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(WASHINGTON)

PRESIDENT NIXON SAYS THE NATION IS MOVING BACK TOWARD STABLE PRICES. AND HE BACKED UP HIS OPINION BY

THIS ISSUE: CATV SOFTWARE DIRECTORY
ONE drop line does the work of Two, Three, or FOUR with Jerrold "DROP-SAVERS"

New Jerrold "DROP-SAVERS" are immediately available to provide all the "on-the-spot" amplification needed to feed up to four TV sets with a single drop line. They're efficient, inexpensive, and already hailed by system operators as the answer to the rapidly growing number of multi-set locations. Perfect for homes, small apartment houses, duplexes, appliance stores, and TV shops.

"DROP-SAVERS" come in two-set and four-set models. Both units are low-voltage powered from a small transformer, Model LVT (not shipped with unit), which plugs into any 117-volt ac source and has an output of 24 volts. Both models are equipped with screw terminals for the power wire from the transformer (twin-lead or twisted pair) and a ground wire terminal. Coaxial cable input and outputs are standard F-type fittings.

"DROP-SAVERS" provide high gain measured at 240 MHz (2-set models, 6.5 dB; 4-set models, 5.5 dB) and high output at each output terminal for each of 12 channels using 3 dB block tilt (2-set models, 32 dBmV; 4-set models, 29 dBmV).


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We field-tested it for a year. We introduced a complete line in June. It's available NOW.

Anaconda Electronics unveiled an all-new product line at the NCTA Convention, and it stole the show. Based on a proven, advanced technology, it establishes a new state of the art in cable repeater amplifiers. We call it the Century Series, because it's years ahead of its time.

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Is all this just a promise for the future? No. You can include the Century Series in your systems designs right now. Anaconda Electronics is ready to deliver tomorrow's technology today. Shouldn't you get complete specifications before you decide?

CENTURY SERIES: THE NEW TECHNOLOGY FROM

ANACONDA electronics
305 North Muller Street, Anaheim, California 92801

in Canada:
ANACONDA electronics Ltd.
Province of British Columbia

A Division of Anaconda Wire and Cable Company
Editorial: The Only Voice Is Yours
When it comes to ownership, system operators are only spokesmen.

The Commission's New Proposals: An Analysis for Laymen
Two well-known attorneys cut through the FCC legalese.

Software for CATV: A Comprehensive Directory
A complete listing of software now being marketed.

Cablecasting Election Returns: An Origination Profile
Handling election coverage in Ottawa, Illinois.

Audio/Video Signal Switching — Part II
Conclusion of two-part feature on patching and switching.

CATV TECHNICIAN SECTION

Using the FSM in System Performance Testing
Bob Bilodeau discusses the use of the FSM as a TDR device.

Expanding Cable Capability — Part III
I. Switzer continues discussion of multi-channel systems.

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How good is the new Electro-Voice RE20 studio dynamic microphone?
Here's proof from the new scoring stage at Glen Glenn.

The fine reputation of Glen Glenn Sound Company rests on their knowledge of sound...their ability to turn a full symphony orchestra into a perfect sound track for TV, the movies, or a new album. And their desire to be first with the finest.

So for their new scoring Studio M, Glen Glenn engineers asked to see the latest products in every category...tape, film, electronics, and — of course — microphones. Especially a new E-V dynamic cardioid microphone which they had seen in prototype form earlier.

Since then, Glen Glenn has scheduled a number of major recordings with RE20's. And the RE20 has often been used where previously an expensive condenser was the automatic choice. Why? Because the RE20 has proved itself a significant advance in microphone design. With wide-range, peak-free response on axis (even the off-axis response is better than many other studio microphones on axis). Transient response rivals any other studio microphone, regardless of design. Directional control is uniform and predictable from every angle. Yet proximity effect is virtually eliminated (a problem that plagues almost every cardioid — except E-V Continuously Variable-D microphones).


P. S. For full technical data on the RE20, write us today. To find out more about Studio M, write Joe Kelly, VP, Engineering, Glen Glenn Sound Company, 6634 Romaine St., Hollywood, Calif. 90038

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19 channels

Answer:

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AEL COMMUNICATIONS CORP., Colmar, Pa. is proud to announce the first successfully operating single cable CATV system with more than 12 channels delivered to customers on a continuous and daily basis.

This unique accomplishment is the result of using AEL's SUPER-BAND® Amplifiers and the SUPER-BAND® Tunerless CONVERTERS!

Coatesville, an Eastern Pennsylvania City, receives over the air TV programs from all points of the compass.

Designed and installed by AEL, the Coatesville system provides its customers with 14 TV channels, and in addition, channel #15 is an automatic Time/Weather channel, and channel #16 is for local originations. Three other channels are available for future expansion.

The SUPER-BAND® Tunerless CONVERTER provides black & white and natural color TV programs with the clarity and definition you might normally find only in station monitors.

AEL COMMUNICATIONS CORP., a subsidiary of American Electronic Laboratories, Inc., Colmar, Pa. draws upon the capabilities and facilities of its parent organization.

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It's Your Voice!

Although the National Cable Television Association cannot be expected to objectively tackle the issues of CATV cross-ownership and ownership limitation, that does not mean that cable operators should ignore the question. The membership of NCTA is quite diverse. A high percentage of member systems are affiliated with broadcast or newspaper interests. Furthermore, NCTA is almost totally dependent upon large MSO's for its financial support.

Obviously, it would be folly for the trade association to take a position against CATV ownership by broadcasters or newspapers (or to support a meaningful limitation upon the size or number of systems which a single corporate entity can own). By the same token, any NCTA argument against ownership limitations would hardly be taken seriously by the FCC or Congress.

The voice of an individual cable television operator, on the other hand, can still carry considerable weight at the Commission. As an individual, you have every right — and perhaps the obligation — to make your views known on all major issues — sensitive or not. Because of NCTA's inability to represent the cable industry on these ownership questions, the only representation that CATV interests will have must come from individuals and companies.

Without suggesting what your position should be, we urge you to carefully evaluate the various limitation schemes which have been put forth by the FCC with respect to CATV ownership. The diversity of approaches suggested implies that the FCC is inviting some constructive suggestions. For the CATV industry to remain silent is not constructive.

Let your opinion be heard on these questions. File your comments to one of the many able communications attorneys who specialize in CATV, or simply write to the FCC direct (be sure to include 50 copies for distribution at the Commission).

This is one instance where you can't "let NCTA do it."
Comm/Scope Coaxials have an unlimited future!
We guarantee the first five years of it!

The first year of a cable's life is the roughest. If anything is going to go wrong, this is the period of greatest probability.

But when you install Comm/Scope Extended Spectrum Coaxials, we see you through that critical year. Should they fail to perform as specified (which rarely happens), we'll give you new cable, and even pay the labor costs for putting it in.

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Indications are that the industry is starting to move again. A number of manufacturers report backlog orders for CATV hardware, and at least one is working hard to get a new plant in operation.

TeleMation, for instance, has sold over twenty-five color cameras to cable operators in recent days — a major index of the fact that local origination purchases, in particular, are on the upswing.

Big problem manufacturers are facing now is tight money. Many manufacturers report they are either afraid to extend credit to operators willing to buy or are unable to get credit for them. "Selling is not too tough," they say, "But getting the money once the sale is made is sometimes difficult."

However, money squeeze appears to be beginning to relax a little. Housing finance, a major index of trends in money, is starting to loosen up in some areas. Retail spending is beginning to increase again, and leading investment men, bankers and economists are predicting the beginning of an upward move soon.

Return of healthy business situation will be slow, however. While this won't hurt cable growth in new areas, it will undoubtedly mean growth will be slower.

Cablemen too are beginning to relax a little. In spite of the uncertainty of the Commission's regulatory proposals, operators are settling down with a generally optimistic attitude about cable's future. The first attitudes of fear and confusion regarding the proposed rules have worn off, and are being replaced with a calm and confident hope with regard to the final outcome.

The proposed rules will probably be modified considerably. The Public Dividend Plan, designed as a boon to UHF, has been objected to strenuously by ACTS, the radical voice for U's. Although the ACTS proposal which would allow UHF the same importation rights as cable is highly unlikely, some aspects of new FCC rules will be of unquestionable benefit to the U's.

The new face at the Commission may be that of Cincinnati lawyer Sherman Unger, informed sources say. Formerly a part of the Housing and Urban Development operation, Unger can be expected to go after measures which will provide more and better television for minorities. He may be Nixon's concession to black pleas for representation at the Commission. Pro-minority attitude may result in pro-cable and pro-UHF stand. Eventual attitude with regard to CATV is impossible to determine at this time.
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The Dual-Trace Type D54 lets you look at two signals simultaneously, a real help in the maintenance of head-end and studio equipment.

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The new CATV share-the-wealth plan

The new CATV emphasis on local origination means better programming, more subscribers, new sources of advertising revenue.

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And, of course, distant off-the-air TV signals can be shared, too. More than one system can share one head-end, with microwave relay to in-town distribution points . . . without intervening line amplifiers and inevitable picture degradation.

Microwave Associates is a CARS band microwave specialist — providing CATV operators with total solid-state relay links. The MA-13B portable, and the MA-13BX head-end microwave relay links, antennas, other equipment, installation service . . . this is our business.

Share-the-wealth. Write.

MICROWAVE ASSOCIATES
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Getting Across to People

“Communication” is a word CATV people hear and use nearly every day. Yet, this word (when applied to management) is a key to success that is too frequently missed. Lack of communication has caused more failures, more frustration and more misunderstanding than any other phase of management.

Communication is a high sounding, impressive management word. Cutting it down to size, it simply refers to your ability to express yourself so that people will understand exactly what you have to say, and your ability to understand exactly what people say to you.

Most people are self-centered and it is hard to get them to listen. Unless we understand this, we will never really learn to communicate. In the business world, it is hard to exchange accurate thoughts and opinions.

People are so preoccupied with their own thoughts and problems that they seldom listen intently. How often have you heard people say, “I'm sorry, I wasn’t listening. Would you repeat what you said?” Or the preoccupied look in their eyes that tell you they are here physically, but mentally off in another world.

Also, most people do not want to listen. They are so eager to begin talking themselves, they can hardly wait for you to catch your breath so they can interrupt your message to introduce their own comments.

Usually people do not bother to listen with an open mind. Their thinking is biased, so they hear only what they want to hear. If your opinion differs from theirs, they actually repel any comments you may make. This goes for all levels of management, up or down. This is a fact of life and should be recognized as such. Your method of presentation will go a long way in reducing or raising their listening barrier.

These are but a few of the problems that create difficulties for good communications. Recognize that odds are against your making yourself clearly understood. Accept it as a real problem and also as a real challenge.

This is why it is important for you to learn to improve your method of communicating to others. It can mean the difference between success and failure; a project or suggestion being accepted or rejected; a receptive ear or complete indifference.

If you don’t get your point across, and you haven’t tried to improve yourself in this area, don’t blame anyone but yourself.

Next month this column will deal with ways to gain your employees willing cooperation.
We don't. Because at Benco, we're perfectionists. Everybody here is expected to turn out equipment that's picture perfect. So we're tough to work for. But we're easy on your viewer's eyes.

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In Canada: Benco Television Associates,
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Construction Reports

Northeastern States

North Adams, Mass., Berkshire TeleCable, adds Channel 22, Springfield, to system... Glen Falls, N.Y. Champlain Cablevision Corp., construction to begin soon... Herkimer, N.Y., Antenna Vision, Inc., seeking to raise monthly subscriber rates by $1 to $5.50 monthly.

Lewiston, N.Y., STV Cable Television, Inc., tower site located... Lake City and Scranton, Pa., Lake City Cablevision, construction under way... Wilkinsburg, Pa., Centre Video, construction nearing completion.

Midwestern States

Crystal Lake, Ill., Vue Sonics, Inc., preliminary work under way... Dixon, Ill. Dixon Cable TV, Inc., construction to begin soon; system to be operational by October 1... Knoxville, Ill., Northwest Illinois CATV, system to be operational by fall.

Pittsburg, Kan., Pittsburg Cable TV, Inc., plans to add KPLR, St. Louis independent, to 10 video channel system... Jefferson City, Mo., International Telemeter Corp., hook-ups continuing... McCook, Neb., Multi-Vue TV, system scheduled to be operational this summer.

Southern States

Columbus, Ga., TeleCable of Columbus, turnkey contract for 100 miles of plant awarded to AEL Communications... Annapolis, Md., Annapolis CATV, construction scheduled to be under way.


Western and Mountain States

Sierra Vista, Ariz., Sierra Vista Cable TV, adds regular local origination programming... Modesto, Calif., Cablecom General of Modesto, Inc., hook-ups under way... Oceanside, Calif., Oceanide Cablevision, hook-ups under way.

San Clemente, Calif., San Clemente Cable TV, monthly subscriber rate hike from $4.50 to $5.50... Whitecliff, Calif., Bay Cablevision, construction to begin in near future... Yountville, Calif., Storer Cable TV, Inc., system energized.

Durango, Colo., Cable TV of Durango, adds two Denver channels, an independent and an educational, to previously 6 video channel system... Palisade, Colo., Comtronics Cable TV, hook-ups to begin in near future.

International

Summerland, B.C., Can., South Okanagan Cable TV, construction under way... Stouffville, Ont., Can., Richmond Hill Cable TV, Ltd., construction under way... Tavistock, Ont., Can., Grand River Cable TV, Ltd., construction plans now being made.

Woodbridge, Ont., Can., Richmond Hill Cable TV, Ltd., service to be available soon... Tokyo, Japan, Tokyo Cable Vision, first system to serve Shinjuku area, to be operational by the end of the year.
NOW that Sony offers the DXC-5000—a compact, color video camera that's a marvel of simplicity. Its three controls replace the usual 30 found on conventional color cameras. And its completely automatic color temperature compensation and gain control do away with complex set-up procedures and readjustments.

AND NOW that Sony offers the most modern 1-inch VTR available—the EV-320 Videocorder® video tape recorder—with electronic editing.

AND NOW that Sony offers the CLP-1B color adaptor, which makes the EV-320 burst into glorious high-quality NTSC color.

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Our famed Phoenician Series and Phoenician XR Series offer a selection to custom-fit any need. And with equipment convertible to added channels (to 32 TV channels plus FM if the "XR" series is used), you can plan for the future while saving money at the outset.

Versatility is the name of the game at KAISER CATV. For some skillful coaching, just give us a whistle.

KAISER CATV Division of Kaiser Aerospace & Electronics Corporation P.O. Box 9728, Phoenix, Arizona 85020, Phone (602) 944-4411
NCTA WANTS REGULATION EXCLUDED FROM COPYRIGHT BILL

The NCTA board has approved a recommendation that the Senate Judiciary Committee take the CATV regulation out of the copyright revision bill and leave such regulation up to the FCC. But NCTA asked that the passage of such legislation should explicitly provide for the cable industry to make no copyright payments until FCC adopts (in final form) some version of the CATV Public Dividend Plan.

NCTA national chairman Ralph Demgen said that the just released text of FCC rules and proposals are too complex for the board to have formulated precise stands yet. NCTA has asked board members and association members in general to study the seven documents and let NCTA know their views.

Then, NCTA general counsel Gary Christensen will draw up a draft of NCTA's position, which will be sent to board members August 10. On September 9, the board will meet again for as long as it is necessary to hammer out a final position which will then be filed with the Commission by October 7.

On the matter of FCC rules and proposals on CATV ownership, Demgen said that the NCTA board had not formulated a position.

The NCTA chairman also said that he thinks the Commission is acting in "good faith" and that "Chairman Burch has done what he said he would do."

NCTA president Donald V. Taverner, also at the press conference, said that although Senator John McClellan (D-Ark.) and the copyright subcommittee haven't assured NCTA that the stripped-down bill would contain a provision protecting cable until the Public Dividend Plan is adopted, "we've been encouraged."

COMMITTEE MEMBERS, CHAIRMEN GET NEW POSTS AT NCTA

NCTA Board of Directors has approved the nomination of two new members of its executive committee and the nominations of chairmen for the association's Public Relations and Legislative Committees.

NCTA national chairman Ralph N. Demgen announced that Amos D. Hostetter Jr., vice president, treasurer and director of Continental Cablevision of Ohio, and Robert H. Symons, vice president of TelePrompTer Corporation of New York, have been named to the seven-man executive committee.

Demgen also announced that the NCTA's new public relations committee chairman is William M. Bresnan, president of H&B American Cablevision. Chairman of NCTA's Legislative Committee is Lawrence W. Kliwer, vice president of Peninsula Cable Corporation in Hampton, Virginia.

The NCTA committees also had vice chairmen named. Taking that slot on the Public Relations Committee is Abram E. Patlove, executive vice president of Goodson-Todman Cablevision Inc. Vice chairman of the legislative committee is Frank Thompson, general manager of Rochester Minn. Video Inc.

TEXAS ASSOCIATION ASKS MEMBERS TO HOLD BACK

The Texas CATV Association has advised its members to continue under their old pole attachment agreements with Southwestern Bell Telephone Co.

The association said that in letters apparently mailed during the latter part of May and early June, Southwestern Bell suggested that all cable operators in their operating territory sign the new form of attachment space agreement.
“The letter acknowledges that the 50-cent increase supposedly to be effective June 1, 1970, has been waived. However, the letter stated that the $4.00 rate effective January 1 has not been waived and that the new contract will become effective on that date,” the association said.

The Texas Association noted that the statement is not “necessarily consistent” with the commitment by Bell System counsel at the hearing in Washington.

The telco said in Washington that the increase would be suspended during the pendency of the proceeding unless the proceeding were unduly delayed.

“There is no immediate advantage to signing the new contract,” said the association. Signing of the new contract has the “disadvantage of implying consent to the $4.00 rate effective January 1, 1971, and to the subsequent increases to $4.50 on July 1 and $5.00 on January 1, 1971.”

HAWAII PASSES LAW FOR NON-FCC REGULATION OF CATV

With the signing into law of Act 107 by Governor John A. Burns, Hawaii becomes the first state to regulate CATV by a department other than the PUC. Act 107 places cable regulation under the Director of Regulatory Agencies. A five man CATV advisory board is to be selected by the Governor to advise the Director of Regulatory Agencies.

NAB CITES FIVE POINTS OF CRITICISM ON RULES

The National Association of Broadcasters board of directors reacted to the new and proposed CATV rules of the FCC by issuing a strongly critical five-point resolution:

“1. We endorse a national policy to encourage increased diversity of programming choice and communications service, but we believe that this is not necessarily achieved by the importation of the signals of distant broadcast stations, nor by the origination of programs by wired systems, where the program types are already in the community.

“2. Areas underserved by broadcasting should be supplemented by a reasonable number of additional signals through wired systems so that optimum communications service to all the public can be achieved.

“3. A legal and regulatory atmosphere to assure fair and healthy competition between broadcasting and CATV should be fostered by the Congress as clearly in the public interest. At present, for example, only the broadcast media pay the fair market value for the programs transmitted to the public.

“4. The continued unregulated growth of the paid wire system represents a real threat to the continuing capability of the broadcast system to maintain or improve the present quality of local service.

“5. The present proposals pending before the Federal Communications Commission are potentially destructive of the over-the-air broadcast service to the public, and are not based on definitive research and public hearings which Congressional procedure could require before such profound changes in public policy were accomplished. If the communications policy of the United States as reflected in the Communications Act of 1934, as amended, is to be so radically changed, the National Association of Broadcasters urges that it be the Congress of the United States and not the FCC which should evaluate and determine the broad public interest.”
Texscan has the answers from head end set-up to full system sweeps

When it comes to electronic test equipment, Texscan wrote the book. With answers you can't get from tower specialists. Or cable experts. Or the antenna people.

We zeroed in on the specifics of CATV test and measurement. So you wouldn’t have to make-do with jury-rigged gear. The results speak for themselves.

Like the 9300 Sweep Spectrum Analyzer. Combines seven instruments in one compact, portable unit. The SSA will analyze your head end, sweep your system, characterize RF components. Measures gain, loss, RF level, distortion, percent modulation. And more.


And Model 9500, the answer to summation sweeps, comes from Texscan, too. Now you can sweep your entire system—anytime—with no program interference. Just two super-compact instruments do the job. Easier and faster than before.

That’s just the beginning. Our 72 page catalog will give you a better idea of Texscan capability in test equipment and instrumentation. It’s yours for the asking. Write, or call collect: Texscan Corporation, 2446 N. Shadeland Ave., Indianapolis, Indiana 46219. AC 317/357-8781. In California, AC 714/772-8207.
FCC Pieces Together CATV Package Of Restrictions, Proposed Rulings

The FCC has devoted a considerable amount of time recently to CATV and the result has been a formalized CATV package incorporating new and proposed CATV rules.

The Commission has banned network and same-market ownership of CATV and proposed even further-reaching prohibitions. It issued the essence of its CATV Public Dividend Plan. It firmed up program origination requirements, proposed technical standards and began to take a close look at preempting state and local franchising autonomy.

Television stations have been forbidden to own CATV systems within their grade B contours and networks have been banned from ownership of CATV at all. In addition to these two rules, the Commission asked for comments on banning newspaper and radio cross-ownership of CATV.

Limits on Ownership

Also proposed for comments were limits on system multiple ownership. The proposal includes: possible limitations of CATV ownership to 50 systems with 1,000 or more subscribers in the top-100 population areas; CATV ownership by an operator who holds interest in more than one TV, two AM or FM or more than two newspapers; a limitation to a maximum of 25 systems in the top-100 markets. Limitations also might be placed on a CATV operation to prevent ownership of more than one top-3 market CATV system.

As an alternate proposal, the Commission asked for comments on the limit of 2 million for the total number of subscribers served by any CATV system. The Commission furthermore asked whether it might ban or restrict CATV ownership by microwave carriers, weekly newspapers, CATV equipment manufacturers, national news magazines, magazines, advertising agencies, wire services and program suppliers.

Adopted rules by the Commission prohibit local cross-ownership of CATV systems and translators, though it said it would consider exceptions to cases where it could be proven that without cross-ownership there would be no increase in broadcast of CATV service to the public.

The CATV Public Dividend plan was issued by the Commission as a proposal. FCC asked for comments on the proposal but noted that the old retransmission consent procedure in obtaining distant signals still holds.

U's Get Protection

Under the Public Dividend proposal CATV systems in the top-100 markets would be permitted to carry four distant independent signals but would be required to delete commercials from the signals and replace them with commercials provided by local stations. Independent UHF station's commercials will receive first priority in the substitution, followed next by UHF network affiliates. Commercial substitution would also be afforded to any local station able to demonstrate that its ability to serve the public has been threatened. The same distant signal permission would apply below the top-100 markets, but CATV systems would also be able to import any missing network signals.

The rules are conditioned on the passage of copyright legislation which sets CATV liability, the Commission said. It stressed that its suggested copyright fees are the only suggestions the Congress may well wish to change. Seven-tenths of one percent of CATV revenues from subscribers...
Everyone in CATV talks about temperature swing, but only a CASE computer program does something about it.

SKL's CASE pinpoints trouble spots in any existing or proposed system design and/or operation. It tells you what's right and what's wrong, indicates necessary amplifier changes, specifies the equipment needed to eliminate seasonal adjustments, reduce maintenance and improve year-round picture quality.

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CBS Will Spin Off CATV, Combining It With Syndication Unit

Columbia Broadcasting Systems, Inc. has said that it will combine its U.S. CATV operations with its program syndications operations. The move will found a company, independent of CBS, whose stock will be distributed to CBS shareholders.

The plans to spin off CATV operations followed by less than a week the Federal Communications Commission ruling which forbids ownership of CATV by the three major broadcasting networks. The prohibition of network ownership of cable was incorporated in a sweeping CATV package (see separate story this issue) that among other things barred TV stations from owning CATV systems within their grade A contours.

CBS said it will discuss with the Internal Revenue Service possibilities of obtaining clearance for a tax-free distribution of the stock it plans to spin off. The network noted that combined 1970 sales for the two units to be spun off are projected at $20 million.

The proposed spin-off was made in reply not only to the latest FCC regulations barring the networks from ownership of CATV systems, but also to earlier FCC regulations that would have progressively barred the networks from syndicating operations.

In announcing the spin-off, CBS noted that FCC regulatory action is "impairing these two operations just at the time when they should be taking advantage of the bright opportunities for growth. It is neither wise nor fair to shackle their prospects during the inevitable long process of seeking more equitable rules."

CBS cable operations, appraised at a worth of $40 to $50 million, consist of approximately 15 franchised systems, 100% owned; 3 systems, 80% owned; and five systems less than 80% owned. The network serves about 10,000 subscribers on the West coast. Its cable operations presently form part of CBS Television Services division. In program syndication, CBS Enterprises, Inc. is the unit that has distributed television programs, CBS newsfilm and other films in the U.S. and abroad.

The FCC rules are final, but subject to petition and court appeals. On the issue of the progressive prohibition of networks from syndicating operations, CBS did petition.

The National Broadcasting Company, division of RCA, didn't announce any immediate comment on its own plans or on the CBS spin-off. NBC operates cable systems serving close to 20,000 subscribers throughout the U.S. American Broadcasting Company has no CATV systems franchised or in operation.

The Commission didn't propose standards for FM carriage, "ghosting," limits or performance characteristics involving phase relationships in the system. But it warned that developments "may impel us" to adopt such standards.

Once it sets the actual technical standards as rules, the Commission said, they would have to be compiled within a period of three years.

The Commission plans to establish general federal standards for CATV operation and leave it up to the local regulators to see that these standards are met as part of the cable system's franchise authority.

The FCC wants to restrict the franchise fee charged by municipalities to 2 percent of the cable system's gross revenues from subscribers. It went to some lengths in its proposals to try to smooth any state and local feathers that might be ruffled.

In asking for comments on the nature of standards to be adopted for local application, the FCC announcement noted that the local franchising authority "would investigate the character qualification of the franchise applicant, check on areas to be served, pole-line attachments, rates, quality of service and repairs. This information would be certified to the Commission by the local government organization before the Commission authorized the CATV system to use broadcast signals. The Commission would also specify to the local government unit a continuing regulatory program for such matters as rates, repair services and expansion timetables."
B.M. Tibshirany has been named general manager of Cox-Cosmos, Inc., according to Charles A. Batson, president of the firm. He most recently served as operations manager for the company, but has also been manager of the firm’s Ocala, Fla., Florence and Sumter, S.C., cable systems.

James V. Dunbar, Jr. has been named director of administration for Cosmos Broadcasting Corp., according to Charles A. Baston, president of the firm. Dunbar, who joined the firm in 1966, will continue to serve as Legal Counsel, in addition to his new position. Cosmos Broadcasting owns and operates five CATV systems through its subsidiary, Cosmos Cablevision.

Earl G. Roberts has been appointed manager of the newlly operative St. Albans Cablevision, Inc., system in St. Albans, Vt. He joined the company’s staff in July, 1969, when construction of its facility was in the planning stages.

Robert J. Wilson has been promoted to the newly created position of group vice president, wire and cable division of Anixter Brothers, Inc., according to an announcement by Bruce Van Wagner, vice president operations for the firm. Formerly Anixter’s Midwest regional vice president, Wilson will now be in charge of all operations of Anixter’s wire cable service centers.

D.A. Riedinger, vice president, marketing of Phelps Dodge Communications Co. has announced the appointment of Kenneth Atkinson as field sales manager. In his new position, Atkinson will be responsible for nationwide sales of coaxial cable for CATV applications. In addition, he will direct five full-time salesmen in district offices and assist in the direction of 18 technical representative organizations from his headquarters in Atlanta, Ga.

Data Technology has announced the appointment of Don Rozak as CATV marketing manager for the firm’s line of Data Vox equipment. In his new position, Rozak will be responsible for all CATV marketing operations, including the company’s line of split screen accessories for advertising and local origination.

B.W. Hughes, sales manager for Spencer-Kennedy Laboratories, Inc. has announced the appointment of Donald L. Wyckoff as Western regional manager. In his new position, Wyckoff will be responsible for administration and sales of SKL’s products in the western half of the U.S.
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Recent FCC Proposals: An Analysis for Laymen

What do the Commission’s proposals mean, and what are their implications for the future of cable? Two well-known communications attorneys tackle these questions in the pages that follow.

Many know E. Stratford Smith as Mr. CATV, a particularly apt title since he himself coined the term “CATV” in a memorandum which he prepared for the FCC while he was a trial attorney (1946 to 1951).

Strat Smith received an engineering degree from the University of Utah. His Juris Doctor (1943) and Master of Laws (1943) were received from George Washington University. In 1941, he established a private law practice in Washington, D.C., Attorney Smith formed the law firm of Smith and Pepper (now Smith, Pepper, Shack & L’Heureux) in April, 1957. It was under his leadership that the well-known Fortnightly case received a U.S. Supreme Court ruling that cable television was free from all liability for payment of copyright fees.

Attorney Arthur Stambler takes a look at the FCC’s new CATV regulatory program and describes his review as “A Minority Critique.” Stambler’s background includes prior service as Legal Assistant to one FCC Commissioner and two Commission Chairmen.

Arthur Stambler was admitted to the New York State Bar in 1959 and the District of Columbia Bar in 1955. His preparatory education was received at George Washington University and Harvard University. He is a member of the American Bar Association and the Federal Communications Bar Association. Stambler has his own law firm in Washington, D.C., where he practices before the Federal Courts and Administrative Agencies including the Federal Communications Commission.

What do the FCC actions of June 24, 1970, foretell for the CATV industry? This question has been repeated many times since that date. It is far too early to attempt a definitive answer. In fact, a reading of the various documents reveals a great deal of indecision on the part of the Commission in various areas; and, it seems clear that the rules and policies which are now evolving will be modified substantially, not only by the time they become effective, but continuously and frequently over the next several years.

It does seem clear, however, that the Commission has

The FCC’s new CATV “package” represents one of the most mixed-bags of federal regulation in recent Washington annals.

It is clearly of landmark proportions — unique, comprehensive, wide-ranging and complex. What is less reasonably perceived, however, is just what it involves, and what it will mean for the future of our country’s communications media, CATV as well as TV.

Initial industry reactions to the FCC’s announcements seem to find that same partisan split — this time with CATV pro and TV con. But the opinion here — apparently a minority view — is that there are substantial questions as to
responded to the significant criticism of its CATV policies from both within and outside the CATV industry, and that it has recognized the compelling need to open the major metropolitan areas for CATV development. The obvious question, of course, is how to do it in the light of the demand of the public for a greater diversity of program sources and auxiliary communication services and the divergent interests of copyright proprietors, broadcasters, CATV operators, franchising authorities and regulatory agencies. The Commission has made a valiant first effort and has produced a fascinating potpourri with something for everybody—or almost.

In this brief comment, no effort will be made to detail or evaluate all of the proposals, or pinpoint the many ambiguities and inconsistencies that appear throughout the several documents. Moreover, this would not be fair to the Commission which apparently has tried to put forth a comprehensive, if tentative, plan to enable CATV to move forward in the major markets. A function of the rulemaking process is to permit interested parties an opportunity to advise the agency where it has erred, and it is not to be expected that in a field such as CATV (where the issues are infinitely complex, interrelated and emotional, where private interests are so divergent and the public interest so important) that a concise, consistent and fully realistic plan would emerge at the outset. Indeed, in view of the previous regulatory attitude of the FCC towards CATV, and in particular the postures of several individual Commissioners on various public interest issues (such as protection of UHF, diversity of ownership of communications media, local community expression and educational television) it was indeed a major accomplish-

whether the FCC has now served CATV's best interests or may have actually diserved them. At least in making the prime attribute of its new program an unprecedented extension of regulatory control over the communications media under its jurisdiction.

There is, to be sure, some good reason for an optimistic CATV view. To an industry weaned on condemnatory FCC attitudes (such as "pirating" of product and harm to TV service), it's fairly heady stuff to now find FCC compliments as to there being "no disagreement about (CATV's) value and importance," and that it "offers the technological and economic potential of an economy of abundance."

But testimonials do not a system make. The FCC's asserted new approach will mean a brighter CATV future if, and only if policies and decisions are soon expressed in actions which permit and encourage the industry to expand into new systems, new signals, new services and (most importantly) new subscribers and users. It is on the traditionally skeptical litmus paper test of "deeds rather than words," that it may be questioned whether the FCC's package merits solid CATV expectations. Or, whether it may actually turn out to mean continued restrictions on further development. Any analysis today is a risky business that must reflect surmise and conjecture. But this striking contrast between what the FCC did and what it said may be enough to dampen CATV optimism in favor of a cautious "wait and see" attitude.

Everything the Commission has now done—such as its ownership limitations and burdensome cablecasting requirements, etc.—imposes new restrictions on the growth of a fledgling industry that has yet to truly get off the ground. In contrast, everything the FCC assertedly has in mind to free, stimulate and expand CATV is only in the form of rulemaking proposals that are decidedly extreme and controversial, that have to undergo long and hotly-contested rulemaking proceedings, and that further depend upon equally problematic Congressional legislation, before the FCC can even consider their adoption.

In the meantime the "freeze" continues as tightly as before, and for a further indeterminate period. It is this absence of any interim relief, pending this extended rulemaking—together with the vast and almost incredible array of new regulatory burdens the FCC contemplates for almost all CATV systems—that drins substance, if not credibility, from the rosy dream of CATV's tomorrow that might otherwise emerge from the Commission's new CATV pronouncements.

Summary coverage of only a few of the basic items of the FCC's new novelty catalog for CATV should be enough to demonstrate the vast size of the "Pandora's Box" which it has now opened.

Public Dividend Plan Has Many Problems

The Commission's new distant signal proposals have all but kissed away the last 20 months of its search for effective CATV regulation that went into its earlier "retransmission consent" concept, unveiled with much fanfare in December of 1968, and since essentially unused. Although reiterating that "retransmission consent" remains a pending alternative to its new scheme; the FCC admits not having bothered to

August, 1970
CATV access to each of the three networks; however, there will be few if any of the top-100 markets not having local service from each network. Non-network programs from distant network stations may be counted as "independent" signals. CATV may carry any number of educational stations "if no objection is made by the local educational licensee or permittee at the time he is informed of the system's intention to carry the distant stations."

Appeals for funds must, at the request of the local ETV, be deleted from distant ETV signals and appeals provided by the local ETV station substituted—that is, distant non-commercial commercials must be deleted and local non-commercial commercials substituted.

The Commission's efforts to protect local commercial UHF (and under some circumstances VHF) as well as ETV stations from any adverse economic results complete its processing of comments long-since filed to that proposal, and chides the industry for being "uninterested in its (properly comprehensive) test." Yet it now opens up a new, even more exotic and controversial approach that could well bog down its CATV regulation for years in trying to find answers to its many problematic elements.

Problem 1: A top-100 market proposal to bring in 4 distant independent signals on the bare conclusion that the anticipated returns to local UHF's from substituted commercials will more than offset the feared fractionalization of local audiences. All of this is done in advance of any effective UHF support, and perhaps even in the face of its active opposition.

Problem 2: A plan to substitute commercials that depends on complex and obviously expensive electronic equipment that is, as yet, not even on the drawing boards. Based on a sharing formula among the local stations that fairly boggles the mind, it is difficult enough to understand, much less to apply in practice.

Problem 3: A proposal for non-top-100 markets that is only partially evolved, and is grossly ambiguous as to whether or not it really differs from the top-100 criteria.

Problem 4: A recognition that Congress alone can determine the indispensable copyright aspect, while apparently refraining to date from working with the Hill to develop some widely-accepted copyright legislation. At this late date the Commission has put forth only its staff's "suggestion" for fees of 0.7% of gross system revenues for each distant signal carried.

Problem 5: The gratuitous and support-seeking "gimmick" of requiring CATV system payment of 5% of annual gross revenues as a subsidy to educational-television development. This idea is offered by the FCC without so much as recognizing the questionable nature of such a proposal in the absence of legislative authorization. (It is a proposal certain to draw strong broadcaster opposition as being the next "for whom the bells toll.")

Problem 6: The proposal to limit local franchise fees to 2% of annual system revenues (admittedly in order to accommodate the 5% ETV subsidy). Again, the FCC proposes an action without even raising the obvious questions of its regulatory power to do so, and ignoring the likely new opposition from the nation's cities at this loss of needed revenues.

Federal-State-Local Relationship Inquiry

Despite its having previously raised these troubling questions as to proper federal-local relationships in CATV regulation—and without even bothering to consider the rulemaking record already compiled in response thereto—the Commission has now waded further into that theoretical bog by raising other fundamental issues that are even more difficult to resolve.

The FCC is rather firm in rejecting—for practical reasons of its own limited resources—an approach that would license CATV's or apply detailed FCC regulation directly to them. But it then asserts only the most bare-boned jurisdictional proposals for a dual regulation with itself in the driver's seat. This would permit local entities to handle basic franchise matters (such as legal, technical, financial and character
guaranteed access to at least two in-state signals if they are available.

The Economics Are Staggering

The proposed contribution of 5% of gross income to the Corporation for Public Broadcasting is discriminatory and unfair. If CATV systems are to be required to originate and to provide local government channels, local public access channels, lease-channels and instructional channels, this is a sufficient tapping of the economics of CATV. A major effort must be made by the industry to place the financial facts of CATV life before the Commission at this proceeding. A notion that CATV can pay 5% of its gross for broadcasting, provide at least three dedicated channels (as much as 50% of channel capacity of 20-channel and above systems), provide adequate production equipment to operate these channels, pay $.30 per subscriber to the FCC for regulatory purposes, pay the cost of state public utility regulation, pay copyright fees, pay its normal operating costs plus the current cost of capital; staggars the credulity of even those operators of the very large systems. Also in this regard, not of the least concern is the Commission's proposal to require conversion to its new technical standards (presumably including its minimum channel requirements in three years). Can you believe such notions in today's money market?

The economic problem is compounded by the striking refusal of the Commission to preclude state rate regulation. It is inconceivable that the states can efficiently regulate the entire economic basis of the industry under public utility concepts, its avowed objective of shortly lifting the “freeze” and adopting some regulatory program for further CATV development.

Technical-Capacity Standards For CATV Systems

While the FCC's Docket 18894 Notice speaks in terms of considering new standards for CATV technical performance, its proposals actually go far beyond that seemingly non-controversial aspect, into some of the most speculative and problematic areas imaginable. These relate to certain operational aspects which the FCC now projects for all CATV systems in the future: a capacity of 20 to 40 channels; a two-way communications capability for any subscriber desiring it; and a series of separate origination studios and distribution facilities for every distinct community (i.e., neighborhood with some 25,000 or so households) within its geographic boundaries.

FCC proposals for such new standards (to be applied to all systems) are made without any consideration whatever of the high costs and other technical problems required to achieve these develop-

while the Commission demands expenditures of the nature and magnitude which the Commission seeks to impose. It is equally inconceivable that any rate regulation of CATV is necessary in the light of the economic burden which the Commission would require the industry to bear.

Don't Expect A Fast Thaw

Many other comments can be made, both favorable and critical, but space does not permit. Moreover, as previously indicated, the place for extensive, constructive and critical knowledge is in the industries' comments to be filed on or before October 7, 1970. The industry, in looking forward to the future, should distinguish between a thawing of a freeze and the breaking of an ice jam. What is happening is the former; even so, before the heat is applied, a copy-right bill must be passed.

(Continued on page 79)
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Software for Cable TV:  
A Directory of Suppliers

FCC compulsory origination rules have generated brushfire development of CATV software suppliers. An up-to-the-minute summary of program availabilities appears on the following pages.

ALLIED ARTISTS TELEVISION CORPORATION  
15 Columbus Circle, New York, N.Y. 10023; Ph. (212) 541-9200. Subsidiary of Allied Artists Pictures Corporation. Officers: Emanuel Wolf, Chairman of the Board; Andrew P. Jaeger, President. Regional Sales Managers: Leo M. Brody, Eastern Division Mgr.; Ken Weldon, Midwestern Division Mgr.; Carl Miller, Western Division Mgr. Programming format includes 16mm films.

Offers more than 500 full-length motion pictures including several from the 1950s, but the majority from earlier years. Along with westerns and "action" movies, 48 Bowery Boys and 11 Charlie Chan flicks are included. Cost is available upon request.

AMERICAN INTERNATIONAL TELEVISION, INC.  
165 West 46th Street, New York, N.Y. 10036; Ph. (212) 245-3035. Owned by American International Pictures. Stanley E. Dudelson, First Vice President. Regional Sales Representatives: Hal Brown, Marvin Levine, Chad Mason, Al. Horwitz. They have feature films for cable systems which "do not interfere with present customers at television stations." No cost information given.

ASSOCIATED CABLE CASTING & EDUCATIONAL SERVICE SYSTEMS, INC.  
501 Welch Road, Palo Alto, Calif. 94304; Ph. (415) 326-4734. Wholly owned corporation. Officers: Kenneth L. Lownes, Jr., President; Karl Schmidt, Vice President-Programming; Anthony Marniscalo; Robert Schar, Secretary-Treasurer. Associated Cable Casting & Educational Service Systems offers a programming format of 1/2" videotape, 1/4" videotape, audio tape and live on-site & MW relay. No programming content information given.

THE ASSOCIATED PRESS  
50 Rockefeller Plaza, New York, N.Y. 10020; Ph. (212) 262-4000.

Membership Corporation. Officers: Wes Gallagher, General Manager; Robert Eunson, Asst. General Manager; Robert Sundy, National Representative for CATV Services. Offices in major cities of every state. Programming format includes electronic display of AP news circuits, A continuously moving alphanumerical display of world, national and regional news is offered on a 24 hour basis, seven days a week. A split-screen adapter allows input of local news and advertising. The operation is totally automatic. Costs vary. The average rate, including local-input capability is $125 weekly.

ASSOCIATION—STERLING FILMS  
600 Madison Avenue, New York, N.Y. 10022; Ph. (212) 421-3900. Officers: R.D. Mitchell, President; G. Roger Cahaney, Executive Vice President. Regional TV Exchanges: New York, Los Angeles, Dallas, Atlanta, and La Grange, Ill. Programming format includes 1/4" videotape. Distributes free sponsored films to TV stations. Featurettes and 1/2 hour and 1/3 hour programs. Also supplies news clips and creative programming services.

AVCO EMBASSY PICTURES TV  
1301 Avenue of Americas, New York, N.Y. 10119; Ph. (212) 956-5500. A subsidiary of AVCO. A wholly owned corporation. Officers: J. E. Levine, President; L. Lightstone, Executive Vice President; E. J. Graff, Vice President for TV. Regional sales representatives in Memphis, New York, Chicago, and Los Angeles. Programming format includes 1/2" videotape, 16mm films. They offer feature films and cartoons. The cost of their services is based on number of subscribers and market size.

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NA WITH POWER CO. TEST BLOCK NO METER ADAPTOR

SC NO POWER CO. TEST BLOCK NO METER ADAPTOR

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NC NO CABINET

OUTPUT VOLTAGE

( REGULATED )

30R 30V @ 12A

35R 35V @ 10A

60R 60V @ 9A (XFMR TAPS)

30V @ 9A

(UNREGULATED )

30U 30V @ 12A

35U 35V @ 10A

60U 60V @ 9A (XFMR TAPS)

30V @ 9A

BASIC UNIT

N NORMAL (AC TO AC)

S EMERGENCY STAND-BY Battery option optional

PRODUCT

CT CATV POWER SUPPLY

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CABLEGUIDE

938 Danny Blvd., Seattle, Wash. 98121; Ph. (206) 622-1052. Officers: David E. Warmuth, President; Clarence N. Gosanko, Secretary-Treasurer; Mary Mayo McCabe, Editorial Director. Program consists of TV program listings and community news and information. Using telephone company leased lines, they tailor TV program listings to match viewing fare on each cable system. Listings appear in 15 minute segments surrounding each hour and half hour. Remaining time is "in-depth TV program information and community news and public service Information."

CBS ENTERPRISES INC.

51 W. 52nd Street, New York, N.Y., 10019; Ph. (212) 765-4321, A wholly-owned subsidiary of Columbia Broadcasting System, Inc. Officers: Ralph M. Baruch, Vice President & General Manager; James T. Victory, Vice President, Domestic Sales; Henry A. Gillespie, Director, Domestic Sales; Joseph B. Irwin, Director, Business Affairs; William G. Aden, Jr., Director, Creative Services; Frank Herman, CATV Programming Consultant. Regional Sales Offices: New York, Chicago, San Francisco, Dallas, Atlanta, Programming format includes live; 16mm film and 35mm film. They provide "virtually everything a cable system needs to produce 15 hours per week, full color, of unduplicated live programming specially designed for maximum local audience interest." Also offered are 13 color half hours; Vince Lombardi's "The Science and Art of Football." A prize-winning guessing game program is also offered.

CENTRONICS INTERNATIONAL

Suite 395, Tower Building, Little Rock, Ark. 72201; Ph. (501) 376-3161. Officers: J.L. Means, Chairman of the Board; Harry C. Fontana, Treasurer; Adolph W. Hefner, Vice President; Frank R.веселл, Director, Sales; Howard T. Mabry, Director, Programming; Charles E. Aden, Jr., Director, Creative Services; Mark C. query, Director, Finance; George H. Stoll, Director, Marketing; William J. Cosgrove, Director, Engineering. The firm produces standardized TV commercials of various lengths, with a variety of formats. They are also equipped to produce special commercials, etc.

BLACK VIDEO SYNDICATION NETWORK

19 Terrel Drive, W. Webster, N. Y. 14580; Ph. (716) 671-7330. Officers: Colby N. Fletcher, President; O. William Lindberg, National Sales Manager. Exclusive distributor: Jerrold Electronics. Cable Channels offers a programming format which includes 1/2" videocassette, 16mm film and audio tape. Black Video offers a variety of programs including gospel music, variety, drama, history, education, religion, serials, cartoons, sports and news programs geared for the Black community.
Have something to show for yourself.

As a CATV operator you've probably been quite content to be a middleman providing distortion-free television. But what about all those extra channels you've got just lying there in your cables? What about the FCC's suggestion that you try a little program origination? What about making a little more money? Huh?

There are many companies around just waiting to let you have syndicated tv series, full-length feature movies, travel films, documentaries, newsreels, and more. Don't worry about big expenses. You could go into movie-film origination with a 16mm tv projector, a slide projector, a multiplexer, and a comparatively low-cost television camera. The whole package almost fits into a closet. And it can surely fit your budget. You might even get local advertising to help defray expenses.

Check into it. Make your subscribers, your financial statement, and the FCC happy. Call one of the Kodak offices listed below for more data.

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Centronics offers college sports programming and variety shows. Cost of their programming is based on the number of subscribers.

COMPUTER IMAGE CORPORATION.
260 S. Beverly Drive, Beverly Hills, Calif. 90212; Ph. (303) 394-5588. Stock Corporation, Officers: Lee Harrison, III, Chairman of the Board; Bruce L. Birchard, President; Richard D. Rush, Vice President-Finance; Francis Honeys, Vice President-Engineering; Samuel C. Kendrick, Jr., Vice President-Western Marketing; E. O. Hulbol, Vice President-Western Marketing; Rudolph F. Handel, National Sales Mgr. Video Systems and Equipment.

This firm offers special production capability. For information and pricing concerning 1" videocassette productions, contact Rudolph F. Handel, 2126 S. Jason Street, Denver, Colorado 80223. For information and prices concerning 16mm film or 35mm film, contact Samuel C. Kendrick, Jr., 666 Fifth Avenue, New York, New York 10019.

DIVERSIFIED CATV SERVICES, INC.
511 No. Akard, Rm. 731, Dallas, Tex. 75201; Ph. (214) 742-8580. Corporation Officers: O.D. Chanslor, Chairman of the Board; Bill E. Cook, President; Robert M. Sinks, Vice President. Offers 1" videotape.

Diversified offers three packages of programming with costs based on subscriber count, with minimum charges. Package one offers 28 hours per week, $210 per week minimum. Package two is 21 hours—$180 minimum. Package three is 14 hours—$150 minimum. Most programming is available in color with content ranging from cartoons and sports to documentaries, adventure programs and game shows. Diversified also offers over 1,400 hours of Instructional TV programs as well as religious programming.

DOCUMENTARY BROADCASTING SYNDICATE
P.O. Box 166, Bryn Mawr, Pa. 19010; Ph. (215) 527-2070. Privately owned corporation. Officers: Jay R. Silber, President and Chairman; L. L. Silber, Executive Vice President. Programming format includes live NTSC color network feed.

Describing itself as "the 4th network," this firm provides live TV news and nationwide "Telephone Talk." Their service is designed to feed news and informational programming to cable systems throughout the country "at no cost to the CATV operators or to the subscribers." Includes eleven hours of news, etc., and 176 commercials.

GREAT PLAINS NATIONAL INSTRUCTIONAL TELEVISION LIBRARY
University of Nebraska, Lincoln, Nebr. 68508; Ph. (402) 432-3637. Non-profit corporation. Officers: Paul H. Schupbach, Director; L. Tracy Clement, Associate Director, Regional Sales Representative: Milton E. Hoffman, Senior Programming Counselor. Programming format: 1" videotape, 16mm film.

The company offers a collection of films on the basics of television production. Covered are such areas as graphics, sound, lighting, use of camera lenses, set construction, make-up and presentation techniques. They also distribute a wide range of Instructional telecassettes on videotape.

GRIDTRONICS, INC.
610 Fifth Avenue, New York, N.Y. 10020; Ph. (212) 581-4940. A subsidiary of Television Communications Corporation, Frank N. Cooper, President. Programming format is 16mm film.

Gridtronics offers a special plan involving their placement of programming on a cable system's unused channels. Subscribers pay extra for these extra channel services and the cable operator retains 50% of the monthly subscriber income. Available are a professional channel, an entertainment channel and two instructional channels.

J. R. HAMPTON & ASSOCIATES
P.O. Box 1401, Englewood, Colo. 80110; Ph. (303) 781-8697. Jack Hampton, General Manager. This is a division of World Wide Productions, Regional Sales Distributor: Diversified Services, Dallas, Texas. They offer the "how to" information and supplies for a cable system to conduct Bingo games (and, for the younger set — Bingo). The games are conducted live at the local cable system by cable people. Also geared to be a promotional plan for building subscriptions.

INDEPENDENT TELEVISION CORPORATION

INTERNATIONAL TELE-CABLE PRODUCTIONS, INC.
115 West Road, Towson, Md. 21202; Ph. (301) 828-4128. Officers: John Claster, President; Jim McGrady, Vice President. Programming format includes 8 local-live programs exclusively for CATV.

International provides the props, stage settings plus scripts and all materials for each program. Includes six adult programs and two children's programs featuring local participants.

KAP V FILMS LTD.
45 West 45th Street, New York City, N.Y. 10036; Ph. (212) 768-3375. Corporation Officers: Steve Kambourian, President, Jackie Vaden, Vice President; Paul Kessander, Executive Vice President; Al Blaek, Vice President. Regional sales representatives located at home office. Programming format includes 16mm films, 1" videotape.

Offers "The Outdoor Life" half-hour program with former New York Giants football star Frank Gifford. Also offered are two series for the do-it-yourselfer: "How To Get the Most Out of the Home Workshop." Each fifteen-minute episode features authorities from Popular Science Magazine.

W.N. KIRSHNER & COMPANY, INC.
1132 Waukegan Road, Glenview, III. 60025; (312) 729-3030. W.N. Kirshner, President. Programming format Includes 1/4" videotape. A production company.

KR GRAPHICS, INC.
1515 Cleveland Place, Suite 407, Denver, Colo. 80202; Ph. (303) 255-2053. Wholly owned subsidiary of King Resources Company. Officers: Bennett King, Chairman of the Board; Robert L. Whearely, President; William A. Baker, Director of Television Services. Regional sales representatives are located in Denver office. Programming format includes 1" videotape, 1/4" videotape, 16mm film, audio tape, and duplication in all formats.

Pilot production has been initiated by this firm for programs dealing with sports, gourmet cooking, interior decorating, religion, outdoor living, juvenile entertainment and public service travelogues. Most programs will be available by early 1971. Twenty hours per week is planned.

LEVIATHAN COMMUNICATIONS INC.
220 East 42nd Street, New York, N.Y. 10017; Ph. (212) 697-5390. Wholly owned corporation. Officers: Theodore C. Levenson, Chairman of the Board; D. William Hanway, President. Programming Includes CATV news and program service by nationwide wire using electronic character generating equipment with local originating equipment for local news, announcements, ads.

LOMAC COMMUNICATIONS INC.
102 Patagon Road, Linwood, N.J.; Ph. (212) 661-8640. Company Principals: L.E. MacDonald and Atlantic Coast Cable Corp. Officers: L.E. MacDonald, President and Director of Engineering; John Helzjn Jr, Vice President of Sales. Programming format includes 1" videotape; 1/4" videotape; 16mm film, audio tape, broadcast quad 2".

Expect to offer (by Fall) a series on a press conference format, produced weekly in Atlantic City with national personalisaties. Will be in color and will be offered free. Also planning a children's show and assorted educational programs for all age groups.

August, 1970
UP YOUR

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SAGE

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AND LOVE

Fresh programming, exclusively for CATV, produced by knowledgeable TV experts for cablecasting with profit.

Each show features an exhilarating celebrity guest discussion, and a demonstration on the fun of cooking. The recipes are a valuable sales aid.

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MCA TV
100 Universal City Plaza, Universal City, Calif. 91608; Ph. (213) 985-4321. A wholly owned division of MCA Incorporated (owner of Universal City Studios, Universal TV and several other allied entertainment companies). Officers: Robert Greenberg, Vice President and CATV Representative. Programming format is 16mm film.

Their initial entry into CATV involves release of fourteen, 12-chapter motion picture serials. All were produced by Universal Pictures in the early 30's. Included are such "classics" as "Perils of Pauline," "Heroes of the West" and "Vanishing Shadow."

MESTON'S TRAVELS, INC.
3801 N. Piedras, El Paso, Tex. 79930; Ph. (915) 566-1631. Officers: Harvey Meston, Elizabeth Ann Meston, Valerie Cavennaugh. Programming format includes 35mm or filmstrips with script.

They offer prepared travel programs using slides and scripts. Cable operator must provide voicing. Programs draw from a library of 3,500 color transparencies from throughout the world.

MONITEL
488 Madison Avenue, New York, N.Y. 10022; Ph. (212) 371-5600.

Officers: Robert L. Lawrence, Chairman of the Board, Monitel, Inc.; Henry S. Bonner, President Monitel, Inc.; Edward A. Grey, President, Monitel National Rep.

Monitel is a 24-hour information service offering temperature and weather forecasting, household hints, cartoons, safety tips, horoscope, sports, recipes and games. They will also represent systems for the sale of advertising time.

NATIONAL CATV PROGRAM BUREAU, INC.
1004 Stemmons Tower South, Dallas, Texas 75207; Ph. (214) 638-5310. A closed corporation (Texas). Officers: R.L. Eaton, President; D.W. Killbrith, Vice President Marketing; T. Martin, Secretary-Treasurer. Programming format includes 1" videotape (IVC and Ampex), CBS-EVR.

This is a library of "television entertainment from the major producers of the industry." Access to the library is offered to cable systems on a membership basis. The basic rate is one-half cent per program half-hour, per subscriber.

NATIONAL TELEMEDIA, INC.
342 Madison Avenue, New York City, N.Y. 10017; Ph. (212) 697-6845; Officers: Richard Perstein, President.

Telemedia provides no "canned" program services. However, they provide a consultant service for local operators involved in local live origination. They will also produce custom TV commercials on a one-time charge basis.

NATIONAL TELESYSTEMS CORPORATION
9125 Sunset Blvd., Los Angeles, Calif. 90069; (213) 276-1018. Joint Venture/Clark Productions Inc., International Video Corporation. Officers: Don Eldredge, Chairman of the Board; Jack Mann, President; Robert Zabriskie, Treasurer; Francis LaMaine, Secretary; Arden Mosher, Sales Manager. Programming format includes programming on IVC and Ampex 1" videotape.

NTC offers fifteen hours per week of new programming produced for cable television. Additionally NTC offers feature films, film series and local origination packages including "Green Valley Cable Nursery School," "Junior Bingo" and "Lunk."

The new CATV programming runs 35 cents to 10 cents per subscriber per month for 15 hours of programming. The films vary from 20 cents to 4 cents per subscriber per month, depending upon the size of the package.

NBC FILMS, INC.
30 Rockefeller Plaza, New York, N.Y. 10020; Ph. (212) CI-7-7-8300. A wholly owned subsidiary of National Broadcasting Company. Officers: Gerald Adler, Vice Chairman; William Schmitt, Chairman; Jacques Liebghuth, President. Regional Sales Representatives located in Chicago, Dallas, Los Angeles and Greensboro, N.C.

No information given as to programming available for cable television.

NICHOLSON-MUIR PRODUCTIONS, INC.
138 Chatsworth Avenue, Larchmont, N.Y. 10538; Ph. (212) 824-1614 or (914) 834-3005. Officers: E. Roger Muir, President; Robert A. Nicholson, Executive Vice President. Programming format includes 1" videotape.

This firm offers the "Video Encyclopedia" free to cable operators. The "Encyclopedia" is a library of special interest, first-run programs in color for CATV. Various subjects are currently in production, with first series to be available in Summer of 1971. The programs have four commercial breaks, two filled by N-M and two for local spots. Cable system will only pay for shipping and handling costs.

NORTH AMERICAN STUDIOS, INC.
14 Newbury Street, Boston, Mass. 02116; Ph. (617) 261-8100, Robert A. Gilmore, President. Programming format includes 1" videotape, 1/2"
videotape, 16mm film, and audio tape.

This firm provides TV and other origination services, including audio-visual displays, commercial production, program production, professional counseling. "In the near future, a complete origination package and lease-a-channel service will be provided."

NORTH AMERICAN TV FILM CORP.
1330 Kuntz Road, Erie, Pa. 16509; Ph. (814) 864-2288. Stock corporation, Programming format includes 16mm films and 35mm films.

Production house for custom programming, etc. Wishes to do special production work for CATV systems.

NTA/CATV
8530 Wilshire Blvd., Suite 407, Beverly Hills, Calif. 90211; Ph. (213) 205-7701. A division of NTA, Inc. Officers: Berne Tabakin, President; Peter S. Rodgers, Executive Vice President, Regional Sales Representatives: Marvin Grey, and Joseph Zaleski, Regional Sales Directors, Programming format includes 1" videotape and 16mm films.

Offered for CATV are three groups of feature length films totaling more than 1,800 in all. Also 57 post-1960 productions (39 in color), and over 600 cartoons (300 in color). More than two dozen syndicated series are offered in half-hour formats. Another 56 Gene Autry western half-hours and 100 Roy Rogers half-hours are available. A new 13 part color sports show "Rodeo, USA" is also offered.

OPTIMEDIA SYSTEMS, INC.
1080 Route 46, Clifton, N.J. 07013; Ph. (201) 777-7600. George Hoffman, President. Programming format includes 1" videotape, 1/2" videotape, 16mm film, audio tape, and video cassette (when available). This is a "complete television production" facility. Mobile facilities are also available. Both facilities and personnel are offered.

R ASSOCIATES, INC.
974 Pavilion Street, Cincinnati, Ohio 45202; Ph. (513) 421-2253, 241-6089. Closed Corporation, Officers: Chairman of the Board, Jerome R. (Tad) Reeves; Carl F. Trunk, Jr., President; Roland O. Reed, National Sales Manager. Regional distributor: The Key Group, Inc., Middletown, Pa. Programming format includes 1" videotape (Ampex and IVC). "Parsley, Sage, Jani and Love" is a half-hour color, daily conversation/contemporary cooking program, produced exclusively for CATV.

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The expenditure for your multi-channel programming was necessary, but your profit loss is not! VDO America Inc., will lease your blank channels and make them productive. In fact VDO America has a double bonus plan for you...additional revenue plus additional programming that will attract and hold NEW SUBSCRIBERS for you! VDO will satisfy all your obligations, and well before the FCC deadline...

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At the end, it is for that...
SHOWCORPORATION OF AMERICA
10 East 49th Street, New York, N.Y. 10017; Ph. (212) 421-8830.
Officers: C. Robert Manby, President; Fred Schneler, Executive Vice
President; Richard A. Harper, Vice President. Regional Sales Repre-
sentatives: William Morris, Eastern Sales Rep.; Henry Guzik, Southern
Sales Rep.; Paul Litt, Midwestern Sales Rep.; Richard Loughrin,
Western Sales Rep. Offers programming format of tape and film 16mm.
They offer 156 Abbott and Costello cartoons; 120 feature films (many
in color); "Vip Travel Guide," a daily, half-hour color series on the
how, when and where of travel throughout the world; "Firing Line",
one-hour debates with William F. Buckley, Jr., in color; and the
Christmas classic "A Christmas Carol."

TAPE-ATHON CORPORATION
502 South Isla, Box 814, Inglewood, Calif. 90307; (213) 776-6933. A
family-held corporation. Officers: George M. Anthony, President; David
J. Anthony, Executive Vice President; H.J. Halvorsen, Vice President;
Wally Rubin, National Sales Manager.
Tape-Athon offers "the World's Largest Tape Library" for background
music via CATV.

TELE-COLOR PRODUCTIONS, INC.
708 N. West Street, Alexandria, Va., 22314; Ph. (703) 683-3203.
Officers: Charles F. Riley; Harold L. Smullian. Programming format
includes 1" videotape, 1/2" videotape, 16mm film, audio tape, and 2"
videotape.
This firm offers color and b/w studios and mobile units for on location
production services. They have tape-to-film transfer services and video
tape dubbing services.

TELEMATION PROGRAM SERVICES, INC.
50 East 42 Street, New York, N.Y. 10017; Ph. (212) 687-0180.
Officers: Robert Weisberg, President. Programming formats include 1"
videotape and 16mm film.
TPS operates as a film buying representative for the cable industry
(currently representing 32 systems). TPS also offers the "Baby Sitting
Channel," consisting of 800 modern, non-violent children's programs.
Cost information on both services upon request.

TELEVISION PRESENTATIONS, INC.
43 W. 61st Street, New York, N.Y. 10023; Ph. (212) 586-1717. A
subsidiary of Sterling Communications. Ira G. Delumen, Vice President
& General Manager. Regional Distributor: Mar-Kit, Jef Marcus, Bert
Kittay. Programming format includes Alpha Numeric Kit.
Programming consists of alpha numeric system of UPI news service,
including New York stock ticker and local origin material, prices
range from $90 to $192 per week.

TRANS AMERICA FILM CORPORATION
Ph. (213) 486-7575. A privately-owned corporation. Officers: C.E.
Feitner, Jr., Chairman of the Board; David Stroom, President; Kyle G.
Thomas, Asst. to the President; A.R. (Bob) Nunes, Western Sales Mgr.;
William Bloom, Mgr. Film Distribution. New York Office: 2 West 45th
Street, New York, N.Y. 10036 (212) 879-1860; C.E. Feitner, Jr.,
Chairman; Claude Hill, Secretary. Tri Cities Office: Box 975, Kingsport,
Tenn. 37662 (615) 246-4000: John Dallas, South East Div. Mgr.; Don
Ferguson, Mgr.-Sales Service.
TAFC is an independent motion picture and TV film owner and
distributor. They own and distribute feature films, western features,
special programs, cartoons and TV series with over 1,000 titles available
to CATV.

VDO AMERICA INC.
1916 Gulf Life Tower, Jacksonville, Florida 32207; Ph. (904) 396-5763. Owned by Securities National. Officers: Bill Hatcher,
President; Gene Orr, Chairman of the Board; Bill Hatcher, President;
Buddy Dykes, vice president; Gilbert Kelley, vice president. Regional
Sales Rep.: Kemp Advertising Agency, Gulf Life Tower, Jacksonville,
Florida 32207. Programming format includes "1" videotape, 16mm film
and slides for commercials.
They offer local emphasis programming tailored to individual markets.
They lease an unused channel from CATV operators and handle all the
programming for that channel. Cable personnel with the skills and
techniques of CATV programming.

VISUAL DYNAMICS
8530 Wilshire Boulevard, Beverly Hills, Calif. 90211; Ph. (213) 687-6020. Partnership. Officers: T.J. Vodrey, President; Carles Callaci,
Vice-President; Neil MacKenzie, Director, Regional Sales Reps.; Audio
Craft, Inc.; Seattle; Recording Center, San Diego; Interstate School
Supply, Baton Rouge, La.; Universal Export De Mexico, Mexico, D.F.;
Oregon Audio Video Systems, Portland; Hyer Associates, Denver;
Universal Magnetics, Inc., Dallas.
Visual Dynamics does not provide CATV programming; rather, they
hold on-site training workshops. These workshops are designed to equip
cable personnel with the skills and techniques of CATV programming.

VISUALIFE PRESENTATIONS
634 S. Victory Blvd., Burbank, Calif. 91502. Div. of Audio Inter-
national, Inc. Officers: O. Berliner, President and Executive Producer;
R.M. Sherman, Vice President; M.P. Larsen, Secretary; M. Daniels, Sales
Manager. Programming format includes 1" videotape, 1/2" videotape,
16mm film.
They offer music, variety and documentary programming.

WINTERS/ROSEN DISTRIBUTION CORP.
9110 Sunset Boulevard, Los Angeles, Calif. 90069; Ph. (213) 274-6607.
Officers: Burt Rosen, President; Jerry Weisfeld, Executive Vice
President-Sales, Regional Sales Representative (East of Mississippi)
Brad Marks, 22 Somerset Dr., Woodcliff Lake, N.J. 07675 (212) 947-7699; (West of Mississippi) Arthur Greenfield, 9110 Sunset Blvd.,
Los Angeles. Programming format includes 16mm film and 2" color
videotape.
Offered are 52 half-hour weekly (color) Barbara McNair Shows; 78
half-hour Buck Owens Ranch Shows (color); 25 feature films; 350
cartoons; 328 half-hour color film hunting and fishing shows; other
special features.
Local Origination Profile: Cablecasting Election Returns

The cablecasting of local election returns can be of major interest to your subscribers. Here’s how it has been done at Ottawa (Illinois) TV Cable.

By Xenophon W. Mitchell
Director of Cablecasting
Jerrold — Midwest Systems

Political cablecasting at Ottawa TV Cable (Illinois) has proven to be successful in both subscriber gain and viewer popularity since the initial local election return cablecast, approximately nine years ago.

The excitement of the election and the new method of receiving results created a festive mood throughout the city. Some CATV subscribers found another justification for a party...election result parties were held in homes and clubs all over the Ottawa TV Cable service area.

The following steps were followed to attract and maintain a viewing audience.

First the limited space at the head-end was rearranged to allow space for props, equipment and people. Arrangements were also made for program participants.

During the election it was necessary to receive results from the entire Congressional District, comprised of 5 counties. Cable TV election representatives covered “key precincts,” reporting to their respective county anchor man, who in turn reported to the overall anchor man at Cable TV election central. Tabulators maintained an accumulative total of all major office candidates.

The system used by the Cable TV election reporting team was at least three hours ahead of all other news media in reporting “unofficial” returns.

Since paper ballots are used in most areas of Illinois, the vote tally process is long and cumbersome. Therefore, late reporting is not uncommon. This allows the Program Director the opportunity to have numerous guests during the evening of election returns.

Invited guests usually include representatives from labor, business, industry, professional groups, civic associations, service organizations...fraternal, religious and educational leaders...and participants from young adult groups. All these people are alerted to be prepared for interruptions during their time “on the air,” for latest election reporting information. This practically guarantees a viewing audience during the lull between election reports.

Candidates are requested to appear on the program during the evening. Cable TV Community Channel MC’s and announcers do not editorialize or project victors of political contests. The Community Channel of the Ottawa TV Cable system provides election information as a public service; therefore, the viewing public does not expect management or staff members to express their individual political views.

Randy Thomas announces election results.

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Berkey-Colortran, Inc. 1015 Chestnut Street, Burbank, California 91502 (213) 843-1200

August, 1970
The Studio Control Room: Switching Audio & Video Signals

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

By Jack A. Rickel

Last month we discussed the role of audio and video patching devices for the small CATV origination system. This article will describe the complimentary and sometimes competitive use of audio and video switching.

While patching is the most flexible of all interconnection methods, it does present some disadvantages. For one thing, there is not room on the designation strip above each jack hole to put more than the briefest of descriptions as to where the jack goes. Unless the operator is familiar with the routing he may have difficulty getting it straight in his mind. For another thing, it is highly unusual to find a combined audio-visual patch panel. The usual practice is to have one or more video patch panels and one or more audio patch panels. It is relatively easy for an untrained operator to get the video from one origination source patched up with the audio from a different source.

Crossbar Switching

The best way to eliminate these two problems is to use a form of crossbar switching. The control panel for a crossbar switcher usually consists of a rack panel with rows of switches arranged horizontally and vertically. For example, each vertical row of buttons may represent a video input with its associated audio. Each horizontal row may represent an output. Activating any button takes both audio and video from that vertical row and switches them to the output represented by that horizontal row. For example, if you went down the rows to horizontal row number 5, and depressed the button in vertical row number 3, the audio and video inputs from input number 3 would be connected to...
the output line number 3, which could be to a modulator feeding Channel 5. Crossbar switches are available with buttons which illuminate when activated so you can see from some distance away which inputs are connected to which outputs.

Most crossbar switches have solid-state distribution amplifiers for both audio and video on each output, so that any number of outputs can be connected across any input without loading it down. These crossbars are usually available in six and twelve input models and up to twelve outputs as standard units. Custom assemblies can be had for any number of inputs and outputs up to several hundred. Principal suppliers of crossbar switches in alphabetical order are Alma Engineering, Dynair Electronics, and TeleMation. Prices for a twelve input, six output crossbar switcher for audio and video are as follows: Alma — $3,440, Dynair — $3,140, and TeleMation — $4,240.

This may seem considerably higher than patching, but it must be remembered that the prices of patch panels do not include distribution amplifiers which must be added externally.

Two useful options which can be added to crossbar switches are (1) bridging inputs, so the video input (such as from a camera) may be fed through the crossbar, and on to some other input; and (2) sync adding outputs, so sync may be added at the output if one is switching non-composite video.

Passive Switching

A simpler form of audio and video switching which may be used by the small system operator is passive switching. This is usually a simple, mechanically interlocked
switch with six or twelve inputs and one output. As an option, the buttons may be illuminated. Such a switcher may be used to select the inputs to a monitor, a video tape recorder, a waveform monitor or similar application.

A word of caution here. Many passive switchers are the terminating type, so that when designing a system the switcher must be at the end of any particular video feed, or else fed from one of the outputs of a distribution amplifier. Most passive switchers have extra contacts so that audio can be switched along with the video. Passive switchers are made by a number of companies and prices range from $60 to $150 depending on the number of buttons and whether or not they are illuminated.

The Switcher/Fader

The most widely-used switcher in any origination system is the switcher/fader or production switcher. The switcher/fader is a device with dual input switching into dual amplifiers, the output of which can be mixed into a single output line. A split handle geared to two level controls, called a “fader bar,” can be moved backwards and forwards in a short arc. The level controls are to control the video output from each amplifier and as the fader bar is moved from one extreme of travel to the other, first one amplifier and then the other is at maximum output.

As the level goes down on one amplifier it comes up on the other and this is called “fading” between two pictures. When the fader arm is in the mid-position half of both amplifier outputs are fed to the outgoing line and the pictures are said to be “mixed” since one is overlaid upon the other. Usually the split fader bars are linked together to make a smooth transition from one picture to another, but they can be decoupled to allow them to be moved independently of each other for special fades and mixes.

Input switching to the fader amplifiers is usually accomplished with two rows of buttons designated “A” and “B” bus, which simply means their outputs either feed A or B amplifiers. The number of switch buttons on either bus determines the number of inputs which can be fed to that amplifier. For example, if you had six buttons on each bus, you could have six inputs to each amplifier. Buttons 1, 2, and 3 might control the input from three studio cameras, button 4 might be from a film camera, button 5 from a message channel and button 6 from the output of the special effects generator. The same inputs would be fed to the same positions on both A & B bus to reduce confusion.

Since the input on many switcher/faders is of the terminating type rather than the loop-through, it may be necessary to use distribution amplifiers on each piece of equipment which is to feed the switcher/fader. One of the distribution amplifier outputs would go to A bus and another one to B bus.

Switcher/faders can switch either composite or non-composite video signals, but can only mix or fade non-composite signals. Therefore, one must be careful to feed only non-composite signals to the input of the switcher/fader if he wishes to have complete control of the output signals. Sync signals are supplied to the switcher/fader by a separate sync feed and sync is added to the mixed or faded signal which appears on the output of the switcher/fader.

Earlier versions of switcher/faders had provisions for both non-composite and composite switching on the input buses, but to avoid confusion, the newer units add composite video switching to the output line (which is also composite) after the mixer amplifier outputs. Some of the composite video which might be switched into the output line would be signals from video tape recorders, signals from off-air tuners or signals from a weather channel camera with internal sync.

The Preview Feature

Many switcher/faders have a third row of switch buttons called a preview bus. Its output is usually connected to a video monitor and a waveform monitor, but not to the mixing amplifiers. The operator by depressing any button on the preview bus can preview any video source before he switches it into A or B bus.

Often there are two extra buttons on a switcher/fader marked “normal” and “reverse.” In normal position the switcher/fader works like it normally does. In the reverse position, the preview bus is switched to the input of the A bus amplifier and the A bus becomes the preview

![Central Dynamics VSE 741 video production switcher.](STUDIO_Technology)
bus. This allows the operator to fade to anything on the preview bus. Some of the newer switcher/faders have "automatic preview." There are only two rows of buttons, either one of which (not being taken at that moment) becomes the preview bus. When the fader arm is moved to the bus being used as preview, it is then taken and the other bus becomes the preview bus.

Production switchers are just like switcher/faders except that they are more elaborate. They may have four or more input buses; many, many inputs in each row; and incorporate a special effects generator. This usually consists of two or three rows of input switches for the special effects generator, a control to set up the effects desired, a joy stick to position the effects on the screen, and another fader bar to fade effects in and out of the program.

Switcher/faders and production switchers come in all sizes from units costing a few hundred dollars to units costing over a hundred thousand dollars. Some of the smallest units consist of no more than two little solid-state amplifiers with a knob on the front panel, controlling a dual level control to fade or mix between video inputs. Large units may run to a dozen rows of switches for broadcast use.

Switcher/faders are made by just about everyone in the television video processing field. Here are a few of them listed alphabetically: Alma, Ampex, Central Dynamics, Cohn, Dynair, GBC, General Electric, General Precision, Grass Valley, Phillips, RCA, Richmond Hill, Riker, Sarkes Tarzian, Shibaden, Sony, TeleMation and Visual.

What are good small switchers/faders for the CATV operator who wishes to begin origination? Dynair has a vertical internal switcher/fader, the VS-150 for $750. It has three non-composite inputs and three composite. Their production switcher, the VS-152-A, sells for $1,795 and incorporates six non-composite inputs, two composites, special effects and dual fader bars. TeleMation has its TPS-8 x 2 automatic preview switcher/fader with eight inputs composite or non-composite for $1,950. Their TPS-12 x 3 sells for as low as $2,995 and has twelve inputs and a separate preview bus. The Alma 6511 has four non-composite and three composite, plus effects buses for $3,300.

If, by now, you're completely confused as to the relative merits of patching or switching, Trompeter has one answer. It is a combination video patch panel with tally lights coupled to a switch matrix. One can switch inputs to outputs by depressressing a switch button or can change the whole set-up by moving the patch cords from one to the other. The tally lights on the patch panel light to indicate which patch positions are activated by the switch.

Next month this column will take a look at video tape recorders. In another article the "how to" of VTR electronic editing will be covered.

---

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**ANNOUNCEMENT**

Robert A. Brooks

We are proud to announce the appointment of Bob Brooks as Vice-President, CATV. He will have full responsibility for Cable Television, Microwave and Emergency Tower Restoration services relating to the CATV industry.

Brooks, an 18-year veteran of the CATV industry, formerly held management posts with Anaconda Electronics and (more recently) Spencer-Kennedy Labs, where he was Engineering Vice-President. He holds a BSEE degree from Northeastern University.

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August, 1970
Reduce the number of amplifiers in your system and you reduce the number of problems. C-COR’s high-output amplifiers can do just that, increasing your system reliability by reducing the total number of amplifiers required. C-COR equipment provides the greatest signal fidelity even on the longest cascade... and unsurpassed system stability through the C-COR Total System Control Concept.

From a performance standpoint, the most difficult problems in designing a system are those imposed by large numbers of amplifiers in total as well as in cascade. Individual amplifier problems such as noise, distortion and tilted frequency response are often cumulative. Therefore, the larger the number of amplifiers, the greater the problems.

C-COR counters these problems with high gain, high output trunk amplifiers with gains tailored to the specific trunk length. These amplifiers, at 34 dB or 40 dB spacings, go a specific distance with fewer amplifiers, lower noise and less distortion than any competitive system.

C-COR further reduces the “parts” in a system through high output bridging amplifiers. These amplifiers, with an output capability 6 to 10 dB above those commonly used, provide maximum efficiency for the distribution portion of the system. This higher operating level increases the feeder length and drastically reduces the number of line extenders with a corresponding reduction in associated maintenance costs and problems.

C-COR has the technical data to support these claims. Write for it, or telephone to arrange for a C-COR engineer to discuss your particular construction or rebuilding plans.

THE SYMBOL WITH MEANING
FOR EVERY CABLE SYSTEM

Half The Parts — Half The Problems

C-COR Amplifiers . . . Rated First Where Performance Is Rated First
Studio Notebook

answers to program problems

QUESTION: Should mobile cablecasting equipment be fixed in a van or mounted in portable cases?

ANSWER: This question usually arises when the CATV system must use the same equipment for both studio and remote program productions. It is not possible to give one answer which would fit all situations because of the different approaches to cablecasting from one system to another. But, it is possible to list advantages and disadvantages of different methods of gaining mobility.

The simplest method of doing a remote program is to detach a single camera and videotape recorder from the studio system, and carry it into the field in any available vehicle. There are certain features that the camera should have for best results: (1) an internal 2:1 interlace or EIA synchronizing generator; (2) a zoom lens with a wide range of zoom focus, preferably 10:1; (3) a superior pick-up tube of the separate mesh or Plumbicon* type for marginal light situations; and (4) self-contained video processing (no external boxes). Obviously, it is helpful if the camera is light weight without requiring heavy tripod equipment.

A mobile van, with all control equipment permanently mounted, permits the most professional assortment of equipment to be moved around town, but it creates inefficiencies in producing programs in the studio. The most serious deficiency is the separation of film multiplexing equipment (mounted in the studio building) and the video and audio control console in the van. In the field, access to public buildings and athletic facilities can sometimes be a problem for a van, causing long cable runs across sidewalks, up stairs, down halls, and in aisles.

A good solution for smooth studio and field operations is to permanently mount your video and audio control console in a studio control room with good access to the studio and all associated equipment. Add a modest and very portable video control unit for synchronously switching and monitoring cameras, recorders (non-synchronous), and audio sources in the field. This insures a minimum of set-up time, and requires no dismantling of studio facilities.

If the budget will not permit the auxiliary mobile control unit, then my preference is a portable console, or small cases which can be used intact, both in the studio and control room and in the field. This requires a standby switching system in the control room for films, tapes, and message units operating on their own self-contained (switchable) sync when studio cameras are taken away for remote cablecasts.

A $10 check is yours when your question regarding cablecasting is used in this column. Send questions to: Studio Technology Editor, TV Communications, 1900 West Yale, Englewood, Colorado 80110.

August, 1970
The FCC Survival Kit

Telemet's

Modulator 4400-A2.
It's the one you're "in spec"
with on January 1, 1971.

Model 4400-A2 is uniquely equipped for origination. Unlike circular modulators, it has the envelope delay characteristic of a TV transmitter. So, it produces the 170 nanosecond Chrominance/Luminance advance the FCC requires.

And the 4400-A2 is all solid-state. With an output level of 35-55 dBmV. Uses plug-in, crystal controlled "up" converters, too. In every way, it's the one modulator you can depend on for many years to come.

OTHER TELEMET CATV PRODUCTS:

Demodulator 4502-A1 — Accepts broadcast signal and converts it to baseband without distortion. Has plug-in V.H.F. front end modules for channels required. When used in conjunction with Modulator 4400-A2, for waveform tests, an overall Modulatcr/Demodulator K rating of 2% is obtained. The 20T composite color test signal is carried with negligible distortion. Chrominance Delay Equalizer 4700-A1 — Corrects origination errors in delay as detected by 20T and 21T pulse measurements. Correct delay is attained when the 20T pulse base line is ±1 and the 21T pulse is symmetrical. A total switchable delay of 275 nsec is in incremental sections of 25 nsec. Each delay is compensated automatically for insertion losses.

Signal Conditioner 4600-A1 — Corrects for loss of detail and positive and negative smearing. Compensates for low chrominance. All adjustments are made from a monitor jack before actually switching to Operate. Adjustments are made easily from day to day and from source to source.

For complete details, write or call: Telemet Company, Dept. T6, Amityville, New York 11701, (516) 541-3600.
“Scotch” Brand's newest video tape. You'd think we invented it especially for CATV origination.

Our new Guardsman series helical video tape gives you precisely the qualities you need most for program origination. Superb performance in color or black and white. Reduced dropouts. Improved signal-to-noise ratio. Improved RF output.

But that's only the beginning. Guardsman's special back treatment actually helps guard itself against damage, protecting your valuable programming.

Its exclusive back treatment resists scratching, reduces polyester redeposits on the oxide surface and makes possible longer tape life.

Guardsman helps solve handling problems, too. Runs smoother on any VTR transport. Its tighter, more even wind virtually eliminates cinching and windowing, halts capstan slippage.

What's more the highly conductive back treatment reduces the static attraction of airborne contaminants that cause dropouts and damage to tape and VTR heads.

Make your next video tape investment in “Scotch” Brand's Guardsman — the ideal tape for CATV origination.

For more information, call collect to Mr. Jack Bondus (612) 733-7627.

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3M Center, St. Paul, Minn. 55101

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TYPE OF VTR EQUIPMENT_________________________

TVCI

"Scotch" is a registered trademark of 3M Co.
CBS Color Corrector; Quality for Low Investment

CBS Labs has recently introduced an electronic color television broadcasting device that enables CATV operators to correct color variations in programs as they are beamed to home television sets.

The CBS Color Corrector makes it possible for studio engineers to adjust color variations in a television program after it has been encoded, and at any time during its transmission to home receivers.

According to CBS Labs, "The color corrector will make it possible for CATV operators to provide the highest possible quality color television programs. For the first time, CATV operators will have control over color quality in television programs, with the ability to make color corrections at any time during transmission without the viewer sensing any variation."

With the unit, it is possible to complete the final match of various signal sources at a central location, where all the program elements can be viewed continually rather than depending on corrections made previously in various locations.

Without the use of the color corrector, color balance adjustments can be made only at the camera source, with no practical method of modifying this balance at subsequent program transmission stages.

In operation, the CBS color corrector performs small color balance changes on a television signal, closely simulating the operating controls of the originating camera and balancing one camera or videotape against another to maintain consistent color.

The device does not process the encoded signal, but generates a correction signal which is added to the incoming signal to produce balanced color tones. If no color correction is required, nothing is done to the signal.

The unit can be used to match color produced by television cameras of different manufacturers. It sells for under $3,000.

CBS Labs encourages the use of its Mark II Image Enhancer with the Color Corrector to enable low cost cameras to "approach professional broadcast quality for a fraction of professional cost."

A sophisticated vertical and horizontal aperture corrector, the Image Enhancer is priced at $3,640.
Head end site of Soble TV Cable in Sebastopol, California, utilizes a 30-foot dish to aid reception of UHF signals.
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MOBILT HEAD-END BUILDINGS

- Designed expressly to house CATV and microwave electronic equipment, Fort Worth Mobilt Head-End Buildings withstand any climate or location problem. . .house electronic equipment according to the most rigid standards. Mobilts are completely portable. . .Simply drop on your site, and connect the service inlet. Complete wiring is installed at the factory. Many options are available in size, outside finish, wiring and ventilation. There's one exactly suited for your system.

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System Performance Testing Using the Field Strength Meter

Cable television has spawned many new applications for the field strength meter. One of these special applications — use of the FSM as a tunable detector — is discussed below.

The February 1970 edition of *TV Communications* included an article by this author, regarding test equipment uses. That article was devoted entirely to a discussion of the singular applications of the field strength meter. This installment moves into some of the special applications that were mentioned at the end of the previous discussion.

**The Field Strength Meter As a Tunable Detector**

The demodulated voltages of the input RF energy to a field strength meter can be used for qualitative purposes, as opposed to the quantitative purposes for which the instrument is basically intended. A list of possibilities follows. In these applications, we will be primarily involved with qualitative system analysis — the system consisting of from one amplifier to many.

FSM extended measurement uses: (a) Cross-modulation, (b) Hum, (c) Second order beats, (d) Third order beats, (e) Level changes vs. temperature, and (f) Co-channel.

There are several unique applications that are not qualitative: (a) As a sweep trace variable marker source, and (b) As a sweep trace oscilloscope triggering source.

This discussion will focus on cross-modulation measurements, with particular emphasis on a low cost, reliable and accurate technique to perform same. The field strength meter in this special application is being used as a tunable detector. Due to its inherent bandwidth limitations (by design), it can only deliver at its detected output information that is low frequency in nature — compared to the video bandwidth. This would be hum, low frequency beats and low frequency components of the cross-modulation transfer phenomenon. N.B.

---

Robert D. Bilodeau was graduated from the University of Massachusetts in 1955 with a B.S.E.E. He and his father, Wilfred, established one of the earliest CATV systems in the United States.

From 1965 through early 1970, he served Jerrold Electronics Corporation, as a first field engineer and later as Technical Director of the CATV Division.

Mr. Bilodeau recently joined Goodson-Todman Cablevision, Inc., as Director of Engineering.
that the noise measurement does not violate this requirement.

Since it is uniformly distributed across the video spectrum of interest, we can measure the narrow band quantity passed by the field strength meter and make a correction for bandwidth that is accurate. In the case of cross-modulation, the transfer characteristics are also uniform across the frequency spectrum of interest. However, amplitude variations occur within the band with a maximum value occurring at the horizontal line rate (sync). In the transmitted video signal, it is a constant in terms of frequency and amplitude and, for the non-synchronous case (which is usual), becomes the first visible component to appear as an undesired signal (vertical black bar moving across the desired picture).

The frequency of this component in the spectrum is approximately 15,750 cycles. The test technique outlined below employs a frequency close to that to approximate real life conditions. For measurement purposes, it is not necessary that it be close to this frequency as long as the frequency used is within the tunable spectrum of the field strength meter and does not fall coincident with other beat products in the carrier sideband. A measurement technique, for example, based on a 100 Kc rate would be just as accurate, but would continually raise the question in some minds of equivalent performance at 15,750.

The Measurement Technique

The measurement technique described here is based on the presently recommended NCTA standard. This standard relies on the predictable addition of synchronous sources for absolute and comparable results. This is the only reasonable way that a true barometer of system performance can be calibrated. A system measurement taken at point A, specified by time and temperature, can be meaningfully compared to other measurements taken at any other time and temperature—and any other point. It is the only technique that can give consistent results from device to device, system to system, point to point. The twelve channel synchronous measurement of a 34 amplifier cascade of brand X equipment in San Jose can be accurately compared to an equivalent cascade (or portion thereof) of brand Y in Sioux City, Iowa.

Basically, it's a way of saying that we all have to live up to and be judged by the same standards. A measurement technique based on the random addition of a number of off-air channels is an exercise in futility. The sources themselves will change and their addition through any non-linear device will change on a random basis mathematically. The net result is that you will probably miss the worst case addition which the synchronous measurement will give you immediately and consistently.

The basic limitation of the synchronous technique is that it is dependent on free access to the system, which currently means early morning measurements. However, we do recognize the need for an on-line application of
The enhanced Enhancer

The CBS Laboratories’ Mark II Image Enhancer — with “crispened comb filter” — delivers spectacular picture clarity. You have to see it to believe it.

The Mark II is the finest yet! It provides truly effective enhancing of both vertical and horizontal detail.

A remarkable CBS Laboratories’ innovation, “crispened comb filter” separates chrominance signals from luminance signals — to permit luminance enhancing without chrominance signal distortion. No degrading of color quality.

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CBS LABORATORIES

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the synchronous technique viable during normal system use.

The Measurement Concept

Now, a description of a low cost and easily implemented application of the synchronous concept described above. The initial requirement is that of a multiple channel carrier source that can be modulated from a common signal. For our purposes here, we will limit our discussion to the typical CATV head-end equipment that is heterodyne in nature. These devices translate all incoming signals to a common IF frequency and it becomes a relatively simple matter to introduce a commonly modulated source at this IF point.

Figure 1 describes one possible arrangement for arriving at a multiple channel head-end output test signal. Descriptively speaking, we have an audio oscillator whose 17 Kc square wave output is feeding a modulator to provide an output signal at approximately 100% modulation. If this modulator is already part of the head-end lash-up, its output can be one of the synchronous carriers. In any event, its output can be attenuated and fed into one of the heterodyne units tuned to the output channel of the modulator. This heterodyne unit can then provide one carrier of synchronous modulation and the sampling of its IF output can provide an input to other heterodyne units at IF.

One channel would be set to standby operation, typically a high band channel, and used in the system at readout points to determine the total amount of 17 Kc information transferred by the other carriers. A 9 channel complement is desirable to use, and it is usually available at most head-ends. A reliable mathematical extrapolation from 9 to 12 or 9 to 20, etc., can be made from there. A table of correction factors for synchronous addition can be located in the Technical Handbook for CATV Systems by Ken Simons, Third Edition, p. 42.

NOTES — Head-End (Points to Consider)

A good mix of low and high band outputs should be utilized and maintained for future measurements. Typical output might be chs. 2, 4, 5, 6, 7, 9, 10, 12 (100% modulation) and ch. 13 CW.

The CW carrier for measurement purposes should be free from local direct pickup.

The purpose of using IF into heterodyne devices is to avoid the need to retune all inputs to the output frequency of the modulator, thereby saving a good deal of setup and breakdown time. This is important in a system that is providing service to customers. If RF inputs were used, one would have to wait for off-air channels to return to normal operation before they could retune the head-end for off-air operation.

Percentage modulation can be checked with an AC/DC coupled scope noting deflection before and after modulation of the carrier. 100% would be maximum carrier to zero carrier and would visibly be the point where “compression” of the wave shape begins.

The accuracy of the measurement is not sensitive to modulation percent — within reason. It is basically a comparison of indicated voltage on the “CW” carrier to its parent source on a modulated carrier by equating maximum carrier to 100% modulation. If percent modulation drops to 85, the trade-off by comparing the amount measured on “CW” to a smaller number is countered by the lower value of transferred energy. This is true down to an approximate error of 2 dB at 50% modulation where the value should read better than actual by that amount, i.e., Don’t waste time trying to achieve 100% modulation.

Seventeen Kc was selected to avoid direct pick-up by the test equipment of the 15,750 component radiated by television receivers operating nearby. They are good transmitters at this frequency.

With a directional coupler lash-up for an output harness, a measurement for cross-modulation at the head-end would be very low and beyond the range of this technique, which in its present form is noise limited at -85 dB. Consequently, a measurement of the head-end should indicate noise in this neighborhood. The aural carrier of the modulator should be set for operation approximately 17 to 20 dB below the picture carrier to facilitate AFC tuning of the one device used for IF distribution. This is an important step since it then obviates the need to adjust any controls on the other units accepting IF input.
A: JACKET—Black all weather PVC .030 nominal wall with a .242" nominal O.D.
B: DIELECTRIC—Low loss cellular polyethylene with a .180" nominal O.D.
C: CONDUCTOR—18 AWG solid, annealed bare copper.
D: DRAIN WIRES—4—28 AWG solid tinned copper weld conductors applied spirally and positioned uniformly around the circumference of the shield.
E: SHIELD—Belden DUOFOIL 100% shield is a polyester film with aluminum lamination on both outside surfaces.

BELDEN 8228 75 ohm, 82-channel DUOFOIL Coax 100% Sweep Tested

The lowest loss of any 0.242" O.D., .75 ohm coaxial cable, by actual comparative laboratory test. Every length sweep tested to insure satisfactory performance. No signal degradation due to fallout resulting from periodicity. See table at bottom of page.

Lightest weight for its size of similar 75 ohm coaxial cable.

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<th>Belden 8228</th>
<th>Foam RG-59/U</th>
<th>Foam RG-11/U</th>
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<td>2.5 lbs./100 ft.</td>
<td>3.5 lbs./100 ft.</td>
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Spiral wrapped drain wires provide more equal distribution stresses when flexed for longer service life, preservation of impedance values. Small diameter for space-saving installation in conduits (only 0.242" C.D.)

Easy to install: Terminates with standard F-type connectors (Foam RG 6/U size connector with RG 59/U size crimp ring). Available in 100, 500 and 1000 ft. spools or 500 ft. Ccrrv-a-pak (black, white or rose-gray colors). Call your Belden distributor about test sample orders, or send us your bulk quantity order: Belden Corporation, P.O. Box 507A, Chicago, Illinois 60607. Phone: (312) ES 8-1000.

New A-weighted per 100 feet

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A simplified version of the head-end lash-up is now available by virtue of a unique feature of one manufacturer's head-end equipment—the ability to externally modulate the standby carrier! A square wave generator and hook-up wire are the only hardware necessary. As off-air stations cease each night, the standby carriers eventually fill the spectrum—each with synchronous modulation. One would, of course, be left CW. The only obstruction to complete automatic head-end set-up would be the 24 hour stations. It would be possible to remote these for shut-down or standby operation during the brief measurement interval.

Receiving Point:
(Trunk or Distribution)

The receiving point diagram is outlined in Figure 2. The field strength meter indicated for this test is the Jerrold 704B, which is ideally suited because of its high detector output capability. The test point for measurement can be any point in the system at which sufficient level can be attained to maintain approximately +20 dBmV into the FSM. This is necessary because it falls within the bracketed range between noise and cross-mod contributions of the FSM itself. For very low level measurements, such as first trunk amplifier output, these contributions can be significant. While we recognize the fact that a bandpass filter could be utilized ahead of the meter to reduce the effect of cross-modulation, we would then introduce other variables; namely, the insertion loss of the filter which would have to be accounted for, unless a similar device was used for the reference carrier, and a family of filters would have to be available for various head-end configurations encountered.

In addition to the above, the normal system noise level for the bandwidth of the equipment employed here is sufficiently high so as to override the improvement of the field strength meter cross-mod characteristics with the use of the bandpass filter. In reality that improvement is in a range that is not measurable with this equipment in the presence of normal system noise.

The output of the 704 detector is applied to a decade attenuator and to the input terminals of a General Radio null detector (model 1232A). In this application it is simply being used as a low frequency wave analyzer with gain which would be permanently tuned to the 17 Kc frequency.

The implementation of this procedure is as follows: On the assumption that we have successfully established our modulated carriers and one CW carrier at the head-end at normal output (see NOTES — Head-End), it is then necessary only to select the point in the system that satisfies the above condition, namely sufficient signal level availability.

Referring to the receiving point lash-up, note that the first device is a variable attenuator. This is very handy for making adjustments when referencing one carrier to another at full scale deflection.

SIGMAFORM
the simpler,
more positive,
better protecting

SPlice COvERS for aerial/underground cable

Answer to a growing demand — thickwall, heat-shrinkable, self-sealing splice covers offering complete waterproofing, insulation, corrosion and abrasion resistance — for connections and splices in coaxial and secondary power and communications cables. They seal over lead, steel, aluminum, copper and all standard plastic and elastomeric insulating materials and conduit. Thickwall toughness provides extra strain relief. Factory applied sealant remains flexible indefinitely. Installation is simple. No special skill or tools — only an electric hot air blower or gas torch. Slide expanded Sigmaform cover over one end of cable before connecting. Connect cable and slide cover over splice or connection area. Apply heat. When cover has shrunk to configuration of connection and sealant is seen to flow, job is done. May be removed by applying a small amount of heat, slitting with a knife and peeling away. Available in standard lengths from 2” to 12” and five expanded inside diameters of 0.4” to 2.0”, each of which offers a shrinkage ratio of three to one; also in bulk 4” lengths (without sealant).

Write or call us for complete information and prices. There are also Sigmaform cable end caps, molded boots, aperseal and re-entry enclosures.
Before You Buy Any Television Modulator
You Must See This All New IF Modulation TV Modulator

Video Modulator Module
Audio Modulator Module
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Price $995.00

We are challenging you to use our amazing new Model IFTM-4170 IF Modulation TV Modulator in your CATV or ETV System for 10 days without obligation. We're sure you'll be quick to recognize its superior color delay response, ease of operation. Complete with Crystal Controlled Aural Carrier. See this unmatched value today.

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Telephone (415) 591-5141
The output of the variable attenuator is fed to the 704 RF input and adjusted by using the indicated ranges for full scale deflection for one of the 100% modulated carriers. Since the measurement is independent of the source of reference and all carriers are modulated with the same percentage, then the carrier normally selected is that which is nearest the CW measurement carrier. If we were measuring on Channel 13, we would use the nearest higband carrier with full modulation.

The operation of the equipment is as follows: (a) Establish in the proper range of the 704B a full scale deflection of one of the (100%) modulated carriers.

(b) With this fully modulated carrier set for full scale and with the decade attenuator impedance at maximum (80 dB), tune the General Radio wave-analyzer to establish full scale deflection by adjusting its gain control. Its frequency control will be at 17,000 cps.

(c) Without changing any settings on either the 704B or the wave-analyzer, tune to the CW carrier on the 704 and establish full scale deflection by adjustment of the variable attenuator.

(d) Remove attenuation from the decade attenuator in steps of 10 until a usable scale indication is reached on the wave-analyzer dial.

(e) Add the attenuation removed from the decade attenuator to the downward scale deflection on the meter face of the wave-analyzer. This is the direct reading of cross-modulation.

(f) Measure signal-to-noise on high and low band in the normal manner and record these values.

(g) Repeat this process at trunk, distribution, and line extender output points and look for a 6 dB degradation on trunkline values for a doubling of amplifier cascades.

NOTES — Receiving Point

While output levels are important, and it is necessary that they be close to design values in order to achieve expected cross-mod and signal-to-noise, it is not necessary that precise trunkline balance be a part of the measurement. These will tend to average when the cascade becomes sufficiently long. The important consideration here is to know the actual difference between cross-mod and signal-to-noise in order to determine system tolerance.

With well behaved equipment, in other words each active device making equal contributions to cross-mod and signal-to-noise, these two parameters will indicate the direction in which the system balance has been favored — or has otherwise shifted to.

With this technique we now have the capability of isolating major contributors that are providing more distortion than expected. Most important, however, is that this relatively low cost equipment can provide reliable, consistent repeatable results in a sensitive enough range for system evaluation.

Proper evaluation is the first step towards corrective action — which, when carefully applied, will keep subscribers from becoming noisy about noise and cross about cross-mod.

The author wishes to acknowledge contributions to the development of this technique to Ken Simons and Larry Fawber of Jerrold Electronics; the latter being responsible for supplying daily precise weather data for the test site in the southwest part of the country.

August, 1970
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August, 1970
Expanding Cable Capability: A State-of-the-Art Review

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 3

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

Multiple-channel transmission systems are an important consideration for the forward-thinking cable operator. The thoughts included in last month's and this month's portions of this series were part of a paper presented by this author at the 1970 International Convention of the Institute of Electrical and Electronics Engineers (IEEE). The subject of the multi-cable approach to increased channels was introduced last month.

Multi-Cable System Without FDM

Rediffusion Limited, in England, pioneered and continues to use a multi-cable approach to cable TV distribution which uses a multi-pair cable, carrying high level TV signals at HF frequencies. Special receivers are provided, without tuners. The desired channel is selected by a suitable wafer-type switch. Only one channel is carried on each balanced pair. Converters are available to permit use with conventional VHF receivers. This is an example of the ultimate multi-cable system—use of one cable per channel.

ADVANTAGES
1. This eliminates problems inherent in broad-band, multi-channel amplifiers.
2. This approach permits use of economical special receivers, or a simple converter system.
3. No new or untried technology is required.
4. Improved reliability is gained through redundancy of the cable systems. Only major problems would interrupt all channels simultaneously.
5. Low HF frequency can be used, reducing cable losses and number of amplifiers.

DISADVANTAGES
1. Capital costs are high. It is very costly to expand the number of channels if an inadequate number is initially installed.
2. This system is susceptible to cross-talk problems.
3. Home installation is expensive since a multiple cable bundle has to be run right up to each receiver. Remote controlled switching is possible but at extra cost.

Switched Systems

The discussion of multi-cable systems leads inevitably to switched systems. Why commit a whole bundle of cables to a television receiver that is only using one of them at a time? A switched system is based on a single transmission line from the subscriber's receiver to a switching center where a number of program channels are available on separate buses. Switching can be remotely controlled by the subscriber to connect his line to a selected program bus. Since the subscriber's line need carry only one program at a time, this program can be on a low frequency carrier to minimize transmission losses. Systems of this type which have been demonstrated, have shown that subscribers can be up to a quarter of a mile from the switching center.

A switched system has, no doubt, the greatest potential versatility of any of the cable television transmission systems proposed. One of the questions which arises in discussion of "more than twelve channel
systems” is, “how many more?” A frequency-division-multiplex system operating at frequencies up to 1,000 MHz could have a capacity of about 80 channels in a single octave operation, and up to 150 channels if multi-octave operation is permitted. A switched system could have capacity limited only by the size and capacity of the switching centers and the trunk systems used to interconnect them. A hierarchy of switching centers could be envisioned which would give access to even more program channels.

Switched systems suffer from the problem of the concept of “more than 12 channel systems” being too new. No one yet knows how many channels are desirable, economical or available. The cost of expanding a switched system once it is built would be very high and might be a very serious deterrent to the addition of more channels. Such a system would probably have to be built “right” the first time.

Switched systems have more advantages than just versatile access to channels. They would usually have no amplifiers between the switching center and the subscriber. They would thus permit easy two-way transmission between the subscriber’s home and the switching center. In fact, it is easy to visualize switched interconnection between subscribers, and the multiplexing of narrow band communications of various types on such a system.

Switched systems require a such circumstances, possibly with the aid of a small intermediate amplifier.

The principle disadvantage of switched systems seems to be the high cost, particularly the cost of interconnecting switching centers. The problem of determining optimum capacity is also significant. The ideal system would have a hierarchy of switching centers, but the cost of inter-center trunking would be very high and there is some practical limit to the value of expanded channel access to the average household.

A “Systems” Approach

The problem of conversion of non-standard channels for reception on ordinary TV receivers is a vexing one. The set-top converters are double conversion systems with attendant complexity and susceptibility to distortion problems. They unfortunately transfer the responsibility for tuner maintenance from the receiver owner to the cable system operator. Other conversion schemes, leading eventually to dual-cable systems, add substantially to capital and operating costs. The typical home television receiver was just not designed or intended for reception of a large number of contiguous, adjacent channels. Conversions and adaptations are necessarily expensive or less than satisfactory. The use of ordinary receivers ties the cable system to transmission technical standards that are not ideal for cable transmission with frequency-division-multiplex techniques.

This series of articles has not dealt with the useful applications and functions of “more than 12 channel” systems. Assuming that such systems serve socially and economically desirable purposes, it becomes desirable to develop a new receiver that would function in a more satisfactory way as part of the entire system. Control over the receiver gives the system engineer the scope to contemplate and design a complete broad-band multi-channel transmission system.

It is doubtful whether the system designer would want to abandon AM frequency-division-
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multiplex in favor of more exotic systems. Even a cable system has frequency spectrum problems if we consider modulation systems requiring more bandwidth than AN systems. FM modulation, with an index sufficiently large to give any transmission advantage, requires considerable bandwidth, as much as 20 to 25 MHz per channel. Pulse code modulation requires even more bandwidth. Delta modulation techniques would require very expensive receivers. The system engineer could, however, consider suppressed carrier, single-side-band transmission. The ability to handle wider bandwidth, high resolution transmissions could also be built into the special receiver. Complete shielding, and virtual freedom from local oscillator beat problems, image problems, etc. is assumed for a special cable TV receiver.

Adapter and conversion boxes could be provided for connecting standard receivers to the cable distribution system. Such converters would be somewhat inconvenient and there might be some compromise of the special performance features built into a special cable TV receiver. A change to suppressed carrier would in itself be a significant contribution to the improvement of broad-band cable systems. Set-top converters have been criticized by many cable system operators because of several significant shortcomings. If a set-top converter was required to adapt conventional receivers to multi-channel cable systems, the converter could be used to improve the characteristics of the receiver to which it is attached. Presently available converters do improve adjacent channel selectivity. A set-top converter could be designed to act as a suppressed carrier, single-side-band converter; or if designed to receive UHF channels, could be designed to act as a high performance UHF front end for any receiver to which it was connected.

In the United States, only 7% or so of the television homes are presently connected to cable television systems. In Canada this figure is 17% and growing rapidly. An even higher percentage of new receiver sales, particularly color receivers, are to homes on cable TV. There is a considerable interest among Canadian TV receiver manufacturers in the development of special cable TV receivers and we expect to see some practical demonstrations of such receivers before the end of 1970.

Resolution of the Problem

It is obvious that there are a great many approaches possible to the problem of “more than 12 channel” systems. There has been very little solid, professional research done into the question of complete evaluation of all the possibilities, with a view to coming up with scientific decisions on the questions which have been raised.

The present day 12-channel system is the climax of a fairly obvious chain of developments centered on the standard 12
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channel VHF broadcast television receiver. Now that we have used up the capabilities of this receiver we do not clearly see in which direction to go. The problem has apparently not aroused the interests of the giant research facilities available to some of the communications interests, except perhaps to disdain it. That is, to decide in favor of switched systems over broad-band, frequency-division-multiplexed systems. The commitment of a cable system of a given design for a whole community is a rather serious matter. The capital costs are very high and pilot trials of various systems must be considered to be very expensive experiments.

The risk of making a mistake and saddling a company, and a community, with a less than optimum system is very high and such decisions are a serious responsibility for those engineers who are faced with making decisions of this kind without adequate resources. The Bell system can afford to have hundreds of engineers and technicians spend years in the study and development of optimum systems. They can afford large scale experiments such as the pilot installation of an experimental electronic telephone exchange, writing off the cost of such development and experiment against their huge income from established communications systems.

No cable television company has such resources, nor has there been the evidence of a large enough market to attract speculative development by potential equipment suppliers. The development of new systems is therefore very slow and painful. There are a few experiments, on a very small scale, and usually not very scientifically conducted—not enough evidence on which to make large scale judgments. Most cable TV operators would rather wait than take a chance on untried systems. The road to success is littered with the bones of pioneers.

We face now a problem similar to that faced some years ago when decisions had to be made on technical standards for color television, stereo radio, and even the basic television system itself. A number of alternative and complimentary systems have been proposed. A significant economic potential and consequence has been demonstrated. A number of highly publicized but very unscientific demonstrations have been staged. It is possible that some government agency might sponsor the research and investigation necessary to arrive at firm recommendations on multi-channel, broad-band systems, or that industry co-operative effort might be arranged. Without such a large scale, intensive investigative effort, it is doubtful whether we will see a rapid development and proliferation of broad-band, multi-channel systems in the "Spectacular 70's'.

Next month this series will conclude with a review of terminal devices related to two-way and multi-channel CATV state-of-the-art technology.

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**MODEL UVC-1:** UHF/VHF, crystal controlled, oscillator stability 0.005%. Specifications otherwise similar to Model UV-1.

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August, 1970
The edible direct burial cable is dead.

Burying TV cable didn't kill the problems. Instead of being rained and snowed on, cooked in July, then frozen in January. And smacked by falling branches above ground. Cables were gnawed at by underground moisture. Chewed away by alkalines. And treated like TV dinners by gophers and ground squirrels.

Plastoid didn't make direct burial cables to exchange one set of problems for another. Our cables are protected with the most durable high molecular polyethylene jacketing. A self-sealant flooding compound. A super-powerful rodent repelling jacket. Every reel of cable is sweep tested. And inspected at each channel.

When the cable you bury is Plastoid, you can be sure it will rest in peace. Not pieces.
AEL NOW MARKETING TUNERLESS CONVERTER

AEL Communications Corp. has recently introduced its Superband Tunerless Converter. The device adds 7 more channels to a 12-channel 270 MHz CATV system. The unit mounts on the back of subscriber's set and features a knife switch for selection of standard or "super" mode.

For further information, contact AEL Communications Corp., P.O. Box 507, Lansdale, Pa. 19446, (215) 822-2929.

JERROLD SHOWS COMPLETE TWO-WAY EQUIPMENT LINE

A complete package of new Starline Data Line equipment for two-way CATV systems has been developed by Jerrold. Only two Starline Data Line items are essential to two-way distribution capability for a dual-cable system. These are the broadband two-way Model FBB-series Flexitaps and the Starline Model SDV-30/60 two-way push-pull extender. Any dual-cable system with these items will provide one-way service, and needs only a Starline Data Line Translator Station be dropped in any main-trunk station with distribution facilities to provide complete two-way service. A single-cable two-way system provides two-way capability for the main trunk and needs only a Starline Data Line By-Pass Station, one of the Model RPS-series, at every Starline main trunk station. The two-way broadband Flexitap introduced locally-originated programming into the main trunk.

For further information, contact Jerrold Electronics Corporation, 401 Walnut St., Philadelphia, Pa. 19105, (215) 925-9870.

NEW FROM KAY: SWEEP AND MARKER GENERATOR

Kay Elemetrics Corp. has recently introduced a new sweep generator, the 159D, which provides a full one volt RMS output into 75 Ω over a 300 KHz to 300 MHz frequency range. Two options include a triggered sweep function for sweeping the system during operation without interfering with subscriber service. In this mode, the test signals are sent down line during short periods of video off times. Secondly, new variable frequency markers, both pulse and birde type, are available covering the range of the sweep.

The unit features continuously variable sweep widths and center frequency over the 300 MHz range, providing coverage of video, IF, and VHF in a single tuning range. A multturn center frequency control includes a direct-reading, digital frequency dial for fine setting of narrow sweeps.

Performance characteristics include line lock, variable repetition rates, CW, manual, external modulation and switchable, blanked retrace. A triangular sweep output, synchronized with the RF output, is available for triggering the horizontal axis of an oscilloscope. A built-in precision RF step attenuator provides up to 79 dB of attenuation plus a 6 dB variable. Provision for operation from external ALC detectors (as in impedance plotter applications), is a standard feature as is a built-in RF detector.

The RF output is AGC'd flat for amplitude linearity of better than plus or minus 25 dB over the widest range. The use of a broad output amplifier in these beat frequency units permits light coupling of the mixed oscillators.

Pulse-markers are available in the PM7650 plug-in, which offers up to eight, optional, individually switched crystal marks at customer specified frequencies up to 100 MHz.

Birdie markers are available in the Model PM7660 plug-in which offers up to eight single frequency or 7 harmonic combs as specified. These marks cover the entire range of the 159D.

For wide-range coverage, the new Model PM300 provides two variable pulse marks which may be set at any frequency along the response trace. Controlled by multi-turn digital readouts, these markers are complemented by one and ten MHz crystal comb markers.

The Model PM7670 variable birde marker module provides a variable birde combined with a crystal controlled 4.5 MHz sideband marker. A calibrated dial indicates marker position both in frequency and by channel. One and ten MHz harmonic combs may also be individually switched for wide band coverage. An external marker input is provided on the 159D so that a variable birde marker may be developed using an external CW source.

For further information contact Kay Eleometrics Corp., 12 Maple Ave., Pine Brook, N.J. 07068.

CRAFTSMAN INTRODUCES TDR, VARACTOR CONVERTER

The newest addition to the Craftsman equipment line, the Model 107 coaxial cable fault finder is designed to be an economical Time Domain Reflectometer (TDR). It can be used with any type of oscilloscope found in CATV systems today. Operating on the TDR principle, the unit sends a fast rise time pulse down the cable under test (up to 2500 ft. of .412). The pulse is in turn reflected back and displayed on the oscilloscope. According to the manufacturer, the return pulse will pinpoint the location of cable faults to within plus or minus 2% accuracy and will indicate whether the fault is an open or shorted circuit and either capacitive or inductive mismatches.

Craftsman has also recently introduced a pushbutton channel selection converter. Channels on the selector can be blanked out by a screwdriver adjustment on any of the 26 potential meters which control the varactor. This allows the FV25 to provide guarded service to doctors, educators, police or industry. Dividing the converter and the channel selector affords a remote control, putting the switching portion in the subscriber's hands.

For further information on these new products, contact Craftsman Electronic Products, Inc., 133 W. Seneca St., Manlius, N.Y. 13104. (315) 682-9105.

GE NOW MARKETING NEW VIDICON CAMERA

GE's new vidicon television studio camera features automatic light compensation and built-in master sync

August, 1970
for driving up to three other similar cameras in small studio systems. According to the manufacturer, the Model TE-34 provides full gray scale and full resolution performance with pickup tube faceplate illumination as low as one foot candle. The camera's circuits are completely solid-state. All its electronic components are mounted on a single fiberglass printed circuit board. The TE-34's resolution specifications of 600 lines, center, and 400 lines, corners, are said to be maintained without readjustment over a temperature range of 0 to 50 degrees, C, and over an input power range from 107 to 127 volts, AC. The camera is 8.25 inches wide, 8.50 inches high, and 13.90 inches long, less lens. It weighs 15.25 pounds, less lens. Video output may be switched from composite to a non-composite signal, for use with applicable special effects generators. Price of the TE-34, with a GE Type 7735 vidicon pickup tube, less lens, is $1,295.

For further information contact General Electric Company, VCPD – A&SP, No. 2 Electronics Park, Syracuse, N.Y. 13201.

TELEMATION OFFERS SWITCHER WITH AUTOMATIC PREVIEW

In TeleMation's new TPS-8X2, the preview output is automatically switched to whichever of the two mixer busses is not in use. The video switch is effected by electronic crosspoints controlled by the fader arm position. Designed for color or monochrome use, the TPS-8X2 employs vertical interval switching. Crosspoints are all solid-state and are controlled by integrated circuit logic. It includes an integral video processor with average picture level compensation to eliminate switching transients and bounce. The unit is equipped with eight video inputs, either synchronous or non-synchronous, composite or non-composite video.

For further information contact TeleMation, Inc., 2275 South West Temple, Salt Lake City, Utah 84115. (801) 486-7564.

FUNG DEVELOPS CONVERTER FOR TWO-WAY SYSTEMS

The model TCC-77 sub to high VHF single-channel converter, specially designed for two-way CATV system use, has been developed by Fung Engineering Co. The unit is designed to provide low noise, and good color response. It features a crystal-controlled carrier.

The model 9500T is both a sweep generator and a sweep transmitter. In the system mode it behaves as a sweep burst transmitter with the normal sweep rate circuitry switched out and a new timing circuitry activated. This new timing circuitry has a front panel switch which allows selection of test rates of 1, 2, or 4 second intervals. All normal sweep generator controls are still operational in the system mode. The operator selects the frequency range and the output level required.

The model 9500R receiver unit contains all the circuitry necessary to view the sweep test signal without the need for additional auxiliary equipment for sync purposes. The range of signal levels which can be viewed with the receiver is +5 dBmv to +70 dBmv. One of the highlights of the 9500R receiver is the completely variable frequency marker. This calibrated marker produces two marker peaks 6 MHz apart. This 6-MHz spacing provides an easy reference for channel width, and a calibrated dial provides a method for easily determining the frequency of tune ups in the system.

The price for the 9500 system is

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$3550.00. The price for the Model 9500R only is $1875.00. Discounts are available as follows: 3-4 units 5%; 5-9 units 10%; 10-19 units 15%; 20-39 units 20%.

For further information, contact Texscan Corporation, 2446 N. Shade-land Ave., Indianapolis, Ind. 46219, (317) 357-8781.

TECHNO PRODUCTS INTRODUCES TWO-TUBE COLOR PLUMBICON

Techno Products Company has announced the availability of the Sony DXC-5000 two-tube color camera with a Plumbicon in the luminance channel. Originally using a vidicon, this new camera has reduced lag and improved low light level capability. It is possible to get low lag color pictures with a light level of only 50 foot candles using the 28-pound camera. With built in color bar generator, the price is $11,500. Additional accessories include: remote video controls, adaptor for the use of any C-mounted lens, and a rack mount for the camera control unit.

For further information contact Techno Products Company, 7405 Greenbush Avenue, North Hollywood, Calif. 91605, (213) 764-0110.

SPENCER-KENNEDY INTRODUCES VARACTOR TUNED CONVERTER

Spectrospan, a varactor tuned converter for increasing the capacity of a 12-channel cable system to 18 channels, is now being marketed by SKL. Spectrospan uses standard amplifiers and an existing 12-channel distribution system. Guardbands are placed between channels to eliminate second-order beat problems. These bands may also be used for voice transmission, telemetry signals and other types of data.

For further information contact Spencer-Kennedy Laboratories, Inc., 2 Lowell Ave., Winchester, Mass. 01890.

COLOR MONITOR/RECEIVER NOW AVAILABLE FROM SONY

Sony’s new portable model CVM-1200U Trinitron color monitor differs from other color systems in that it employs a single gun to produce three electronic beams, one for each primary color, instead of the conventional three separate guns. Also, instead of the conventional shadow mask, the Trinitron system uses an “aperture grill” that permits more electrons to reach the screen, and is said to result in a picture of greater brightness. The Trinitron picture tube is 12” (measured diagonally). Additional features include automatic adjustment circuits; independent AGC pulse oscillator from the deflection circuit said to assure perfect electronic-to-electronic monitoring regardless of phase delay; three independent output connectors; and a built-in, 75-ohm output connector for single or multiple monitor operation. Suggested list price for the Model CVM-1200U is $595. For further information, contact John McDonnell, Sony Corporation of America, 47-47 Van Dam Street, Long Island City, N.Y. 11101.

LOW-COST COAXIAL RELAY FROM DOW-KEY COMPANY

Dow-Key Company has announced the availability of the type 77 coaxial relay fitted with type “F” connectors. This low-cost 75-ohm SPDT relay, which is particularly adapted to CATV service, occupies a space of only approximately 2” x 2” x 7/8″. The series 77 relay is available in a number of actuating coil voltages, from 6 to 115 volts, AC and DC.
CATV package can effectively be resolved in time to meet its asserted primary objective of developing a new CATV regulatory program for an early cutting of the "Gordian Knot" that has hobbled CATV development over the past several years.

Above all else, it is necessary for everyone in CATV and TV to consider and analyze precisely what the FCC is proposing for their industry's further development — and what it means to the industry as a whole, as well as to each particular system or station. The situation calls for particular and pointed comments far beyond the general expressions of approval or disapproval that have been voiced in the past. But even a first review of this complex package of FCC actions/proposals makes clear just how demanding this task will be. It should be a hot summer and fall in Washington. During which time every system and station should be asking itself "Just What Hath the FCC Wrought" this time around.

FCC Rules Analysis . . .

(Continued from page 34)

predecessor and companion media such as radio and TV. All of which leads to the basic issue of the wisdom and propriety of such conditions on the further development of what the FCC concludes is a valuable new service. Quite possibly such regulatory demands may be too great a price for CATV systems to pay for the carriage of distant signals (which many do not seek, and which others feel they already have a right to carry, either gratis or on the payment only of reasonable copyright fees).

Future of Proposals Seems Quite Unclear

For all of these reasons, it is currently far from clear as to whether (and when) the Commission may be able to adopt any substantial part (much less all) of this complex package of CATV proposals. This is particularly so in light of the determined and widespread opposition that seems in store from copyright owners, cities, many established CATV systems, the broadcasters and perhaps even from Congress. Such opposition may not materialize in full, or it may be overcome. But at this early stage it seems quite doubtful whether the new problems raised by the FCC's
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TV Communications ADVERTISING STAFF

1900 WEST YALE ENGLEWOOD, COLORADO 80110 AREA CODE /303-761-3770

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Contact Adv. Salesmen Don Steele, Phil Cook or Sid Black. They'll assist you with your display advertising or professional listing program, specialized market and media information, reservation/copy deadlines.

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Contact Advertising Sales Manager Don Steele. Don will assist you with full production information and creative services. Contact Production & Traffic Supervisor Karyn Zimmerman for traffic coordination.

RESEARCH & PROMOTION SERVICES
Contact Director of Marketing, Wayne Wilson. Wayne will assist you in your total marketing efforts with the general market and media information you require, including research. Direct mail lists are also available.

August, 1970
CHIEF TECHNICIAN
Chief Technician position available. Responsible for maintenance, system design, and operation of a growing CATV system in North Carolina. Requires ability to organize and direct the activities of others. Hospitalization, vacation and profit-sharing benefits. Send resume to: Cox-Cosmos, Inc. P.O. Box 3757 Charlotte, North Carolina 28203

ATTENTION: CHIEF ENGINEER

FOR SALE
Established Cable Company – Three network channels, F.M. Music on air and on cable, one channel Mexican music. All equipment in excellent condition as is new – Own poles. Reply to TV COMMUNICATIONS, Dept. T870-1.

Mr. MSD
Here is your chance to hire an Outstanding Chief Technician for your problem spot. I am well-versed in CATV from the Head-End to the Subscribers' set. I can design, construct and operate your system or systems at peak efficiency. 6 years Broadcast and Microwave and 6 years CATV in large system operation. Prefer Rocky Mountain or West Coast. Don't miss the buy of the year, Resume from Box T870-2 TV COMMUNICATIONS.

FOR SALE
All-band aluminum cable system. 220 customers with 700 potential located in gas fields of Kansas. This is a dandy little system. Price $85,000. Reply to TV COMMUNICATIONS, Dept. T870-3.

PROGRAM DIRECTOR-MANAGER

JANSKY & BAILEY
BROADCAST-TELEVISION DEPARTMENT
Atlantic Research Corporation
Division of The Susquehanna Corporation
1812 K Street N.W.
Washington, D.C. 20006
Phone: 202/296-6400

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• Signal Feasibility Studies
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• System Maintenance
• Operations Supplies
• Local Origination Equipment

1780 Albion Road Rexdale, Ontario 416-741-0566

CATV SYSTEMS

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<td>177M</td>
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FIELD SALES REPRESENTATIVES WANTED
Leading CATV corporation has open territories for experienced reps to call on system operators and equipment manufacturers. To sell complete product line of connectors, fittings and cable assemblies. Send resume to: COMMUNICATION DYNAMICS CORP., 887 Nepperhan Avenue, Yonkers, New York 10703, (914) 965-3006.

REPRINTS
... of articles and advertisements can be an effective method of promoting your services and products.
Write to:
TV Communications
1900 West Yale
Englewood, Colorado 80110
HY-GAIN

ANNOUNCES A NEW LINE OF LOG PERIODIC ANTENNAS

Guaranteed to Outperform Any LP System Presently Available

Now there's a new leader among CATV log periodic antennas, from an established leader in the antenna field. Hy-Gain's new LP antennas provide optimum electrical performance combined with extremely reliable mechanical construction. Only three frequency ranges are required to cover all VHF channels. Each frequency range is available in three configurations — single bay, dual stacked and quad stacked array.

Extensive research and testing has led to a unique electrical configuration which is incorporated into the dual and quad stacked systems. This new phase center optimizing technique eliminates phase distortion and presents more sharply defined patterns. It is a complete departure from any LP system configuration heretofore available because it presents a constant phase center relationship over the entire frequency range of the antenna. Since this relationship is varied according to frequency, it leaves no possibility for distortion introduced by out of phase signals being fed to the antenna system head end. The new Beam Phasing concept provides sharper pattern control to facilitate precise adjustment for elimination of co-channel interference.

All the new Hy-Gain LP systems are fully cantilever mounted and incorporate a mechanical azimuth adjustment that allows a full 120 degree variation without remounting. Mounting brackets structurally take advantage of the full face-width of the tower rather than simply being mounted on a tower leg, yet are cantilevered so that azimuth variations are easily accomplished. Quad stack systems support structures are a single integral unit attached to the tower at two points, thus distributing wind load over a larger area on the tower for additional strength.

All antennas are constructed of non-corrosive materials including aluminum, hot-dipped galvanized steel and stainless steel. They afford long life in extreme environments of high wind load, vibration and ice loads. Thorough mechanical testing, including field installation and lab tests, verify the mechanical superiority of these systems.

Hy-Gain's new line of Log Periodic Antennas make every other LP system obsolete. And prices for the new systems maintain Hy-Gain's tradition of top performance at low cost. Write for complete details.

HY-GAIN ELECTRONICS CORPORATION
P.O. Box 5407-JM Lincoln, Nebraska 68505
from professional-quality local origination
... all the way to testing, switching and distribution

DYNAIR OFFERS
MORE THAN 200 DIFFERENT PRODUCTS
FOR THE TELEVISION INDUSTRY

DYNAIR concentrates its major effort in one technical area: Equipment for the television industry. More than a decade of pioneering design experience has produced a comprehensive line of equipment that—year after year—sets the pace in video signal distribution, switching, modulation and RF demodulation.

FOR THE HEAD END

DYNAIR's field-proven, solid-state equipment solves CATV head-end problems and assures broadcast-quality pictures. Here are three tried-and-proven units which belong at the head end of every CATV system...

RX-4B DYNA-TUNE for high-fidelity off-air color. Uses completely new filtering and signal-restoration concepts to provide superior adjacent-channel color performance in either microwave-fed or demod-mod systems. Actually improves the color signal in many critical areas over that produced by the broadcast RF transmission system.

TX-4A DYNA-MOD for broadcast quality transmission. Supplies signals approximating FCC specifications. Provides interference-free pictures in a full 12-channel system... with crisp, clean color. Available for operation on any standard VHF channel.

TS-100B SIDEBAND ANALYZER for broadcast-precision testing. Quickly checks overall alignment of video amplifiers, modulated stage and RF amplifiers of modulators—in normal operation. Provides the same test techniques used by broadcasters and eliminates tedious point-to-point checking. Tuned to all channels for system flexibility.

FOR LOCAL ORIGINATION

DYNAIR's complete line of low-cost programming accessories are designed specifically to provide professional results without fancy cabinetry or expensive "frills." You can assemble a system for your particular needs between camera and monitor from dozens of available DYNAIR units, including...

- Video Switcher-Faders
- Special-Effects Generators and Switchers
- Sync Generators
- Video Distribution Equipment
- Pulse Distribution Equipment

DYNAIR's new "IDEAS" booklet will prove very helpful in designing your local-origination system. Make sure you add it to your library.
Consolidated Cable-Vikoa Sign
250 Mile Turnkey System Contract
at 1970 NCTA Show in Chicago

Aurora, Ill... Mr. Phillip Schalz, President and Treasurer of Consolidated Cable Utilities, has confirmed that construction has started on the first phase of an extensive system.

Mr. Schalz stated that "This system, with a potential of 20,000 subscribers, will bring studio quality television to the subscribers of Aurora, North Aurora, Montgomery, and Oswego, III. with the added advantage of an increased selection of television programs plus additional FM stations.

The contract terms call for Vikoa to provide all cable and equipment, to install the system and turn over to Consolidated Cable Utilities the completed operating system. Equipment installed will include Futura 21 Channel Mainline, Mainline/AGC, Bridge Amplifiers, Line Extender Amplifiers (manual and AGC), a complete Head-End facility and all ancillary equipment, plus all subscriber drop equipment.

The system, although equipped for 21 Channels, will initiate service with 12 television channels plus FM and will gradually increase service to a full 21 Channels plus FM operation.

The channels carried will be Channels 2, 5, 7, 9, 11, 20, 26, 32 and 44 generated from Chicago, Channel 13 from Rockford, Channel 38 from Chicago and Channel 60 from Aurora.

Mr. Richard Reed, Vice President and General Manager of Consolidated Cable, present at the contract signing, commented that "after visiting a number of existing Vikoa Future II Channel Systems, we are convinced that Vikoa's long experience in professional Turnkey Operations and the reliability of its 21 Channel Amplifier Systems now in operation will assure us a successful and profitable system". This alone has demonstrated once again that Vikoa is the leader in Turnkey System Operations.

Mr. Philip Schalz (seated center), President and Treasurer, Consolidated Cable Utilities, Inc. (standing left to right) Mr. James Ascher, Vice President and General Manager, Mr. Richard Reed, Vice President and General Manager, Western Sales, Vikoa, Mr. Richard Reed, Jr., Regional Sales, Vikoa.

vikoa INC.
technically, the One