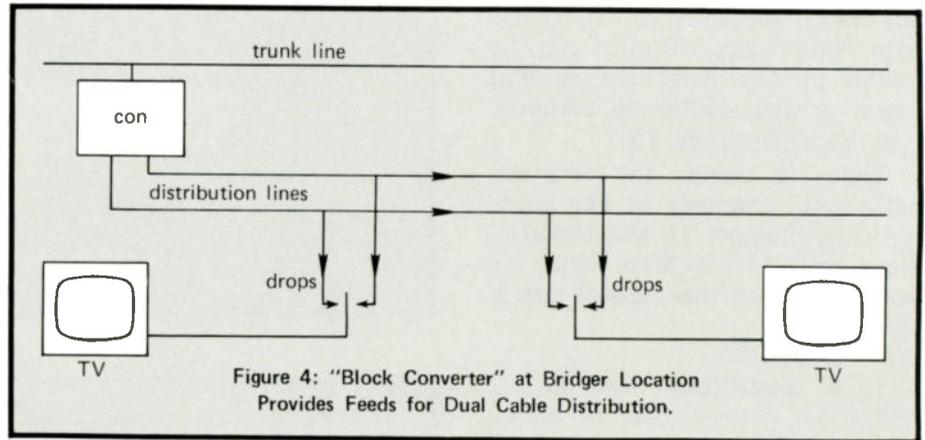


Figure 3). A converter in such a location could serve several homes, with a dual drop into each home. Remote switching at this point would mean that each set in the home would have to watch the same block of channels, unless a

dual drops are derived from the distribution cables, just as in a complete dual cable system (see Figure 4). At this point, only the trunk is operated as a single-cable, extended-band-width system. Since the trunk cables are only a

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small proportion of the total cable footage and cost in a system, there would seem to be little advantage over going dual cable all the way back to the head-end (see Figure 5).

The cost trade-offs involved in

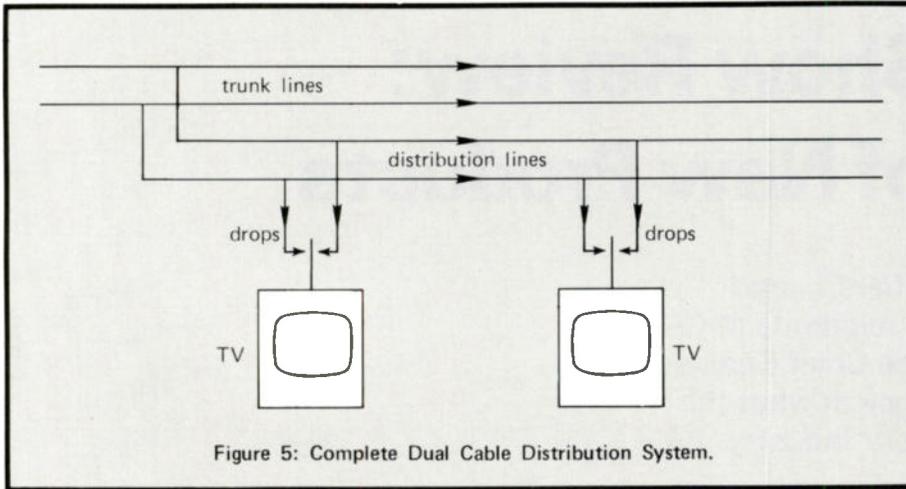


Figure 5: Complete Dual Cable Distribution System.

systems of this kind are very involved and there is not enough experience or cost data available yet on all the possible variations to give conclusive support to any particular version of these.

### Multi-Cable Systems

One of the ways to avoid the problem of non-standard channels at the receiver is to avoid their use by multiplying the number of transmission cables operated in parallel. Several dual-cable systems have been built by simply building two complete, identical 12-channel systems side by side, right through to the home receiver. A selector switch at the TV receiver then connects it to either cable. This type of operation could presumably be extended to three or more cables in parallel.

#### ADVANTAGES

1. It is simple and direct. No new technology or significant items of new equipment are required. Practical application did require development of service drop cable with improved shielding characteristics and a suitable selector switch for the receiver.

2. No converters or receiver modifications required. The subscriber need only operate a simple A-B selector switch. All ordinary

receiver functions remain unchanged.

3. There is some improvement in reliability to the extent that the system is partially redundant.

#### DISADVANTAGES

1. High initial capital costs are

involved in building a completely duplicated system.

2. Higher maintenance costs are involved in maintaining two separate cable systems.

3. Dual systems are susceptible to cross feeds from cable to cable. This susceptibility could be reduced by phase-locking channels in the A and B cables to each other. The beat between slightly different carrier frequencies is visible before the cross-talk effect. Phase-locking would eliminate the beat problem.

4. Each cable system is subject to the technical problems still inherent in normal 12 channel operation. There has been no alleviation of these problems. If normal 12 channel operation in a particular area is hampered because of direct pick-up problems, i.e. ghosts or beats caused by pick-up of strong local broadcast signals by the receiver itself, then this problem will exist on both cables. In some cities four or more channels are lost for cable use (seven in New York City) because of direct pick-up problems. In a dual or multiple cable system, these channels would be lost in each of the cables.

Next month the author concludes his review of multi-channel transmission systems and takes a look at "switched systems." 

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# NCTA Trade Show Review: An Analysis of New Products

Two-way... thin film hybrid amplifiers... and other new innovations. Yet, some segments of CATV technology seem to be lagging. The Chief Engineer for a major MSO takes a critical look at what the commercial vendors are offering our industry.

*By I. Switzer, Chief Engineer  
Maclean-Hunter Cable TV Limited*

The year 1970 will probably be remembered by most as the year of the "two-way breakthrough." Certainly two-way equipment and associated "communications concepts" took up most of the exhibition space and provided most of the glamour in the 1970 exhibition. The longest lasting technical innovation of 1970, however, will probably be the introduction of thin film hybrid techniques in CATV amplifiers.

## Thin Film Hybrids

Anaconda Electronics featured production prototypes of their new "Century-21" line of amplifiers, built around thin film hybrid amplifier modules developed for Anaconda by Hewlett-Packard. A "thin film hybrid" is a cross between an integrated circuit and an ordinary printed circuit board. Thin film hybrids are built up of IC-type substrates using IC techniques to build up all the interconnections and resistors. Transistors and capacitors are added as individual "chips." All the active RF elements are mounted on one small  $\frac{3}{4}$  inch square substrate which then goes into a single

sealed package about the size of an ordinary power transistor.

Advantages have been summarized in Anaconda's literature and I say "Amen" to almost all their claims. I am very enthusiastic about the prospects for this new amplifier technology. I think it is the greatest new development in CATV amplifiers since the introduction of successful transistorized amplifiers.

The collaboration of Anaconda and Hewlett-Packard on the development of the special hybrid modules continues a trend in equipment development started a few years ago by the Hughes-TelePrompTer alliance. CATV equipment performance requirements have outstripped the capabilities of the companies that first developed cable equipment. The new generation amplifiers and associated equipment require the talents and capabilities of a broader cross-section of the electronics industry. I have seen the kind of equipment, laboratories, scientists and engineers required to successfully make these new micro-circuit devices. They could not possibly be developed by CATV equipment manufacturers on their own.

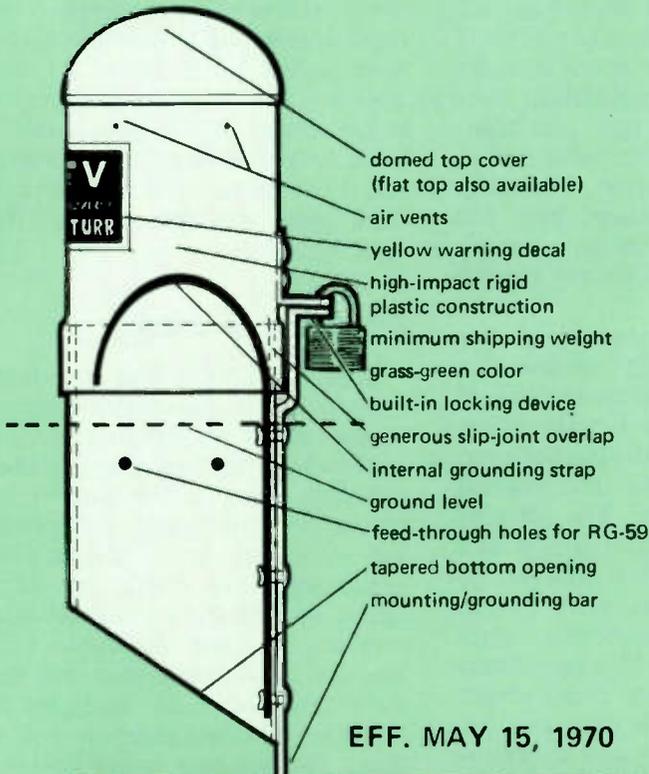
I fully expect that the new hybrid microcircuits will deliver what they promise and that the exhibition a year from now will find virtually every CATV equipment manufacturer showing prototypes of new amplifiers developed in partnerships with semiconductor manufacturers who have supplied the necessary micro-circuit capability.

The exhibition was, of course, full of rumors of similar developments by other companies. It seems certain that Fairchild, a major semiconductor device manufacturer, will bring out a complete line of amplifiers using their own hybrid micro-circuits later this year. Vikoa and Jerrold spoke of small amplifiers with what appear to be thick film hybrids.

## "Two-Way" Everything

"Two-way" on cable systems seemed to take up at least part of every equipment manufacturer's display space. Even manufacturers of lowly passives were concerned with the ability of their devices to pass the extra bandwidth that two-way operation requires, parti-

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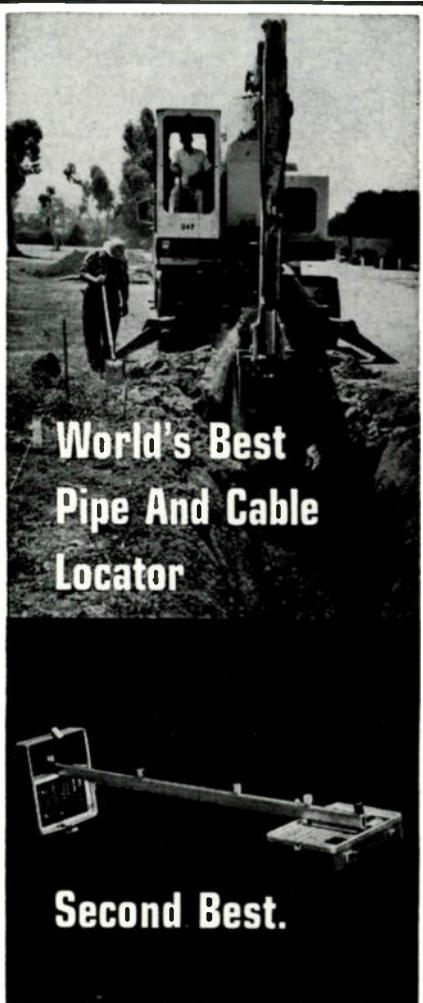
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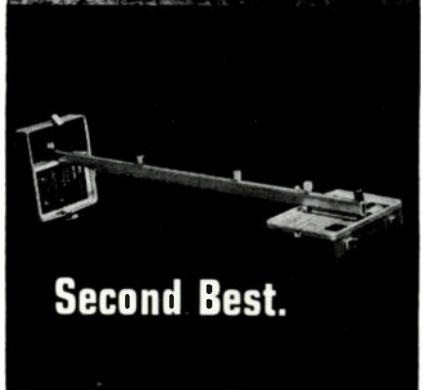
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cularly at the low end of the cable frequency spectrum.

Jerrold, as is often the case, was trying to tell me "black" when everyone else was telling me "white." The Jerrold two-way system display promoted a combination of dual cable and two-way. (I boned up on the Jerrold system by reading the literature after I got home.) Distribution legs are run on a frequency-division, two-way basis. At bridge locations, the reverse direction information is gathered together, suitably changed in frequency, and fed into a reverse direction trunk which takes it back to the system head-end or hub.

A single-cable, two-way system is rather grudgingly offered for those who insist on this method of operation. Sub-low bypass filters are packaged in outboard housings to be attached to the regular Jerrold equipment. The Jerrold engineers question the ability of a single-cable, two-way system to provide really first class results because of the problems introduced by the pair of by-pass filters required at each main trunk amplifier. Maybe they're right and are telling me "white" and everyone else is telling me "black." Jerrold recommends that you don't fiddle around with two-way on your trunk lines — put in an extra reverse trunk line!

The companies with most two-way experience seem to be HTV and Cascade. Both are delivering two-way equipment right now and have some degree of practical experience with it. Cascade had an interesting system-fault alarm system to go with their two-way line of equipment.

Almost everyone else had two-way capability, whether with filters built right into the housings or with filters and amplifiers bolted on outside. The difference seemed to be how recently the equipment housings had been designed.

The exhibition welcomed several new amplifier manufacturers. Sylvania showed new equipment and is representative of interest in our market by a major electronics company. Electronic Industrial Engineering is a small firm braving the financial hazards of the ampli-

fier game. EIE's equipment featured built in two-way and dual-amplifier capability. Sylvania's main sales feature is very tight AGC and good distortion performance achieved with single-ended circuit designs.

Both SKL and Entron appear to have survived acquisition and plant moves. SKL's designs always were a few years ahead of their time and the older designs still had some appeal in this year's exhibition. Entron showed new housings and both firms will no doubt be back even stronger at the 1971 exhibition.

### Terminals Missing

Notably missing was any strong showing of two-way terminal equipment. Even for such obvious applications as cablecasting there did not seem to be any visible pieces of equipment for getting the cablecast into the sub-low band and then back out of it again. Jerrold showed a solid-state version of their venerable CDX sub-low to V converter, but this piece was not really intended for this kind of single channel application. Cablecasters using two-way transmission in their systems will probably have to look around for custom pieces of equipment.

There was some attention to the special problems of UHF conversion. C-Cor showed a "deluxe" UHF converter. Entron displayed the "deluxe" model that they have made for several years. CAS had a UHF front-end for their head-end processor. This plug-in converted direct from UHF to IF frequency for head-end processing.

Head-end equipment got a significant boost up the technical ladder from the new modulator shown by Scientific-Atlanta. This unit modulates at IF frequencies but does not mix aural and visual carriers until after they have been up-converted in separate mixers, thus avoiding a significant source of distortion in head-end equipment. This should be a good example to other manufacturers of head-end equipment. Dynair's new demodulator is noteworthy for its new type of sound trap which considerably reduces

envelope delay distortion. Telemet modulators and demodulators exhibited remarkable "back-to-back" performance in transmission of standard video test waveforms. Blonder-Tongue makes a pitch for simplicity in head-ends with new solid-state "strip" amplifiers and associated accessories. These were noteworthy for their inclusion of automatic changeover to stand-by strips.

There was nothing drastically new in test equipment, although some pieces were worthy of note. Don Kirk, of St. Petersburg Communications, showed a number of small portable test sets for CATV. These are all very light and portable and show careful attention to providing the operating features and accuracies that working system technicians will actually need. These were not laboratory instruments but seem to be worthwhile technicians' tools.

Along the same line, Craftsman had a small TDR adapter for attachment to medium quality oscilloscopes. The adapter box provides a pulse generator and a well calibrated time marker system for converting any medium quality oscilloscope into a cable fault locator. Texscan showed their version of an "in-system" summation sweeper. This unit featured a very long persistence oscilloscope tube which saves a great deal of money when compared to the storage oscilloscopes used by other systems.

The "more-than-23-channel" art does not seem to have advanced the way that it might have in the last year. Converters were visible but hardly featured. AEL had their block converter for super-band channels. Jerrold showed the prototype of a mid-band block converter. Craftsman had a new varactor tuned set-top converter, but neither this varactor unit nor the "conventional" set-top converters shown by others appeared to be "world beaters" or attract any very special attention.

Some miscellaneous items of interest were scattered through the exhibition. Data Technology had a digital weather display system compatible with their news

service display equipment. Chomerics showed heat shrink tubing with a conductive inner coating designed to reduce signal radiation at connectors and splices.

## Switched Systems

I had expected to see a major promotion push for Ameco's Discade system. This system for remote selection of TV channels using something like a telephone dial at the TV set has been demonstrated within the past year and I understand that field trials of the equipment are now under way. There was practically no mention of it in Ameco's booth and practically no discussion. Rediffusion International and Leghorn Corporation had a sizable joint display and demonstration of their switched distribution system. The system is essentially the same one that Rediffusion demonstrated in Washington about 14 months ago. It uses balanced pair (actually a balanced signal pair and an additional signaling pair) for connecting subscribers to the switching center. The system uses electro-mechanical switching, a technique which has probably not been incorporated in new design switching systems for ten years or more. The balanced pair transmission is also foreign to North American practice. British car manufacturers do not argue as to which is the proper side of the road to drive on, so I am surprised that Rediffusion should choose to base their switching distribution system on balanced pair transmission. The concept works just as well with coaxial service lines, and the use of coaxials would probably be much easier to sell to North Americans.

I gave scant notice to the variety of "communications concepts" that were on display. Most of the hardware seemed to be empty cases or hardware borrowed from specialists in other fields. I don't think we are quite ready yet for serious consideration of the hardware required to implement all the communications potential of our cable systems. This year I am concentrating on building the best and broadest cable system that I can. 

I want to know more about "The Science and Art of Football."

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# PRODUCT REVIEW

NEW COMPONENTS FOR CABLE TELEVISION SYSTEMS

## MARKER GENERATORS FEATURE LOW COST

Kay Elemetrics has announced the availability of model PM100 and PM300 variable pulse market generators. The new, low-cost market plug-ins feature twin variable pulse markers that are designed for easy and quick calibration for the particular frequency range being swept. The accuracy, settability, and readability are said to be far better than the performance of the usual "full-scale" variable markers. The model PM100 is designed for use in the Kay 154C, 50KHz-110MHz sweep generator. The PM300 is for use in the Kay 159D, 400KHz-300KHz sweeper. In addition to the two variable markers with direct-reading, digital frequency dials, each unit includes crystal comb markers at 1 and 10 MHz intervals, marker mixing circuits and range calibrate controls.



The units are priced at \$395 each.

For more information on these new products contact Kay Elemetrics Corp. (formerly Kay Electric Company), 12 Maple Avenue, Pine Brook, New Jersey.

## JERROLD ALL-CHANNEL HYBRID TV SPLITTERS

A new type of all-channel signal splitter, one that connects two TV



receivers to one ultra-tap, is offered by Jerrold Electronics Corporation. The ultra-splitter, model 1572G, plugs into a Jerrold outlet and instantly converts from a single outlet to a dual outlet. The unit is captivated by the same screw

that holds a UT cover plate. The hybrid unit prevents interaction between receivers, mates with "G" (gamma) fittings and is used for all-channel color TV. Splitting loss is 3.5 dB from 54 to 216 MHz and 3.8 dB from 470 to 890 MHz. Isolation between outputs is 15 dB. Price for 1572G is \$9.25.

For further information on this new product contact Jerrold Electronics Corporation, Distributor Sales Division, 401 Walnut St., Philadelphia, Pa. 19105.

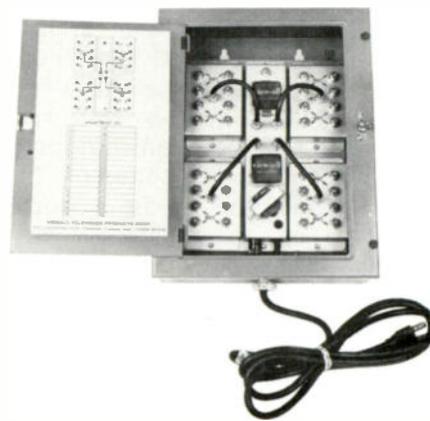
## AC POWER SUPPLIES NEW FROM GLENTRONICS

Glentronics, Inc. offers a line of AC output power supplies which are available with either single or multiple outputs and at frequencies of 60 Hz, 400 Hz, or as specified. Manufacturer claims overall efficiency of the power supplies is more than 90%. The units are available for converting either AC or DC inputs, with or without automatic transfer, to outputs ranging from 0 to 1500 VAC at 1 KVA, single phase. All power supplies inherently incorporate automatic overcurrent and short-circuit protection. Regulation with a plus or minus 15% line change is plus or minus 1%. Voltage regulation of plus or minus 2% can be held with a 0 to 100% variation in load. All units are designed to meet or exceed FCC requirements for RFI.

For further information on these new products contact Glentronics, Inc., 748 East Alostia Avenue, Glendora, California.

## DISTRIBUTION CENTER SERVES 32 TV SETS

View-All Television Products has introduced an active distribution center for feeding up to 32 television sets from a single drop. The plug-in amplifier has its gain adjusted to compensate for the splitter insertion losses. The distribution center also includes a spare amplifier. The electronics is housed in a convenient, lockable, electrical box.



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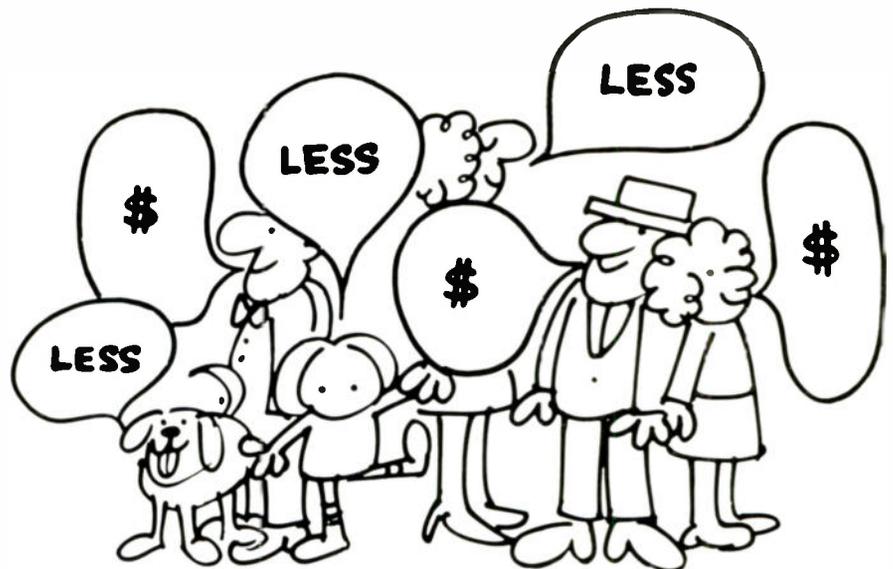
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**SKL**



For further information on this new product contact View-All Television Products Corporation, 2510 Electronics Drive, Anniston, Alabama 36201.

The new switch is usable at frequencies up to 1,000 MHz. At 400 MHz, isolation between terminals is 100 dB, minimum, and VSWR is 1.15:1, maximum. The switch illustrated is an

ST3T model. Connectors may be types UHF, BNC, or N.

For further information on this new product contact Dow-Key Company, P.O. Box 348, Broomfield, Colorado.

## HIGH ISOLATION NOTED FOR DOW-KEY COAX SWITCH

Dow-Key Company has announced the addition of a new multi-position, single-pole model to their series 78, manually operated, coaxial switches. The new switch features very high isolation between ports, due to the use of a patented means for grounding unused terminals.

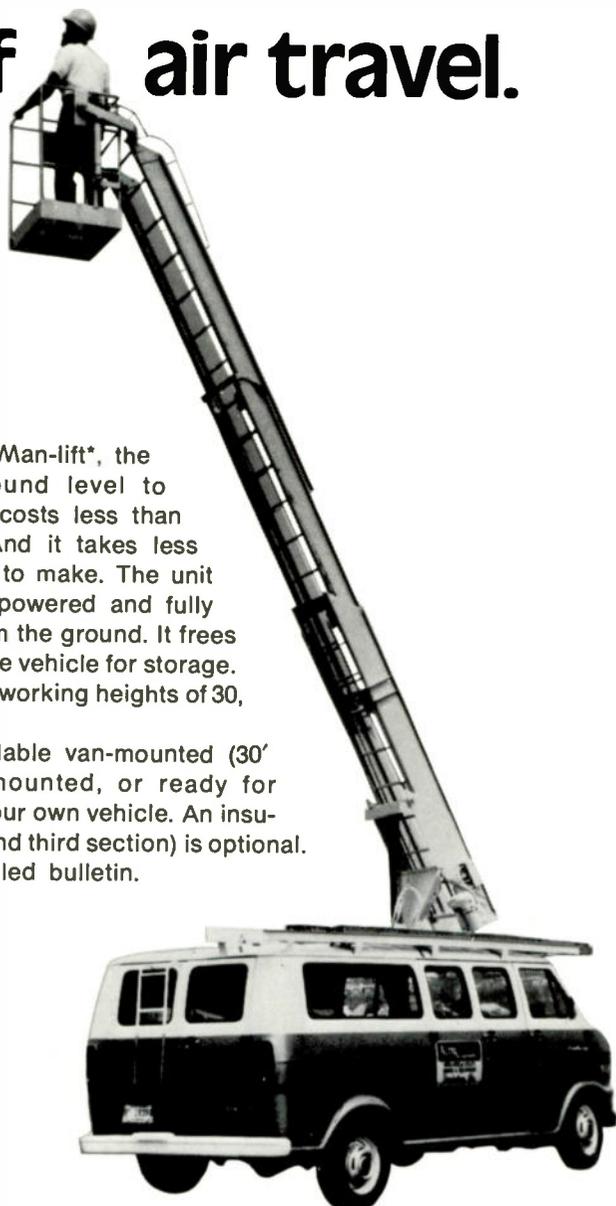


## Q-E MANUFACTURING HAS TWO-WAY CABLE BLOCK

Q-E Manufacturing Company announces availability of their patented two-way cable block. Constructed of high-tensile aluminum and cadmium plated alloy steel, it supports cable to 2 3/4" in diameter and will lock securely to string cable in either direction. Designed to withstand mistreatment, the 4 1/4 pound tool can be disassembled with a wrench should parts need replacement. A special roller has also been developed for greater safety in stringing coaxial cable. The block is priced at \$12.90.

For further information on this new product contact Q-E Manufacturing Company, Inc., New Berlin, Pa. 17855.

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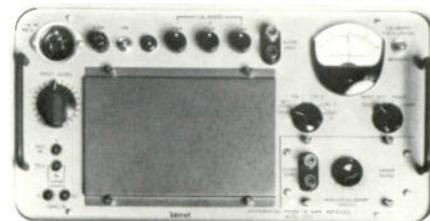
\*Patents Pending



**ALTEC MANUFACTURING CO., INC.**  
1759 Vanderbilt Road • Birmingham, Alabama 35201

## TELEMET TEST SYSTEM IS A TWO-PIECE UNIT

Telemet Company has announced a solid-state differential phase and gain test system, model 3703-A1, for measuring APL's (Average picture levels) of 10, 50 and 90 percent. The new system is fully compatible to Western Electric Kelly Set 47 B/C, says Telemet. Another feature of the system,



claims Telemet, is that it is internally self-calibrating. In terms of sensitivity, the differential phase of 100mV scope deflection is 5 degrees. Practical resolution is better than .1 degree, limited only by oscilloscope sensitivity and noise. Differential gain of 100mV of scope deflection is equal to 1 dB. Practical resolution is .02dB, limited by oscilloscope sensitivity and noise.

For further information on this new system contact Telemet Company, Amityville, New York 11701.

## JERROLD PRESENTS COMPACT TV CAMERA

The TVC-500 television camera presented by Jerrold Electronics Corporation is designed to develop clear and sharp monochrome pictures in video or in RF signal at a switch-selected output. Video is viewed on a



monitor but when the camera is switched to RF output, the pictures are displayed on a standard TV receiver. The operator, with a screwdriver adjustment, can select output frequency covering channels 2 through 6. Complete within itself, the TVC-500 camera contains synchronizing circuits and an RF modulator. Output level on a composite signal is 1.4 V p-p while video level output is 1 V p-p; RF output is greater than 29.5 dBmV (30 mV) and output impedance is 75 ohms. Horizontal resolution of center is 550 lines on video output and 300 lines on RF output. Each camera (6 lbs. including lens) is supplied with a 25 mm F/1.8 lens at \$325.00 dealer net. Wide angle and telephoto lenses are available.

For further information on this new product contact Jerrold Electronics Corporation, Distributor Sales Division, 401 Walnut St., Philadelphia, Pa. 19105.

## COLORCASTING CENTER OFFERED BY RCA

RCA has announced its new Colorcasting Program Distribution Center, a complete system for selecting and originating color programs from motion picture film, slides or video tape. The packaged system, priced at \$24,950, is operated from a 20-inch control console which includes a built-in RCA 860 color video recorder/reproducer, a switching system, a four-input audio mixer/amplifier, and monochrome picture and waveform monitors. Two 16mm film projectors, a slide projector, optical multiplexer and RCA's single-tube color camera for film originations, the PK-701, complete the Center. Its console also is adaptable for "live" TV camera control and is equipped with casters for alternate use aboard vehicles at remote program recording assignments.

TV Communications

For further information on this package of products contact RCA/Commercial Electric Systems Division, Building 1505, Camden, New Jersey 08102.

## C-COR INTRODUCES CROSS MOD TEST SET

A complete signal generation and measurement unit specifically designed for measuring cross modulation on CATV amplifiers under actual loaded operating conditions has been introduced by C-Cor Electronics Inc. Known as Cross Modulation Test Set model

TSI-20, the unit provides for measurement on 20 channels in accordance with NCTA standards of square wave modulation (50% duty cycle). Test procedures call for loading the amplifier with the desired number of channels, each modulated at 100%, except for the channel to be measured. Percentage of cross modulation (or dB down from 100%) as induced by the amplifier on an unmodulated channel, is measured by means of a selective voltmeter-wave analyzer which has been calibrated by a known percent modulation.

For further information on this new product contact C-Cor Electronics Inc., State College, Pa. 16801. 

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N.W.	300	700	75M	29%	N.W.	165	1000	40M	NEGO
Gulf	357	1700	110M	CASH	South (2)	870	1900	230M	TERMS
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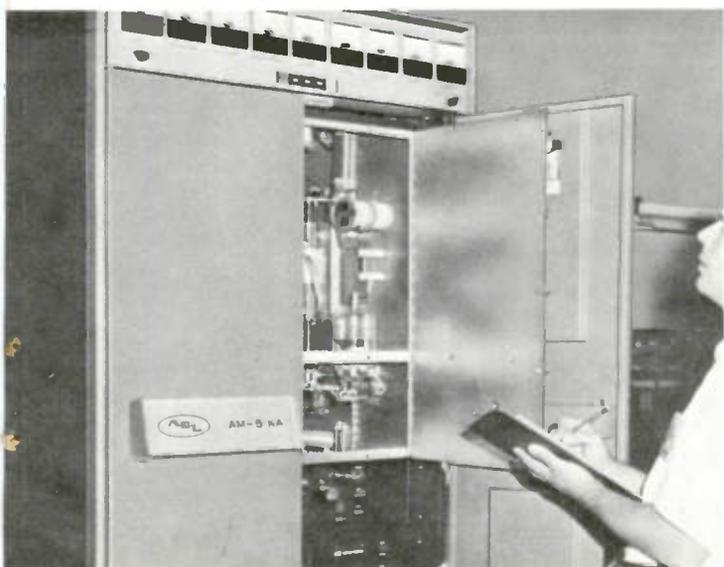
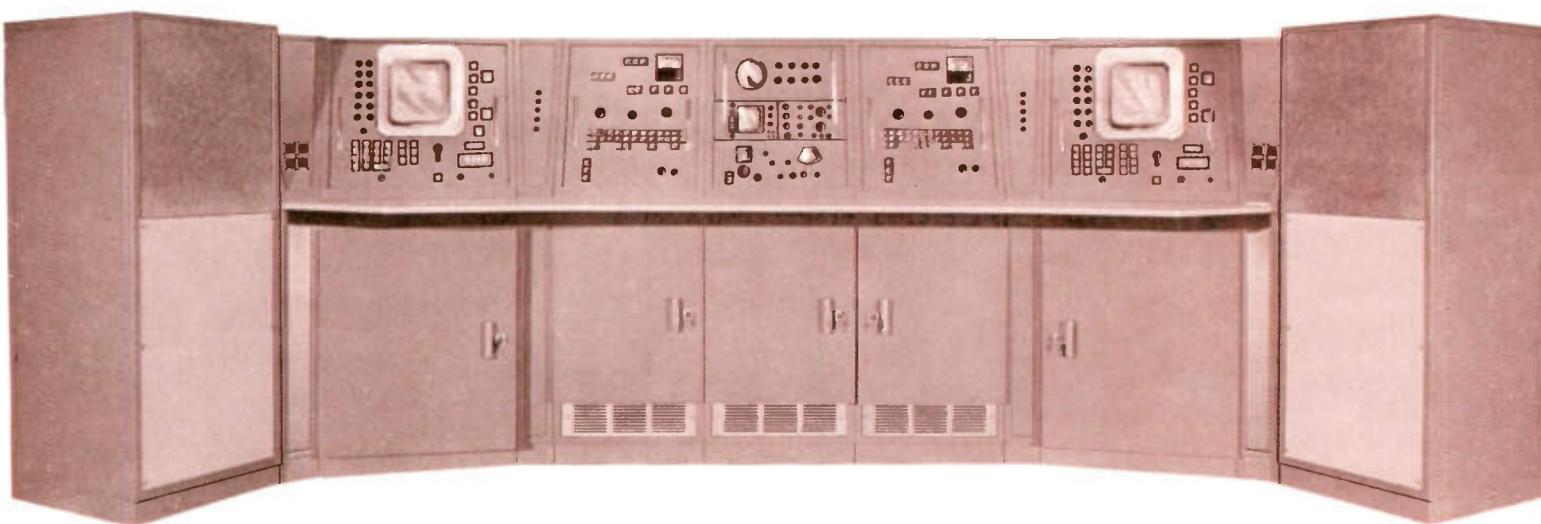
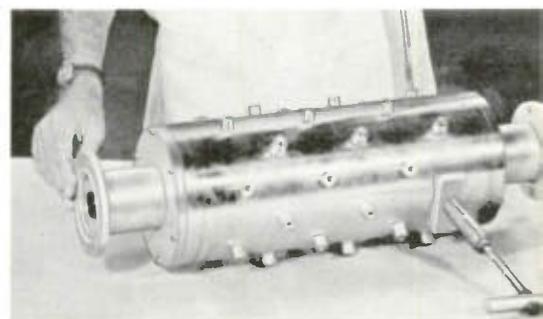
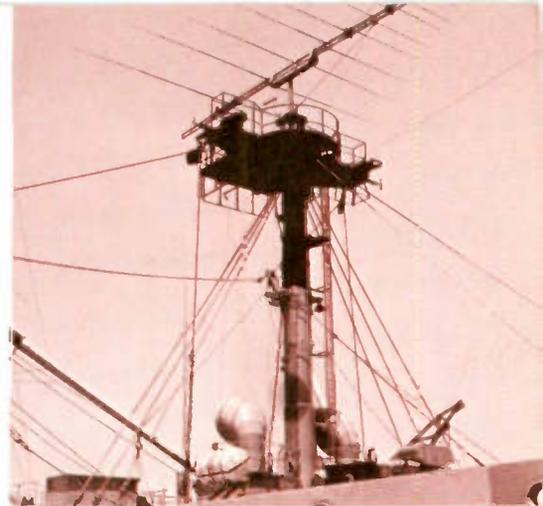
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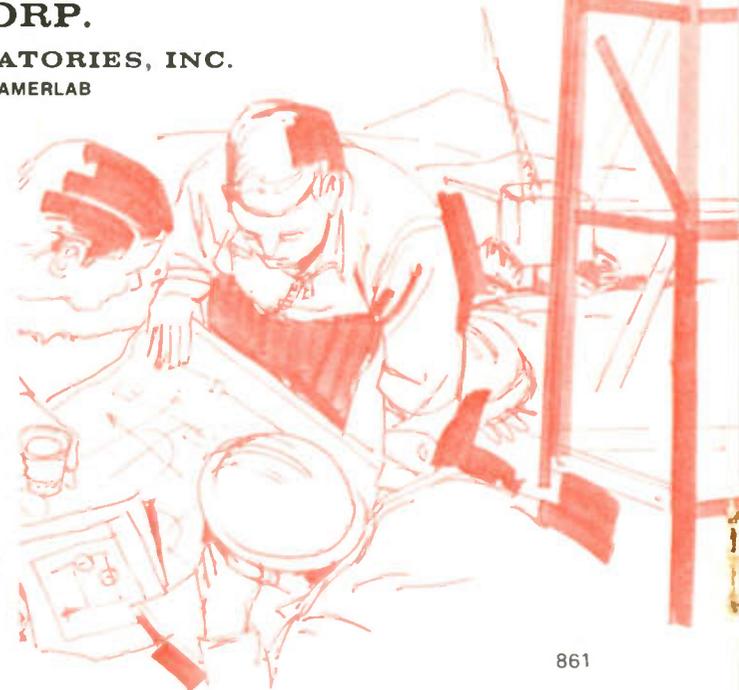
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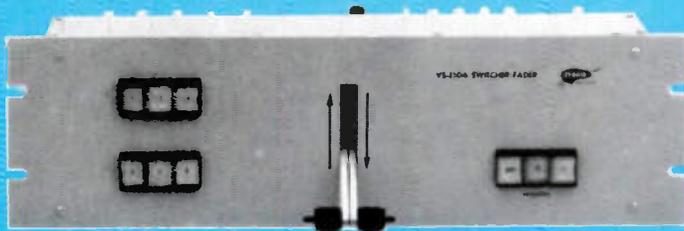
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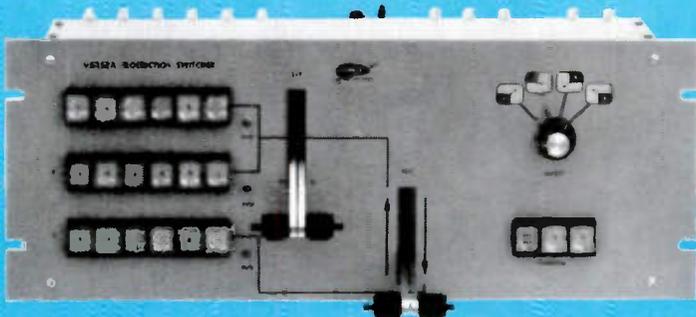
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MODEL VS-150A VIDEO SWITCHER-FADER



MODEL VS-152A PRODUCTION SWITCHER

# Start Your 1972 Studio NOW!

## Dynair's new Vertical-Interval Switchers Make it Possible

You'll probably have to wait at least two years before you see anything comparable to Dynair's brand-new VS-150A Video Switcher-Fader and VS-152A Production Switcher. *Right now*, these completely new units give you professional programming capability . . . *and they do it by means of electronic switching during the vertical interval to assure glitch-free signal transfer.*

Both units are designed especially for the small studio: CATV, educational, broadcast or remote. Over 80 percent of their circuitry is made up of IC's.

They can be mounted in a shallow console arm. Both operate on broadcast or most industrial sync and color or monochrome video. They are easy to operate, with illuminating pushbuttons and interlocks which make it impossible to mix or fade any but a non-composite signal.

Finally . . . and here's one of the most important features of all . . . *the VS-150A and VS-152A are the lowest cost units on the market today offering professional quality and vertical-interval switching.*

### Model VS-150A Video Switcher-Fader

- Accepts 3 non-composite and 2 composite video inputs.
- Provides: Instantaneous switching between two inputs  
Fade-in or fade-out of a single input  
Manual fade or dissolve between two signals at any desired speed  
Superimposition of two inputs with any desired degree of mixing
- Easy operation: Split lever, locking fader handles . . . . . \$750.00

### Model VS-152A Production Switcher

- Accepts . . . 6 non-composite and 2 composite video inputs
- Provides . . . Horizontal and vertical wipes, inserts from any corner and diagonal expansion  
Mix control for fade-in, fade-out, lap, dissolve and superimposition.
- Easy operation . . . Automatic preview system for positive indication of program conditions . . . . . \$1795.00

**TO ADD PROFESSIONAL PROGRAMMING CAPABILITY TO YOUR STUDIO, WRITE TODAY FOR COMPLETE DETAILS.**

**DYNAIR Electronics, Inc.**  
6360 Federal Boulevard  
San Diego, Calif. 92114  
Telephone (714) 582-9211



# Vikoa and A.C.E.C. Awarded Contract for Huge European CATV Complex

Charleroi, Belgium...Ateliers de Constructions Electriques de Charleroi, a most distinguished and respected manufacturer of electrical and electronic equipment for nearly 100 years, has been awarded an exclusive license to produce Vikoa Futura Amplifiers and associated equipment for CATV systems throughout the Benelux countries (Belgium, The Netherlands and Luxembourg).

A most significant result of the licensing agreement between A.C.E.C. and Vikoa has been the award of a contract to A.C.E.C. for the construction of a 1250 mile, 18 Channel CATV system at Liege...Belgium's fourth largest city.

This unique system, perhaps the most technically sophisticated in the world, will carry up to 28 channels, utilizing four different transmission standards. Initially, the system will carry seven "off-the-air" UHF stations converted to VHF for transmission, plus three additional "off-the-air" VHF stations. Several of these signals will be carried in the Midband portion of the frequency spectrum because of the wider bandwidths required. Three of the channels carried will be: the Luxembourg program, black and white, 819 lines, 7 MHz bandwidth; the French First Network, black and white, 819 lines, 14 MHz bandwidth; and the French Second Network, color, 625 lines, 8 MHz bandwidth. The French color program will be transmitted twice over the system using different color transmission systems; PAL (Phase Alternation Line) and SECAM (Sequential with Memory). These different transmission methods require the flat response and distortion-free amplification characteristics inherent in Vikoa Futura Amplifiers.

The three "French Standard"



Gary Balsam (standing), Vikoa's Director of International Sales, explains the new Vikoa Field Strength Meter Calibrator to (left to right), Messrs. Roger Scohy, Marcel Beunle and Roger Brouschmiche of the A.C.E.C. Engineering staff.

programs (including the Luxembourg program) are received at a site 60 miles south of Liege and relayed by microwave to the two Head-Ends of the system. The two Head-Ends will transmit over the mainline system using Vikoa Futura Mainline and Mainline-Bridging Amplifiers to feed an extensive distribution system employing approximately 4000 Vikoa Futura Line

Extender Amplifiers. System ancillary equipment including splitters, directional taps, power supplies and connectors will also be constructed by A.C.E.C. under Vikoa license.

The Liege CATV system layout consists of two semi-circles surrounding the city with a Head-End at each center and has a potential of ninety-thousand subscribers.

**vikoa** INC.  
technically, the One