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Tech Review

Communications Engineering Digest/The Magazine of Broadband Technology

January 1981

- The Greening of Fiber Optics
- System Design Program

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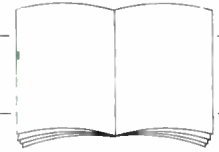
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Techscope 7

Hot items from the industry rumor mill.

Seminars 8

SCTE technical workshops and other industry events.

Editorial 14

Pat Gushman discusses why some industry veterans worry that another cable slump is coming, and why they shouldn't worry.

Communications News 20

The top technical news in the cable industry.

Saving Time with Computer-Aided System Design 31

Two programs for developing trunk and feeder designs using home computers

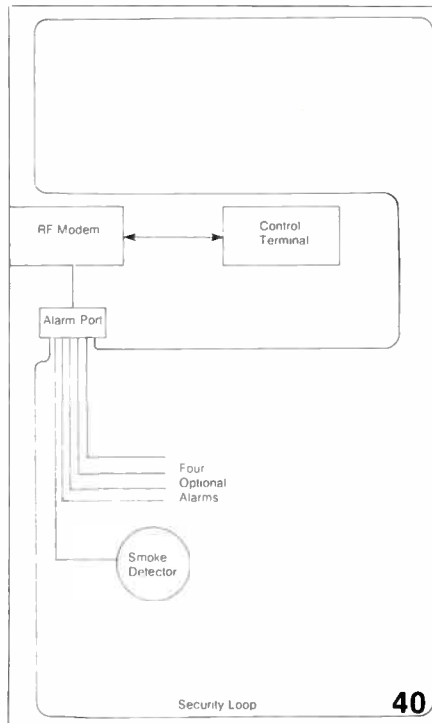
The Greening of Fiber Optics: Times Fiber Cultivates New Applications 34

Times Fiber presses ahead to bring the benefits of fiber optics to cable television, but massive projects sponsored by foreign governments already threaten to take the fiber optics industry overseas.



Jerrold Gambles In Cable Security 40

Examining the nuts and bolts of Jerrold Division's new cable security system.



Tech Review 44

CEd profiles the products and services that 82 cable television companies presented at the Western Cable Television Show.



About the Cover

In this step of the manufacture of optical fiber, a preform technology supervisor inspects the deposit of borosilicate glass in a deposition chamber. The ingot of glass being formed will subsequently be drawn into six km. length of optical fiber. The photo was supplied by Times Fiber Communications.

Classifieds 70

Ad Index 74

Out of Sync 79

Answers to your technical questions.

Intermod 83

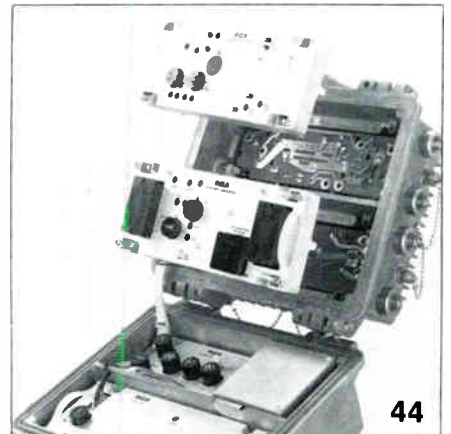
CEd's Glenn Chambers urges cable technicians to pick up their pens.

International News 85

Canada revises its earth station licensing procedures

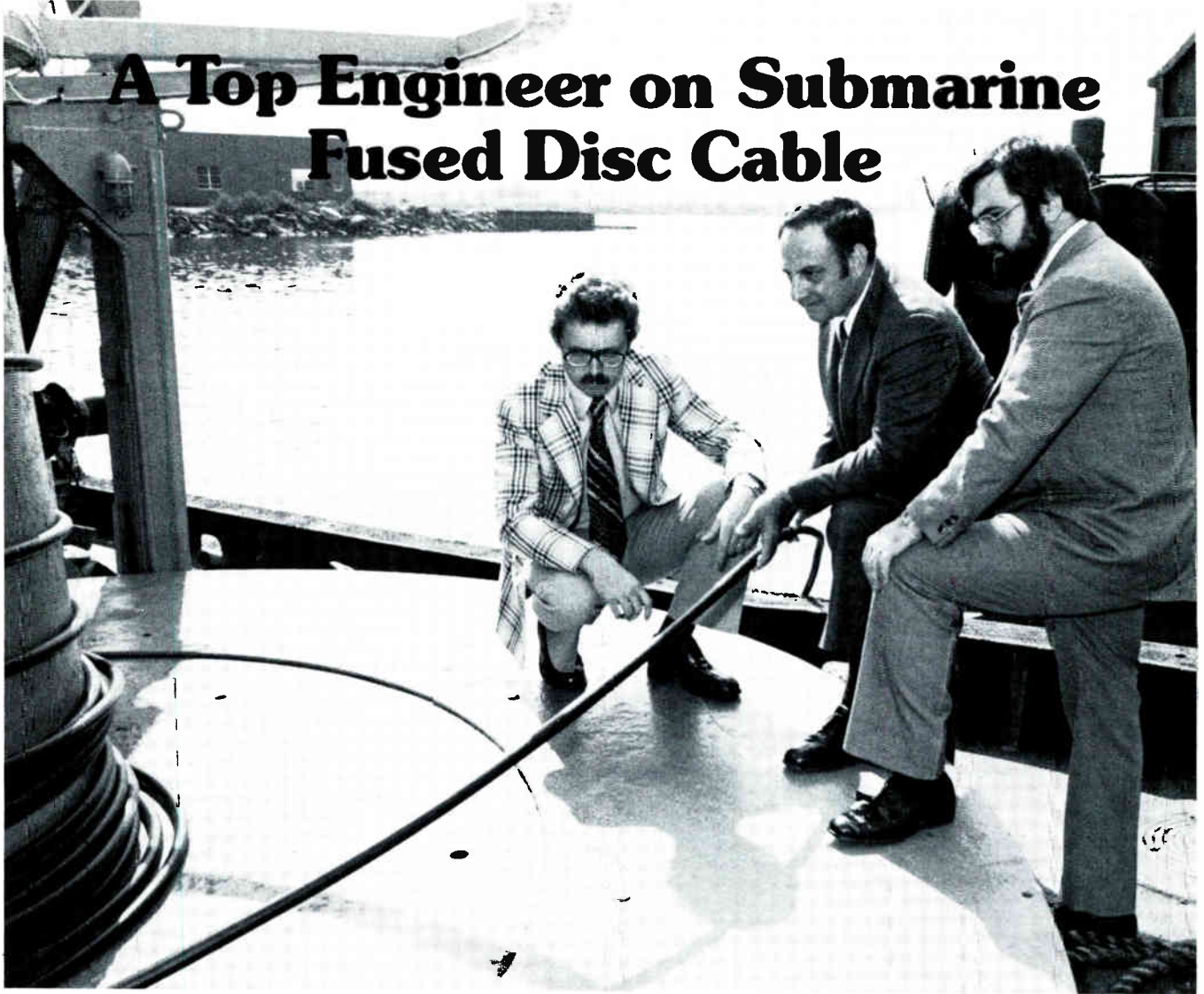
People News 87

In Orbit 90



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A Top Engineer on Submarine Fused Disc Cable



Richard M. White, Vice President, Engineering for Vision Cable Communications, Inc. of New York, N.Y. had this to say in a recent letter to us:

"...Thank you and your associates for the excellent technical support supplied by General Cable through all phases of design and construction of our recent submarine cable crossing in our Bergen County, New Jersey system.

"Our primary concern was to install a cable with superior mechanical strength and high specific gravity while still retaining the same electrical characteristics as your standard Fused Disc Cable.

"Your cable design incorporating helically applied round copper wires under the jacket provides an excellent optimization of these criteria and results so far have been highly satisfactory.

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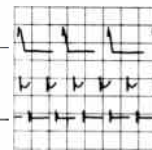
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Picturephone Objection Axed

Satellite Business Systems (SBS) has lost a round to AT&T at the hands of the **Federal Communications Commission**. The commission **refused to reject provisions of an AT&T tariff that governs the sale of its Picturephone Meeting Service (PPMS)** to the public. SBS had complained that the PPMS teleconferencing service had unreasonably low rates that had never been justified. The reason for the complaint is that SBS intends to offer its own teleconferencing service but the low PPMS rates offered by the industry giant are hampering SBS's marketing efforts. SBS's request for an investigation of the tariff provisions was denied as well. The commission said it was reluctant to review the tariff provisions which expire June 10. If AT&T decides to continue the service, it must file sufficient information for an FCC analysis 90 days prior to the June expiration date.

Five Fat Years To Come

An organization called Business Communications Company (BCC) of Stamford, Connecticut, has made some interesting financial predictions for the coming years. According to its New Burgeoning Video Industries report, 50 percent of the entire video market comes from basic cable service revenues. Currently, that figure totals \$1.67 billion and is expected to reach \$3.75 billion by 1985—a 17 percent per year average annual growth. The next most important service today is pay cable which pulls in \$910 million, according to the report. By 1985, pay services are projected to outgrow even basic revenue, bringing the level up to \$4.25 billion. That represents a 37 percent per year annual growth rate. Based on these figures, **BCC predicts that cable equipment manufacturers will enjoy five good growth years. The current market of \$609 million is expected to reach \$2.95 billion in 1985**, which ironically enough exactly matches the predicted average annual growth rate of pay television—37 percent.

There Goes Taylor Again

It wasn't all that long ago that a satellite receiving dish was considered a spectacular bit of technology. Now, with the boom in programming and the addition of several cable birds in geosynchronous orbit, the satellite dish has lost its eminent position as the shiny new toy on the auction block to the multiple-beam antenna. **Radiation Systems of Sterling, Virginia, has just sold its first 4.5-meter multiple-beam torus antenna to Satellite Syndicated Systems.** The torus, designed by Comsat, is capable of simultaneously picking up signals from five satellites within a 24° orbital arc. The price tag on one of these gems is about \$29,000, and the torus only needs the addition of feeds to receive programming signals from new or different satellites. Another plus, especially for inner-city systems, is that the torus fits into an area approximately 20 feet square. Tentative plans call for SSS to install the torus at its Douglasville, Georgia, site, with a delivery date estimated at late winter. SSS President Ed Taylor has gained a reputation over the years for his willingness to go with a new thought, so, it isn't surprising that the first torus from Comsat was acquired by his company.

Engineering Assistance

The **Community Antenna Television Association (CATA) has established an office to coordinate and develop technical training seminars for cable engineers.** The new CATA Engineering Office, which will operate out of Vero Beach, Florida, also will provide assistance to CATA members with technical dilemmas. Ralph Haimowitz, formerly general manager and chief engineer of the Indian River Cablevision system in Sebastian, Florida, will direct the new office. Haimowitz, who will resign as District Four director on CATA's board to accept the engineering post, will plan the seminars along with Raleigh Stelle of Texscan Corporation, who is a vice director of CATA. Seven five-day training sessions have already been scheduled for 1981, beginning in Dallas in April. Subsequent sessions will be held in Philadelphia and Portland, Oregon, during the second quarter. The final four seminars will be held between September and the end of the year with the locations yet to be determined. Steve Effros, executive director of CATA, said the seminars will offer theory and hands-on training in all phases of cable construction and engineering.

Let It Snow, Let It Snow

The **Federal Communications Commission has granted an extension of its recently adopted computer rules to Heath Company and Apple Computer, Inc.** The rules were designed to control radio and television interference from computing devices, but the two companies are having trouble complying. Both stated that despite "strenuous efforts," the interference from their line of personal computers exceeds FCC technical standards and immediate compliance would force them to shut down their plants. The FCC gave them an extension until April 1 to get certification for the computers, but each unit sold must carry the following warning: "Operation of this computer in a residential area may cause objectionable interference to radio and TV reception, because it emits more radio frequency than the FCC rules allow. If interference occurs, the user will be required to take all steps necessary to correct the interference."

Fiber Fever

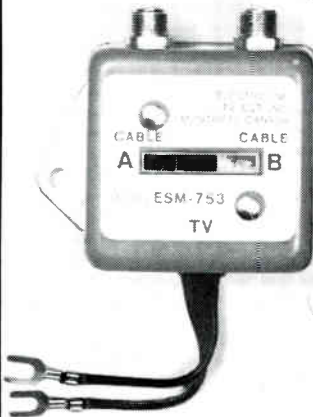
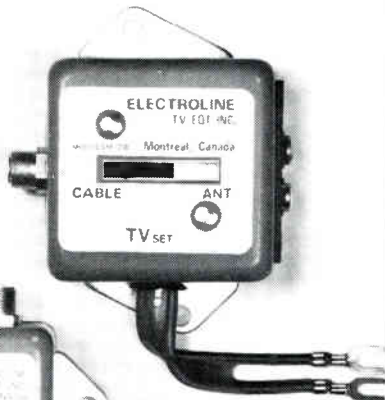
Cox Cable may be the next major MSO to back fiber optics cable technology if a project currently underway proves successful. Cox is **installing a half-mile link** of fiber optics cable connecting its research and development center with the company's corporate offices. The baseband-video system was supplied by Valtec Corporation. Cox purchased the system to evaluate the future applications of fiber optics in trunking, local distribution and short-haul signaling. According to Dr. Gary Tjaden, Cox's vice president of engineering and technology, coaxial and twisted-wire cable will also be installed along the loop so an accurate comparison between a fiber optics cable system and a conventional installation can be made. Since Cox has a satellite receiving antenna in its R&D facility, the link will also allow the corporate executives to review and test a variety of satellite programming.

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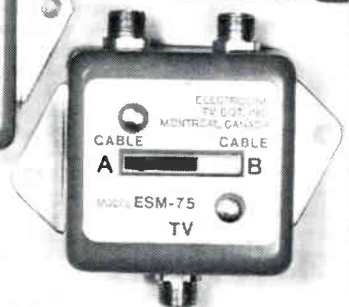


SWITCH MATCH ESM-753

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Output, 300 ohm

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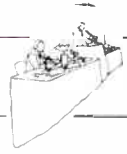
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Seminars



JANUARY

14: The **New England Cable Television Association** is holding its winter meeting at the Sonesta Hotel in Boston, Massachusetts. Contact the association at (603) 224-3373.

14-16: **Integrated Computer Systems, Inc.** is holding a workshop on "Fiber Optics Communications Systems" in San Francisco, California. Contact Ruth Dordick, (800) 421-8166; (213) 450-2060.

19-20: The **Society of Cable Television Engineers** will hold a seminar on "Digital Electronics and Cable TV" and "Preventive Maintenance" at the Cross Keys Inn, Baltimore, Maryland. Contact SCTE at (202) 293-7841.

25: **Conexpo '81** opens at the Astrodome in Houston, Texas. Contact Dan Fricker, (414) 636-7000.

27-29: A **Jerrold** Technical Seminar is meeting at the Princess Kaiulani Hotel in Honolulu, Hawaii. Contact Len Ecker, (215) 674-4800.

FEBRUARY

1-2: **Information Gatekeepers, Inc.** will sponsor a two-day marketing and technology conference on fiber optics and satellites in local broadband and computer networks at the Hyatt Regency Hotel, San Francisco, California. Contact Ellen Bond, (617) 739-2022.

3-5: A **Jerrold** Technical Seminar will be held in Long Beach, California. Contact Len Ecker, (215) 674-4800.

4-6: **Texas Cable Television Association** is holding its annual convention and trade show at the Convention Center in San Antonio, Texas. Contact W.D. Arnold, (214) 593-0335.

9-10: The **Society of Cable Television Engineers** will hold a seminar on "Cable Plant Construction" and "System Test Requirements" at Stouffer's Indianapolis Inn, Indianapolis, Indiana. Contact SCTE at (202) 293-7841.

10-11: **Arizona Cable Television Association** is having its annual meeting at the Adams Hotel in Phoenix, Arizona. Contact the association at (602) 257-9338.

18-20: The **Arkansas Cable Television Association** is holding its annual meeting in Little Rock, Arkansas. Contact Tom Carroll, (501) 321-7730.

24-26: A **Jerrold** Technical Seminar will be held in Orlando, Florida. Contact Len Ecker, (215) 674-4800.

24-26: **Nepcon West '81** will feature 1,490 electronics displays from over 750 manufacturers and suppliers and include 15 technical discussions on electronics testing. The show will take place at the Anaheim, California, Convention Center. Contact Industrial & Scientific Conference Management, Inc., (312) 263-4866.

MARCH

2-4: **Information Utilities '81** will focus on interactive cable and new technologies at the New York Hilton, New York, New York. Contact Jeffery Pemberton, (203) 227-8466.

9-11: **Arizona State University**, Tempe, Arizona, is holding a three-day intensive course on "Fiber Optical Communications." Contact Dr. Joseph Palais, (602) 965-3757.

12-13: The **Louisiana Association of Cable Television Operators** will hold its annual convention at Toro Hills near Many, Louisiana. Contact Andrew Angelette, (504) 446-8444.

15-17: **North Central Cable Television Association** is



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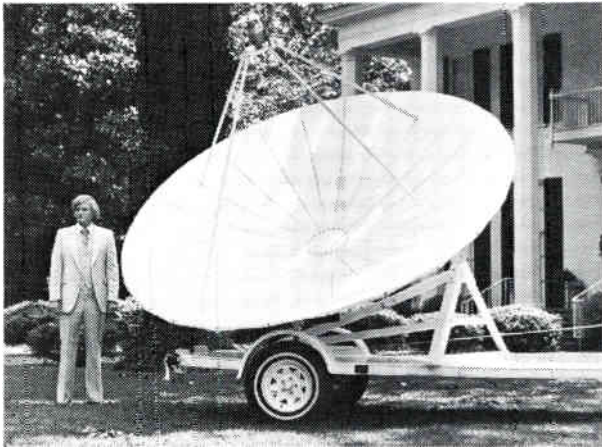
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meeting at the Holiday Inn in Fargo, North Dakota. Contact Paul Keating. (701) 662-8141.

16-17: The annual spring engineering conference of the **Society of Cable Television Engineers** is being held at the Opryland Hotel in Nashville, Tennessee. Contact the association at (202) 293-7841.

18-19: The **Georgia Cable Television Association** will hold its annual convention at the Sheraton-Atlanta Hotel, Atlanta, Georgia. Contact Marian Smith. (912) 354-7531.

24-26: Information Gatekeepers, Inc., is holding FOC '81 East at the Hyatt Regency Cambridge in Boston, Massachusetts. The event will include a fiber optics trade show, three short courses on fiber optics and a technical program on short-to-medium-range fiber optics applications. Contact the firm at (617) 739-2022.

28-April 1: Illinois-Indiana Cable Television Association is having its annual convention at the Hyatt Regency Hotel in Indianapolis, Indiana.

APRIL

13-14: The **Society of Cable Television Engineers** will hold a seminar on "Digital Electronics and Cable TV" at Stouffer's Inn, Denver Airport, Denver, Colorado. Contact SCTE at (202) 293-7841.

13-15: The **International Association of Satellite Users** is holding its 1981 conference and trade show at the Washington Hilton Hotel, Washington, D.C. Contact the organization at (703) 893-2217.

22-24: Integrated Computer Systems, Inc. is holding a workshop on "Fiber Optics Communications Systems" in Los Angeles, California. Contact Ruth Dordick. (800) 421-8166; (213) 450-2060.

23-24: Information Gatekeepers, Inc. is sponsoring "VIEWTEXT '81" International Viewdata Markets and Applications, at the Sheraton National Hotel in Arlington, Virginia. Contact Steve Weissman. (617) 739-2022.

MAY

11-12: The **Society of Cable Television Engineers** will hold a seminar on "System Test Requirements" and "Preventive Maintenance" at the Hilton Airport Inn, Kansas City, Missouri. Contact SCTE at (202) 293-7841.

13-15: Integrated Computer Systems, Inc. is holding a workshop on "Fiber Optics Communications Systems" in Washington, D.C. Contact Ruth Dordick. (800) 421-8166; (213) 450-2060.

20-22: Videotex '81, an international conference and exhibition, will be held at the Royal York Hotel (Toronto, Ontario) and the Canadian National Exhibition grounds.

29-June 1: The National Cable Television Association is holding its 1981 convention in Los Angeles, Convention Center. Contact Dan Dobsin. (202) 463-7905.

JULY

27, 28: The **Society of Cable Television Engineers** will hold a seminar on preventive maintenance in Orlando, Florida. Contact SCTE at (202) 293-7841.

SEPTEMBER

14-15: The **Society of Cable Television Engineers** will hold a seminar on "Cable Plant Construction" and "System Test Requirements" at the Hyatt Airport Hotel, Los Angeles, California. Contact SCTE at (202) 293-7841.

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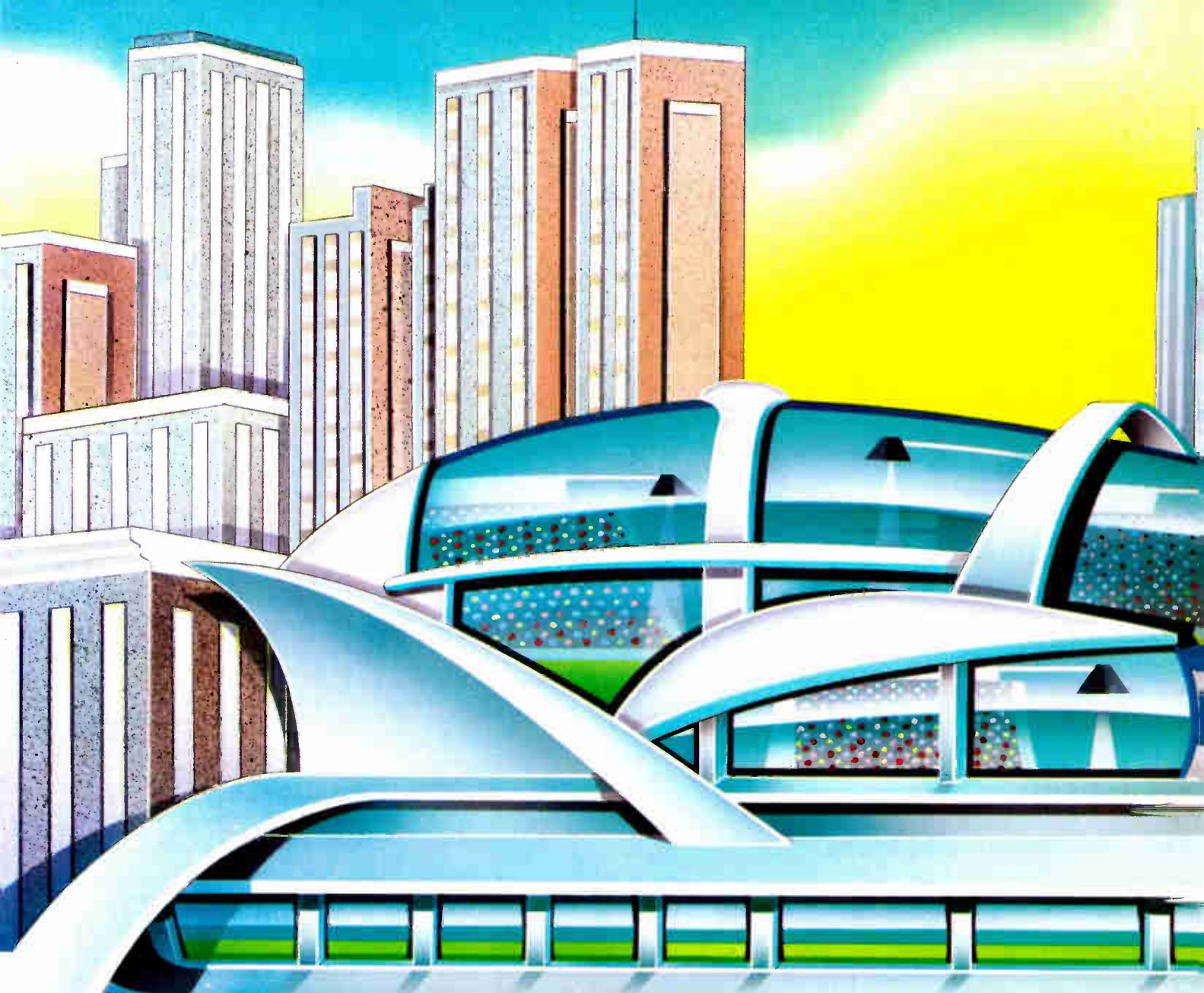
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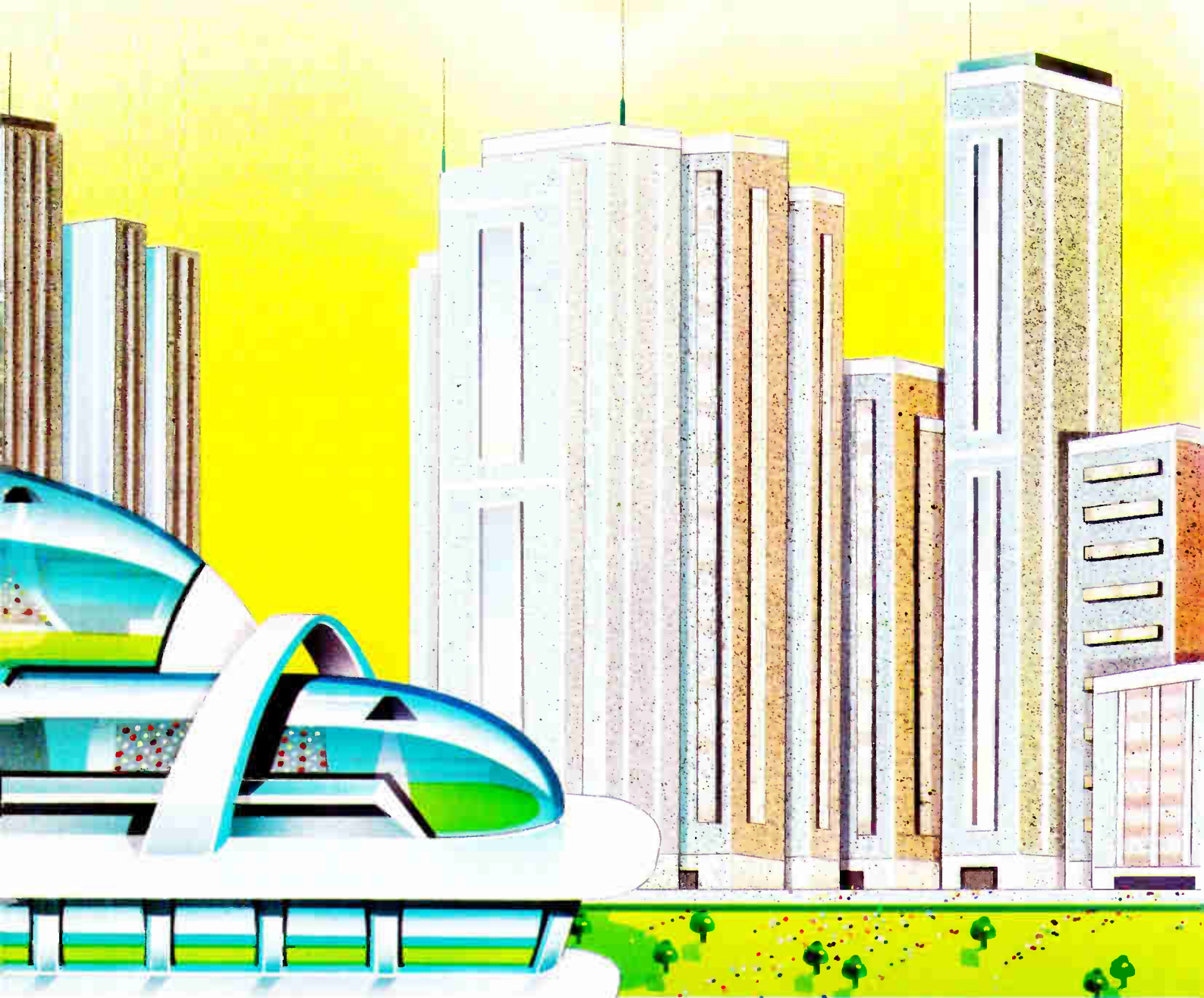


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Editorial



Are We Doing It To Ourselves Again?

Another year has come and gone. 1981 is already upon us. As usual, the annual Western Cable Television Show provided a fitting opportunity to cap-off the old and bring in the new. Nearly 7,000 people attended last month's convention in Anaheim, 70 percent more than ever before. Exhibit space was practically doubled, as well. In fact, rooms which in the past have served as meeting rooms and banquet halls had to give way to booths, booths, and more booths. So, who's complaining?

No one is complaining at all, actually. But more than once this question was asked in both public and private conversations at the Western Show: *Are we doing it to ourselves all over again?* Is it simply that things just appear to be too good to be true? Or is there something in the air that causes old war injuries from the early '70s to give us a little twinge? You can't really blame survivors of the blue-sky shortfall that characterized the first half of the last decade for being slightly gun shy. But let us hope that it is the former, that things do seem just a little too good to be true. That is a symptom which can be treated with a few small doses of reality. So, let's be realistic.

To begin with, although the general inflationary and recessionary economy in which we now operate might seem very similar to that which existed seven or eight years ago, there are some very basic differences in the microeconomy in which the cable television industry now operates. In the early '70s, the industry listened to its own prophecies and tooted-up for a market demand which turned out not to be there. It tried to push its basic product, TV reception, through the suburban and urban marketplace in an economy which could not and would not accept it.

But with the upturn in the economy came the satellite explosion and the boom in superstations, pay TV and specialty channels—services beyond basic reception for which experience has now shown there is a real demand. The franchise rush was set in motion and buying and selling even approached a fever pitch. There was only one bottleneck. Smarting from their miscalculations in the early '70s, many suppliers, including some of the largest ones, initially found themselves unprepared to meet the demand for their products.

Having tested the ice and found it solid, manufacturers are embarking on, and in

some cases have completed, major plant expansions in an effort to keep up with demand. They are not stopping at playing catch-up, either. Considerable market research and strategy formulation are going into planning for the potentially giant market for fiber optics and coaxial cable transmission facilities.


Nevertheless, dozens of operating officers, system engineers, and construction supervisors are lamenting the delays they are suffering because of equipment delivery. We were told of one case at the Western Show where a manager of a major market build has been waiting more than a year for delivery of quantities of a key component. Wringing his hands, he said he has now found a new supplier but is concerned about the overall integrity of the system.

This is not to dwell on the problems that any industry would suffer if it experienced the type of dramatic, yet sporadic, growth that cable television has. Rather, it is to put into perspective why people in the industry question whether we are doing it to ourselves all over again. It is just very difficult sometimes to get even the most farsighted individuals to begin to think digital, microprocessors, videotex and security systems, if they are 11 months behind schedule and awaiting delivery on basic modules or, worse, receiving equipment that doesn't work.

Fortunately, there is a consensus that the problem, in its most severe form, will be a temporary one. Albeit, wiring the urban markets will not be without challenge. This experience, however, should restore faith and trust between supplier and customer. A new confidence must be established if the challenge presented by the next generation of services is to be met. Suppliers must be honest with themselves as well as everyone else as they rush to the marketplace with new devices. So too, the operators must be sincere in the promises of service offerings and their ability to pay on terms. Then we can be sure that things only seemed a little too good to be true and we can be certain that we are not doing it to ourselves again.

Pat Gushman

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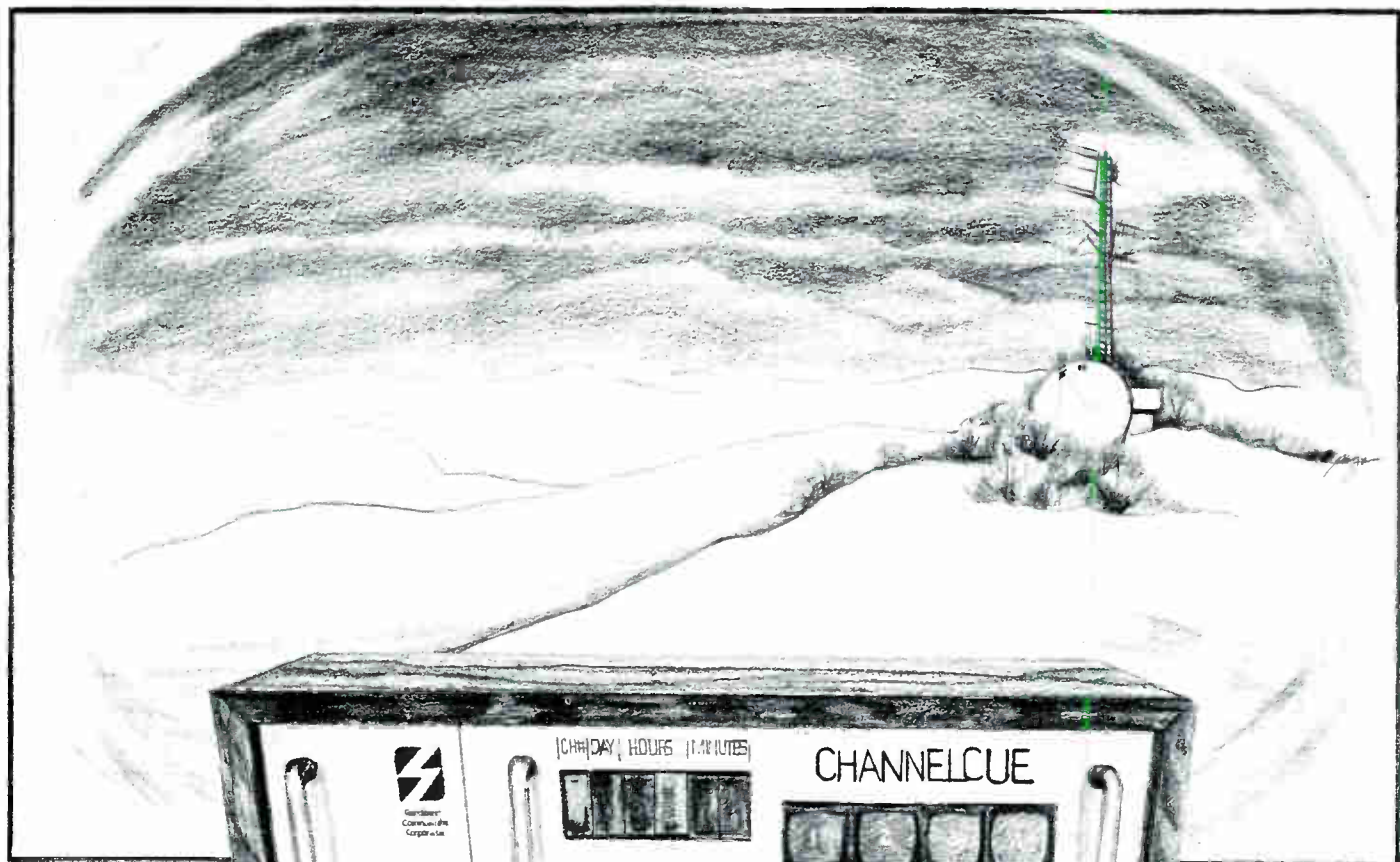


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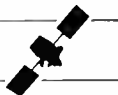
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Satellites



Comsat Filing Seeks Direct Broadcast Satellites

WASHINGTON, D.C.—Already deluged with comments on the development of a direct broadcast satellite (DBS) regulatory policy, the Federal Communications Commission now has an application for the much-talked-about service with which it can contend. On December 17, after months of delay, Comsat and its subsidiary, Satellite Television Corporation (STC), formally filed for approval of a plan which would enable it to provide at least three channels of premium television direct to homes via satellite as early as 1985.

The satellite and signal-reception data in Comsat's DBS application are outlined in Table 1.

STC has asked the FCC for permission to construct two satellites for the first phase of its satellite subscription television service. The two satellites, one operational and an in-orbit spare, would cover an area corresponding roughly to the Eastern time zone of the United States. Other satellites would follow until as many as five would cover each time zone and the population centers of Hawaii and Alaska.

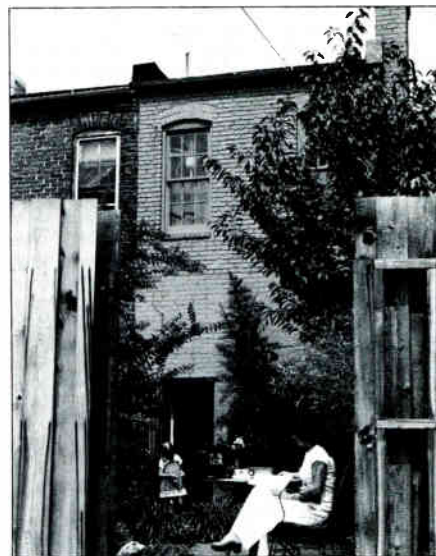
The satellites would broadcast in the super-high frequency 12 GHz range, with a minimum of 1,700 watts of power providing a concentrated but strong beam

capable of being received by relatively small aperture receivers averaging 0.75 meters.

In its application, STC outlined its general programming plan, noting that continued marketing research will be needed to assure that the programming offered in the mid-'80s would meet the needs of the public at that time. In general, the service, as proposed, would offer three channels of commercial-free video programming. One channel would operate 24 hours per day and the other two, each for 15 hours or more per day. STC's "Superstar" channel, operating 24 hours, would provide general entertainment including major movies, concerts, theater and other family entertainment. The "Spectrum" channel would provide children's programs, film classics, performing arts and cultural attractions, and public affairs. "Viewers Choice" would provide sports, adult education, lecture hall material and experimental theater.

The basic three-channel service and equipment leased from STC would cost about \$25 per month. The receiving equipment, in the \$300-\$400 range, could also be purchased by subscribers. STC plans to establish an extensive network of local authorized dealers to sell or lease, install and maintain the receiving equipment in an arrangement similar to that some STV and MDS operators have with major retailers.

As in the case of the commission's general inquiry into how DBS should be



Comsat plans to send satellite signals directly to small aperture receivers, such as the one on this California home.

regulated, FCC officials are expecting to receive voluminous comments on the Comsat STC proposal, the first of its kind. To date, commission staff has expressed hope that DBS not be pigeon-holed into any of the commission's existing regulatory categories. Comsat attorneys, however, are inclined to view the service as primarily broadcast in nature.

No matter how DBS is eventually classified, its development is sure to meet stiff opposition. Challenges to even the authorization of an interim type of service have been mounted on the grounds of its being a threat to local broadcasting concepts, spectrum management, and the international considerations of the Western Hemisphere RARC coming up in 1983.

FCC Allocates Orbital Slots; Satellite Squeeze a Tight Fit

WASHINGTON, D.C.—The Federal Communications Commission has shown its commitment to making more efficient use of the geostationary orbit by authorizing the launching of 20 new or previously constructed satellites. In addition, construction permits for 25 new domestic satellites were granted to seven companies.

The new satellites approved for launch can be broken down into three categories: replacements for in-orbit satellites nearing the end of their life expectancies; initial facilities for new entrants into the domestic communications market; and expanded facilities for existing carriers. Several of the carriers had applied for the

Table 1

DBS Specifications

Satellites:

PAM-D class, high-powered with a minimum of 1700 watts and equipped with traveling-wave tubes with minimum of 185 watts.

Uplink: 17 GHz.

Downlink: 12 GHz.

Proposed orbital location for the initial satellite: 115° west longitude to service the Eastern U.S.

Subsequent satellites for nationwide service: placed 20° apart at 115°, 135°, 155° and 175° west longitude.

Reception:

Due to the power of the satellites, a dish antenna of only 2.5 feet in diameter is needed. The antenna would be connected to a small set-top descrambler.

same slots, but the common carrier bureau worked out what it considered an equitable solution in granting the highly sought prime slots (see Table 1). FCC Chairman Charles Ferris praised the staff for the final configuration, calling the task "Solomon's choice."

The allocation is the first step toward squeezing more efficient use out of the available geostationary orbit. The next move, strongly backed by the common carrier bureau, is to reduce the spacing between satellites from the current four degrees to three degrees. Feasibility studies are already underway to evaluate the technical ramifications of such a plan and are expected to be completed in the first quarter of this year. Implementation of the three-degree spacing could begin as early as 1982, according to the common carrier bureau, as the new satellites are launched. The reduced spacing would underscore the U.S. commitment to more efficient use of the geostationary arc before the World Administrative Radio Conference (WARC) convenes in 1984.

The two new entrants to the 4/6 GHz satellite market are Southern Pacific Communications Company and Hughes Communications. Specific plans for their birds have yet to be announced, but sources from both companies have indicated the possibility of competing directly with RCA Americom and Western

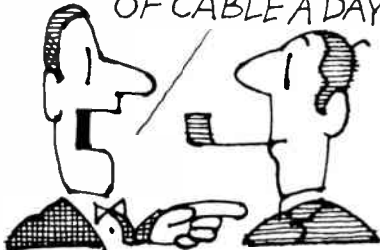
Table 1

Orbital Slot Chart

Company	Construction permits granted	Orbital slots granted*
RCA Americom	6	131° (Satcom III-R)+ 83° (Satcom IV) 139° (Satcom I-R) 143° (Satcom II-R)
Southern Pacific Communications	3†	70° (SPCC I) 119° (SPCC II)
Western Union	2	99° (Westar IV) 123° (Westar V)
Space Communications (A partnership of Western Union, Fairchild Industries and Continental Telephone)	5	79° (Advanced Westar) 91° (Advanced Westar)
Hughes Communications	3	74° (Hughes I) 135° (Hughes II)
Comsat General		127-127.5° (Comstar D-4) 95° (to reposition Comstar D-1)
AT&T	3	95° (Telstar— will replace Comstar D-I) 87° (Telstar— will replace Comstar D-II)
Satellite Business Systems (For satellites in the 12/14 GHz band)		SBS may choose among several available slots
GTE Satellite (For satellites in the 12/14 GHz band)	3	100° or 103° (GTE I) 103° or 106° (GTE II)

* All slots are West Longitude and will operate in the 4/6 GHz band unless otherwise indicated
+R indicates replacement
† (SPCC filed for four permits but the FCC deferred authority on the last.)

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Any company that was unhappy with the allocation was allowed one final option: The FCC stated that all participants are free to negotiate with the others for a trade.

News



Tymshare Gains FCC Nod For Microband Takeover

WASHINGTON, D.C.—The Federal Communications Commission has approved an application filed last September by Arthur Lipper Corporation and Tymshare, Inc., asking the commission's consent to transfer control of Microband Corporation of America to Tymshare. At the same time, the FCC dismissed a complaint filed against Microband by the National Association of MDS Service Companies (NAMSCO) alleging violations of the Communications Act.

With this action, Tymshare will gain control of licenses for MDS operations in 37 cities and common carrier radio station construction permits in 35 cities. In essence, the transfer of control results from a consummation of a merger agreement between Tymshare and Microband. The deal will be effectuated by the transfer of all of Arthur Lipper Corporation's stock in Microband to Tymshare. As of the date of the merger, Arthur Lipper Corporation will own nearly 80 percent of the stock in Microband.

After studying the issues at hand, the commission found no indication that the merger would be adverse to the public interest.

"There is no evidence that the merger would tend to reduce competition in either the pay TV market or the domestic private line market," the commission stated.

The FCC also determined that Tymshare was "legally, technically and financially qualified" to control the common carrier licenses and that the merger will "promote the growth and diversification of MDS service offerings."

The major barrier to the applications was the filing submitted by NAMSCO. The organization had requested that any action be deferred until "all doubt about Microband's qualifications as a licensee are resolved."

NAMSCO had asserted that Microband lacked the qualifications because it had refused to sell time in the morning and afternoon hours to NAMSCO members for distributing pay television programming. The commission dismissed the NAMSCO petition, ruling that "the character allegations raised... by NAMSCO [do not] impair Tymshare's ability to operate as a common carrier in the public interest."

REA Cable Loan Program Expects Funding in February

WASHINGTON, D.C.—The Rural Electrification Administration's (REA) low-interest financing and guaranteed-loan program for 1981 did not win approval before the Congressional recess. According to sources at the REA, the rural cable construction funds may not be cleared until mid-February.

Under the program, \$24 million in guaranteed loans were available for construction in rural areas in 1980. Also included was an additional \$10 million in insured loans at a five percent interest rate. This latter money, however, is only available to non-profit or cooperative organizations.

The REA's budget request for 1981 is identical to its 1980 allocation. During the past year, cable operators filed more than 100 applications with the REA requesting over \$100 million in guaranteed-loan funds.

The goal of the REA in granting the loans is financing cable construction in the most rural areas. Although technically the money is available on a first-come, first-served basis, the REA is attempting to disperse the funds equally among rural regions across the country.

FCC Clarifies Second Computer Decision

WASHINGTON, D.C.—In response to 36 petitions asking for reconsideration of its April 7 Second Computer Inquiry decision, the Federal Communications Commission has approved final language that clarifies several key points.

The Second Computer Inquiry decision established the commission's intent not to regulate enhanced telecommunications services and provision of terminal equipment by common carriers. In its clarification, the commission affirmed its classification that defines network services as either basic or enhanced.

Basic service is limited to a common carrier offering transmission capacity for the movement of information. Enhanced services were defined as the combination of basic service with computer-processing applications that provide additional information. Based on those definitions, American Telephone and Telegraph Company would be allowed to provide enhanced services and Customer Premise Equipment (CPE), but only through separate subsidiaries.

The commission also affirmed that it has the authority to "impose structural safeguards" on carriers to guard against potential abuses. This point has been one of the major issues through the debate over allowing AT&T to enter the enhanced-services market. FCC

Chairman Charles Ferris has insisted upon strong interpretation of the commission's powers.

"These regulatory safeguards are absolutely necessary if we are to carry out our responsibility under the Communications Act to protect rate-payers from cross-subsidy and ensure non-discriminatory access to underlying basic transmission facilities by all participants in the evolving enhanced-communications industry," Ferris said.

The commission modified its earlier decision by eliminating the requirement that General Telephone and Electronics Corporation provide enhanced services only through separate subsidiaries. Since GTE is dependent upon AT&T for the vast majority of its interstate transmission needs, the commission ruled that the limitation would be inappropriate. At the commission's request, the common carrier bureau staff will seek comment on the structural separation conditions for GTE.

M/A-COM, CTM Venture Boosts Interactive Cable

McLEAN, VIRGINIA—Communications Technology Management, Inc. (CTM), has announced a preliminary agreement reached with M/A-COM, Inc., to participate in a cooperative development project involving interactive cable systems and services.

According to Robert L. Schmidt, CTM president, the project will take an integrated, systematic approach to dealing with the "chicken-and-egg" problems currently inhibiting the advancement of cable television as an interactive service technology.

Initial activity on the project is scheduled to begin early this year, with phased expansion projected over a three-year period. Schmidt noted that other participants would join the project and that discussions were presently underway with a series of non-entertainment information and service providers.

The projects emphasized will be the design of an advanced two-way cable system architecture using M/A-COM digital distribution and packet-access technology. It will simultaneously focus on the development of communications and applications of system software and the structuring of a marketable package of informational, transactional and entertainment programming.

"The project will ultimately include three separate test markets connected via satellite to a centralized computer center in northern Virginia," said Schmidt. "We see the project as a 'developmental laboratory' which can help provide systems structure and service packages for use by the entire cable television industry."

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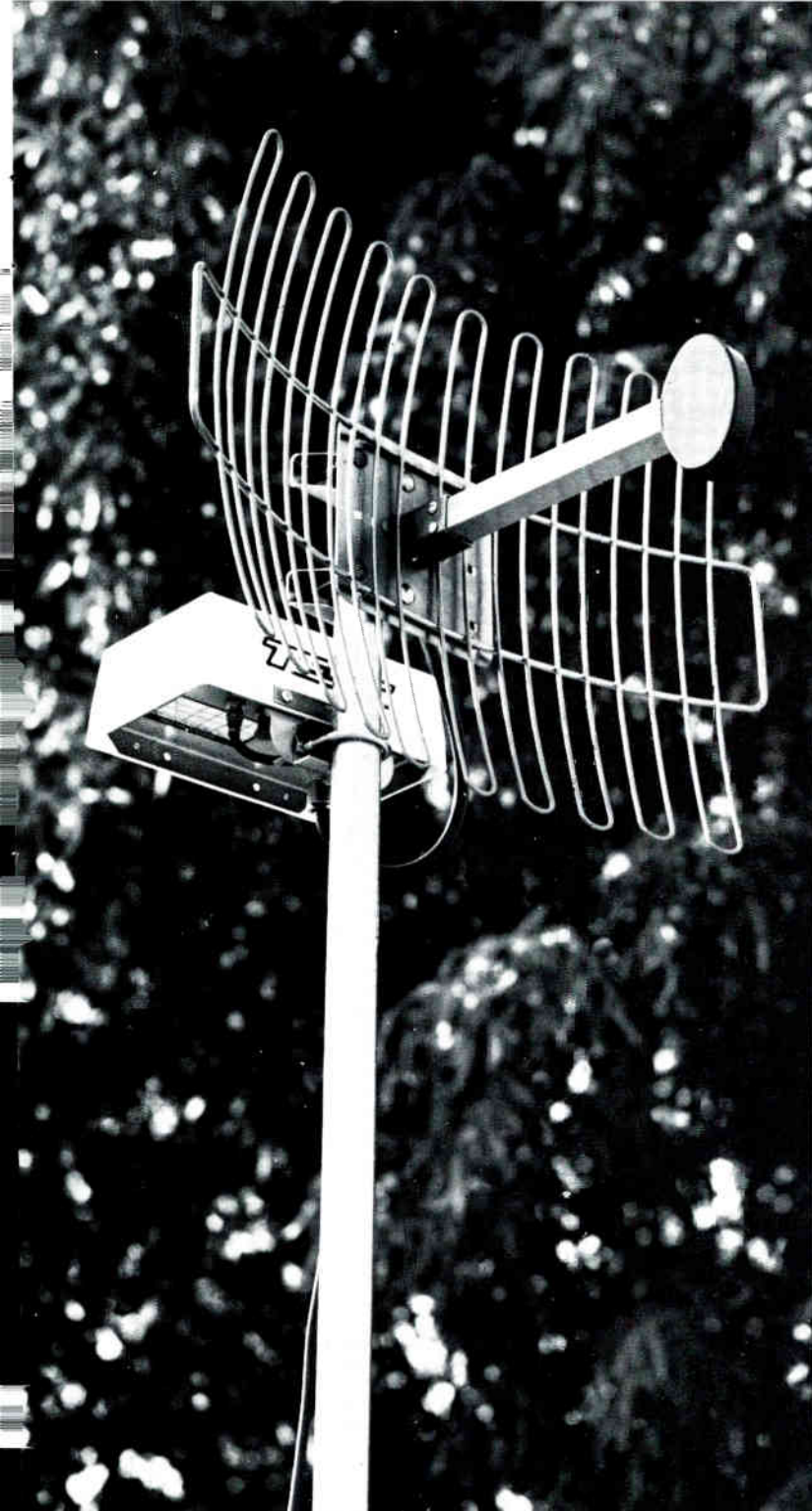
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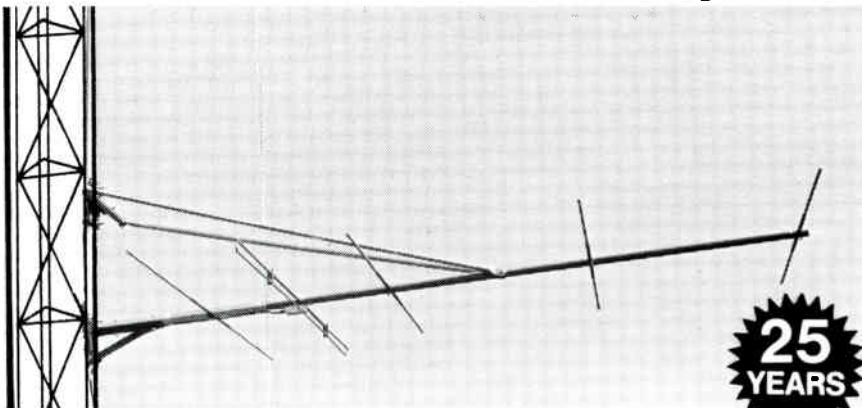
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Dr. Larry Gould, chairman and chief executive officer of M/A-COM, described the project as a logical extension of his company's current activities in digital-data distribution.

"Hardware systems must be developed in concert with saleable software," said Gould. "M/A-COM sees this project as a practical vehicle for advancing systems hardware and program services in a coordinated manner. Our consolidated manufacturing capabilities, including the recent acquisition of Ohio Scientific, Inc., [see *CableVision*, 12/15/80, p. 153] allows us to focus on all aspects of digital broadband distribution, from satellite transmission to end-user terminal interaction. This project with CTM will provide a developmental test environment in which to apply our equipment to the provisions of specific application services."

TRW Invests \$2 Million In Hybrid Amplifier Production

LAWNDALE, CALIFORNIA—TRW RF Semiconductors is continuing its expansion of CATV product capacity with the announcement of an additional \$2 million dollar investment in new production and testing equipment. According to company sources, this latest capital expenditure program is designed so TRW can produce enough hybrid amplifiers "to support the entire CATV industry" by the end of 1981.

In 1979 and 1980, TRW spent about \$1 million in expanding its CATV capacity by 80 percent. By early 1981, the company expects to have doubled its current production. The new program is expected to boost capacity to 3.6 times the 1978 level.

In addition, the upgraded manufacturing processes in 1981, according to TRW, will result in "significantly improved component performance, including a five dB gain in dynamic range."

Cable Will Be Competitive, Wheeler Tells Conference

LOS ANGELES, CALIFORNIA—"There are some amazing realities which tear apart the hypothesis that the cable television industry doesn't know anything about technology," said Tom Wheeler, president of the National Cable Television Association.

Wheeler made the statement at a conference on developmental strategies for marketplace delivery of telecommunications sponsored by the University of Southern California Annenberg School of Communications and Communications Technology Management, a McLean, Virginia, firm. Wheeler explained to industrial, media, and telecommunica-

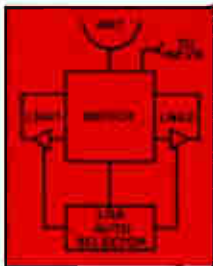
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tions executives that the cable television business is, in reality, three different businesses: CATV, pay TV and, now, the broadband local-loop business.

Wheeler noted that traditional CATV was what got the business started and carried it for so many years. In recent years, pay TV has driven the industry to do much more, including identifying its audience and developing the kinds of product leading to video publishing. The next logical progression, he said, is the broadband local loop.



Tom Wheeler, president, National Cable Television Association.

"There are many similarities between telephone and cable, but one of the most striking is that each was built for something else," said Wheeler. "The telephone industry was built for delivery of switched voice. Cable was built for delivery of TV service. Now people are asking of both: what is the next service going to be?"

Wheeler, as did many industry leaders at the conference, believes that before too long the telephone and cable industries will be in keen competition for the delivery of future services now that cable's major growth will be taking place in the urban markets. This is where the cable industry cannot sell itself short, he said.

"Sure the telephone companies already reach 98 percent of the marketplace," Wheeler said, "but their existing transmission system is slow and dirty. Sure they are in a leadership position in the rest of the world, but in most other countries telephone service is provided by government monopolies. Sure they are already into data and fiber optics, but so are we. It is just that the cable industry can't justify buying time on the "NFL Today" to advertise its lasers."

Wheeler pointed out that the cost to the telephone companies for rebuilding will be extremely high. The companies will be able to afford it, however, because their rates for plant depreciation are set by the

Federal Communications Commission.

In order for the cable television industry to compete on a technological and economic basis, Wheeler said, it must accept the basic challenge of preserving the freedom of the marketplace by maintaining the same entrepreneurial spirit it has displayed thus far. Also, it must now look for new alliances in the fight to preserve that marketplace freedom.

The two-day conference sponsored by USC and CTM was attended by more than 100 executives and regulators. According to Robert L. Schmidt, who co-hosted the conference, it was designed to investigate and address the complex issues and alternatives involved with telecommunications applications in order to help the participants maintain a competitive posture in the future. The conference included an examination of satellite networks, alternative delivery systems, target-market advertising, interactive systems and services development.

Martin Laven Named Titsch Associate Publisher

DENVER, COLORADO—Robert Titsch president of Titsch Publishing, Inc. (TPI), has named Martin Laven as associate publisher for the company's cable television magazine group. The Cable Division magazines include **Communications Engineering Digest**, **CableVision**, the weekly news and feature magazine for the cable television industry, and **CableFile**, the annual directory for the cable television industry.

Laven will move from TPI corporate headquarters in Denver to the company's bureau offices in New York. There he will assist TPI vice president and publisher of **CableVision**, Barbara Ruger, and Washington, D.C., vice president and **CE** publisher Pat Gushman in the areas of sales, marketing and circulation.

Laven, who will assume his new position in January, was most recently assistant to TPI President Robert Titsch where his duties included corporate planning, marketing and special projects. Titsch maintains sales offices in New York, Los Angeles and Denver with overall cable sales management directed from Denver by Paul Levine, vice president of sales.

Chicago Distributor Starts Training Program

CHICAGO, ILLINOIS—Satellite Communications Systems, Inc., is planning a \$2.1 million training program to orientate and train minorities and other interested individuals to qualify for work in the cable television industry. The firm expects approximately 1,000 persons to participate in its program over the next two and one half years.

The training will be conducted in a renovated 10,000 square-foot facility in the Southeast section of Chicago. The facility will be equipped with cable television headend, an electronic and research laboratory, pole farm, computer facility and several earth stations.

The initial focus of the program will be training technical personnel with strong emphasis on a concurrent management intern program.

Business Notes

★ **General Cable Company**, a division of GK Technologies, Inc., is expanding its cable production facilities. The multimillion-dollar project will add capacity at the Pearl, Mississippi, facility. The plant manufactures the fused disc III series 450 coaxial cables, developed in 1979 by the company's CATV Division.

★ **North Supply Company** of Lenexa, Kansas, has signed a distributor agreement with Microdyne Corporation of Ocala, Florida. North Supply will distribute Microdyne's complete hardware line, which includes 3.66-meter, five-meter and seven-meter antennas, modulators and a complete line of receivers.

★ **S.A.L. Communications, Inc.**, has been appointed as a stocking distributor of Sadelco's complete line of test equipment. Featured in the Sadelco line are new signal level meters with expanded super band range to 400 MHz.

★ **Cox Cable Communications, Inc.**, plans to purchase more than \$500,000 worth of equipment from the Professional Video Division of US JVC Corporation, according to national sales manager for the division, Dan Roberts. Cox Cable has already taken delivery of 17 JVC KY-2000U portable three-tube color cameras, an order valued at \$170,000.

★ **Century Communications** has purchased the cable television system serving Indianola and Moorhead, Mississippi. The system is presently comprised of some 50 miles of plant passing about 4,500 homes and serving about 2,700 primary subscribers.

★ **Colony Communications, Inc.**, of Providence, Rhode Island, has ordered more than \$1 million worth of equipment for its cable operations in Providence and Hialeah, Florida, from Hughes Aircraft Company's microwave communications division. The order includes two 36-channel high-power AML local distributions, and eight-to-ten satellite ground stations.

★ **GenRad, Inc.**, will relocate its corporate headquarters group, presently based in Concord, to the company's new sales and services operations facility in Waltham, Massachusetts.



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Equally newsworthy is the AK-710's built-in genlock and adjustable horizontal and vertical blanking intervals. With them the AK-710 can double as a system camera. There's also an optional remote control unit, as well as a 5" CRT viewfinder for studio use.

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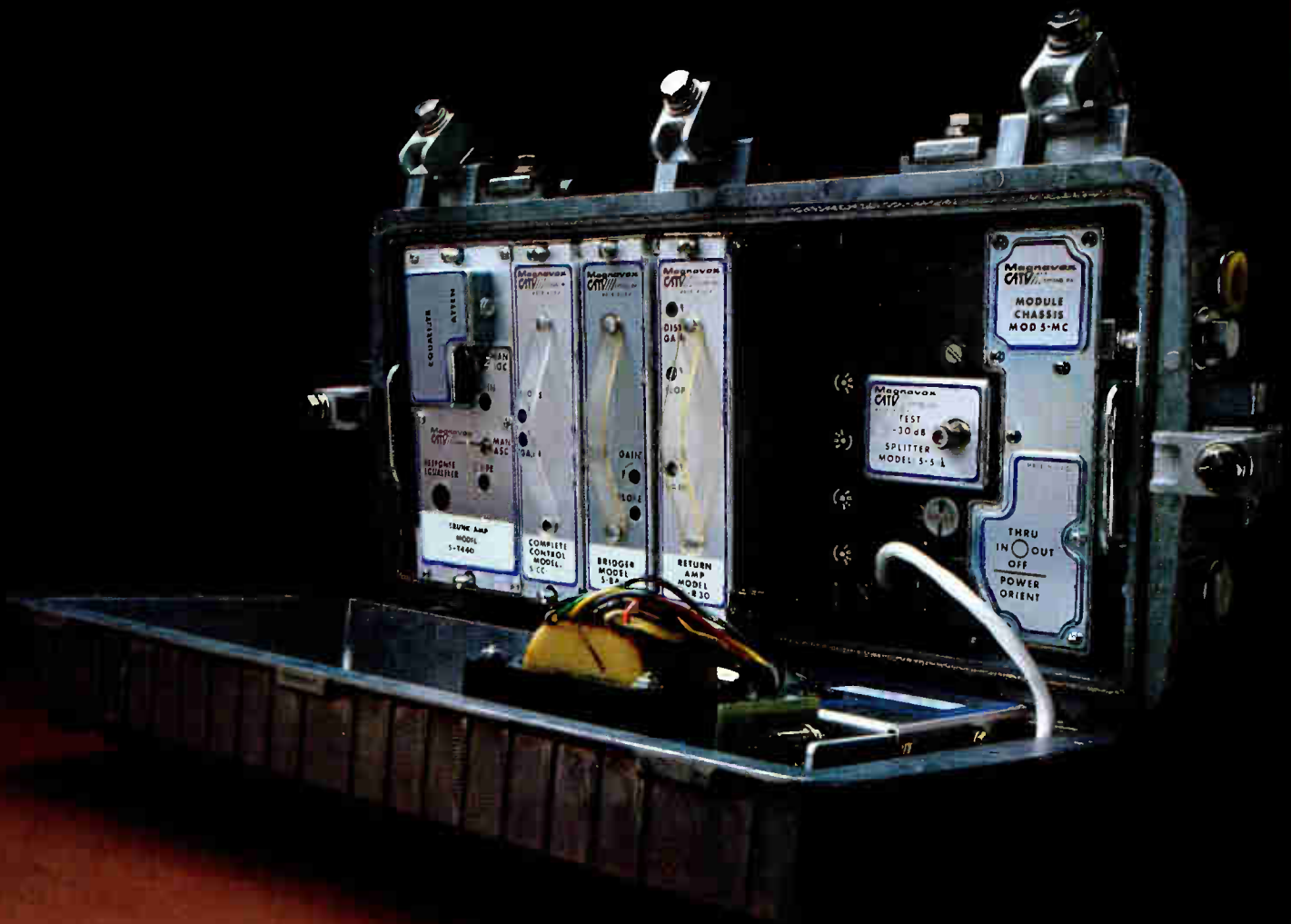
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Saving Time With Computer-Aided System Design

By David L. Brzeczek, district technician, Tele-Media Company of Lake Erie.

Have you ever gotten tired of computing trunk and feeder designs for cable systems using a hand calculator or a printing calculator? How often has someone come along and interrupted you in the middle of a calculation? By the time you got back to it, the calculator has shut off (thanks to the battery-saver circuit) and you had to go through the whole line of calculations again.

After seven years of working in the cable industry, David L. Brzeczek, district technician for Tele-Media Company of Lake Erie, decided to revolutionize his job with the purchase of a Radio Shack TRS-80 Level I computer. After learning how to program it (in between games of chess and flying saucers), Brzeczek wrote a program for use in feeder design. The computer program cut his design time in half and gave him a chance to submit his program to **CED** for the benefit of other cable system engineers.

CED is providing two versions of the feeder design program. The first can be used on a Level I, 4K Radio Shack TRS-80 computer. The second is for use with the Level II, 16K Radio Shack TRS-80 computer.

Using these programs, a cable system technician can obtain the same results with a \$1,000 computer that the major MSOs obtain with \$18,000 computers.

Brzeczek added one note for operating the program. When inputting the installing splitter at output of amplifier, enter "0" for footage before asking for splitter. The "0" is entered because closed coupled footage is "0." After the entry for splitter, the tap value given by the computer will not be correct. The tap value indicated will be for input to splitter. To obtain the correct tap value on output of splitter, enter "0" again.

Happy cabling.

Level I

```
1  CLS: GO TO 500
10  REM ***** CABLE TV FEEDER DESIGN *****
20  REM ***** NOVEMBER 6, 1980 *****
30  REM ***** BY DAVE BRZECZEK *****
35  CLS
40  PRINT "THIS PROGRAM WILL CALCULATE THE LEVELS FOR
41  CHANNELS 2 & R"
42  PRINT "(270 MHZ). ALL YOU NEED DO IS ANSWER THE
43  FOLLOWING QUESTIONS."
44  PRINT
47  INPUT "WHAT IS THE AMPLIFIER OUTPUT LEVEL AT CHANNEL
48  2(DBMV)";Z
48  INPUT "WHAT IS THE AMPLIFIER OUTPUT LEVEL AT CHANNEL
49  R(DBMV)";S
50  PRINT
```

```
55  INPUT "WHAT IS THE LOSS OF THE CABLE AT CHANNEL 2 (100
56  FT)";B
56  INPUT "WHAT IS THE LOSS OF THE CABLE AT CHANNEL R (100
57  FT)";C
57  PRINT
60  INPUT "WHAT TAP OUTPUT LEVEL TO DESIGN AT (CH. R)";T
90  E=Z :J=S
100 PRINT
120 PRINT "WHAT IS THE FOOTAGE OF YOUR CABLE?"
121 INPUT F
122 IF F=A THEN 185
123 IF F=B THEN 430
125 F=F / 100
130 G=F*B : H=F*C
135 I+E-G: K=J-H: L=K-T
136 IF F = 0 THEN 160
140 IF L < 10 GO TO 180
141 IF L < 13 GO TO 146
142 IF L < 16 GO TO 147
143 IF L < 19 GO TO 148
144 IF L < 28 GO TO 149
145 IF L > 28 GO TO 150
146 I=I-3.3 : K=K-3.3 : GO TO 160
147 I=I-1.4 : K=K-1.4 : GO TO 160
148 I=I-.8 : K=K-.8 : GO TO 160
149 I=I-.4 : K=K-.4 : GO TO 160
150 I=I-.3 : K=K-.3 : GO TO 160
160 PRINT
165 PRINT I,K,L
170 E=I : J=K
175 GO TO 120
176 Y=1
177 N=0
180 PRINT: PRINT I,K,L: PRINT
181 PRINT "TERMINATE OR BACKUP AND INSTALL LINE
182 EXTENDER!"
182 INPUT "DO YOU NEED TO RESET DATA (Y/N)";O
183 IF O = 1 THEN 35
184 IF O = 0 THEN 90
185 PRINT "DO YOU WISH TO SAVE THESE INPUT LEVELS?
186 (Y/N)";PRINT I,K
186 Y=1:N=0:INPUT W
187 IF W=1 THEN 400
189 IF W=0 THEN 200
200 PRINT "WHAT IS YOUR WISH MASTER?"
205 PRINT "(10) -3.5 DB";(20) 7 DB";(30) -8 DB"
210 PRINT "(40) -12 DB";(50) -16 DB";(60) -1 DB"
215 INPUT D
230 CLS
250 IF D=10 GO TO 300
255 IF D=20 GO TO 310
260 IF D=30 GO TO 320
265 IF D=40 GO TO 330
270 IF D=50 GO TO 340
```



The Radio Shack TRS-80 Level II Microcomputer system.

```

280 IF D=60 GO TO 350
300 I=I-3.5 : K=K-3.5 : GO TO 160
310 I=I-7 : K=K-7 : GO TO 160
320 I=I-8 : K=K-8 : GO TO 160
330 I=I-12 : K=K-12 : GO TO 160
340 I=I-16 : K=K-16 : GO TO 160
350 I=I-1 : K=K-1 : GO TO 160
400 P=I : Q=K
410 PRINT "YOU HAVE SAVED THESE LEVELS" : PRINT P,Q : GO TO 200
430 I=P : K=Q
440 PRINT "YOU ARE NOW USING THE LEVELS YOU SAVED" : PRINT I,K : PRINT : GO TO 200
500 GO TO 520
520 GO TO 550
550 GO TO 600
600 PRINT@10,"***** DLB'S CABLE FEEDER DESIGN PROGRAM *****"
610 PRINT@85,"***** INSTRUCTIONS *****"
620 PRINT : PRINT "ANSWER ALL QUESTIONS AS ASKED"
630 PRINT : PRINT "WHEN YOU REACH THE QUESTION ON CABLE FOOTAGE, YOU WOULD"
640 PRINT "NORMALLY ENTER THE FOOTAGE OF CABLE HOWEVER;"
650 PRINT "IF YOU WANT TO INSTALL A SPLITTER IN THE LINE, ENTER AN 'A'"
660 PRINT : PRINT "IF YOU ARE GOING TO DESIGN FEEDER FROM ALL OUTPUTS OF THE"
670 PRINT "SPLITTER ANSWER 'YES' (Y) TO THE SAVE QUESTION THIS WILL"
680 PRINT "THEN ALLOW YOU TO COME BACK TO THOSE LEVELS UPON COMPLETION"
690 PRINT "OF THE PRESENT FEEDER"
691 PRINT
692 PRINT
695 INPUT "          PRESS 'ENTER' TO CONTINUE " : AS : CLS : GO TO 700
700 PRINT : PRINT "AFTER COMPLETION OF THE PRESENT FEEDER, YOU MAY GO BACK"
710 PRINT "TO SPLITTER INPUT LEVELS BY ENTERING 'B' ENTER SPLITTER LOSS;"
720 PRINT "THEN CONTINUE WITH DESIGN;"
730 PRINT : PRINT "THIS PROGRAM MAY BE USED TO DESIGN TRUNK RUNS IF YOU IN-"
740 PRINT "HIBIT THE AUTO TAP THRU LOSS PORTION OF THE PROGRAM, TO DO SO:"
750 PRINT : PRINT "PRESS BREAK AND ENTER THE FOLLOWING INTO THE PROGRAM"
760 PRINT : PRINT "'138 G.160' ----ENTER IT ---- THEN RUN"
761 PRINT
762 PRINT
763 PRINT
765 INPUT "          PRESS 'ENTER' TO CONTINUE " : AS : CLS : GO TO 770
770 PRINT : PRINT "THE LEVELS INDICATED ARE READ IN THIS ORDER;"

```

```

780 PRINT : PRINT "LEVEL","LEVEL","TAP"
798 PRINT "@ CH.2","@ CH.R","VALUE"
800 PRINT : PRINT "","",""
806 PRINT : PRINT "          'GOOD LUCK'  ----- DLB"
807 PRINT
810 PRINT : INPUT "          PRESS 'ENTER' TO START PROGRAM" : AS : GO TO 10

```

Level II

```

1   CLS : GO TO 500
10  REM ***** CABLE TV FEEDER DESIGN *****
20  REM ***** NOVEMBER 6, 1980 *****
30  REM ***** BY DAVE BRZECZEK *****
35  CLS
40  PRINT "THIS PROGRAM WILL CALCULATE THE LEVELS FOR CHANNELS 2 & R"
42  PRINT "(270 MHZ). ALL YOU NEED DO IS ANSWER THE FOLLOWING QUESTIONS;"
44  PRINT
47  INPUT "WHAT IS THE AMPLIFIER OUTPUT LEVEL AT CHANNEL 2(DBMV)";Z
48  INPUT "WHAT IS THE AMPLIFIER OUTPUT LEVEL AT CHANNEL R(DBMV)";S
50  PRINT
55  INPUT "WHAT IS THE LOSS OF THE CABLE AT CHANNEL 2 (100 FT)";B
56  INPUT "WHAT IS THE LOSS OF THE CABLE AT CHANNEL R (100 FT)";C
57  PRINT
60  INPUT "WHAT TAP OUTPUT LEVEL TO DESIGN AT (CH.R)";T
90  E=Z : J=S
100 PRINT
120 PRINT "WHAT IS THE FOOTAGE OF YOUR CABLE?"
121 INPUT F
122 IF F=1 THEN 185
123 IF F=2 THEN 430
125 F=F/100
130 G=F*B : H=F*C
135 I=E-G : K=J-H : L=K-T
136 IF F=0 THEN 160
140 IF L < 10 GO TO 180
141 IF L < 13 GO TO 146
142 IF L < 16 GO TO 147
143 IF L < 19 GO TO 148
144 IF L < 28 GO TO 149
145 IF L > 28 GO TO 150
146 I=I-3.3 : K=K-3.3 : GO TO 160
147 I=I-1.4 : K=K-1.4 : GO TO 160
148 I=I-.8 : K=K-.8 : GO TO 160
149 I=I-.4 : K=K-.4 : GO TO 160
150 I=I-.3 : K=K-.3 : GO TO 160
160 PRINT
165 PRINT I,K,L
170 E=I : J=K
175 GO TO 120
176 Y=1
177 N=0
180 PRINT : PRINT I,K,L : PRINT
181 PRINT "TERMINATE OR BACKUP AND INSTALL LINE EXTENDER"
182 INPUT "DO YOU NEED TO RESET DATA (Y/N)";OS
183 IF OS="Y" THEN 35
184 IF OS="N" THEN 90
185 PRINT "DO YOU WISH TO SAVE THESE INPUT LEVELS? (Y/N)";PRINT I,K
186 INPUT WS
187 IF WS="Y" THEN 400
200 PRINT "WHAT IS YOUR WISH MASTER?"
205 PRINT "(10) -3.5 DB","(20) -7 DB","(30) -8 DB"
210 PRINT "(40) -12 DB","(50) -16 DB","(60) -1 DB"
215 INPUT D
230 CLS
250 IF D=10 GO TO 300
255 IF D=20 GO TO 310
260 IF D=30 GO TO 320

```

Continued on page 77.

Guess who's introducing Simulchannel™ AR1000- the ideal Satellite CATV Receiver!

Avantek's Simulchannel AR1000 is the most advanced expandable, 6-channel earth station receiver available today. Great news, whether you're building CATV systems or operating your own: Avantek is introducing a complete, expandable receiver system that can significantly reduce the cost of getting you on the air; reduce your cost of adding channels; and permanently reduce your cost of operating repairs. Combine the AR1000 with an Avantek ACA4220 LNA-Downconverter module at your antenna, and you have the critical electronics you need to receive satellite signals for cable TV.



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With the AR1000 you get features such as full digital tuning; threshold

extension; automatic frequency control; a 40 dB dynamic range; and your receiver-input frequency is the new industry standard centered on 1.2 GHz to avoid excessive interference. Also, 12-channel block down conversion simplifies the addition of modules for new TV channels.

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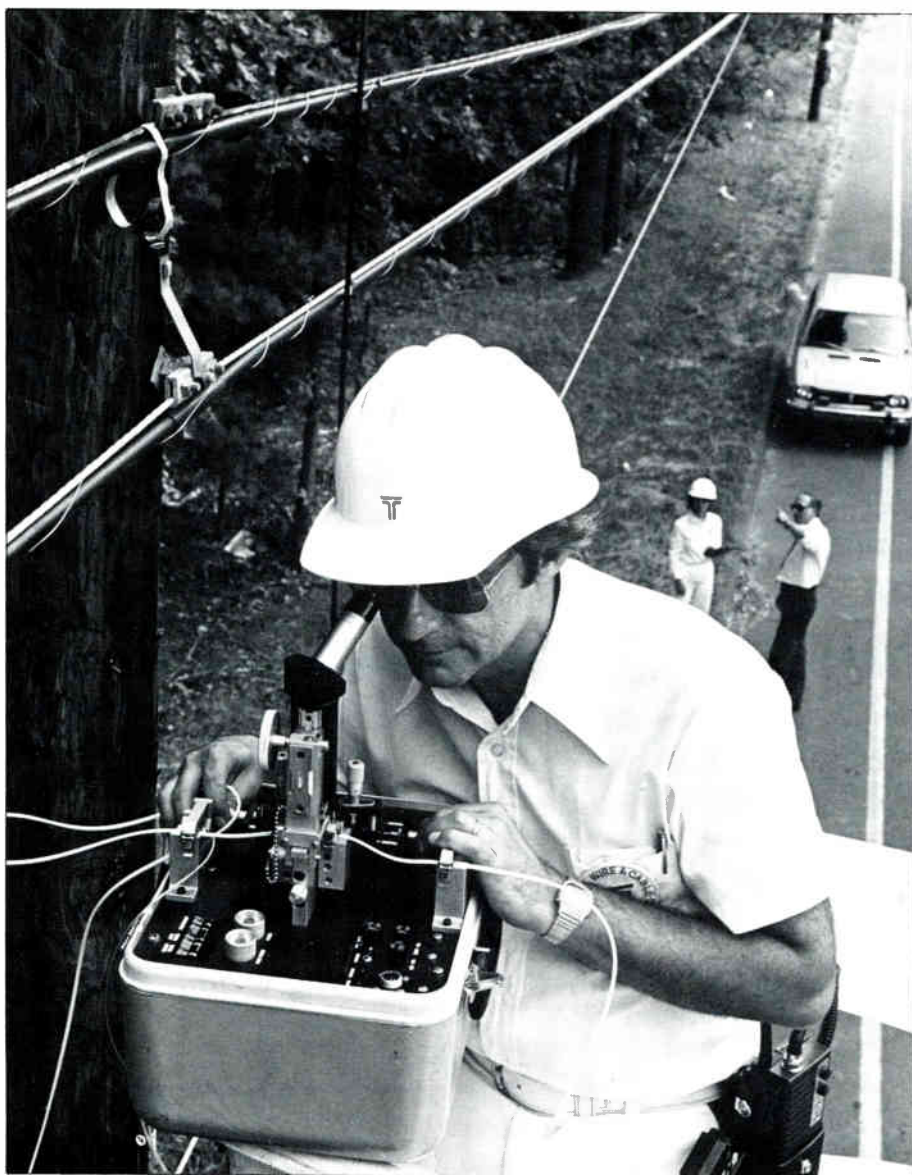
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The Greening of Fiber Optics: Times Fiber Cultivates New Applications



Times Fiber Communications personnel supervise the installation of fiber optics cable and provide fuse splicing. Robert Leroux, manager of fiber optics engineering field operations, uses the company's portable fusion splicer to fuse each 8.5 km. strand in the four-fiber cable for United Cable TV of Plainville, Connecticut.

By David Price, managing editor.

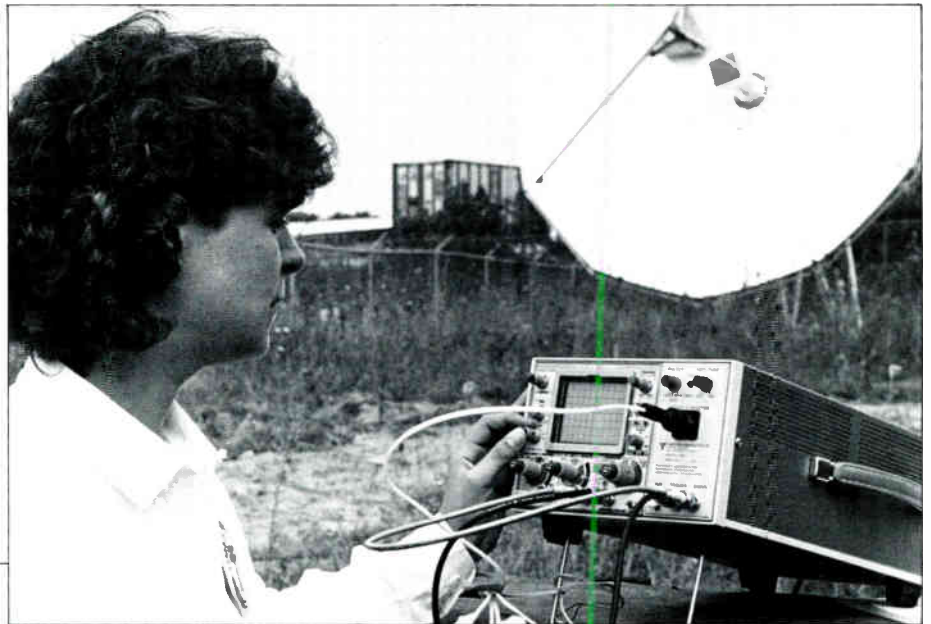
In 1854, British physicist John Tyndall postulated that "light in a dense optical medium cannot escape to a less dense medium if the grazing angles of the light rays are sufficiently low." To demonstrate the concept, Tyndall placed a light source within a tank of water that had a narrow hole in its side. As the water flowed from the tank, the light rays followed the stream of water, confirming Tyndall's hypothesis.

This basic principle of total internal reflection has become the foundation for the operation of fiber optics. Now, after a bevy of promises the technology is showing its potential as the transportation mode of the future in the cable industry. Although the use of fiber optics through a complete system must wait until several crucial stumbling blocks are overcome, the technology is beginning to prove itself as a cost-effective trunking delivery system.

One of the best ways to look at the growing acceptance of fiber optics is through Times Fiber Communications, Inc. (TFC), a division of Insilco Corporation. TFC is one of only a handful of U.S. companies that is actively researching and manufacturing fiber optics cable and related components for the cable industry. TFC's commitment to the technology will climb into the tens of millions of dollars before a profit will be realized, but the payoff is expected to be astronomical by the 1990s.

The first commercial fiber optics system was a link of only 800 feet. Teleprompter made the historic decision to employ the link in its Teleprompter Manhattan system in New York City to carry the Home Box Office channel from the rooftop antennas down to the headend. Transmission began on July 8, 1976, and the link has been in continuous use since.

Two years passed before the second



Lurette Cote, an electro-optic technician, checks a segment of the United Cable TV fiber optics system using an optical time-domain reflectometer.

TFC commercial system was installed, this time for another Teleprompter system at Lompoc, California. The system is a super-trunk that transports 12 channels over a distance of 8.4 km. on two fibers. When the link was first installed, three repeaters were used at 2.1 km intervals. With this set-up, the signal-to-noise was measured at 50 dB with no visible distortion. However, in December 1979, the decision was made to retrofit the Lompoc system and allow the signals to be transported with only one repeater, located 4.2 km. along the link. Tests performed at that time indicated that signal-to-noise would increase to 52-56 dB.

In the first four years of actual fiber optics availability, these were the only two TFC applications. However, last year six other companies took the fiber optics plunge. The companies are listed in Table 1 below.

As the testimonies to the improved signal quality and potentially positive economics of fiber optics transmission begin to trickle in, more interest is generated in employing these systems. But the avalanche of orders is yet to

come. As in any technological innovation, adventurous companies are leading the way, and others are waiting to see how these initial operations succeed.

"The biggest problem," said a TFC spokesman, "is that although people are marginally interested, who wants to go out on a limb? The answer is the progressive companies. But the others should keep in mind that they're not just buying hardware, they're buying performance. You can't sell just hardware."

Currently, the capabilities of fiber optics links for cable systems are limited to three areas: satellite downlinks, hub-to-hub transportation, and local origination-to-headend links. Until the bugs can be worked out between the optical sources and the conventional electronic amplifiers, fiber optics will be limited to these trunking applications. But all the proponents of fiber optics predict that those breakthroughs will come, allowing total fiber optics cable systems.

"There's no doubt that it can be done,"

said Dr. Douglas A. Pinnow, director of research and development for TFC. "But it has to be done in a way that's competitive with the technology. A lot of people have been making forecasts on this, but I myself am taking a much more guarded position. When it actually occurs, that's it. But we're not there yet."

The advantages of fiber optics technology are a combination of improved signal quality and the economics created by using fewer, if any, repeaters. According to TFC, the fiber optics satellite downlinks can carry four channels FM at 10.75 MHz deviation over a distance of 13,120 feet (four km.) without a repeater. This saves not only equipment but maintenance costs as well. If a longer distance is required, up to three repeaters can be used and TFC claims performance of better than 50 dB signal-to-noise with no visible distortion (at a total distance of 52,450 feet, or 16 km.) The downlink is illustrated in Figure 1 on page 37.

Transportation links of five channels

Table 1

Cable Fiber Optics Systems Installed in 1980 by Times Fiber Communications

System:	Falcon Cable TV, Monterey Park, California	Hillsborough Cablevision, Hillsborough, New Jersey	Storer, Hollywood, Florida
Application:	Satellite downlink	Satellite downlink and local origination link	Local origination link
Number of channels:	18	11	1
Length:	4 km.	4.5 km.	5.5 km.
System:	Teleprompter, New York, New York	United Cable TV, Plainville, Connecticut	Vision Cable Communications, Fort Lee, New Jersey
Application:	Local link	Satellite downlink	Two-way local link
Number of channels:	26	8	7
Length:	1.3 km.	9.5 km.	8.8 km.

CA-2500

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per fiber, utilizing FM at 5 MHz deviation, can also go as far as 13,120 feet without a repeater as illustrated in Figure 2. This would be employed in a typical super-trunk application with up to 12 fibers fabricated into a single cable (capable of carrying 60 video channels). According to the company, two repeaters can be used, extending the distance to 39,370 feet (12 km.), and still keeping within the 50 dB signal-to-noise limits.

The third application is the local origination-headend connection, which again can carry five channels per fiber for 13,120 feet (four km.) without a repeater, as shown in Figure 3.

If the standard to measure the progressive nature of a cable company is its willingness to use fiber optics, Vision Cable Communications (VCC) of New York, New York, is one step ahead of everyone. VCC has the distinction of being the first company to place a second order for a fiber optics link with TFC

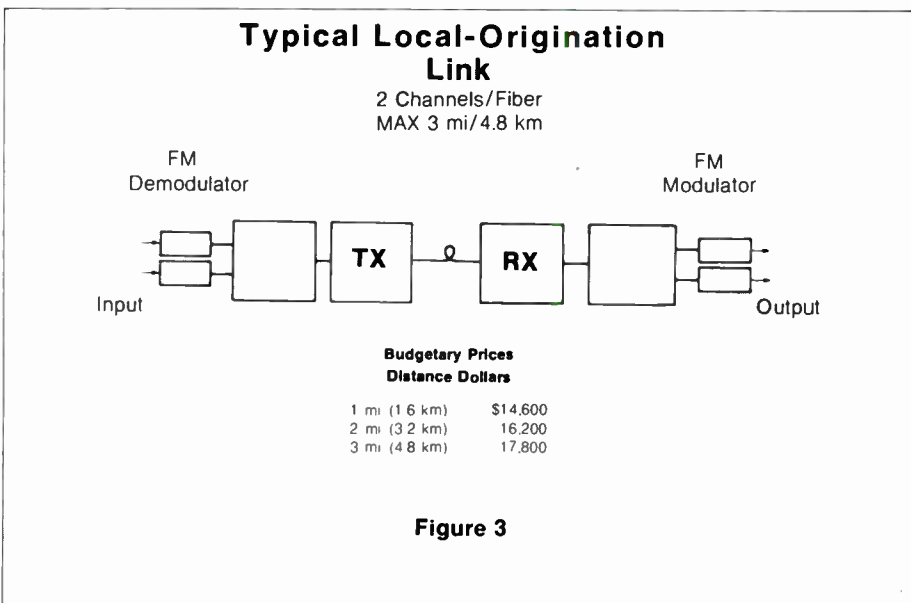
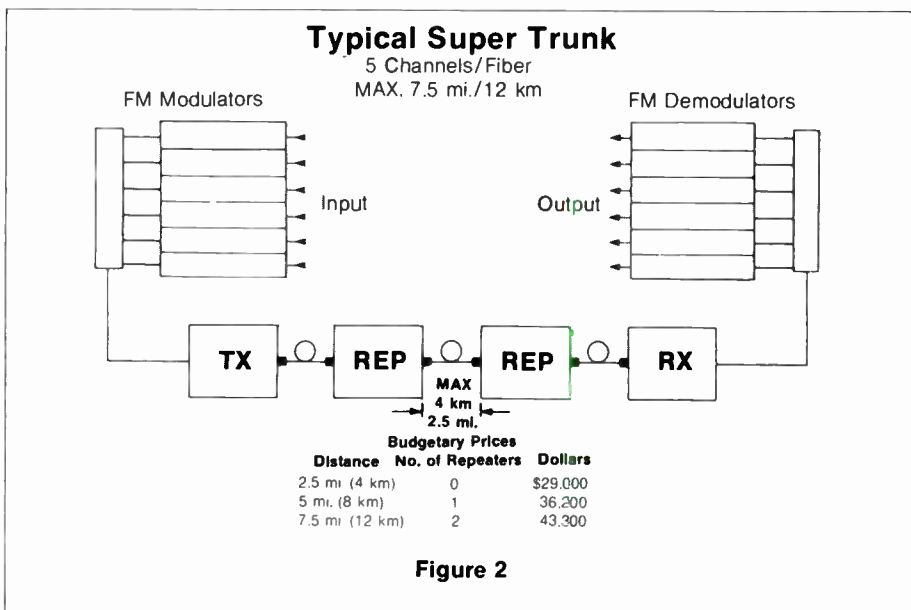
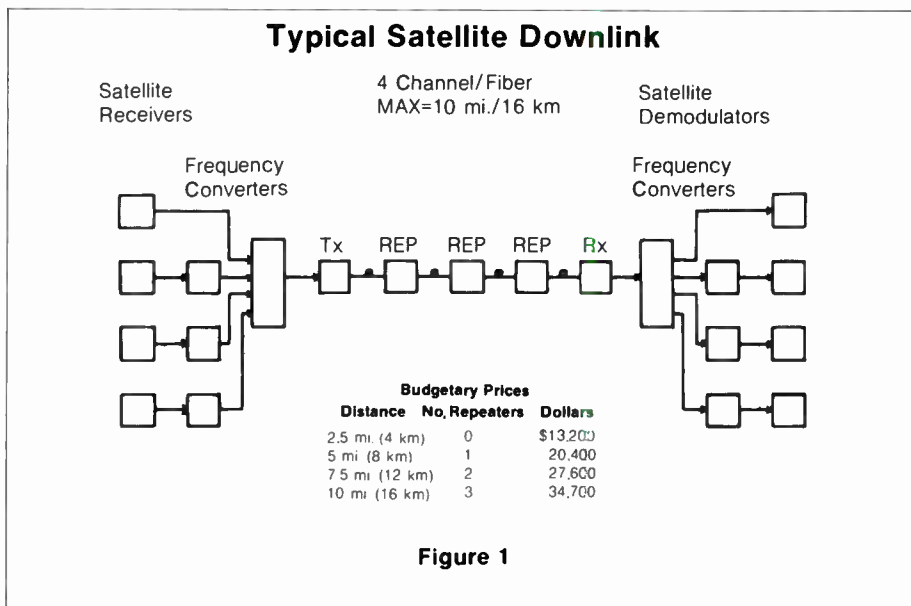
Last April, VCC installed an 8,800-foot link to connect its Fort Lee, New Jersey, headend site with its local origination studio in Palisades Park. The move enabled VCC to send two sports channels to its studio for the insertion of commercials and then send them back to the headend with minimum signal degradation. In addition, premium channels and local origination programs are also carried, for a total of five channels, from the studio to the headend.

The VCC management was so pleased with the result that it has contracted with TFC for a second leg in the fiber system. The second leg, scheduled for installation in February, will transport signals 600 meters from the system's three earth stations to the studio office complex. At the studio, the satellite and locally originated programming will be selected and sent to the headend by way of the first fiber optics link. Six fibers will be used, with a carrying capacity of 24 channels.

Because of the length, no repeaters will be needed and the signal-to-noise will be at least 53 dB. The specific fiber involved contains two active fibers and four spares. Each fiber, according to the company, is driven by a 70 MHz satellite receiver signal that is fed directly to a passive mixer with three additional signals stacked at 110, 160, and 250 MHz, using frequency converters.

According to Charles Dietz, assistant vice president for VCC, the plan to use fiber optics arose when a decision was made to upgrade the system. The headend site did not have sufficient room to install the necessary earth stations and the closest available place was 8,800 feet away. The arrangement was a perfect opportunity to give fiber optics a try.

TFC will supervise the installation of the second leg of the VCC system. Last April, the first leg was installed under TFC



supervision in a total of five working days. The TFC supervisors then did the fuse splicing and checked out the electronics in another two days. Working with the new cable turned out to be easier than Dietz had anticipated.

"We found out that it's very rugged," Dietz said. "On a normal cable installation, if you can get a couple of 90 degree bends out of the cable, that's a lot. We took this thing around six 90 degrees in spots. We had to have people at midpoint pulling the cable by hand to keep the tension off it around the corners. But it was a very easy cable to work with. We were surprised."

The United States, however, may not be the first country to develop these methods. The Japanese government is supporting fiber optics with its Hiovis system experiment. A recently announced project slated for Biarritz, France, (see **CED**, 12/80, p. 76) is another indication of the commitment foreign governments are making to fiber optics.

In the Biarritz project, the French ministry of Postes, Telecommunications et Telediffusion awarded a contract valued at approximately \$100 million to Societe Anonyme de Telecommunications (SAT) for the design and implementation of a fiber optics communications network for 1,500 subscribers in the resort city. Irving Kahn's General Optronics will supply the lasers for the project, which will

include delivery of state-of-the art video services.

Other experiments are on the drawing board in Canada, Germany, Sweden, Switzerland and the Netherlands. The cooperation of foreign governments could advance the fiber optics industry more rapidly than the efforts of initial uses here.

"Some of the foreign competitors actually have a superior edge," said Pinnow. "Government underwriting is going to drive them to pretty rapid solutions of some of the problems."

One recommendation Pinnow made is that the cable industry should take a long look at what the other countries are doing.

"I would offer the comment that people in the decision-making capacities should get out of their own country at least once a year. We can already see that the advances in Japan are having an effect on the United States and the European countries, and vice versa. This is not a game to work in the dark."

Obviously, the cost of the technology is another contributing factor. But as the price of copper rises, fiber optics will become more attractive. Like any other high technology, the cost will fall as production volume increases. But by then, Europe's present efforts could have positioned the foreign manufacturers on the leading edge of the industry.

"For example, if France or another country decides to wire everything with fiber optics, that will ensure major investments in that country," said Pinnow. "It would be important for the U.S. not to lose its position and get dependent on foreign fiber."

In order to avert that possibility, TFC is pumping its finances into the research, development and manufacturing of fiber optics components. Final construction on a 25,000-square-foot headquarters and manufacturing complex in Wallingford, Connecticut, is underway. The plant recently became operational. When the building is completed in August 1981, it will house primarily the data processing, fiber optics system engineering and marketing departments. Initially, the plant is expected to employ 70 people with the capability of producing 1,000 km. of fiber per month.

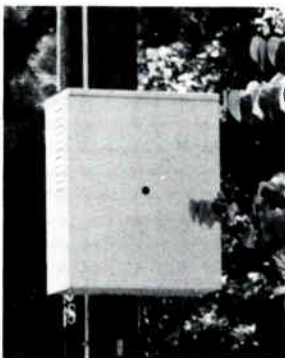
The use of fiber optics for a total cable system remains a long-range goal. A TFC spokesman referred to that eventuality as "the pot of gold at the end of the rainbow." Still, fiber optics is finding its way into cable construction at an increasing rate. With the international interest in technology, it's only a matter of time before laser-produced beams of light make their way from satellite earth stations to color-television consoles in a subscriber's home.

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FIVE YEAR WARRANTY

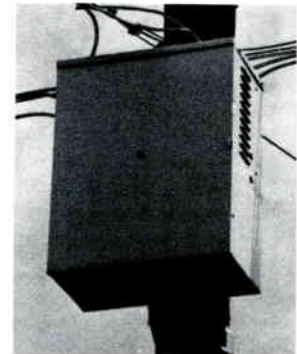
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MIDWEST GROWS NATIONAL!

Jerrold Gambles In Cable Security

By Brian Huggins, associate managing editor.

Three channels of data transmission—one downstream channel from the headend to the box in the subscriber's home, and two upstream channels from the subscriber's home to the headend—is a key element in the new cable security system developed by General Instrument's Jerrold Division. One upstream channel

is used in the polling process. The second upstream channel remains clear at all times for sounding an alarm.

The Jerrold Division plans to announce a brand name for its cable security system at the National Cable Television Association show in May and to embark on a campaign to gain national brand name recognition, according to Lindsay Miller, product manager. Jerrold plans to complete its market research on the product in May and to begin delivery of

commercial operating systems in October.

To help cable television engineers evaluate this new entry in the home security market, **CE**D spoke with Joe Rocci, a Jerrold engineer, on the technical aspects of the security system. Rocci explained the system from the headend to the subscriber's home. The system design is shown in Figure 1.

Headend

The Jerrold cable security system



Jerrold Cable Security System Design

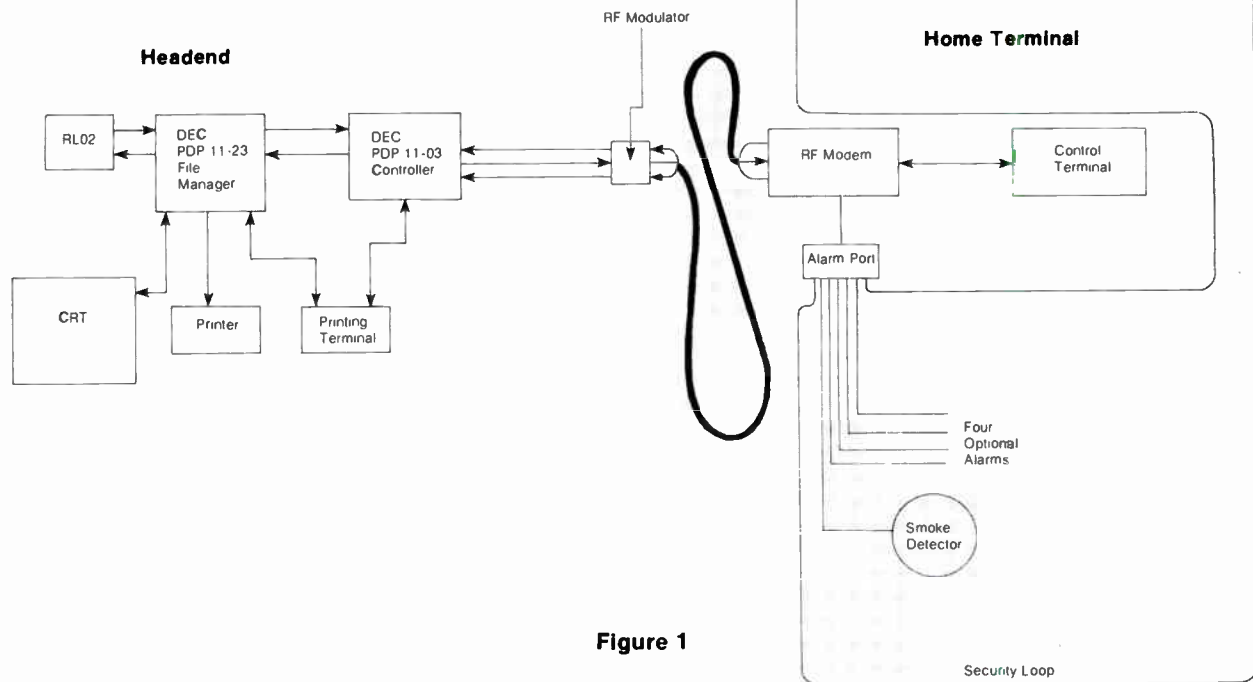


Figure 1

uses two computers at the headend, a file manager and a controller. The file manager is the PDP 11-23, manufactured by Digital Equipment Corporation. The PDP 11-23 has a ten-megabit cartridge disc drive, the DEC model RL 02, and serves as the primary file storage. The PDP 11-23 can handle up to 16,000 subscribers and can store up to 512 alpha numeric characters for each subscriber. The file manager will store the vital information needed for the system operator to follow through on alarms, such as the name of the subscriber's doctor and the addresses of the nearest fire company and hospital. The file manager will also keep track of how often each alarm is activated and, on command, will print out a history of alarm use. With some modifications, the file manager can also conduct statistical analysis, according to Rocci.

The file manager is equipped with a dual floppy disc system. The smaller unit, also made by DEC, has 1.5 megabit storage and will back up the system if the main file manager fails. The dual floppy disc is also capable of restoring the subscriber database in the main file manager.

Three other pieces of equipment round out the file manager: two printers for reproducing the database and a DEC VT-100 CRT for modifying the database.

The file manager is driven by the controller, the DEC PDP 11-03. This unit is the link between the alarm system in the subscriber's home and the file manager. The 11-03 is equipped with SRX 11 intelligent data-transmit cards manufactured by Jerrold. The microprocessor

cards control the downstream and upstream channels and are programmed to monitor the system and receive alarms. The 11-03 has a battery in case of power failure.

The headend functions in the following manner. The alarm comes into the 11-03, the box number goes to the 11-23 and the 11-23 prints out all relevant information. The line printer will begin producing information a quarter of a second after the alarm is sounded in the home, according to Rocci.

If the 11-23 and its backup system fails to operate due to a power failure, the system will lose access to its database. The 11-03, however, will continue to operate on battery power and, when an alarm is sounded, will print out the box number and nature of the alarm. The system operator can then look up the information needed to follow through on the alarm in a printed version of the database.

The entire headend is priced at approximately \$42,000. The lion's share of the price tag is for the file manager. The 11-03 is inexpensive enough (\$3,000-\$4,000) that an operator could purchase a second 11-03 as a backup, said Rocci.

Transmission

The alarm boxes in the subscriber's home are linked to the RF modulator at the headend by three channels, one downstream and two upstream. The downstream channel and one of the upstream channels are constantly engaged in polling the subscriber boxes to make sure that the boxes are present and operating.

The system is capable of a polling rate as high as 1,250 subscribers per second. At this rate, it can poll 16,000 subscribers in 12 seconds.

The second upstream channel is for sounding an alarm. In systems that are not equipped with two upstream channels, an alarm is not relayed to the headend until the headend contacts the subscriber box in its normal polling sequence.

The transmission data rate for all three channels is 14 KHz. The security system employs Datachannel™ data transmission technology, which Jerrold developed for its Playcable™ system, said Rocci.

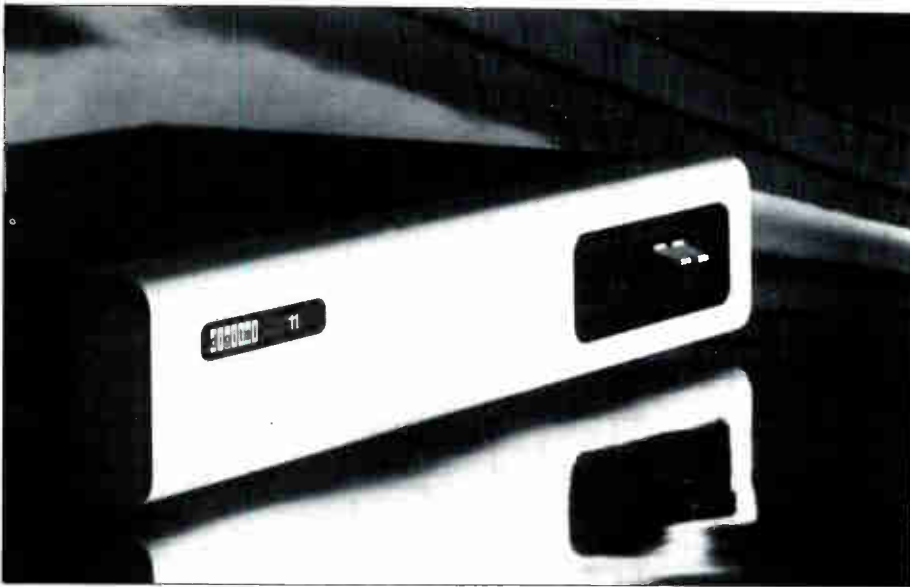
Subscriber Boxes

The subscriber's home is equipped with two boxes—the RF modem, or "downstairs" box, and the control terminal, or "upstairs" box.

The RF modem is attached to the cable drop and is equipped with two microprocessors. One microprocessor handles all data communications with the headend. The other microprocessor is the alarm controller and has an eight-bit alarm-input port. The ports are connected to alarm sensors in the subscriber's home.

Attached to the alarm controller is the status port, which is read only during the polling process. The status port is not used in the basic security system and could be applied to other home two-way services, according to Rocci.

The control terminal is designed to be installed in the living quarters of the home and is linked to the RF modem by a two-



The PDP 11-03 from Digital Equipment Corporation.

way wire link. The terminal has a five-button numerical keyboard, LED indicators, a beeper and three panic buttons. The panic buttons are for fire, medical assistance and police. With them, the subscriber can activate the alarm manually. The keyboard is used for entering special subscriber codes that arm and disarm the system. Each terminal responds to three subscriber codes—a

primary code and two secondary codes that the subscriber can program into the unit.

The terminal also has a siren that is activated when an alarm is sounded and a backup battery which keeps the system running in the event of a power failure.

The RF modem and the terminal controller are priced at \$95 in quantities over 1,000, according to Rocci.

Alarms

The Jerrold system can accommodate 11 alarms, according to Miller. The two standard alarms are smoke detection and a security loop. The system then has four hookups for optional alarms. The subscriber can hook into the system any four alarms that he or she feels are necessary. Among the alarms that could be used are detectors for gas leaks, basement flooding, freezing and internal traps to detect

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The PDP 11-23 from Digital Equipment Corporation.

intruders. Vital information about the optional alarms the subscriber installs is stored in the file manager at the headend.

As mentioned, the system has panic buttons for fire, police and medical assistance, bringing the count up to nine. The last two alarms are sensors built into the equipment. The first sensor will sound an alarm if the security system is tampered in any way—if someone tries to dismantle a box or cuts the wire-link between the RF modem and the control terminal. The second sensor monitors the system's

backup battery and sends word to the headend if the backup battery is low.

The Test

Jerrold and Cablevision of Woodbury, New York, began testing the cable security system this month. An important part of the test will be experimenting with alarm sensors, according to Miller. While Jerrold does not plan to manufacture

alarm sensors, it will recommend specific sensors for use with its system.

Though home security is a relatively new cable service, competition to provide security hardware and software is already intense. Miller declined to give any sales projections for the new system but indicated that Jerrold is going to put as much effort and energy into marketing its system as it put into designing it.



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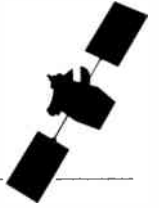
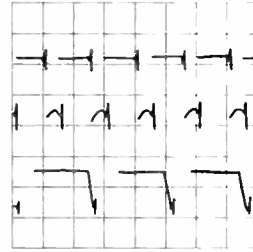
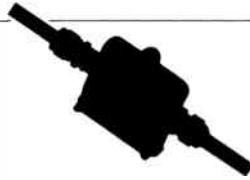
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CEC Tech Review



To those who attended Western cable television shows and conventions in the past, projections that last month's extravaganza at the Disneyland Hotel in Anaheim, California, would be 50 percent larger than before seemed unrealistic. Well, they were half right. As it turned out, attendance was up more than 70 percent over 1979. Almost 7,000 people jammed the hotels, meeting rooms and exhibit halls to pick up on the latest in cable television hardware and software. **CEC** picked up on it, too, and as is our custom we present on the following 11 pages our special January '81 tech review featuring products and services presented at the show by 82 cable television equipment manufacturers and suppliers. In addition to the new products unveiled at the show, we have included new or re-tooled equipment made available by many of the major industry suppliers during the last six months.

Cable 45

CCS Hatfield Communication Products
Cerro Communication Products
Comm/Scope
General Cable
Times Wire and Cable

Cable Accessories 45,46,47

Ben Hughes Communication Products
Cable Spinning Equipment
Cable TV Supply
Electroline Television Equipment
Intercept
Jackson Communication
LRC Electronics
S.A.L. Communications

Construction Machinery 47,48

Ditch Witch
Durnell Engineering
Jl Case
Lamb
Sky Dart

Converters 48

Oak Communications CATV
Satellite Cablevision Equipment
TOCOM

Headend 48,51

Phasecom
Tomco Communications

Line Equipment 51,53

AM Cable TV Industries

Arvin CATV
Broadband Engineering
C-COR Electronics
Century III Electronics
Delta-Benco-Cascade
GTE Sylvania
Jerrold
Magnavox CATV Systems
RCA Cablevision Systems
Theta-Com
TRW RF Semiconductors

MDS Devices 55

Bogner® Multitenna
Conifer
TEST

Pay TV Components 55,56

Eagle Comtronics
Hamlin® USA
Pico
Pioneer
Vitek Electronics

Power Supplies 56

Alpha Technologies
Larson Electronics
Lester Equipment Manufacturing
Mercantile Manufacturing
RMS CATV
Sawyer Industries

Satellite Dishes and Receivers ... 58,61,62

Anixter-Prizan

Avantek
Comtech Antenna
Comtech Data
Gardiner Communications
Harris
Hughes Microwave Communications Products
Microdyne
Microwave Associates
Scientific-Atlanta
Triple Crown Electronics

Services 61, 62, 67

CableData
Commco Construction
Communications Distribution
Compucon
Comsearch
Copal Industries
LDM
North Supply
Signal Vision
Tele-Wire Supply

Test Equipment 67

ComSonics
Times Fiber Communications
Wavetek Indiana

Video 67,68

BEI
Colorado Video
Compact Video Systems
Computer Video Production
Computer Video Systems
Harris Video Systems
Hitachi Denshi America
Panasonic Video Systems
US JVC

Cable

GID3 Cable

CCS Hatfield Communication Products Division introduced two new sizes of its GID3 cable: $\frac{3}{8}$ -inch and $\frac{7}{8}$ -inch. Both cable sizes are available for immediate delivery. The firm also plans to begin delivery of one-inch GID3 cable by April. The one-inch cable is geared for super trunk applications. The firm recently completed a 30 percent expansion of its manufacturing capability in Phoenix, Arizona, and plans to expand another 25 percent by March. For information, contact CCS Hatfield Communication Products Division, 5707 West Buckeye Road, P.O. Box 14710, Phoenix, Arizona 85063; (602) 272-6855.

Bonded Shield Drop Cable

Cerro Communication Products is marketing Cerroflex™ bonded shield/braid drop cable. The cable has an aluminum tape shielding that won't "tiger strip"—develop radial cracks at bending points. Because the shielding is bonded to the dielectric, the shielding won't push back when connectors are slipped on. Cerroflex™ is moisture resistant and comes in RG 59 and RG 6 sizes. For information, contact Cerro Communication Products, Halls Mill Road, Freehold, New Jersey 07728; (201) 462-8700

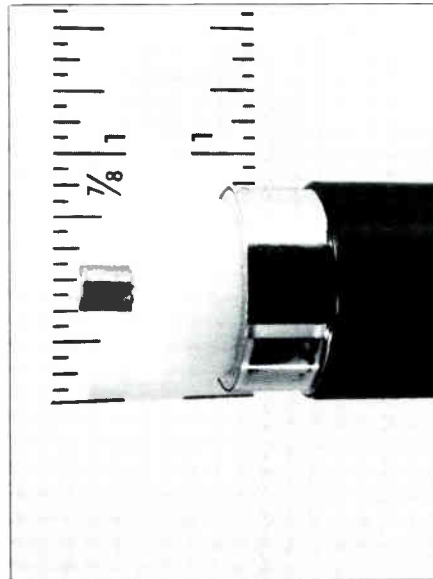


Cerro Communication's Cerroflex™ bonded shield/braid drop cable.

$\frac{7}{8}$ -Inch Trunk Cable

Comm/Scope Company is now offering for the first time $\frac{7}{8}$ -inch trunk coax. This latest addition to the Comm/Scope line of Parameter III (PIII) cables gives CATV engineers attenuation specifications that were previously not

available from the manufacturer. This new dimension assures the same super-low loss characteristics and SRL to 450 MHz available in all PIII cable. For information, contact Comm/Scope Company, Route 1, Box 199-A, Catawba, North Carolina 28609; (704) 241-3142.



Comm/Scope's $\frac{7}{8}$ -inch trunk coaxial cable.

60-Channel Cable

General Cable Company has completed the conversion of its fused disc III coaxial cable production line to manufacture 60-channel capacity cables. These fused disc III series 450 cables offer extended bandwidth from five to 450 MHz. The fused disc III series 450 cables are offered in a full range of aerial, buried and submarine constructions. A choice of copper-clad aluminum or solid copper center conductor is available in all sizes. For information, contact General Cable Company, 500 West Putnam Avenue, Greenwich, Connecticut 06830; (203) 661-0100.

400 MHz Cable

Times Wire and Cable is marketing Lumifoam III™ JT4875 ($\frac{7}{8}$ -inch) and JT4625 ($\frac{3}{4}$ -inch) trunk and feeder cables designed for 400 MHz systems. By adopting these sizes as a replacement for traditional $\frac{3}{4}$ -inch trunk and $\frac{1}{2}$ -inch feeder, a new system designed for 300 MHz can be extended to 400 MHz with no loss of performance and with no changes in amplifier spacing or remapping. The cables feature second generation foam polyethylene dielectric, seamless aluminum tubing, copper-clad center conductor, plain and jacketed construction and optional visual identification for dual- and triple-trunk systems. The cables come jacketed and armored for burial. For information, contact Times Wire and Cable, 358 Hall

Avenue, Wallingford, Connecticut 06492; (203) 265-8500.

Cable Accessories

Crimping Tools

Ben Hughes Communication Products Company, which for years has supplied the cable industry with crimp tools and coring tools, has introduced two new Cable Prep™ crimping tools for use with larger size cable. The DCT-625 crimping tool is designed for $\frac{3}{8}$ -inch cable, and the DCT-875 crimping tool is designed for $\frac{7}{8}$ -inch cable. For information, contact Ben Hughes Communication Products Company, P.O. Box AS, Old Saybrook, Connecticut 06475; (203) 388-3559.

Cable Spinner

Cable Spinning Equipment Company displayed its model CD cable spinner. The unit uses any type or size lashing wire and can handle cable as wide in diameter as 2 $\frac{1}{4}$ inches. The spinner double lashes and single lashes. Spinning action is derived solely from the lashing material playing off the spinner. It does not depend on strand traction. The unit weighs 33 pounds before loading with wire and is furnished with excessory tools. For information, contact Cable Spinning Equipment Company, 3100 South Topeka, Topeka, Kansas 66611; (913) 267-2034.

Cable Markers

Cable TV Supply Company is marketing a line of cable markers and aerial cable supports. The Brady PWC-PK3 cable marker is made of vinyl with a white-coated printable area. The clear overwrap seals the printed area with a permanent laminate. User identification may be applied by a typewriter or, for on-site marking, a ballpoint pen. Lamination resists water, oils, alcohol, fungus, abrasion and temperature extremes from -20° F. to 150° F. The Brady PWC-PK3 is approved by major telephone companies for underground burial.

Cable TV Supply's A.B. Chance's CATV epoxirod standoff is designed to support standard aerial cable away from the pole and to eliminate the need for certain pole rearrangements. A suspension clamp may be bolted to the end of the bracket to clamp the cable messenger. The standoff is available in two rod diameters, 1 $\frac{1}{2}$ -inch and two-inch, with four lengths available for the 1 $\frac{1}{2}$ -inch rod and three lengths for the two-inch rod.

For information, contact Cable TV Supply Company, 5933 Bowcroft Street, Los Angeles, California 90016; (213) 204-4440

Splitters

Electroline Television Equipment, Inc., has introduced a new line of splitters, directional couplers, power inserters and equalizers. The equipment was designed for a range from five to 400 MHz. The features of the new products include: zinc die-cast housing for durability and weather resistance; functional design; tapered counter-bore parts that enable the connector-sealing gasket to set inside the port; stainless steel inserts to prevent thread damage to cable-entry ports; a centered, strand-clamp base for stability; and a corrosion-resistant chromate and thermo-setting acrylic finish. Both the

power-passing splitters and power-passing directional couplers are available in either two-way or three-way design. For information, contact Electroline Television Equipment, Inc., 8750 8th Avenue, Ville St.-Michel, Montreal, Quebec H1Z 2W4; (514) 725-2471.

Metal Cable Closure

Intercept Corporation displayed its PED 6000 metal cable closure. The unit is a 5 1/2-inch wide, 5 1/2-inch deep and 20-inch high metal cable closure that is used for mounting of traps, splitters and related equipment for underground construction. The closure is fabricated from heavy

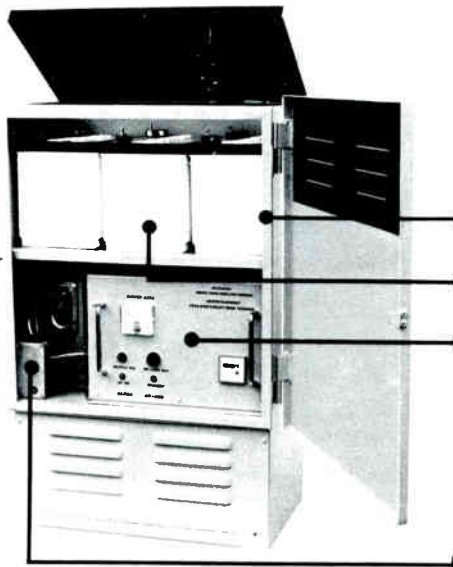
gauge hot-dipped galvanized steel to protect against rust. For information, contact Intercept Corporation, 215 Entin Road, Clifton, New Jersey 07014; (201) 471-2212.



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See our card on page 17.

Tool System

Jackson Communication Corporation presented its line of cable system construction tools. Included in the line are cable reel trailers, reel brakes, swivel-strand brakes, stand-chute brackets, 45° corner blocks, multiple-cable blocks, multiple-cable pullers, 90° corner blocks, pole bracket and chute adapters, crossover braces, positioners and its Uni-Bend® tool for producing uniform expansion bends. For information, contact Jackson Communication Corporation, P.O. Box 6, Jackson Lane, Clayton, Ohio 45315; (513) 836-2641.

Ultra Series Connectors

Heading the list of products from **LRC Electronics, Inc.** is the Ultra Series of connectors for .625 and .875 cable. The



LRC Electronics is marketing its Ultra Series connectors.

alpha

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connectors are designed for 400 MHz systems and feature a two-piece design that eliminates an additional step in installation, according to the company. Utilizing the shorter, slimmer connector also results in an additional saving since smaller size heat shrink can be used. LRC Electronics has tested the prototypes of the Ultra Series connectors for more than two years under monitored radiation field testing. The data collected shows that even after that period of time, isolations of 130 to 140 dB are typical. The company also cites a return loss of at least 30 dB at 400 MHz when properly prepared. For information, contact LRC Electronics, Inc., 901 South Avenue, Horseheads, New York 14845; (607) 739-3844.

Pedestal Enclosures

S.A.L. Communications, Inc., offers a complete line of all products needed to build and maintain a cable television system. Among the products carried at both the New York and Atlanta locations are: metal pedestal enclosures in varied sizes (6½ inches square, 8½ inches, 10½ inches, and 16 inches); an upgraded line of 400 MHz passive devices manufactured by TUSA; and wireless programmable remote converters with built-in auto-time settings and favored-channel memory and recall. S.A.L. Communications also carries a complete line of Sadelco 400 MHz test equipment. The FS 3D-VS signal level meter gives a reading with ±1 dB accuracy and the 733C has an accuracy reading of ±1.5 dB. For information, contact S.A.L. Communications, Inc., 5 Hub Drive, Melville, New York 11747; (516) 694-7110.

Construction Machinery

Digging Machine

The Charles Machine Works, Inc., is marketing the **Ditch Witch 6510**. The 65-HP-class model 6510 is built to perform 24-hours a day under full load. Its tubular frame is designed to give double-duty as a hydraulic reservoir with three times more capacity than any 65-HP-class machine in Ditch Witch history. The unit is equipped with the Ditch Witch Modularmatic design for underground jobs, including trenching, backhoe and backfill operations. The unit has a maximum forward transit speed of 9.2 mph and a maximum transit reverse speed of two mph. Maximum backfill speed is 3.8 mph. The machine is powered by a Wisconsin V465D gasoline engine. For information, contact The Charles Machine Works, Inc., P.O. Box 66, Perry, Oklahoma 73077; (800) 654-6481.

Fiberglass Boom Lift

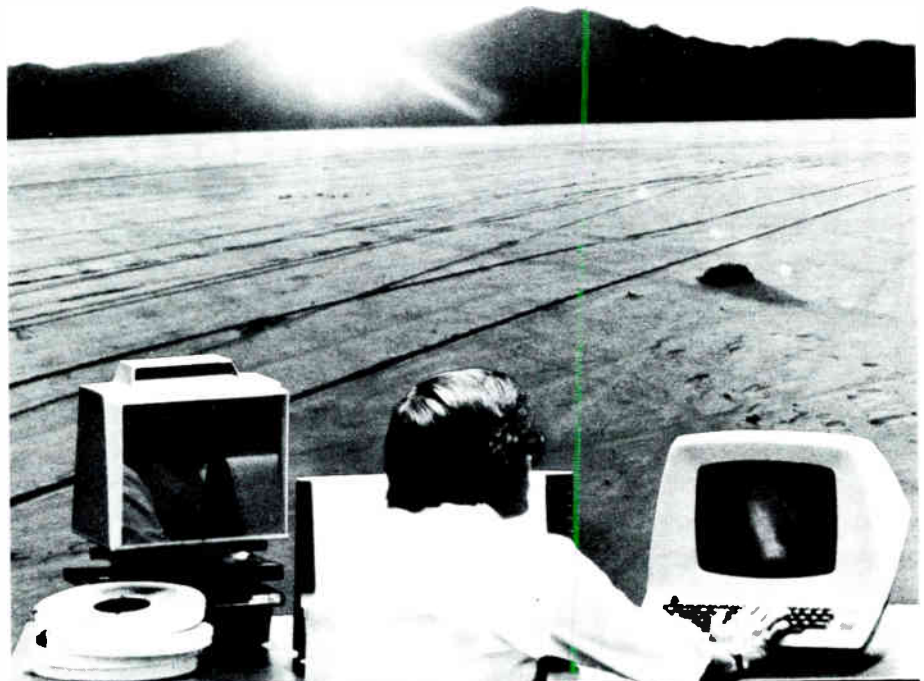
Durnell Engineering, Inc. displayed its DFFL-36 Dur-a-Lift personnel lift. The DFFL-36 has a fiberglass insert boom, making it safe for operation near electrical wiring. The lift has a 36-foot working height and a 31-foot platform height when mounted on a 40-inch bed. The side reach is 19 feet from center when mounted on a 15.5-foot platform. Basket capacity is 300 pounds. The lift operates on electro-hydraulic power and is equipped with two six volt, 210 amp batteries. The batteries are hooked up to the vehicle's electrical system and are recharged whenever the vehicle is in

operation. The lift needs to be mounted on a 10,000 gvw dual tire cab. For information, contact Durnell Engineering, Inc., Broadway (Highway 4) South, Emmetsburg, Iowa 50536; (712) 852-2611.

Vibratory Compactor

One of the three vibratory plate compactors from **J I Case**, the AVS 1300 diesel, is an economical performer. Powered by a 3.54 kW (4.75 hp) diesel or 5.97 kW (8 hp) gasoline engine, the 275-pound versatile compactor features an automatic decompression engine, sealed belt drive which protects parts from abrasive dust and dirt, and oil-splash

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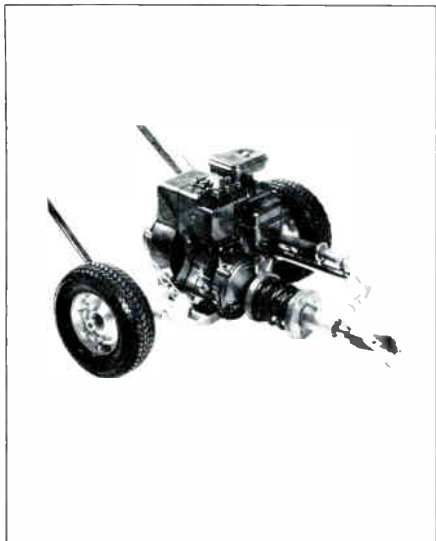
lubrication. A swingover handle increases maneuverability in congested areas and allows the AVS 1300 to perform a variety of patching and coverage jobs. Working at speeds up to 30.48 m/min (100 fpm), the AVS 1300 diesel offers a rounded edge cast-iron plate for smooth finishing. Its low center of gravity provides stability for easy handling. The AVS 1300 will climb slopes up to 20 degrees (35 percent grade) and will compact to a depth of 14 inches. The AVS 1300 is also available with a rugged, four-cycle, air-cooled gasoline engine featuring recoil start and a centrifugal clutch. A transport cart for both models is also available. For information, contact: JI Case, Light Equipment Division, P.O. Box 9228, Wichita, Kansas 67277.



JI Case's AVS 1300 diesel vibratory plate compactor.

Boring Machine

The Lamb Corporation displayed its UnderWunder™ portable boring machine. Powered by a three H.P. Briggs & Stratton



The Lamb Corporation's hole boring machine.

engine and weighing 75 pounds, the unit bores to six-inch diameter holes in dirt and to 2.6-inch diameter holes in rock. It bores distances in excess of 60 feet and utilizes city water pressure in cutting. One man can operate the unit. For information, contact The Lamb Corporation, P.O. Box 950, Addison, Texas 75001; (214) 233-3833.

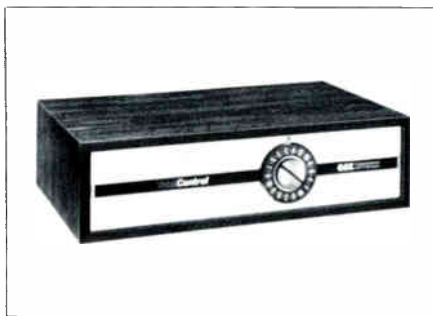
Aerial Bucket Lifts

Sky Dart presented its line of Sky Dart Line Lifts. The lifts have a basket capacity of 300 pounds, feature 360° noncontinuous rotation, a working height ranging from 30- to 36 feet and a maximum side reach ranging from 14- to 18 feet. The firm offers six models: the telescoping model, SDTP-30 and SDTP-33; the telescoping van model, SDTV-30 and SDTV-33; and the articulating model, S-32 and S-36. For information, contact Sky Dart, Loop 132 and Highway 79, Olney, Texas 76374; (817) 564-5535.

Converters

Addressable 400 MHz

Oak Communications CATV Division expanded its TotalControl product line to include 400 MHz units. TotalControl Dimension 2 is a fully interactive system capable of delivering up to 16 tiers of premium programming. The Dimension 2 converter/decoder is designed to interface with security, fire and medical



Oak's TC-35 converter/decoder.

alert systems and can be expanded to include videotext and home energy management. Oak's 400 MHz converter/decoder is available with two scrambling methods. The TC-56-A uses conventional sine-wave sync suppression, while the TC-56-B incorporates a modified encrypted, digitized scrambling technique to maximize signal security.

Oak also demonstrated its KDM-400 frequency-synthesized 400 MHz converter/decoder. It uses microprocessor-controlled frequency synthesis and a crystal-referenced local oscillator for frequency stability. The firm also revealed an infrared remote that interfaces with the KDM-400. The infrared remote uses a transmission medium that eliminates

interference that is associated with standard ultrasonic controls.

For information, contact Oak Communications, Inc., CATV Division, Crystal Lake, Illinois 60014; (815) 459-5000.

Mid-Band Converter

Satellite Cablevision Equipment, Inc., announced that it has in stock mid-band converters, one, two, three and seven channel models. The three-channel mid-band converter has the following performance specifications: input channels: G, H and I, 156 to 174 MHz (157.25, 163.25 and 169.25 video carriers); output channels: channel 2 (G Input) 55.25 MHz, channel 3 (H Input) 61.25 MHz, channel 4 (I Input) 67.25 MHz. Gain is 1 dB minimum, 6 dB maximum. Noise figure is 12 dB maximum. Cross-modulation is -60 dB at worst, with input signal level of +15 dBmV on all specified picture carriers. Intermodulation is -60 dB minimum for all spurious signals 156-174 MHz. For information, contact Satellite Cablevision Equipment, Inc., 9144 South Bishop, Chicago, Illinois 60620; (312) 779-2391.

Seven-Channel Converter

TOCOM announced its seven-channel block converter. The converter uses the dual-conversion principle so it does not require inverted headend equipment. It operates on standard FCC-assigned frequencies and provides clear conversion of mid-band channels A through G to VHF channels seven through 13. The unit can be bypassed for standard channel operation and easily fine tuned. Gain ranges from one to five dB, and the noise figure is 13 dB maximum. Input-return loss is 20 dB or better five to 300 MHz with selector switch in bypass position; nine dB or better 120 to 164 MHz with selector switch in premium position. Output-return loss is 13 dB or better, 174 to 216 Mhz. For information, contact TOCOM, P.O. Box 47066, Dallas, Texas 75247; (214) 438-7691.

Headend

Modulator

Phasecom Corporation has introduced its model 2106 modulator, which combines the surface acoustic wave (SAW) filter with other circuit components and design techniques to generate a high-quality vestigial sideband signal. The modulator offers an integral package design and includes these features: a sync-tip output AGC for long-term constant outputs; a hybrid-chip broadband amplifier; an internal bandpass filter; full 60 dBmV output over the entire frequency range; and external IF links for insertion of a scrambling device or other IF switching.

COMTECH



Comtech's 5 meter Earth Station Antenna

**High Performance,
Low Cost, and
Guaranteed Accuracy**

Comtech Antenna offers more than 17 years experience on space applications and advanced prototypes in the communication's field. Through good engineering design, we maximize the performance of our system while reducing the cost to you. So before you buy, take a close look at Comtech Antenna.

- Provides high quality video/audio signals to CATV operators.
- Surface tolerance of .060" RMS is maintained by one-piece fiberglass backing hat.
- Newly-developed splice plate enables the dish to be separated into 3 sections for easy transportation and field assembly.
- Maximum efficiency feed horn provides a 44.3 db gain.
- Frequency coverage of 3.7-4.2 GHz is provided with a single or dual linear polarization feed.
- Tripod structure mount provides azimuth coverage of 0° to 360° and an elevation of 0° to 60°.
- Non-corrosive reflector can withstand 125 MPH winds.

For further information, call Comtech's Small Aperture Consultant at (305) 892-6111 or send in this coupon for our 5M Data Sheet with all the specifications on Comtech's high performance Earth Station Antenna.

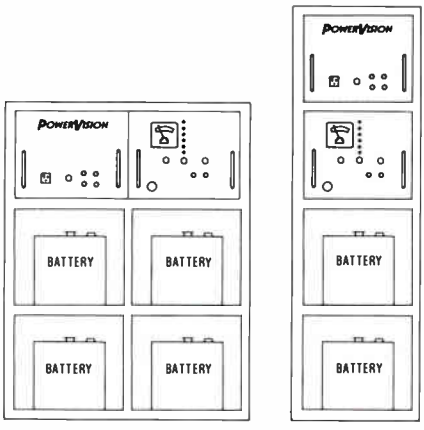
Comtech Antenna Corporation			
3100 Communications Road			
P.O. Box 428			
St. Cloud, Florida 32769			
Name _____			
Company _____			
Address _____			
City _____		State _____	Zip _____
Phone _____			

Comtech Antenna Corporation
3100 Communications Road
P.O. Box 428
St. Cloud, Flo

Forget About Powervision... Once You've Got It!

Technical advantages are what make POWERVISION® first choice among CATV engineers and maintenance managers. In the cable system, POWERVISION can be counted upon for reliable standby operation for fully automatic, fast switchover — whatever the emergency. Don't sweat it, do routine service... and forget it!

Available for a wide range of pedestal and pole installations, POWERVISION standby power supplies feature modular design for convenient service, battery units on sliding trays for ease of service and inspection, temperature compensated battery charger with automatic time out, optional volt/amp meters, screened louvres for efficient ventilation, surge protection (standard MOV at no extra cost), status monitoring and up to five hours of standby operation time.



With over 3300 units in operation in the field, POWERVISION demand is still increasing and production is keeping pace for immediate delivery to CATV Operators with expansion needs and new systems to equip.

But, don't forget to call today for additional technical and pricing information on POWERVISION.

POWERVISION®...for reliable CATV standby power.

LESTER EQUIPMENT MFG. CO., INC. 2840 E. Coronado, Anaheim, CA 92806, Telephone (714) 630-2260

According to the company, it also has -60 dB at rated output and -65 dB at +65 dBmV output. For information, contact Phasecom Corporation, 6365 Arizona Circle, Los Angeles, California 90045; (213) 641-3501.



The model 2106 modulator from Phasecom.

Switching System

Tomco Communications, Inc., is marketing its series 540 universal switching system. The product allows for convenient switching of video, audio, RF, and IF signals. The 540 PS universal power supply panel is wired to accommodate up to eight switch modules of any configuration desired. All control is done at the power supply rear panel with a contact closure to ground. Each switch has a status light indicating the signal direction through the switch for ease of identifying the switch position. All modules are identical in size and are connected to the 540 PS wire harness in an identical manner. For information, contact Tomco Communications, Inc., 1145 Tasman Drive, Sunnyvale, California 94086; (408) 734-8401.

Line Equipment

400 MHz Directional Tap

AM Cable TV Industries, Inc., introduced its model SDT-400 400MHz directional tap. The tap is available in two-way, four-way and eight-way versions. The tap is made out of corrosion-resistant aluminum and is sealed first with a molecular adhesion coating and then with hot-dip wax. As an example of the unit's low insertion loss, a 17 dB four-way unit has an insertion loss of less than 1 dB. The unit is compatible with all amplifier applications in the industry and is shipped

fully assembled. A stainless steel RFI gasket is standard in the tap. The firm plans to publish a booklet defining the total electro-mechanical capabilities of the tap. For information, contact AM Cable TV Industries, Inc., Box 505 Quaker Town, Pennsylvania 18951; (800) 523-6742. (215) 536-1354.

Directional Tap

Arvin CATV displayed its series 3600B directional tap. The product comes with a die-cast aluminum case with integral F connectors and a permanent weather seal to provide protection against the elements. The series eliminates the need for intermediate connectors from module to housing and features a center seizure mechanism which cannot shear center conductor. Other features include: optional polyurethane coating, full five to 300 MHz two-way response, low insertion loss and modularity for easy maintenance. For information, contact Arvin CATV, 4490 Old Columbus Road, N.W., Carroll, Ohio 43112; (614) 756-9211.

Modification Kits

Broadband Engineering, Inc., has made available Push-Pull kits for the Jerrold SA-1 series of distribution equipment. The kits feature circuits using gold metallization and emitter ballasting. The Mod-Kits are aimed at providing economic upgrading of single-ended Starline One equipment, especially operation of 21 channels and 30 channels. The kits are prewired and tested, and the power supply comes as a complete assembly. A 60-volt option is available. Other Mod-Kits available for distribution systems include those for the Jerrold Starline 20 series, the Kaiser/Theta-Com Phoenician series, and the older single-ended C-Cor series. For information, contact Broadband Engineering, Inc., P.O. Box 1247, Jupiter, Florida 33458; (305) 747-5000.

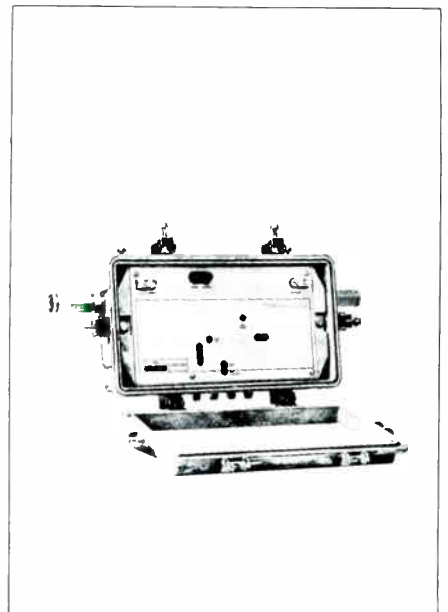
Mainline Passives

C-COR Electronics' main line passives are enclosed in a new die-cast aluminum housing of corrosion-resistant alloy #360. The housings are designed for messenger mounting with provision for connectors on each end. A fifth port can be used when needed. The housing is long enough to allow splicing of the device on existing cable without cable extension devices. Up to one inch diameter cable can be accommodated. The stainless steel cover bolts are captive and a pivot bolt allows the cover to swing open but to hold the cover captive. There are extended bosses for each coaxial input with a retention lip for the use of heat-shrink tubing. All units are provided with an aluminum messenger clamp with its stainless steel bolt. For information,

contact C-COR Electronics, Inc., 60 Decibel Road, State College, Pennsylvania 16801; (814) 238-2461.

Line Amplifier

Century III Electronics, Inc., offers its 2130B line amplifier designed for CATV feeder-line application and used in systems operating at bandwidths up to 300 MHz. With the addition of a reverse module, the line amplifier will provide five to 30 MHz reverse transmission. Other features of the 2130B include: hybrid integrated circuit design with a multi-stage circuit for RF amplification; optional reverse modules for active- and passive-reverse functions; a built-in duplex filter; plug-in equalizers; plug-in gas tubes to protect RF circuits from lightning or power surges; switchable powering; and a switchable power selector. For information, contact Century III Electronics, Inc., 3880 E. Eagle Drive, Anaheim, California 92807; (714) 630-3714.



The Century III 2130B line amplifier.

Cascade 300 Celecom

Delta-Benco-Cascade is marketing its Cascade 300 Celecom amplifier. The Celecom utilizes a modular construction with VHF amplifier modules interchangeable with those in the Cascade 300 series. Celecom can be used as a trunk or distribution amplifier with temperature-level control or as a line amplifier using a bridger module. Five-hundred data channels and two video channels (five-30 MHz) are available with the appropriate choice of modules for two-way operation. The mother board is good up to 250 MHz. It is equipped with a low-power consumption-switching regulator, 30/60 V AC-fullwave. For information, contact Delta-Benco-Cascade, 124 Belfield Road, Rexdale, Ontario M9W 1G1; (416) 241-2651.

PROFIT TRAPS:



PICO Variety and Quality Means More Profit for You!

A PICO-trapped system is the most cost effective system yet engineered for CATV.

We make the biggest assortment of notch filter traps available today in the CATV industry. With PICO traps and filters you can design a virtually unlimited programming mix that will generate the greatest possible revenues from your subscribers. That means added profits.

PICO's advanced engineering and high manufacturing standards mean more profits through less replacements. Our filters are so rugged, so dependable, that we back them with a full two-year warranty. Over 1,000,000 PICO filters are at work in the field today.

Looking for fast, efficient service? We've doubled our facility size and workforce to meet your needs. Orders for our standard filters, listed below, are filled in four weeks or less. What's more, Anixter Pruzan can now ship PICO filters for all channels on a daily basis.

So check our filter variety. Find what's best for your needs, then get in touch. Put PICO to work making profits for you!

PICO has single channel traps, single channel super traps, mid band reject filters, GHI reject filters, channel D thru I reject filters, ABC reject filters, low band reject filters, high band reject filters, super band reject filters and both indoor and outdoor positive filters compatible with all interfering carrier systems and more!

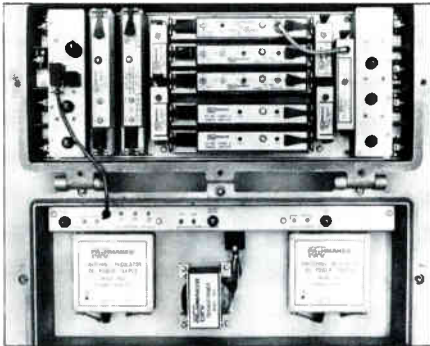
Call (315) 451-0680



1001 Vine St.
Liverpool, N.Y. 13088

Amplifier Station

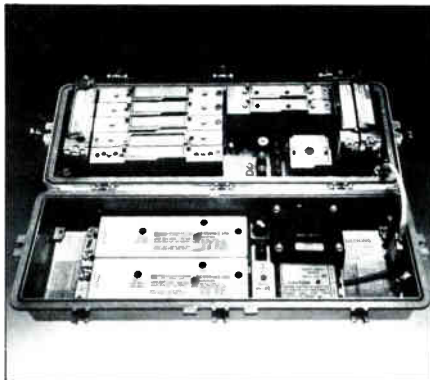
The Sylvania CATV Division of **GTE Products Corporation** announced the addition of a new series 5000 multi-service amplifier station to its product line. The series 5000 station, with bandwidth up to 400 MHz, was designed for application in major metropolitan franchise areas. The amplifier station incorporates plug-in modules and can be configured to handle full-forward transmission redundancy, automatic level and slope control, status monitoring, mid-band split and other dual cable applications, and addressable feeder disconnect sub-VHF distribution ports. The multi-service amplifier station will accommodate up to seven active modules plus eight additional modules for powering, signal routing and splitting. For information, contact CATV Division, GTE Products Corporation, 10841 Pellicano Drive, El Paso, Texas 79935; (915) 591-3555.



Sylvania CATV's series 5000 multi-service amplifier station.

Distribution Amplifier

The **Jerrold Division** of General Instrument Corporation introduced the Starline 400™, a distribution amplifier designed for state-of-the-art institutional and commercial service and full 52-channel consumer operation. Starline 400 can be fitted with two amplifier modules. If one fails, the other continues to provide uninterrupted service. The unit can also be equipped with two power modules to provide back-up protection if



The Jerrold Starline 400™ distribution amplifier.

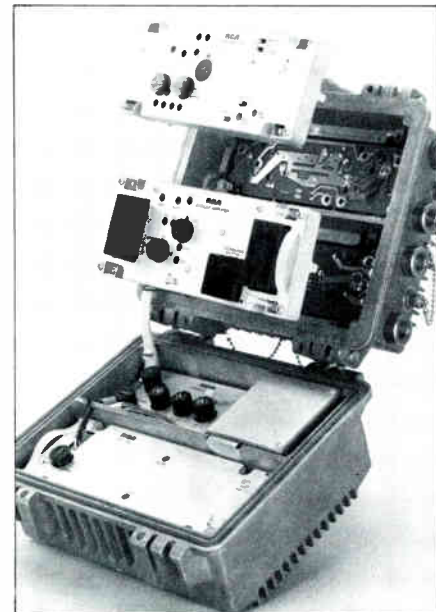
one power module fails. The Starline 400 can operate in both one-way and two-way systems. In addition, the unit can be equipped with status monitoring to alert the headend whether its operating level is high or low, whether an amplifier or power module has failed and other status information. For information, contact Jerrold Division, 2200 Byberry Road, Hatboro, Pennsylvania 19040; (215) 674-4800.

440 MHz Equipment

Beginning this month, **Magnavox CATV Systems, Inc.**, is offering the cable operator the opportunity either to proceed with a 440 MHz system or to purchase 300 MHz or 330 MHz equipment that can be upgraded at a later time. All of the amplifiers feature the same housing and have complete flexibility so that all 5-MC-2 chassis that are shipped in 1981 will accept the plug-in modules for System Sentry 2 (status monitoring) and feeder/disconnect. In other words, an operator can have the status monitoring immediately when he places his order or upgrade to it in the future. Also, beginning in the late first quarter of 1981, all Magnavox taps will be 440 MHz. The delivery dates for the amplifiers are 30 days for the 330 MHz; 30-45 days for the 300 MHz; and 90 days for the 440 MHz. For information, contact Magnavox CATV Systems, Inc., 100 Fairgrounds Drive, Manlius, New York 13104; (800) 448-5171, (315) 682-9105.

400 MHz Amplifier

A new line of amplifiers developed for 54-channel capability was introduced by



RCA's 400 MHz model 452 amplifier.

RCA Cablevision Systems. The RCA model 452 amplifiers accommodate an expanded bandwidth of from 50 to 400 MHz to meet the cable industry's demand

for expansion beyond the 36-channel capacity of existing CATV amplifiers. Electrical and mechanical design features incorporated in the new amplifier line include tested two-way modules, gold-plated RF connectors, and plug-in hybrids. RCA amplifiers are also protected for optimum performance in adverse weather conditions.

The connector interface will accept the largest one-inch cable center conductor, the shrink-boot collar has been expanded for improved surface contact, and the plug-in surge arrestors are mounted directly to the housing connectors. The RCA model 452 amplifier group includes a trunk, trunk bridger, terminating trunk bridger and intermediate/terminating bridger. RCA has also developed a model 450 line extender and a 400 MHz series of passive components to interface with the new amplifiers. For information, contact RCA Cablevision Systems, 8500 Balboa Boulevard, Van Nuys, California 91409; (213) 894-8111.

Trunk Amplifier

Theta-Com offers a new series of completely modular trunk amplifiers called its "T" series. The amplifier can be purchased in 300 MHz (T300), 330 MHz (T330) or 400 MHz (T400) versions. It can be configured for one-way 300 MHz operation and upgraded to 400 MHz or two-way by changing plug-ins. Features included in the 400 MHz series are: optional switching regulator; status monitoring (optional); transient and sheath current protection at all levels; high level bridger output and mid-split amplifiers. A mid-split system can be built with the standard T series modules. Theta-Com has included as standard the protection circuits that were previously available at extra cost. This offers surge protectors and guardian compensator to protect against excessive sheath currents. Since Theta-Com has made the series completely modular, a 300 MHz system can be built initially with 400 MHz spacing and converted later to 400 MHz by replacing the plug-ins.

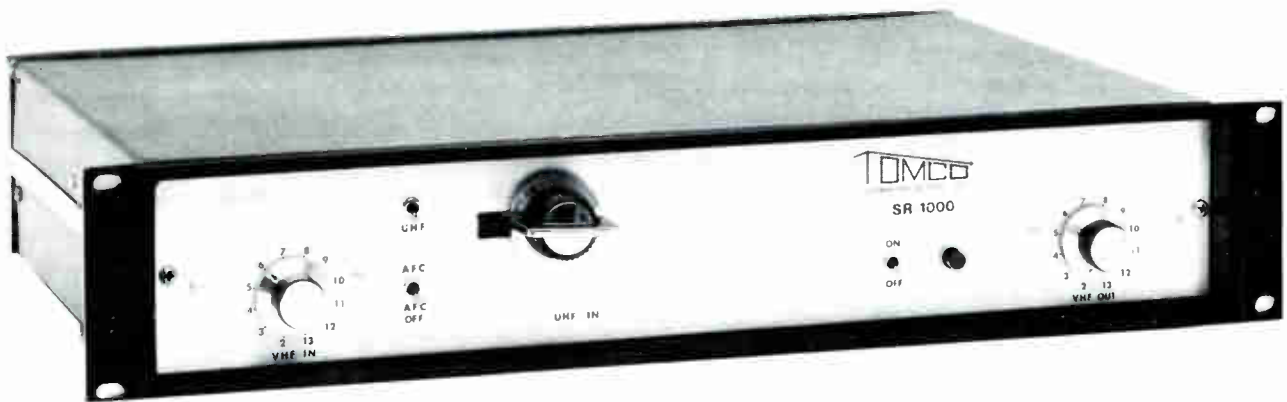
For information, contact Theta-Com, 2960 Grand, Phoenix, Arizona 85017; (602) 252-5021.

Hybrid Amplifier

TRW RF Semiconductors, which plans to invest about \$2 million more next year in cable television, is marketing its new 400 MHz, 52-channel hybrid amplifier for CATV and MATV applications. The devices—included in its CA-4000 series—incorporate technical advances that provide superior performance over standard 300 MHz, 35-channel components. The most apparent is the 50 percent increase in available channels and a sharp noise reduction, 2.5 dB at 400 MHz. The CA-4000 series of amplifiers

THE ONLY STANDBY PROCESSOR YOU CAN BUY!

... With the **TOMCO SR-1000 Standby Processor**, any VHF and/or UHF channel can be processed and converted to any VHF channel, by just the turn of a knob!



There is a \$350.00 discount available through January 31.

Features:

- UHF to IF with internal AFC
- VHF to IF tuneable Crystal Controlled
- Demod Video and Sound output
- IF to VHF output tuneable Crystal Controlled

Available in the Northeast from
Northern CATV Distributors: 800-448-5174

Available in Canada:

COMM-PLEX
ELECTRONICS LIMITED
(514) 341-7440

TOMCO COMMUNICATIONS INC.

1145 Tasman Drive • Sunnyvale, California 94086 • 408/734-8401

are already in use and TRW plans to expand capacity in 1981 to meet demand. For information, contact TRW RF Semiconductors, 14520 Aviation Boulevard, Lawndale, California 90260; (213) 679-4561.

MDS Devices

Bogner® Multitenna

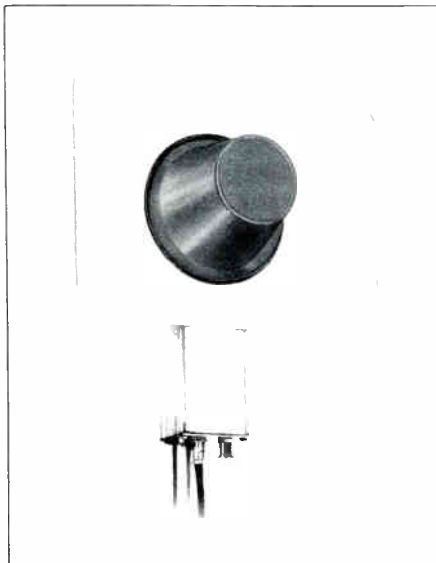
Bogner® Multitenna Corporation of America announced that it is now marketing a 16 dBi model of its MDS receiving antenna at \$14 each in lots of 1,000 and a 21 dBi gain model at \$28 each in lots of 1,000. The firm also announced that its MDS receiving antennas now come with attached jumper cable and are shipped fully assembled from stock. For information, contact Bogner® Multitenna Corporation of America, P.O. Box 67, Valley Stream, New York 11582; (516) 997-7800.



The model R21J MDS antenna from Bogner®.

Conifer

Among the products presented by



Conifer's Microceptor™ mounted in vertical mode.

Conifer Corporation was the Microceptor™, an antenna/converter combo. The unit features an anodized reflector antenna with a factory-preassembled crystal-controlled downconverter. The unit is available with a standard downconverter (MDPA) or with special high-gain, low-noise converter (MDPA-LN) and with a choice of vertical or horizontal polarization. For information, contact Conifer Corporation, P.O. Box 832, Burlington, Iowa 52601; (319) 752-3607.

TEST

Tanner Electronic Systems Technology, Inc., (TEST), has developed a lightweight MDS antenna made of corrosion-resistant steel. It is designed to be strong, erect and easy-to-assemble. The antenna has low wind loading and the dipole is pressure tested to keep water out. The TEST MDS antenna is available in three sizes: medium gain (15 inches by 21 inches, weighing three pounds), high gain (15 inches by 34 inches, weighing four pounds), and extra-high gain (23 inches by 35 inches, weighing seven pounds). Also available from TEST is a complete line of MDS receiving equipment for both residential and MATV systems, including antenna/downconverter combinations, crystal-controlled units, and low-noise units. For information, contact Tanner Electronic Systems Technology, Inc., 16130 Stagg Street, Van Nuys, California 91409; (213) 989-4535.

Pay TV Components

Audio/Video Descrambler

Eagle Comtronics, Inc., exhibited its audio and video descrambler for pay television at the Western Show in Anaheim. The device, called the Eagle 2-DF, can be coupled with the 1001-SG encoder to enhance the viability of the system in a cost-effective manner, according to the company. Eagle's outside-and-inside-the-home security shields are not accessible to the subscriber. Completely potted to prevent moisture absorption, the 2-DF is temperature-compensated -30° to +140°. Other specifications for the descrambler include: ability to withstand 200 VAC from center conductor to sheath; impedance of 75 ohms; brass housing with nickel plating, and a decoding level of -50 dB at temperature extremes. For information, contact Eagle Comtronics, Inc., P.O. Box 93, Phoenix, New York 13135; (315) 638-2586.

Pay TV Decoder

Hamlin® USA, Inc., displayed its 3000-P converter/decoder. The unit handles up to 35 pay channels and

comes in both remote control and single-piece models. It features a multi-level, field-programmable slide switch. Each converter is custom-programmable for the pay level ordered by the subscriber. Switching is automatic. Pay customers view program by slide-switch selection of channel. Descrambler is switched on automatically, and non-pay subscribers see and hear nothing. Pay models and non-pay models are identical in appearance. For information, contact Hamlin® USA, Inc., 35 Corporate Woods #209, 9101 West 110 Street, Overland Park, Kansas 66210; (913) 381-7469.



Hamlin® USA displayed its 3000-P converter/decoder.

Super Notch Filter

Pico, Inc., introduced its super notch filter, compatible with systems up to 400 MHz. The filter is designed for long term stability and durability. It has a machined thick-wall brass housing and is plated with anti-corrosive nickel. It is potted to halt moisture absorption and to stabilize circuitry. The units are drop-tested 20 feet to hardtop. Electrical features include: choice of channels three, four, six and the midband; pay channel video rejection is minimum -55 dB but averages better than -75 dB; insertion loss is less than one dB from 50 to 400 MHz; return loss is 20 dB nominal, 16 dB minimum from 50 to 400 MHz. For information, contact Pico, Inc., 1001 Vine Street, Liverpool, New York 13088; (315) 451-0680.

Pioneer Interactive System

Pioneer is offering its two-way interactive VIP System to the entire cable industry. The data communication and home terminal equipment was designed for the Warner Amex QUBE system in Columbus, Ohio, but now the equipment is available on a non-proprietary basis to the entire industry. The VIP System

includes the BT-1300 interactive terminal, home security alarm terminal and several other devices such as an alpha numeric keyboard that is currently under development. The BT-1300 terminal features: eight-digit data transmission, ASCII format; message lamp; parental-control keys; forced tuning; signal-level monitoring; SAW filter; phase lock-loop tuning; microprocessor-controlled descrambler; and high speed data communications at a rate of 256 K bits per second. For information, contact Pioneer, 3518 Riverside Drive, Columbus, Ohio, 43221; (614) 451-7964.

Jumper Cable/Filter

Vitek Electronics, Inc., is marketing the Vitek Jumper Trap, a combination jumper cable and video-notch filter. The cable is installed between the set-top converter and the subscriber's TV set, replacing the attenuator pad. The Jumper Trap has the same physical appearance and characteristics as regular RG-59 cable but it utilizes the patented Vitek Cable Trap technique. It reduces only the interfering signal level, with no effect on the signal-to-noise ratio of the desired channel. The Vitek Jumper Trap, with male/male connectors, is easy to install and totally replaces the jumper cable and attenuator pad. For information, contact Vitek Electronics, Inc., 4 Gladys Court, Edison, New Jersey 08817; (201) 287-3200.

Power Supplies

Non-Duplication Switcher

Alpha Technologies Ltd. introduced the RTC-8001 non-duplication switcher. The switcher features seven-day advance programming, a memory capacity standard of 600 individual switches, a battery backup that can power the unit for at least four hours, and IF, RF or video crosspoint switching. The unit is microprocessor controlled. Its operational temperature is -25°C to +45°C and its power requirements are 50 VA at 110V AC. Options are also available. For information, contact Alpha Technologies Ltd., 5657 Dorset Street, Burnaby, British Columbia V5J 1L7; (604) 430-1476.

Larson Electronics

Larson Electronics supplies standby power needs with a variety of equipment. The LNA isolated power supply provides 12 to 24 volts of DC power and completely isolates the LNA from any AC power surges. Also available from Larson is the LE60-9PS complete power station which includes both AC and standby power, up to 15 amps. For information, contact Larson Electronics, 311 South Locust, Denton, Texas 76201; (817) 387-0002.

Lester Equipment

Lester Equipment Manufacturing Company, Inc., is marketing the PS 750B power supply. The unit supplies 60V or 30V to amplifiers of the cable television distribution system. It will operate from a conventional 95-130 V AC source, providing a current capacity of 14 amperes. The unit is modular in design. Input protection is provided by a 15 ampere circuit breaker. Reset and/or on/off operation is by flip-type actuation. Output protection is provided through internal transformer-current limiting. Output voltage is restored to normal when the load returns to normal. Built-in transient protection is provided by a fast-acting MOV, and a built-in R-F filter box provides additional rejection of unwanted R-F signals present in the AC power path. The auxiliary outlet is rated at five amperes. For information, contact Lester Equipment Manufacturing Company, Inc., 1044 Pioneer Way, El Cajon, California 92020; (714) 588-1272.



Lester Equipment Manufacturing Company, Inc., is marketing the PS 750B power supply.

Field Power Source

Mercantile Manufacturing Company, Inc., provides a line of power generators that allows the operation of power tools, test equipment and heavy equipment in the field. The AUTO-GEN generator is belt-driven by the engine of a car or truck and produces 115 volts AC power, 60 Hz. The generator is available in five models that supply from 2,000-6,000 watts of electrical power. The AUTO-GEN is packaged complete with the necessary mounting hardware and all orders are shipped from stock. For information, contact Mercantile Manufacturing

Company, Inc., P.O. Box 895, Minden, Louisiana 71055; (318) 377-0844.

RMS CATV Division

RMS CATV Division introduced the Power-King™ Econo-Series model PS-E30 regulated power supply. The unit converts 115 volt-60 Hz commercial power to a 30 volt square-wave output voltage. The constant-voltage, square-wave power source is designed for CATV systems where trunk and feeder distribution lines must carry both RF and AC power. The model PS-E30 ferro-resonant regulated power supply offers primary input-circuit surge and transient protection, output-circuit surge and transient protection and includes an on/off primary overload circuit breaker, input and output pilot light indicators, 115 V AC convenience outlet and pole-mounting brackets. For information, contact RMS Electronics, 50 Antin Place, Bronx, New York 10462; (212) 892-1000.

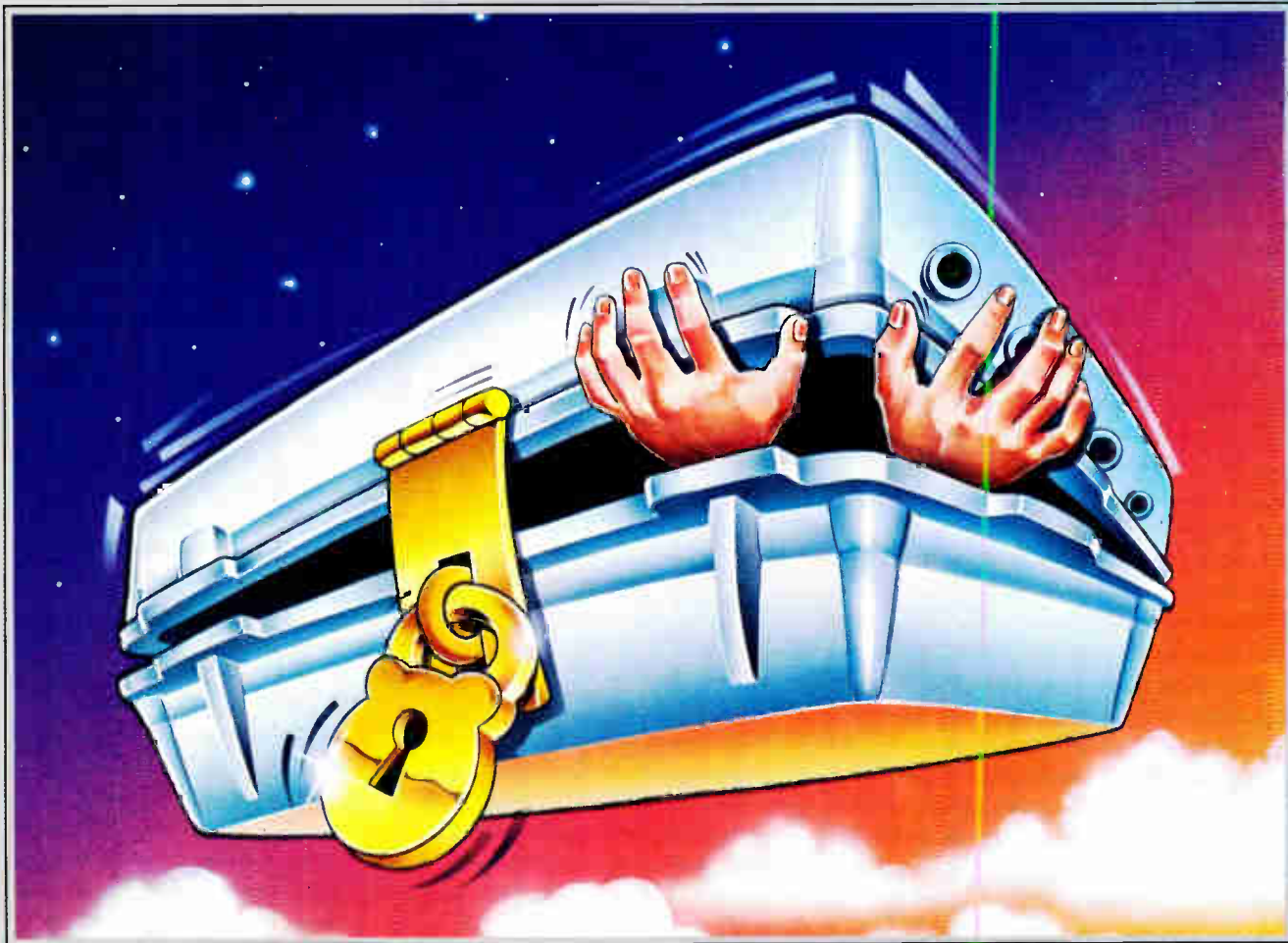


The Power-King™ Econo-Series regulated power supply from RMS CATV Division.

Sawyer Industries

Sawyer Industries, Inc., provides a line of standby power supplies that are built to withstand a wide range of environmental conditions. The heavy-duty units combine compactness with a modular design that allows for easy maintenance and accessibility. They also offer power up to 900 VA in pole mount and pedestal configurations. Additional features include: a clam shell door design for complete access; local/remote status monitor; output current/voltage meters; battery heaters; surge protection; and a safety line cord. For information, contact Sawyer Industries, Inc., 5649 Peck Road, Arcadia, California 91006; (213) 422-5981.

A 400 MHz system that won't lock you in.



With the new Sylvania Series 5000 station, you'll never get locked into a situation you can't get out of. Because customizing it to your own needs—even as they change—is as simple as replacing any of up to seven active plug-in modules.

And with interchangeable base plates, you can work out the best balance of price and performance for a wide variety of transmission needs.

For example, you can outfit the new Series 5000 station with a 400 MHz forward amplifier module and input/output module to provide trunk only amplification. Or you can have a full station with expanded services such as dual power supply, forward redundancy, station bypass, status monitoring and bridge switching. And for institutional networks, it can accommodate dual trunk as well as mid-

band or high-band split.

This modularity also lets you upgrade your existing trunk and line extender amplifiers to accept the 400 MHz and expanded services similar to the Series 5000 station.

To keep up with the industry's growth and to assure the continued high quality of Sylvania products, we've tripled our staff, computerized our customer services and we're building a new manufacturing plant.

So whatever your CATV needs, just call your local Sylvania CATV Transmission Systems sales office for complete details. Or phone toll free 800-351-2345 within the continental U. S., except Texas. From Alaska, Hawaii and Texas, call (915) 591-3555 collect.

You'll see why the Sylvania Series 5000 station does so many things right for you.

SYLVANIA

CATV
Transmission Systems

GTE

Satellite Dishes And Receivers

Five-Meter Dish

Anixter-Pruzan's Anixter-Mark five-meter antenna system is a dual-polarized TVRO antenna operating in the 3.7 to 4.2 GHz band. It features a parabolic reflector and feed and mount structure design that allows for two-man installation.

The reflector subsystem is five meters in diameter and consists of 24 stamped aluminum petals, 24 aluminum brace struts and a welded aluminum center hub. The mount structure is an elevation azimuth type and is adjustable 360° in azimuth and +5° to +90° elevation. The antenna is equipped with cassegrain feed for both TVRO and uplink/downlink applications. Polar mounts and mount structures are also available.

For information, contact Anixter-Pruzan, 4711 Golf Road, Skokie, Illinois 60076; (312) 677-2600.

Earth Station Receiver

Avantek, Inc. has introduced a video earth station receiver, model AR1000 Simulchannel™. The receiver offers digital selection of 24 video program channels and includes a PLL demodulation system with effective threshold extension. It provides simultaneous reception of any six of the transponder program channels at a cost approximately one-half that of a system requiring separate receivers for each channel. Four AR1000 receivers can be cascaded to provide simultaneous demodulation of all 24 channels. The AR1000 is used in conjunction with the Avantek ACA-4220 LNA/block down-converter. For information, contact Avantek, 3175 Bowers Avenue, Santa Clara, California 95051; (408) 727-0700.



The AR1000 Simulchannel™ receiver from Avantek.

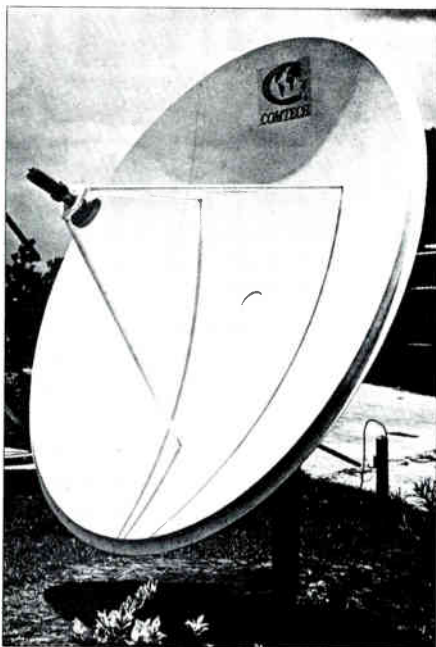
Comtech Antenna

Comtech Antenna Corporation is marketing a five-meter earth station antenna. Surface tolerance of .060-inch RMS is maintained by a one-piece fiber-

glass backing hat. A newly-developed splice-plate enables the dish to be separated into three sections for easy transportation and assembly. The feed horn provides a 44.3 dB gain. Frequency coverage of 3.7-4.2 GHz is provided with a single- or dual-linear polarization feed. The tripod structure mount provides azimuth coverage of 0° to 360° and an elevation of 0° to 60°. The non-corrosive reflector can withstand winds of 125 mph. For information, contact Comtech Antenna Corporation, 3100 Communications Road, P.O. Box 42, St. Cloud, Florida 32769; (305) 892-6111.

Comtech Data

Comtech Data Corporation presented its three-meter earth station. Each antenna consists of a precision molded, three-piece parabolic reflector surface, a dual-axis mount and a feed system. The whole station can be installed by two men in two hours. No special tools, panel alignment or testing are required. The three-piece configuration allows for economical transportation and facilitates assembly in remote sites or on rooftops. The newly designed E1/AZ mount provides a sturdy support for the antenna system and simple adjustments for acquiring any satellite. The Comtech-developed joint lines on the three-piece reflector assures minimum surface distortion and maximum rigidity. For information, contact Comtech Data Corporation, 613 South Rockford Drive, Tempe, Arizona 85281; (602) 968-2433.



Comtech Data's three-meter earth station.

24-Channel Receivers

Gardiner Communications Corporation has introduced two new 24-channel receivers. The 4100 will succeed

the crystal controlled SR5000 and the SR4000-S. The 4200 will replace the SR4000-D. The receivers will have 24-transponder capability. The new models feature integral power supply for low noise amplifiers, circuit function lamps and all test points on front panels. Four audio frequencies may be selected: 6.8, 6.2, 5.8 and 7.4 MHz. Other combinations are optional. Selector switch for 12- or 24-transponder satellite. Both BNC and F connector outputs are included. The top-of-line 4200 is remotely tuneable, with dual input, automatic polarity switch, touch pads for transponder selection and LED readout. The manually tuned 4100 has a single output and push button transponder selector switch. For information, contact Gardiner Communications Corporation, 1980 South Post Oak Road, Suite 2040, Houston, Texas 77056; (713) 961-7348.



Gardiner's model 4100 satellite video receiver.

Satellite Video Receiver

Harris Corporation is marketing the model 6522 satellite video receiver. The unit features dual conversion, a video static threshold of less than eight dB; full 24-channel frequency ability, automatic polarization switching, full video and audio fidelity and a remote-channel tuning option. For information, contact Harris Corporation, Satellite Communications Division, P.O. Box 1700, Melbourne, Florida 32901; (305) 724-3000.



The model 6522 satellite video receiver from Harris Corporation.

Scientific-Atlanta introduces the cable system you can talk to



Want to check on signal levels and power throughout your entire system? Just ask the system.

How are you doing?" asked the Headend. "I'm doing fine," the Trunk Amplifier replied.

"Are you getting enough power?"

"No problem."

"Signal strength OK?"

"Fine."

"Anything else you want to tell me?"

"Not right now."

At last, you can monitor signal levels and power throughout the *entire* trunk system, from headend to neighborhood bridging station, on a 24-hour basis.

The Scientific-Atlanta Series 6500 Status Monitoring System literally opens up an on-going dialog with your cable system.

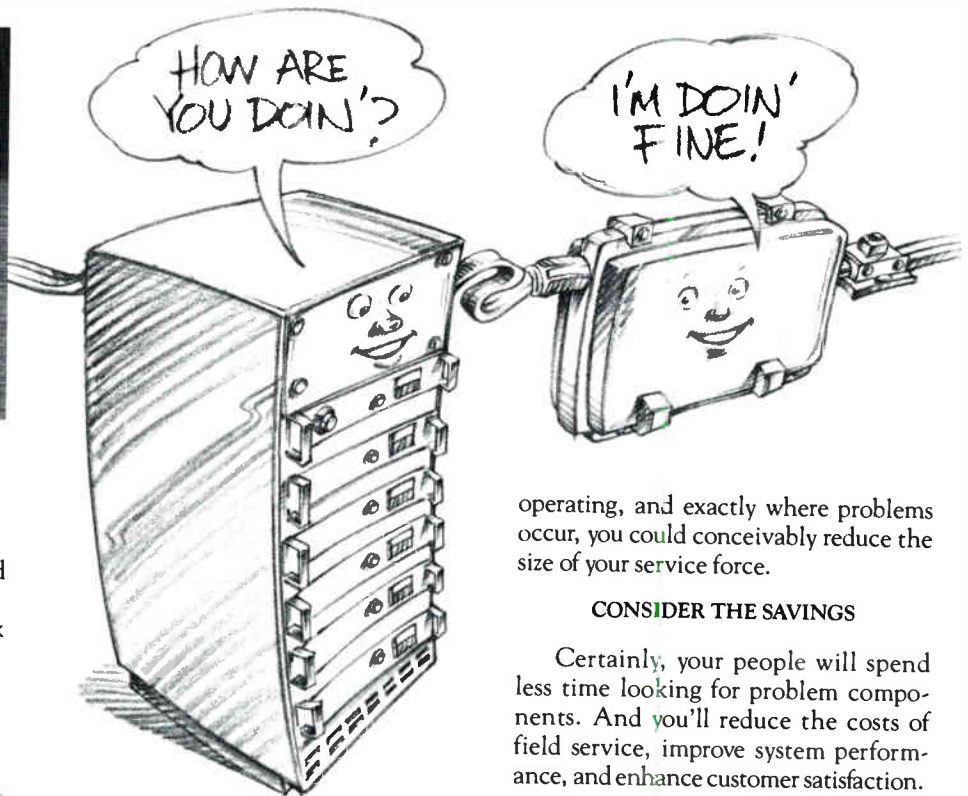
You can interrogate, give reverse bridger switching commands, and evaluate the replies of as many as 2048 amplifier status transponders.

When there's a problem, the system provides a visual and audio alarm to your headend, hub or office. It identifies the failure, and tells you exactly where it's located.

And unlike the bulb in the Christmas lights, you don't have to test the whole system for trouble. You can dispatch service crews directly to the problem area.

IT STARTS WITH OUR COMMUNICATIONS CONTROL UNIT

The communications control unit is installed at your headend or any central distribution point. Then, amplifier



status transponder modules are installed in the trunk amplifier housings.

The control unit (combining CRT terminal, microprocessor, message transmitter and receiver) interrogates and evaluates replies from each status transponder, and sends reverse bridger switching commands.

Reverse bridger switching means that specific reverse feeders can be connected or disconnected so you can identify the particular trunk station involved. (RBS also reduces reverse system noise by turning off all feeders not being used at that time.)

Monitoring continues 24 hours a day. When acceptable signal or power levels aren't met, the alarm sounds and vital information is displayed simultaneously.

A glance at the CRT screen identifies the problem amplifier and explains the fault. Your operator can then take the appropriate action to correct the situation.

And that's the basic system. It works now, and can easily be expanded with plug-in memory boards, hardcopy printer, even a floppy disc system. Also, by knowing just how your system is

operating, and exactly where problems occur, you could conceivably reduce the size of your service force.

CONSIDER THE SAVINGS

Certainly, your people will spend less time looking for problem components. And you'll reduce the costs of field service, improve system performance, and enhance customer satisfaction.

READY NOW FOR OUR 300 THROUGH 400 MHz SYSTEMS

The 6500 Status Monitoring System is technologically advanced, yet simple to understand and use. It's available now on our 300 through 400 megahertz systems— which we're currently supplying in *quantity* for cable systems across the country.

For more information, contact Solomon Webb at Scientific-Atlanta, (404) 441-4111. Or send this coupon.

**Scientific
Atlanta**

4386 Park Drive, P.O. Box 105027,
Atlanta, Georgia 30348

- Please send details on your
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EZ-SNAP™ comes in three convenient sizes and shapes and the light beige color blends with most decors.

The unique snap-top cover provides easy access to wires, cables, and components for inspection, repair, or add-on service. Non-Corrodable "Raceway" mini-midget VHF, UHF, two and three-way Hybrid Splitters and Directional Couplers are available to fit EZ-SNAP™ Moulding Ducts.

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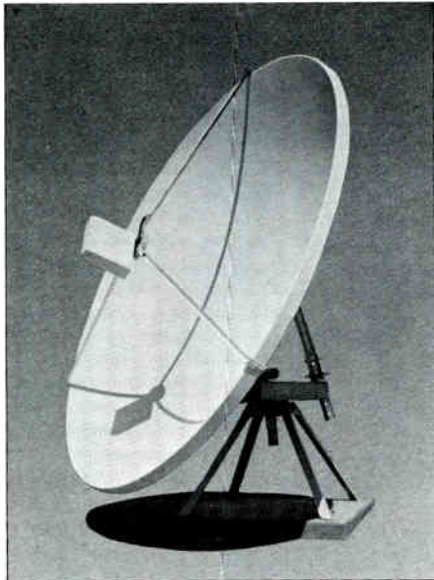


Five- to Six-Meter Antennas

Hughes Microwave Communications Products produces convertible five- to six-meter antennas that are built and certified to pass the Uniform Building Code. The computer-designed mount uses torsionally-stable tubular members instead of conventional angle iron. Anti-friction bearings enable the operator to adjust azimuth and elevation in orienting or re-orienting the antenna. Two feed options are available, as well as a high-gain Cassegrain design and a focal-point feed for strong signal areas. All Hughes receivers have built-in 24 channel capacity, threshold extension and remote control capability. For information, contact Hughes Microwave Communications Products, P.O. Box 2999, Torrance, California 90509; (213) 534-2146.

12-Foot Antenna

Microdyne Corporation introduced a 12-foot antenna that provides reception in EIRP contours between 36 and 33 dBW. It features a minimum gain of 41 dB at four GHz with easy polarization adjustment. The 12-footer is a single-piece molded fiberglass antenna with a parabolic reflector surface mounted on a galvanized steel pedestal. The antenna pedestal has a full 360° azimuth range with a 10° to 65° adjustable elevation. The antenna can withstand winds up to 125 mph. The firm also introduced its model 1000 TVRM satellite TV receiver/modulator. For information, contact Microdyne Corporation, P.O. Box 7213, Ocala, Florida 32672; (904) 687-4633.



Microdyne's 12-foot antenna.

Microwave Associates

Microwave Associates Communications has introduced two satellite receivers, the VR-3X, and the VR-4X. Both feature threshold extensions, system

flexibility, and 4.5 MHz subcarrier composite. Additionally, the VR-4X features 24-channel frequency agility, and plug-in modular design. On each receiver, automatic frequency controls lock the receiver to the signal of the selected channel. Threshold extension demodulators produce 3 dB extension when compared to a 30 MHz IF bandwidth. Baseband (video or composite video) outputs can be provided, allowing for flexibility.

Both receivers can be used to feed a cable system directly when the optional cable modulator and frequency converter modules are used. Options available include built-in modulators, the capability for IF switching, and extra audio demodulators. The VR-4X also has available automatic vertical/horizontal polarization switching. For information, contact Microwave Associates Communications, 121 Middlesex Turnpike, Burlington, Massachusetts 01803; (617) 272-3100.



The VR-4X satellite receiver marketed by Microwave Associates.

Digital Earth Terminal

Scientific-Atlanta has introduced its DET-56 digital earth terminal system, which incorporates the S-A model 8008 five-meter antenna. This antenna utilizes an elevation-over-azimuth mount and operates over the frequency bands of 3.7 to 4.2 GHz and 5.925 to 6.425 GHz. Also included in the system are GaAs FET low-noise amplifiers, frequency flexible, dual-conversion upconverters and downconverters, wide-band traveling-wave-tube power amplifiers, phase-shift-keyed modems with rate 7/8 forward error correction codecs, a 1:N modem protection switch, and system monitor control. The DET-56 system is designed for maximum performance with the minimum use of satellite power and frequency spectrum. For information, contact Scientific-Atlanta, 3845 Pleasantdale Road, Atlanta, Georgia 30340; (404) 449-2000.

Satellite Receiver Packages

Triple Crown Electronics, Inc., presented its TSR 4000 series satellite receiver. The primary variations are: TSR 4000, basic receiver four GHz to baseband; TSR 4100, home-use receiver with

television channel output; and TSR 4200, cable television receiver with integral modulator. The series has a frequency-agile receiver with continuous tuning over the 3.7-4.2 GHz range and incorporates: LNA power supply with alarm; two audio subcarrier demodulators; standby power capability; AGC and AFC monitors; and LNA power selection (terminal or input cable). For information, contact Triple Crown Electronics, Inc., 42 Racine Road, Rexdale, Ontario M9W 2Z3; (416) 743-1481.

Services

Management Software

CableData presented its DDP/5 software designed for operation with Tandem computers. The DDP/5 can run reports in significantly less time than CableData's previous system and its design allows for fast processing, even during peak workloads. The system is equipped with dual processors and mirror image discs to ensure minimal down-time and no loss of vital data. It is also designed so that the failure of one part of the system will not affect the rest of the system. The basic system can be expanded to 16 CPUs and up to 256 peripheral devices per dual set of CPUs. Each CPU has a memory capacity of two million bytes. For information, contact CableData, 3200 Arden Way, Sacramento, California 95825.

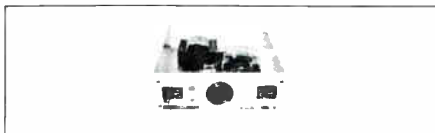
Construction Service

Commco Construction Company has expanded its operations to provide a full range of aerial, underground and technical services. The firm added a technical staff to provide assistance in such areas as proof and meter balancing and reequipping and realigning cable systems. The firm already has 11 underground crews working and will expand its underground capability early this year. The firm also opened a field office in Houston, Texas. For information, contact Commco Construction Company, P.O. 1480, El Campo, Texas 77437; (713) 543-6725.

Power Supplies

Communications Distribution Corporation presented a full line of Lectro power supplies. Model SH-0-3-11-0 has DC power requirements of 24 V, 35 amps maximum, and AC recharging power requirements of 90-130 V, 57-63 Hz 2 amp maximum. Transfer time, line power to battery, is 15-20 msec and from battery to line power, seven seconds standard. Temperature range is -40°F to +140°F. It offers surge protection for power transistors as well as 115V AC input and output. For information, contact Communications Distribution Corporation,

P.O. Box 567, Athens, Georgia 30601;
(404) 353-1159.



The model SH-0-3-11-0 power supply from Communications Distribution Corporation.

Earth Station Planning

Compucon, Inc., provides satellite communications users with engineering services to plan, coordinate and protect earth stations, from the time of preliminary

site evaluation to FCC filings. When provided with basic system information, satellite engineers examine the feasibility of proposed sites, interference path profiles, terrain blockage and over-the-horizon propagation losses, client consultation, examination of the satellite arc, individual transponder analysis, and recommendations for alternate sites, antennas, LNA's, RFI measurement, and/or artificial shielding if required.

Once the site is engineered, the proposed system is coordinated with all other spectrum users within 200 km. The firm also prepares all necessary technical exhibits and data required for client's filing with the FCC. A six-month frequency

protection service is included in the plan. For information, contact Compucon, Inc., 13749 Neutron Road, P.O. 401229, Dallas, Texas 75240; (214) 233-4380.

Earth Station Coordination

Comsearch, Inc., explained its satellite earth station coordination service. The service, designed to help systems minimize interference in an earth station operation, has three steps. The first step, preliminary analysis, identifies all potential great circle and precipitation-scatter interference cases. Then, in the analysis, Comsearch identifies which model antennas will best suit the operator's purpose and studies the affect of artificial shielding and other interference-elimination techniques for the site. If the initial site proves unsatisfactory, Comsearch will evaluate or recommend at least three alternative sites. In the frequency coordination, Comsearch carries the earth station through the FCC application phase. For information, contact Comsearch, Inc., 7633 Leesburg Pike, Falls Church, Virginia 22043; (703) 356-9470.

Remnant Cable Purchasing

Copal Industries, Inc., bids on and purchases cable removed from rebuilt systems as well as remnant cable sections from new-build systems and all cable currently on the ground. The bids include the pickup, weighing and hauling of all cable. The firm presents bids on an individual basis depending on type, amount, quality and location. Payment is made upon certification of weights and materials at the firm's processing plant. For information, contact Copal Industries, Inc., 595 Madison Avenue, New York, New York 10022; (212) 759-7164.

Business Support

LDM, Inc., introduced its Subscription Accounting System, a complete on-line system for the cable/subscription TV industry. The service includes installation scheduling, service-call scheduling, billing, financial reporting, on-line inquiry and market-analysis reporting. Other services offered by LDM include facilities management, time sharing, programming/systems design, data entry, management consulting, inventory planning and control systems and financial and accounting software packages. For information, contact LDM, Inc., 529 South Second Avenue, Covina, California 91723; (213) 967-1506.

North Supply

North Supply has 11 distribution centers across the country and offers delivery from stock within 24 to 28 hours. In addition to selling equipment, the firm



MX-5 five channel mixer



ACCU-FIVE five channel rack mount console



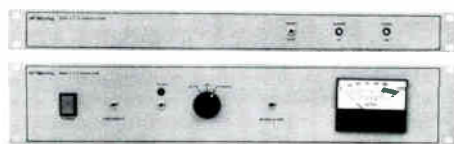
EBS-2 tone detector



LR-1004C compressor limiter amplifier



FMR-1 fixed frequency FM receiver



SMR/SDR satellite receiving components

McMartin is CATV

McMartin Industries, a leading manufacturer of commercial broadcast and sound equipment for over twenty-five years, offers many products well suited to the CATV market.

The products that will fit your needs are 5 channel mixers, both rack mounted and console; AM and FM fixed frequency receivers; EBS receivers and generators; compressor limiter amplifiers; and our newest satellite receiving components, just to name a few. This family of products will enhance the capability of your cable system.

For more additional information, please call or write for your McMartin CATV catalog.

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While you're lining up subscribers, RCA can set up a cable system for you. Bill of materials or turnkey. Engineered to your specs, with guaranteed performance. And all up to the standards you'd expect of a leader in electronic communications. RCA/Cablevision Systems, 8500 Balboa Blvd., Van Nuys, CA 91409. Call: (213) 894-8111. Outside California, call (800) 423-5651 toll-free.

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383-2732. **Southwest:** 643 Sky Harbour Dr., Granbury, TX 76408. Telephone (817) 573-2752. **West:** 15335 Morrison St., Suite 340, Sherman Oaks, CA 91403. Telephone (800) 423-5651 or (213) 894-8111. California License #176131C61



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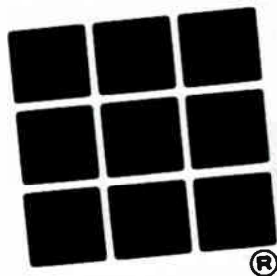


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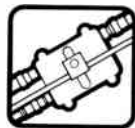


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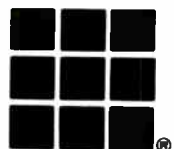
products for you at 11 distribution centers coast-to-coast.

And, our **computerized inventory control system** monitors your order from entry to shipment.

For these reasons and more, North Supply is a source you'll want to get to know. Start **by sending for our free introductory Supermarketplace[®] catalog**. Or phone us today.

Cable, hardware and more now available for immediate delivery. Call toll-free (800) 255-6458.

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also has a leasing program that does not involve a large cash outlay. Among the CATV product manufacturers it represents are Jerrold Division, TOCOM, Pyramid Industries, Gilbert Engineering, Comm/Scope, Times Wire and Cable, Utilities Products, Coil Sales, Ripley, Ben Hughes Communications Products, Lemco Tools, Theta-Com, Trans USA, United States Tower, Collins Radio Group, Microdyne, Magnavox and Auburn Extrusion. For information, contact North Supply Company, 10951 Lakeview Avenue, Lenexa, Kansas 66219; (913) 888-9800.

Signal Vision

Signal Vision, Inc., markets a product line of cable coring and preparation tools and cable jumpers. Among the manufacturers and products it represents are: Pyramid Industries (fittings, connectors, terminators and security sleeves), EMC Corporation (traps, converters and pay hardware systems), Arvin Systems (taps, switchers, meters and programmable-channel switchers) and Delta-Benco-Cascade (amplifiers, line extenders, processors and splitters). Contact Signal Vision, Inc., 22732-B Granite Way, Laguna Hills, California 92653; (714) 586-3196.

Tele-Wire Supply

Tele-Wire Supply Corporation is a national distributor of all materials necessary for the construction, both aerial and underground, and maintenance of a cable system. Offering everything "from the top of the pole to the bottom of the hole," Tele-Wire has been supplying materials since 1946. Included in Tele-Wire's catalog are: pole-line hardware, messenger-strand, lashing wire, trunk and distribution cable, drop materials and assorted installation equipment. Tele-Wire also carries Sigmaform heat-shrink tubing, as well as the heat-shrink repair sleeve. The product wraps around existing cables, conforming over irregular tape and surfaces. It is also water-tight and has an exterior heat-sensitive coating. The tubing is available in diameters of .5 and 1.5 inches. For information, contact Tele-Wire Supply Corporation, 122 Cutter Mill Road, Great Neck, New York 11021; (516) 829-8484.

Test Equipment

440 MHz Spectrum Analyzer

ComSonics, Inc., introduced its model SA 440 440 MHz spectrum analyzer. The field instrument features storage display mainframe, internal calibration, and an on-screen dynamic range of 72 dB. The unit operates over the 500 KHz-to-400 MHz frequency range. Its amplitude flatness is held within +1 dB over any

selected frequency span, and its dial accuracy is better than +1 percent of the full frequency range. The unit has fast, slow, single slot and linelock scan modes and rates, and four selectable bandwidth ranges. For information, contact Com-Sonics, Inc., P.O. Box 1106 Harrisonburg, Virginia 22801; (703) 434-5965.

Reflectometer

Times Fiber Communications, Inc. presented its series 50 optical time domain reflectometer. The series, marketed under the Fiberscan™ name, measures optical fiber length and distance between connectors and attenuation. The unit operates under both sunny and windy conditions. The reflectometer incorpor-



The series 50 optical time domain reflectometer from Times Fiber.

ates up to 70 dB round-trip path loss capability for ends, multiple pulse-width setting (10 nS, 80 nS, 80 nS/filtered), and total immunity to signal distortion from ambient light when connectors are used. Additional features include an injection laser diode, a coupler that eliminates mode selectivity, and a linear APD photodetector to minimize the possibility of overloading during amplitude adjustments. The unit comes in portable models that plug into any Tektronic series 500 mainframe and stand-alone models for use with any wide-band scope.

For information, contact Times Fiber Communications, Inc., 358 Hall Avenue, Wallingford, Connecticut 06492; (203) 265-8580.

Service Monitor

The model 4200, a 1 to 520 MHz service monitor, was introduced by **Wavetek Indiana**. The test instrument includes a lab quality signal generator with a sweep generator function, a frequency measurement system, and an oscilloscope. The signal generator section of the model 4200 is a synthesized



The model 4200 service monitor from Wavetek Indiana.

signal source with 0.0001 percent (1 ppm) accuracy, 50 Hz resolution, and an output range of 316 mV to 0.0316 +V.

Complex modulation capability allows the generation of simultaneous audible and subaudible tones (with external tone generator). A sweep generator measurement mode permits testing broadband RF and IF circuits. The measurement section of the test set has an input sensitivity of 2+V and measures carrier frequency and modulation of externally generated signals—including off-the-air signals.

For information, contact Wavetek Indiana, Inc., 66 North First Avenue, P.O. Box 190, Beech Grove, Indiana 46107; (317) 783-3221.

Video

Message Display System

BEI presented its "Marquee" model CG-800 message system for producing alpha numeric displays. The basic system includes a microprocessor controller, keyboard and interface, 32 lines of 32 characters, a crawl line with 1,000 characters, RS-170 color sync generator, a blue matte background, housing and power supply. Standard features are automatic centering, crawl line with elastic length, random display of pages and page-by-page display time. Options include four-color colorizer, 32-line memory sections, title-line generator, interface-adaptor board, HEATH® weather interface and NOAA interface. For information, contact BEI, 15315 South 169 Highway, P.O. Box 106-A, Olathe, Kansas 66061; (800) 255-6226; (913) 764-1900.

Slow-Scan Television

Colorado Video, Inc., now manufactures black and white or color Slow-Scan TV Equipment for use with satellite subcarrier or other narrow-band channels. Considerable production and transmission economies may be gained

by transmitting "still" TV pictures over ten KHz bandwidth channels in the form of a horizontal "wipe" from left to right, with a period of 8.5 seconds.

For color, the resolution is 490 x 240 picture elements, a single-field NTSC compatible signal, repeated twice per frame with standard EIA sync switchable between genlock or crystal-control at color rate. In black and white, the resolution is 240 x 512 elements, full frame (dot interlaced). Both color and black/white units reproduce a 64-level (six bit) grayscale.

A solid-state digital memory on plug-in circuit cards is used for picture storage to provide maximum reliability and easy maintenance. For information, contact Colorado Video, Inc., Box 928, Boulder, Colorado 80306; (303) 444-3972.

Mobile Earth Station

Compact Video Systems, Inc., introduced Compact 42, a 42-foot trailer that functions as a fully self-contained uplink earth station. It can transmit directly to 4.5-meter, five-meter and ten-meter receive-only stations. The trunk features a five-meter collapsible dish from Scientific-Atlanta. Standard and optional features of the Compact 42 include: the ability to transmit on the standard uplink frequency band of six GHz and receive on the four GHz band; a short-hop microwave transmission capability; VHF/UHF communications; and a 60 kw power generator with a tank that can hold enough fuel for 48 hours of continuous use. For information, contact Compact Video Systems, Inc., 2813 W. Alameda Avenue, Burbank, California 91505; (213) 843-3232.



A cut-open diagram of Compact Video's Compact 42.

Video Production

Computer Video Production, Inc., produces video programming and commercials for cable systems and also serves as consultants on the creative and technical aspects of cable programming. The firm can do location recording and computerized editing on one-inch and 3/4-inch videotape. It is equipped with two-inch, one-inch and 3/4-inch VHS and Beta dubs. At the Minneapolis, Minnesota, studio the firm can perform film/slide transfers to tape, foreign language subtitling and the following special affects: line animation, still frame, reverse slow

motion and forward slow motion. The studio also has a quad machine for duplication of two-inch tape. For information, contact Computer Video Productions, Inc., 2901 Metro Drive, Minneapolis, Minnesota 55420; (612) 854-5604.

Data Display System

Computer Video Systems is marketing the Compuvid™ CDD series data display system which provides individual stand-alone microprocessor-based displays. Fully controlled by entry from the keyboard, the keyboard is also used to update weather parameters, time and calendar data, and edit trace. The weather display can be presented in three modes and includes temperature, barometric, humidity and wind readings. Other features include: regional National Weather Service forecasts presented in a one-line crawling message; possible news service displays interfaced from major providers; and special keyboard memory programs including TV program guide, Vector shopping guide, and bulletin board. The system includes 16 character sizes, eight background colors, an EIA RS-170 sync generator and six keyboard-selectable character enhancements. Options are available. For information, contact Computer Video Systems, 3678 West 2150 South Number 2, Salt Lake City, Utah 84120; (801) 974-5380.

Time Base Corrector

Harris Video Systems has introduced a new, increased bandwidth version of its CVS 516 broadcast quality time base corrector. Called the CVS 516WB, the unit handles all current non-segmented heterodyne VTRs and the newer, extended frequency VTRs. The 516WB's extended frequency response is accomplished without the usual requirement of 3.58 MHz feedback and is designed to keep VTRs free of TBC-imposed limitations on resolution performance and the "soft" look of earlier time base correctors. The unit has automatic vertical centering, a feature that eliminates throughput delay ambiguity to improve editing accuracy, as well as Harris Video Systems' exclusive Gyrocomp circular memory to handle severe gyroscopic disturbances without picture breakup. Other standard features of the CVS 516WB include a 16-line window, chroma luminance delay correction, 3 dB chroma noise reduction, broadcast-stable genlock sync generator, color dropout compensation, and an adjustable proc amp with preset level controls. For information, contact Harris Video Systems, 1255 East Arques Avenue, Sunnyvale, California 94086; (408) 737-2100.

Prism Camera

Hitachi Denshi America, Ltd., has introduced two models of its Hitachi FP-

40 ENG prism camera, the FP-40S and the FP-40SS. The cameras have a +6 and +12 dB gain switch that can add two f/stops for shooting under dark lighting conditions or indoors. Both employ the Hitachi-developed Saticon tubes. Other features include left/right flip-over viewfinder; a light, balanced design; and an integral DC power pack. Additional studio and system versatility is available with such options as a five-inch viewfinder, genlock and remote operation panel. The FP-40S offers an s/n ratio of 50 dB; the FP-40SS gives 52 dB. For information, contact Hitachi Denshi America, Ltd., 175 Crossways Park West, Woodbury, New York 11797; (516) 921-7200.

Editing System

Panasonic Video Systems Division

has introduced a second generation 3/4-inch editing system called the Panasonic 9000 G-2 series. Included in the system is the NV-A960 controller, the NV-9600 editing recorder and the NV-9240 recorder. Both decks have full direct-drive video head cylinders and capstan motors. According to Panasonic, the direct-drive capstan servo system improves time-base stability and reduces wow and flutter to less than 0.12 percent. Because of the direct drive, the head-switching line was moved into the vertical blanking area to reduce video noise. These features are added to the crystal-oriented HPF heads, giving horizontal resolution of 260 lines color, 330 lines black-and-white and a signal-to-noise ratio of 46 dB color and 50 dB black-and-white. The entire G-2 series can interface with any other Panasonic solenoid-operated videocassette deck. For information, contact Panasonic Video Systems Division, One Panasonic Way, Secaucus, New Jersey 07094; (201) 348-7000.

Videotape Editor

A new line of three videotape editing controllers from **US JVC Corporation** meets the needs of both the beginning and advanced video user.

The line consists of the RM-70U remote control unit, the RM-82U automatic editing control unit and the RM-88U, a full-function automatic editing control unit. Each "RM" has a large rotary search-dial control so a user can quickly locate any portion of a videotape program. This shuttle search mechanism can vary the playback speed of any controlled videocassette recorder from still to five times normal speed in both forward and reverse. It also maintains any selected playback speed automatically when a user releases it during operation. Each of the new RM units is also constructed on a full logic circuit based on a microprocessor. For information, contact JVC, 5875 Queens Midtown Expressway, Maspeth, New York; (212) 752-8610.

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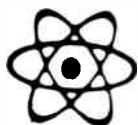
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Ad Index

Alpha Technologies, Ltd.	17,46
AM Cable TV Industries	3
Amplica, Inc.	25
Avantek, Inc.	33
Ben Hughes Communications ..	85
Beston Electronics, Inc.	74
Broadband Engineering	78
Communications Distribution Corp.	38
Compucon, Inc.	24
Comm/Scope Company	80-81
Comsearch, Inc.	46
Comtech Antenna	49
Comtech Data Corp.	82
Conifer Corp.	89
Copal Industries	77
CWY Electronics, Inc.	77
dB CATV Supply	69
Eagle Comtronics	91
Eastern Microwave	15
Electroline Television Equipment .	8
Gardiner Communications ...	18,19
GTE/Sylvania	57
General Cable/CATV	6
Harris Satellite Corp.	42
Hughes Microwave Communications	21
Intercept	86
Lester Equipment, Inc.	50
LRC Electronics	84
Magnavox CATV Systems, Inc.	28-29
McMartin Industries	79
Microwave Associates Communications	12-13
Midwest Corp.	39
National Microtech	10
North Supply Co.	66
Oak Industries	2
Panasonic	27
Pico, Inc.	52
Pioneer	9
RCA Cablevision Systems	63
RMS Electronics	4,36,60,92
Sadelco	43
Scientific-Atlanta	59
Sitco Antennas	24
Test, Inc.	23
Texscan/MSI	30
Theta-Com	16
Times Wire & Cable	64-65
Tomco Communications	18,54
TRW Semiconductors	21
Vitek Electronics	11

Continued from page 32.

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265 IF D=40 GO TO 330
270 IF D=50 GO TO 340
280 IF D=60 GO TO 350
300 I=I-3.5 : K=K-3.5 : GO TO 160
310 I=I-7 : K=K-7 : GO TO 160
320 I=I-8 : K=K-8 : GO TO 160
330 I=I-12 : K=K-12 : GO TO 160
340 I=I-16 : K=K-16 : GO TO 160
350 I=I-1 : K=K-1 : GO TO 160
400 P=I : Q=K
410 PRINT "YOU HAVE SAVED THESE LEVELS":PRINT P,Q. GO TO
    200
430 I=P : K=Q
440 PRINT "YOU ARE NOW USING THE LEVELS YOU SAVED":PRINT
    I,K: PRINT: GO TO 200
500 GO TO 520
520 GO TO 550
550 GO TO 600
600 PRINT@10,"***** DLB'S CABLE FEEDER DESIGN PROGRAM
    *****"

610 PRINT@85,"***** INSTRUCTIONS *****"
620 PRINT: PRINT "ANSWER ALL QUESTIONS AS ASKED."
630 PRINT: PRINT "WHEN YOU REACH THE QUESTION ON CABLE
    FOOTAGE, YOU WOULD"
640 PRINT "NORMALLY ENTER THE FOOTAGE OF CABLE.
    HOWEVER,"
650 PRINT "IF YOU WANT TO INSTALL A SPLITTER IN THE LINE,
    ENTER A '1':"
660 PRINT: PRINT "IF YOU ARE GOING TO DESIGN FEEDER FROM
    ALL OUTPUTS OF THE"
670 PRINT "SPLITTER ANSWER 'YES' (Y) TO THE SAVE QUESTION.
    THIS WILL"
680 PRINT "THEN ALLOW YOU TO COME BACK TO THOSE LEVELS
    UPON COMPLETION"
690 PRINT "OF THE PRESENT FEEDER."
691 PRINT
692 PRINT
  
```

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695 INPUT"          PRESS 'ENTER' TO CONTINUE " ;A$:CLS: GO
    TO 700
700 PRINT: PRINT "AFTER COMPLETION OF THE PRESENT FEEDER,
    YOU MAY GO BACK"
710 PRINT "TO SPLITTER INPUT LEVELS BY ENTERING '2'. ENTER
    SPLITTER LOSS."
720 PRINT "THEN CONTINUE WITH DESIGN."
730 PRINT: PRINT "THIS PROGRAM MAY BE USED TO DESIGN
    TRUNK RUNS IF YOU IN-"
740 PRINT "HIBIT THE AUTO TAP THRU LOSS PORTION OF THE
    PROGRAM. TO DO SO:"
750 PRINT: PRINT "PRESS BREAK AND ENTER THE FOLLOWING
    INTO THE PROGRAM"
760 PRINT: PRINT " ' ' 138 GO TO 160 ' ' ---- ENTER IT ----
    THEN RUN"
761 PRINT
762 PRINT
763 PRINT
765 INPUT "          PRESS 'ENTER TO CONTINUE" ;A$:CLS GO
    TO 770
770 PRINT: PRINT "THE LEVELS INDICATED ARE READ IN THIS
    ORDER:"
780 PRINT: PRINT "LEVEL","LEVEL","TAP"
798 PRINT "@ CH.2": "@ CH. R": "VALUE"
800 PRINT: PRINT " " " " " "
806 PRINT: PRINT "          " "GOOD LUCK" "----- DLB"
807 PRINT
810 PRINT: INPUT"          PRESS 'ENTER' TO START
    PROGRAM";A$: GO TO 10
830 END
  
```

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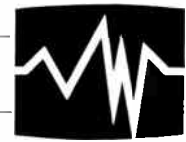
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Q We have recently changed our old tube-type headend signal processors to new solid-state units. I hate to just throw out the old processors. Can you suggest a way to update them and use them as spares?

A. From your description, I assume that the tube-type units are of the COM-series built by Jerrold Electronics a few years ago (usually called COM-1). These were excellent units for their time. The only update information that I have seen on them was the conversion of the downconverter and upconverter (tuner and CCV-*) to solid state. These conversions provided more stability and longer periods between servicing, but limited the processor to a single input channel. Their ability to be tuned to any standard VHF channel input was one of their better features. If you are just interested in spares, you should select one of them, retube it and align it and keep it with a full assortment of CCV modules. This will cover the standard VHF channels.

You may want to investigate buying a processor with tunable inputs and outputs as well as I F. and video outputs. This way you can have a spare for anything you need in the headend.

One way that I use old COM-1 is in training people in process theory and alignment. It always amazes me how quickly students can learn to follow video and audio signal paths through tube-type equipment. After a few hours on a COM-1, almost anyone can easily move on to the newer processors with a minimum of assistance. If you decide not to keep the old processors, I'm sure that some of the technical schools that teach CATV would welcome them as a donation.

Q What is the most effective scrambling technique for controlling unauthorized reception of our pay TV channels? I have heard quite a lot about a technique that uses a computer to control the scrambling and descrambling.

A. I could be drawn and quartered by several manufacturers if I passed along my opinion. Instead, I discussed this with several engineers and three manufacturers and came up with five different answers. Each manufacturer is firmly convinced that its own methods are vastly superior to all the others. Most of the engineers stated that the most expensive systems are probably the best. They also felt that pay TV security would be the next big cable problem to overcome.

Almost 80 percent agreed that a computer-controlled random-video-inversion and random-sync-inversion method is the most difficult technique to defeat. The costs involved, however, are a major drawback. Many smaller systems cannot afford a dedicated computer and the associated terminals just to achieve a more secure pay channel. The engineers and manufacturers felt that probably more manufacturers will develop security encoders and decoders in the near future.

Technical questions for this column should be addressed to: Out of Sync, CED Technical Editor, Titsch Publishing, Inc., 2500 Curtis Street, Denver, CO 80205

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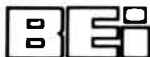
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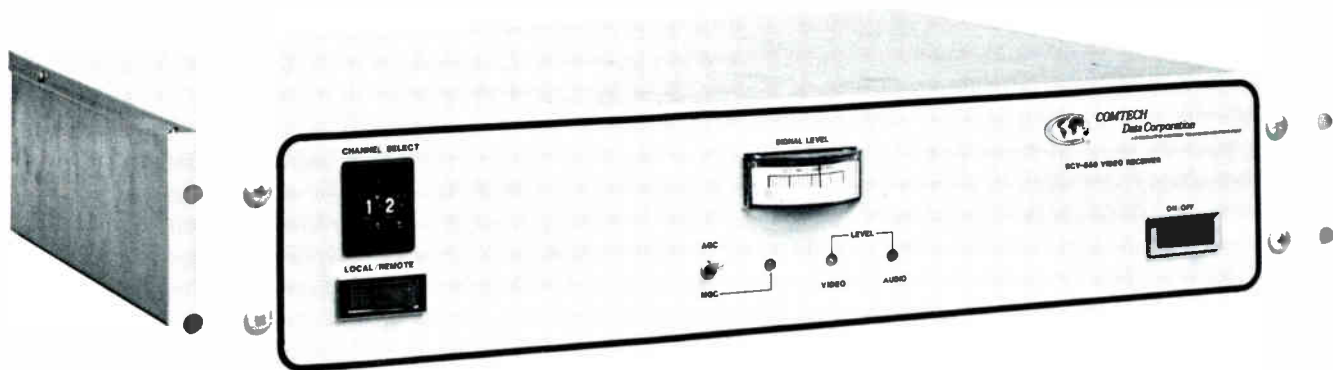


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An Opportunity to Excel

Communications Engineering Digest has sent the following letter to engineers involved in cable television operation and manufacturing. I am looking forward to their response.

I apologize to those persons who were inadvertently missed in the mailing and hope that they will forgive the omission. If we missed you, please substitute your name for the "Dear Sir" and read the letter. **CED** needs the assistance of every reader who is willing to share his or her knowledge, experience and expertise to help someone less knowledgeable.

If you have an idea for a how-to-do-it article, please contact me. I would be happy to discuss with you how your idea could be turned into an article for **CED**. If you have published a how-to-do-it piece in another publication and would like to see it updated in **CED**, please let me know. Send me a copy of the article, the publisher/magazine name and the date of publication. I will contact the publisher and attempt to obtain permission to work with the article. It is a shame that so many really fine articles are published once and then allowed to disappear. Many younger techs never get a chance to benefit from them.

Dear Sir

I have undertaken a task which will be impossible to complete without the assistance of people like yourself. The engineering people in the cable television industry traditionally have been more like fraternity members than competitors, and most are more than willing to teach anyone who shows an interest in learning. This is an appeal for your help in providing technical information to those who may otherwise never have access to it.

Communications Engineering Digest wants to be deserving of the heading "Reporting the Technologies of Broadband Engineering," and I have agreed to help in all possible ways. We want to reverse the trend of the last few years and go back to serving technicians and engineers with articles and information they want and need.

There is no way that any one person, or even a small group of people, can accomplish this goal within any reasonable time frame. For this reason, I am appealing to industry leaders such as yourself for help. We need immediate and continuing articles on all types of technical subjects. Those most urgently needed are low- and medium-level technical how-to-do-it articles. I am sure that each

of you has some practical advice and tips which would help to fill the void in this field.

This does not mean that high level articles and information are not wanted or needed. We need articles at every level and on every appropriate subject. It simply means that those persons who need the most help are not high level engineers, they are struggling technicians who want to improve their knowledge and skills and move into the higher levels. Let's not let them fail for lack of our help. Please share your knowledge with them. They are our future.

If you can help, please send me your articles and a short biographical sketch of yourself. A photo, too, would be welcomed if one is available. The articles don't have to be professionally written or illustrated. We have an excellent editorial and art staff which can turn any article into a thing of beauty. No matter how you write, your submissions will be gratefully received. It is content, not appearance or style, that we need.

Please?

Please send your suggestions and articles to Glenn Chambers, **CED** Technical Editor, Titsch Publishing, Inc., 2500 Curtis Street, Denver, Colorado 80205; or call (303) 573-1433.

Western Show Comment

As predicted, the Western Show in Anaheim, California, was a tremendous success. There were more people and exhibits than ever before, and some pretty fine hospitality suites, too. No partridge was to be found but there were a lot of other birds in evidence.

One thing about the exhibits really got everyone's attention. There was about 90 percent more computer-based or computer-controlled equipment than last year. That is a message to all you young (and not so young) techs showing the future direction of our industry. If you don't understand computer technology, or learn it pretty soon, you could be in trouble.

It will not be an overnight change. There must be some transition period, but you can bet your favorite pair of nines that the change is coming. I just hope that we are all ready when it gets here, especially me.

See you next month.

Glenn Chambers

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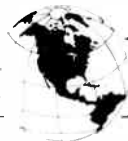


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Canada Embarks on Campaign To Bolster New Technologies

TORONTO, ONTARIO—Canadian Communications Minister Francis Fox has embarked on a major campaign to bolster new communications technologies in Canada and to strengthen Canada's programming industry. The initiatives include changes in earth station licensing and a crack down on unauthorized earth stations.

The initiatives, by the Minister and the Canadian Radio-Television and Telecommunications Commission (CRTC), will "help create a climate in which Canada's vital and talented creative community has a genuine opportunity to flourish," Fox said.

The CRTC, according to Fox, has endorsed a recommendation of the Therrien committee calling for the introduction of pay TV in Canada. The CRTC will also hold license hearings for extension of basic TV services via satellite to rural and remote communities next February. The early scheduling of the hearings is a positive sign for pay TV advocates in Canada because the CRTC has said it will settle the issue of rural and remote service before it deals with pay TV.

The Canadian Department of Communications will pursue, with the Canadian Broadcasting Corporation and other interested parties, a proposal for an "interim package" of private network English and French programming, said Fox.

According to Fox, the Canadian government will crack down on unauthorized satellite earth stations which threaten "the integrity of the Canadian broadcasting system" through unrestricted, unregulated interception and redistribution of U.S. satellite TV signals in urban Canadian areas. Fox added that he will initiate enforcement action to shut down urban earth station operators who distribute U.S. satellite television in apartment complexes and hotels.

The Canadian government has also simplified application procedures for TVRO earth station licensing, reducing the time required to receive a license from 18 months to within 90 days of the application. License applications will also be accepted from provincial educational agencies and authorities, which will be permitted to own and operate terminals to receive Canadian-originated educational TV and other Canadian signals. The earth stations will be permitted to receive radio program signals transmitted over the same satellite channel as the TV signal.

Fox said he will call for public participation in a review of earth station licensing policy. The review will examine the possibility of curtailing licensing requirements for certain types of TV-receive earth stations aimed at Canadian satellites. Fox also said he will introduce a telecommunications bill to set broad objectives for Canada's telecommunications system and to define more precisely the relationship among its various parts.

In a related area, Fox announced that his department will review aspects of the Canadian government's microwave system licensing policy. The goal, Fox said, is to increase the requirements for intercity delivery of TV program signals.

Fox expressed concern at the present discrepancy "between our technological capability to deliver signals and our economic ability to provide Canadian content." He said the campaign will go a considerable way toward supporting the efforts of program producers, broadcasters and other entrepreneurs in exploiting fully the enormous potential of new communications technologies.

Worldwide Satellite Users Schedule April Conference

WASHINGTON, D.C.—The International Association of Satellite Users (IASU) will hold its 1981 conference and trade show here April 13-15 at the Washington Hilton Hotel. The panel sessions will cover three areas: user environment and regulatory concerns, user resources and services, and user planning strategies and markets.

The objective of the IASU is to promote coordinated planning among the community of satellite users and suppliers. Since developing nations are beginning to demand more satellite-system capability, the IASU intends to protect and share the available radio-frequency spectrum and orbital space allocated to serve satellite communication requirements.

According to Dr. Jerome Lucas, conference chairman, the most critical problem facing satellite users is the limited domestic satellite space segment. This shortage will affect all users from data customers to cable television operators.

"Even future cable television franchises are likely to require the petitioner to have access to transmission channels for intercity two-way communications, which comes down to having space segment in order to receive a local network license," Lucas said.

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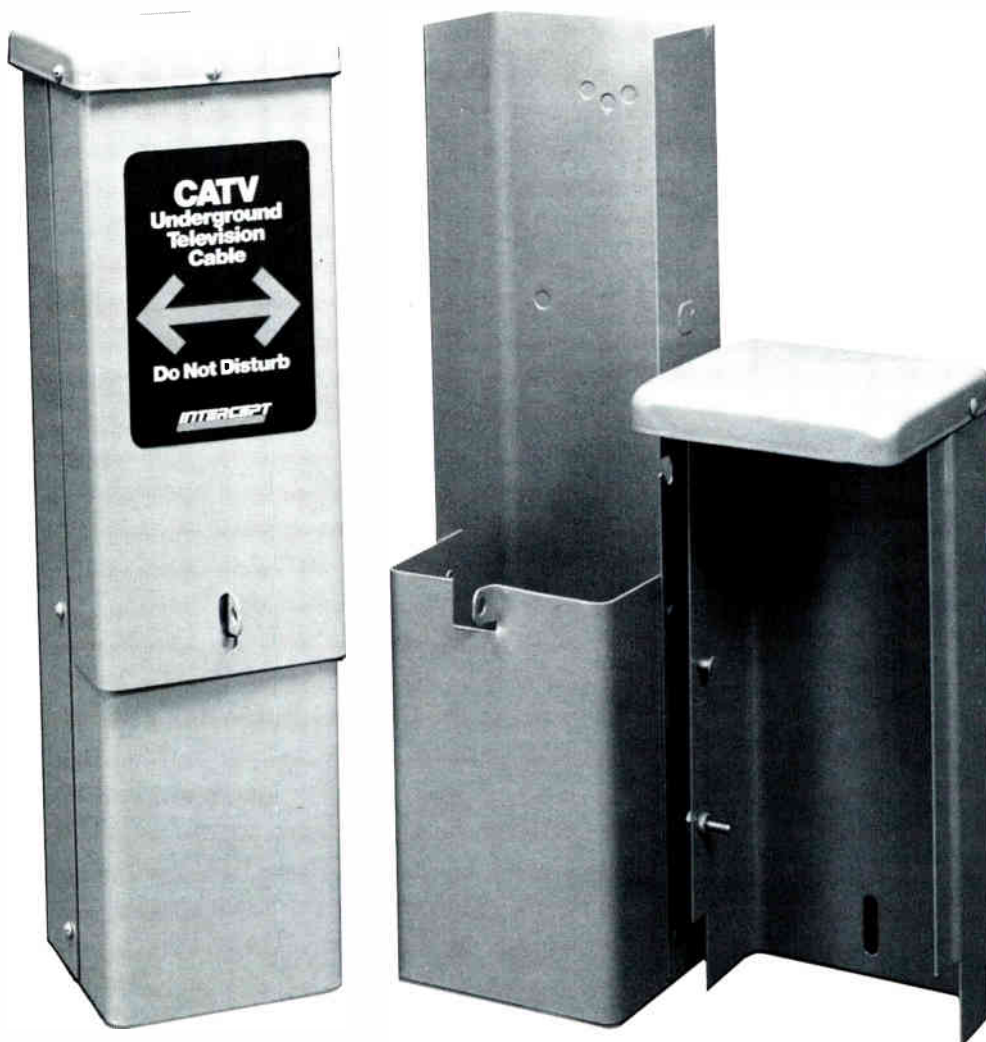
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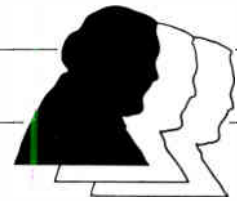
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★ **ComSonics, Inc.**, has announced the creation of three new operational vice president positions. The following executives have been elevated to the position of vice president: **Richard L. Shimp**, vice president of research and corporate development; **Dennis A. Zimmerman**, vice president of system services; and **Carl H. Hensley**, vice president of internal operations and development. **Glen Shomo III** was also made director of product development and production, and **Alex Lushpinsky** was made general sales manager.

★ The Extron Division of **Varian Associates'** Industrial Equipment Group has made two engineering appointments.

William McMakin has joined the division as EeBES project manager. He is responsible for manufacturing, testing, marketing, and sales functions, as well as applications and process lab operations



William McMakin

related to Varian's E-beam lithography systems. One of these, the EeBES-40, is the first commercial system capable of writing wafer circuit patterns at 40 MHz data rates. McMakin was formerly international service manager for Perkin Elmer's ETEC subsidiary. Previously, McMakin managed his own company and served as a lab manager for Celanese Corporation.

Mihir Parikh, Ph.D., has also joined the company as manager of CAD (computer-aided design) engineering for E-beam systems. His responsibilities will include supervision of R&D activities in the areas of computer-aided design and electron-beam lithography.



Mihir Parikh

Parikh is noted for research into incident electron scattering as it pertains to semiconductor E-beam lithography, in particular, to lithography involving sub-micrometer geometries. He was previously a senior scientist and research staff member at IBM Research Labs, in San Jose, California, and in Yorktown Heights, New York. He has developed numerous algorithms and computer programs used to compensate for the proximity effects that occur when incident electrons scatter during E-beam lithography. Parikh's work has been applied both to VLSI (very-large-scale integration) and bubble technologies.

Prior to working for IBM, Parikh received a Ph.D. in engineering science in 1974 and a B.S. in engineering physics in 1969 from the University of California at Berkeley.

★ **Ron Donoghue** has been promoted to chief technician of **Saginaw Cable TV** (Cox Cable) in Saginaw, Michigan. He was the previous sweep tech in Saginaw's 450-mile system. **William Scaife** has been promoted to chief installer of the Saginaw system. Scaife's responsibilities include the installation department, wiring apartments and supervision of contract installers.

★ **John N. Rose** was named director, Telecommunications and Management Division (TMD) of the **Rural Electrification Administration**. Rose succeeds William Kelly, deputy assistant administrator, telephone, who had been acting director, TMD.

In this position, Rose is responsible for developing techniques and criteria relating to the financial and operating performance of REA telephone borrowers. He also

directs agency programs relating to telephone rates and valuation and conducts research and develops marketing and sales methods for new telephone services.

Prior to this appointment, Rose was chief, loans, management and marketing branch, TMD. Before joining REA in 1977, he was with C&P Telephone Company in Richmond, Virginia, where he developed an expertise in cost separations.

Rose is a 1967 graduate of the University of Richmond with a degree in business administration and mathematics. He has also taken numerous courses from Virginia Commonwealth University and the Bell System Schools.

Rose, his wife and two children live in Fredericksburg, Virginia.

★ **Applied Micro Circuits Corporation** (AMCC) has appointed **William Walker** as senior engineer responsible for custom chip development. With a BSEE degree from San Jose State University, Walker brings to AMCC an extensive design engineering background from American Microsystems and Synertek. In addition to selected custom integrated circuit products and projects, AMCC designs and produces families of advanced MOS and high-speed bipolar gate arrays.



Robert C. Enright

★ **Robert C. Enright**, general manager, industrial products, has been named general manager of rectangular products for **ITT Cannon Electric**, Santa Ana, California.

★ **William H. Ellis** has been named to the new position of vice president of operations for Broadband Manufacturing, Inc., a division of **Broadband Engineering, Inc.** Ellis, who will report to Robert J. Savard, the firm's president, was most recently manager of system engineering for General Electric Cablevision's Evansville, Indiana, system. At Broadband,



William H. Ellis

Ellis will concentrate on Broadband Manufacturing's growth along with marketing and new product development. He has a B.S.E.E. from Purdue University and a graduate science degree from George Washington University. He is a senior member and past Eastern vice president of the Society of Cable Television Engineers.

★ **Dr. Lawrence G. Roberts** has been elected as president of **GTE CNS Products**, a newly established component within GTE Communications Network Systems. **J. David Hann** will succeed Roberts as president of GTE Telenet.

The new organization will be responsible for developing and manufacturing new products for GTE Communications Network Systems. It will include the network products and manufacturing functions of GTE Telenet; Cambridge Telecommunications; CNS product engineering, and the development engineering segments of GTE Telecommunications Systems.

In addition to his new responsibilities, Roberts will continue to serve as vice president, technology, of GTE Communications Network Systems, with responsibility for strategic technical direction of the organization.

Roberts served as president of GTE Telenet since June 1979. He began his career in 1963 at MIT Lincoln Laboratory and eventually headed a computer research program there. In 1967, Roberts was appointed director of information processing techniques at the Advanced Research Projects Agency of the

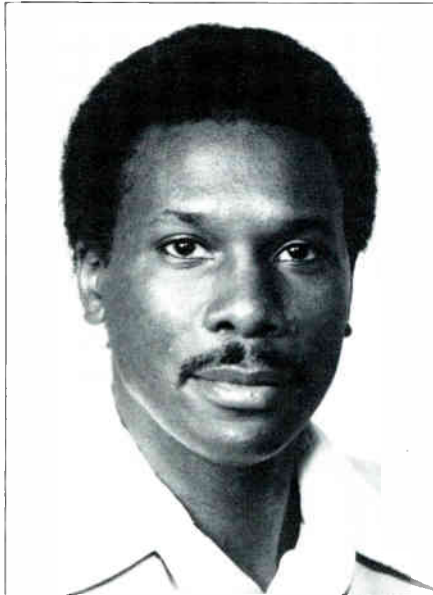
Department of Defense, where he developed ARPANET, the world's first major packet network. He was elected president and chief executive officer of Telenet in 1973.

A native of Norwalk, Connecticut, Roberts received a bachelor's degree in electrical engineering from Massachusetts Institute of Technology in 1959, and a master's and doctor's degree in electrical engineering from the same institution in 1960 and 1963, respectively.

Hann previously served since 1979 as executive vice president and chief operating officer of UNC Resources, Inc., Falls Church, Virginia. He began his career in 1956 with General Electric Company serving for 16 years in several engineering and managerial capacities including manager of large-system product planning in GE's information systems equipment division.

Hann joined Courier Terminal Systems, a subsidiary of Boothe Computer Corporation, in 1972 as vice president of engineering/operations and was elected president and chief operating officer in 1973. From 1976 to 1978, he served simultaneously as president of both Boothe and Courier Terminal Systems.

A native of Kansas City, Kansas, Hann received a bachelor of electrical engineering degree from the University of Minnesota in 1954.

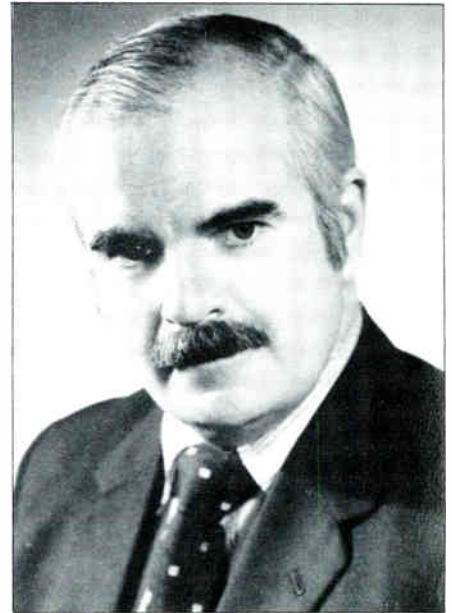


Van Welton

★ **Van Welton** has been named sales manager of **Southern Telecom, Inc.**, the Georgia-based multiple cable television system operator. Welton will have over-all responsibility for the direct sales effort in the 28 franchise areas currently being developed by Southern Telecom and its subsidiary companies in the Southeast.

Welton was previously senior regional manager for American Television and Communications Corporation in Greensboro, North Carolina.

★ **Ed Larrabee** has been promoted to director of marketing sales for **Switchcraft, Inc.**, Chicago, a Raytheon company. He has been manager of distributor operations for the electromechanical component manufacturer. Larrabee is now responsible for all phases of Switchcraft marketing and sales programs, which include marketing through nearly two dozen sales representative firms and industrial, telephone, and general line distributors.



Ed Larrabee

★ **B.J. Jones** has been named engineering services manager for the **Jenel Consultants Corporation** of Dallas, Texas. Jones' major responsibilities are mechanical design of both television and cable studio facilities, mobile units, and satellite earth stations. Previously, Jones was with Texas Instruments of Dallas, Texas.

★ **California Microwave, Inc.**, has named **Robert L. Scrafford** vice president of satellite systems for the company's Satellite Communications Division. He is responsible for the development of California Microwave's business in two-way satellite communications, both domestically and overseas.

Scrafford comes to California Microwave from Future Systems, Inc., where, as director, he participated in systems design for Southern Pacific Communications Corporation, as well as provided consulting service to INTELSAT's operations in the Philippines, Tunisia and Sudan. He was formerly associated with Teleconsult, Inc., a consulting firm engaged in all aspects of electronic communications. He was president of ITT Space Communications, Inc., and prior to that, general manager of Hughes SATELCO, a joint Hughes/NEC company, as well as general manager of Hughes Communications International. Scrafford holds a BSEE from Cornell University.



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COLOR CODE	orange	gold	white	black	green	purple	yellow	red	silver	blue
TAP LOSS										
INSERTION LOSS										
5 MHz		2.2	1.2	.5	.4	.3	.2	.2	.2	.2
300 MHz		2.7	1.4	.7	.5	.4	.3	.3	.3	.3
400 MHz		3.1	1.6	.8	.6	.5	.3	.3	.3	.3
450 MHz		3.2	1.7	.9	.7	.6	.4	.4	.4	.4
500 MHz		4.5	2.0	1.1	1.0	.9	.7	.7	.7	.7
ISOLATION-out to tap										
5 MHz		30	32	34	40	43	46	49	52	55
300 MHz		30	32	34	38	41	44	47	50	53
400 MHz		28	30	32	35	38	41	44	47	50
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