

# CEED<sup>TM</sup>

**SPECIAL SECTION:**  
Satellite Chart

Communications Engineering Digest/The Magazine of Broadband Technology



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- 18 Portable microwave gear for remote origination
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# PHASECOM'S FREQUENCY AGILE STANDBY MODULATOR

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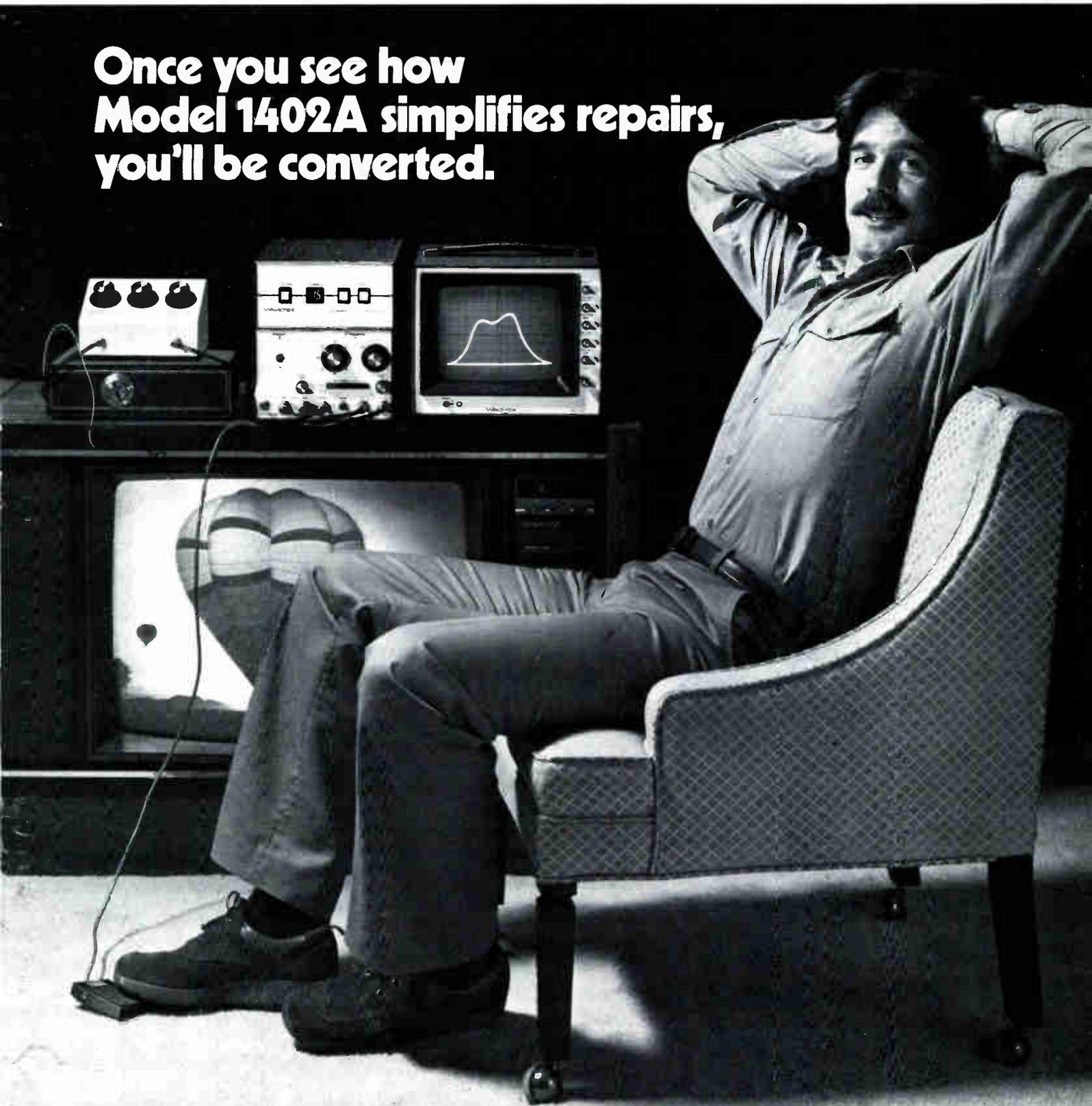
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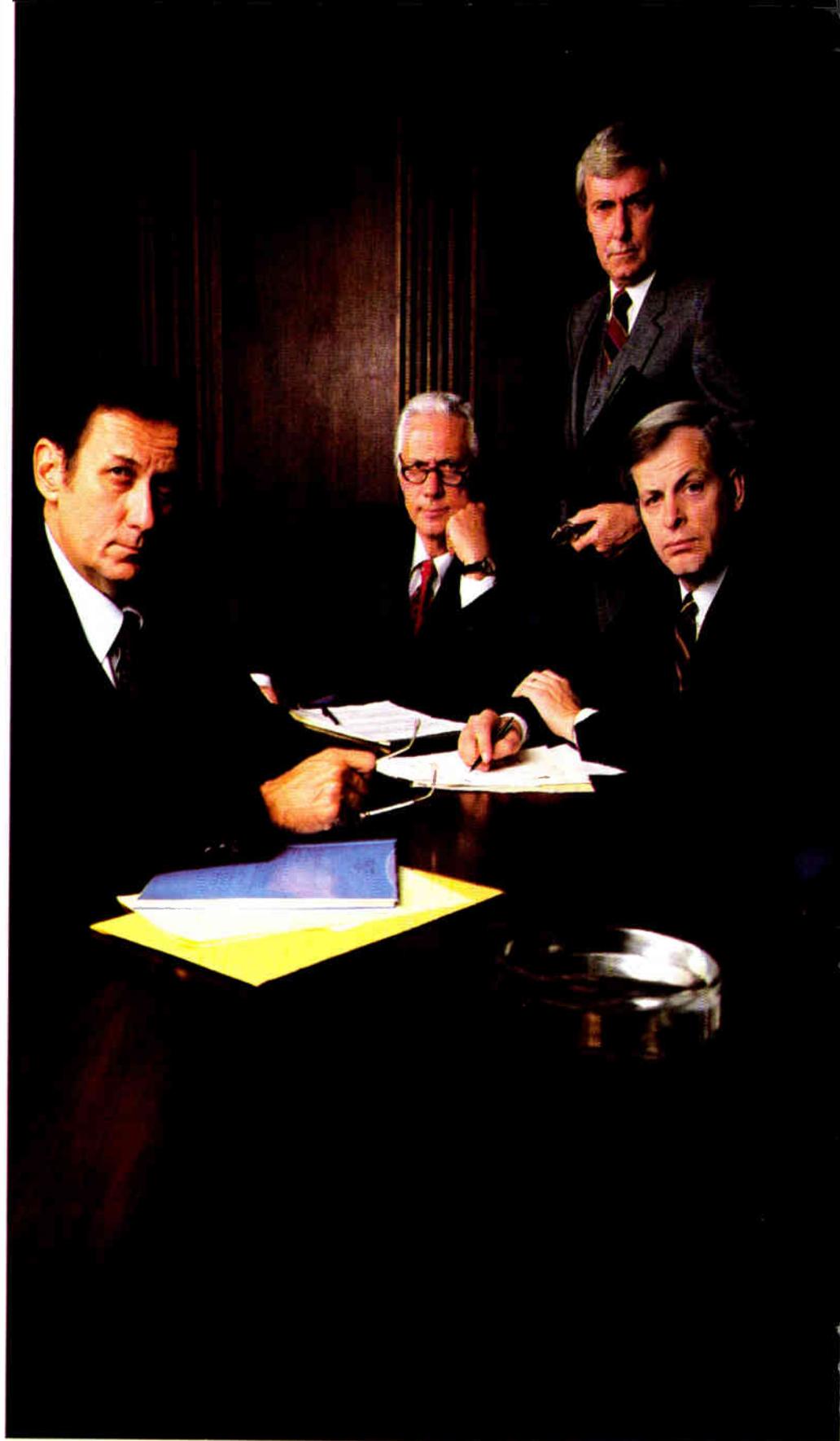
Then, too, there's a case to be made for value received. Jerrold addressable systems, for example, outsell the competition by far. The reason is simple enough: they're the best cost-performance buy in the business.

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INSTRUMENT**

# CED

## TECHSCOPE

### In the public eye **7**

C-COR's Jim Palmer talks about going public and a recent run-in he and his company had with Mr. Dow and Mr. Jones.

## EDITORIAL

### Back to business **11**

Large scale studio production and operation draws a lot of attention, but only in its final polished form, the program. Associate editor Gary Witt found that engineering these programs for signal quality is something to reckon with.

## COMMUNICATION NEWS

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A hybrid CATV network plan calls for wiring of this French city over the next six years at a total cost of \$400 million.

## FEATURES

### The portable microwave revolution **18**

Broadcasters use portable microwave equipment for the majority of their remote and local origination newsgathering. M/A-COM's new 23 GHz portable microwave gear is designed for the cable operator who needs remote origination capability but has a limited budget.

### Quality control in satellite services **20**

Satellite services have spent millions to make quick and dramatic strides in upgrading and maintaining their signal quality in recent years. *CED* explores what some services do to maintain signal quality and what the future holds for quality control in satellite transmission.

## TECH II

## INTRODUCTION

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Sticking to a maintenance schedule may be one of the most difficult tasks facing a cable operator once the system is up and running.

## HANDS ON

### Automated test equipment **34**

This equipment can save a lot of time and trouble for monitoring specified video characteristics.

## TRENDS

### Proof of performance-what's the FCC up to? **36**

With the FCC in the midst of a deregulatory trend, engineering requirements are taking a backseat to marketplace forces.

## PRODUCT PROFILE

### Standby power supplies **57**

As cable becomes a complete telecommunications medium supporting full video, voice and data, the standby power supply will be a mandatory fixture for cable operations.

## DEPARTMENTS

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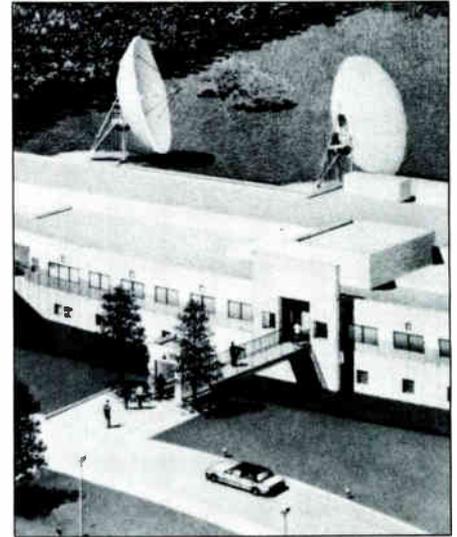
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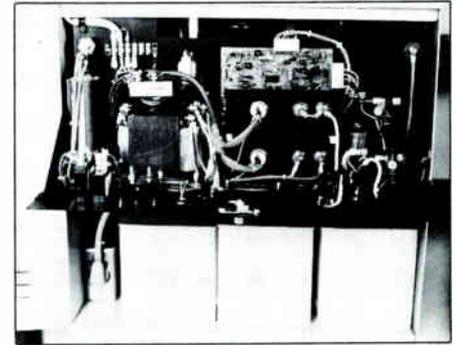
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20



57



## About the cover

This senior video control room at Skaggs Telecommunications in Salt Lake City, Utah, tests, maintains and provides final color shading for all of its studio cameras. There are preset and program monitors, as well as individual monitors, for every camera in the studio. Photo courtesy of Paul Adams-The Negative Approach.

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Executive Offices: 5 Hub Drive, Melville, NY 11747

## Going public

Jim Palmer of C-COR writes in his monthly newsletter that C-COR had a little in-house problem with an unreliable chip capacitor. According to C-COR's top dog, the problem affected only a special batch of amplifiers, none of which were in the field. He goes on to say that they designed the unreliable component out of the unit, which delayed the shipment for two months. C-COR reported this to Dow Jones along with information on order delays and financial projections for the quarter. Palmer claims the big board garbled this message, reporting that business was down, "because of component failure problems." According to Palmer, Dow Jones corrected the error after he, "threatened suit and a few other things." He went on to say that the damage had been done and that rumors still abound that the company has had a "system failure" and has problems with all of their amplifiers. Says Palmer, "What a month—being public is like being a participating visitor at a nudist colony; it all hangs out."

## Back to the alley

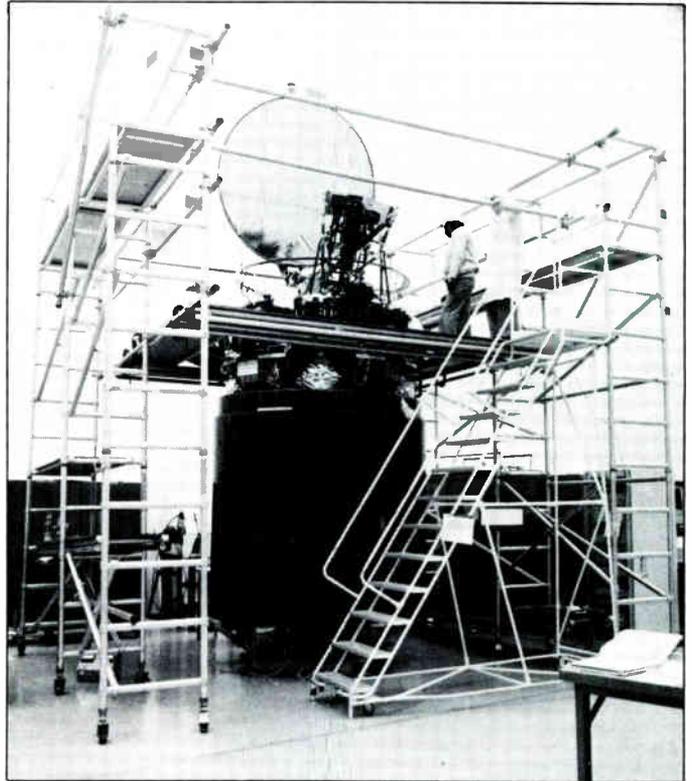
At a Paul Kagan seminar entitled, "Economics of Addressability," held prior to the Texas Show, Ken Gunter, executive vice president of Rogers/UA Cablesystems said that addressability, "has all the earmarks of being the most expensive and unforgiving equipment buy yet for the cable industry." Gunter, along with Bob Rogers, president of TCA Cable, a Texas-based MSO, also said that the subscriber does not want an addressable converter in the home, that it is unsightly and complicated to operate, and that the equipment bought today will last only three or four years, a relatively short time period. Gunter urged consideration for what he called "back to the alley" equipment (pole mounted addressable hardware) that would take hardware out of the home and away from tampering hands.

## Cutting back

Still battling the recession, Tektronix Inc. has notified some 479 employees throughout the company of impending layoffs, including 300 employees at its Clark County, Wash., portable oscilloscope plant. According to Rolf Rudestam, information director of the Instrumentation and Technology Group, the company furloughed nearly 700 employees last fall and roughly 50 percent of them were reassigned to the company's other divisions. Rudestam says that sales have been lower than expected and he can't say how many of those workers just notified eventually will be reassigned. Tektronix' total work force is about 23,000. Their latest cutback represents about 2 percent of total personnel.

## Canadians issue theft warning

"Cable television companies will exercise their right under the Criminal Code of Canada to prosecute persons using homemade or other equipment to obtain pay television without paying for these services," warned Michael Hind-Smith, president of the Canadian Cable Television Association, last week. "CCTA members are concerned that the public may not be fully aware of the potential legal consequences" of theft of service, Hind-Smith said. According to the CCTA, there have been numerous reported incidents of cable theft. A Saskatchewan provincial court judge recently convicted one resident of theft of pay TV via a homemade descrambling device.



USCI will transmit a five-channel medium power DBS service via the ANIK C-2 satellite (shown above).

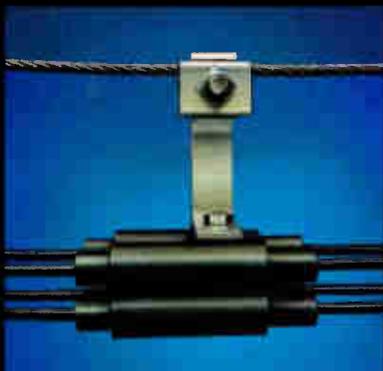
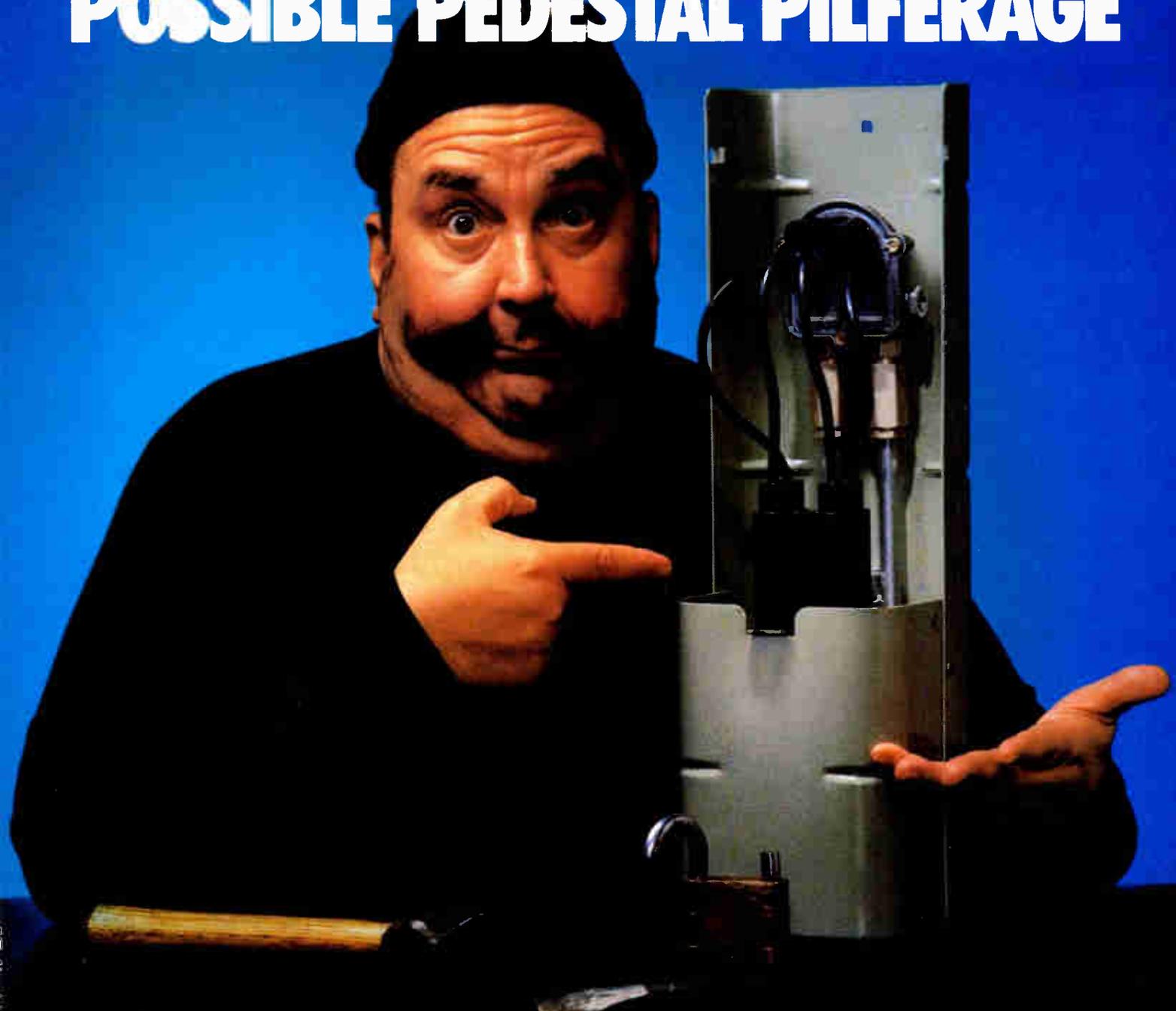
## Buy a piece of the bird

The Prudential Insurance Co. has invested \$45 million in a direct broadcast via satellite venture known as United Satellite Communications Inc. and is the largest single shareholder in the new entity. Another major shareholder, General Instrument, will supply over \$600 million worth of satellite transmit/receive gear over the next three years. General Instrument will manufacture dishes for home use (about three feet in diameter) that will initially receive signals from a five-channel medium power DBS service via the Anik C-2 satellite. USCI plans to switch over to GTE Satellite Corp.'s G-Star 1 shortly after its scheduled launch in mid-1984. USCI will begin as an entertainment service but will also become involved in enhanced services.

## Get off my sidelobe

In a panel discussion on satellite spacing at the Texas Show, Ralph Haimowitz, CATA engineering director, and Jim Grabenstein of Microdyne Corp. said that three- and even two-degree spacing is inevitable because of the demand for space in the geostationary arc, and that spacing requirements may go into effect as early as the mid-1980s. Both panelists pointed out that tighter spacing in the orbital arc may jeopardize the effectiveness of many small diameter antennas and hurt the quality of the picture received by many system operators. They suggested that operators may want to install larger diameter earth stations in planning for the long run because multifeed systems may have a problem with the loss in gain off the boresight of the antenna. Tighter spacing in the geostationary arc may degrade the sidelobe characteristics of smaller diameter dishes.

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# Seminars

## March

**8:** The winter meeting of the **Michigan Cable Television Association** will be held at the Hilton Inn, Lansing. Contact John Liskey, (517) 372-4811.

**8-10:** A **Jerrold** technical seminar will be held in Dallas. Contact Diane Bachman, (215) 674-4800.

**9-10:** **Probe Research Inc.** will hold a seminar on "The New Local Telecommunications Business: Linking the Office to the World" at the Plaza Hotel in New York. Contact (201) 285-1500.

**9-11:** **Magnavox CATV Systems** will hold a field training seminar with its Mobile Training Center in Phoenix, Ariz. Contact Laurie Venditti, (800) 448-5171; in New York, (800) 522-7464.

**13-15:** The **Ohio Cable Television Association** annual convention and trade show will be held at the Hyatt Regency in Columbus, Ohio. Contact (614) 461-4014.

**14-16:** **Magnavox CATV Systems** will hold a field training seminar in its Mobile Training Center in Phoenix, Ariz. Contact Laurie Venditti, (800) 448-5171; in New York, (800) 522-7464.

**14-16:** **Scientific-Atlanta** will be conducting a product training seminar in Portland, Ore. Contact Tammy Waller, (404) 925-5847.

**16-18:** **Scientific-Atlanta** will be conducting a product training seminar in San Jose, Calif. Contact Tammy Waller, (404) 925-5847.

**21-25:** A **CATA** advanced technical training seminar, co-sponsored by the **Southern Cable TV Association**, will be held at the Best Western Downtown in Charlotte, N.C. Contact the CATA Engineering Office, (305) 562-7847.

**22-24:** A **Jerrold** technical seminar will be held in Kansas City, Mo. Contact Diane Bachman, (215) 674-4800.

**24-25:** The annual convention of the **Georgia Cable Television Association** will be held at the Atlanta Marriott. Contact Nancy Horne, (404) 252-4371.

**30-31:** The **Oklahoma Cable Television Association** will hold its annual convention at the Lincoln Plaza in Oklahoma City. Contact Jay Allbaugh, (405) 721-6377.

## April

**4-8:** The **Community Antenna TV Association** will conduct an advanced technical training seminar at the Uplander Motor Inn in Upland, Calif. Contact the CATA Engineering Office, (305) 562-7847.

**6-8:** **Magnavox CATV Systems** will conduct a field training seminar with its Mobile Training Center in Dallas. Contact Laurie Venditti, (800) 448-5171; in New York, (800) 522-7464.

**10-13:** The annual convention of the **National Association of Broadcasters** will be held at the Las Vegas Convention Center, Las Vegas, Nev. Contact the NAB, (202) 293-3500.

**11-13:** **Magnavox CATV Systems** will conduct a field training seminar with its Mobile Training Center in Dallas. Contact Laurie Venditti, (800) 448-5171; in New York, (800) 522-7464.

**12-14:** A **Jerrold** technical seminar will be held in Dallas. Contact Diane Bachman, (215) 674-4800.

**17-19:** The annual convention of the **Virginia Cable Television Association** will be held at The Homestead in Hot Springs. Contact Dick Carlton or Lorraine Whitmore, (804) 358-7060.

**19-21:** A **Jerrold** technical seminar will be held in Portland. Contact Diane Bachman, (215) 674-4800.

**25-27:** The **International Association of Satellite Users** will sponsor SATCOM '83 at the Hyatt Hotel in Orlando, Fla. Contact Ann Roark, (703) 759-2094.

## May

**2-6:** The **Community Antenna TV Association** will conduct an advanced technical training seminar at the Best Western Coachman in Cranford, N.J. Contact the CATA Engineering Office, (305) 562-7847.

**4-6:** **Magnavox CATV Systems** will conduct a field training seminar with its Mobile Training Center in Kansas City, Kan. Contact Laurie Venditti, (800) 448-5171; in New York, (800) 522-7464.

**5-7:** The **University of Wisconsin Extension** will conduct a seminar on "Municipal Administration of Cable Television" at the Wisconsin Center in Madison. Contact Barry Orton, (608) 262-2394.

**6-8:** The **Society of Cable Television Engineers** will hold its first cable TV hardware exposition, Cable-Tec Expo, at the Dallas Convention Center. Contact SCTE, (202) 293-7841.

**9-11:** **Magnavox CATV Systems** will conduct a field training seminar with the Mobile Training Center in Kansas City, Kan. Contact Laurie Venditti, (800) 448-5171; in New York, (800) 522-7464.

**10-12:** A **Jerrold** technical seminar will be held in Minneapolis. Contact Diane Bachman, (215) 674-4800.

**25-26:** The **Public Service Satellite Consortium** will conduct a workshop in Washington, D.C., on "How To Video-Conference Successfully." Contact (202) 331-1154.

## Looking ahead

### 1983

**April 10-13:** National Association of Broadcasters convention, Las Vegas Convention Center.

**May 6-8:** SCTE's Cable-Tec Expo, Dallas Convention Center.

**June 5-7:** The Microwave Communications Association convention, Washington Marriott Hotel.

**June 12-15:** National Cable Television Association convention, Houston.

**June 27-29:** Videotex '83, New York Hilton.

**August 7-10:** Cable Television Administration and Marketing Society conference. Town and Country Hotel, San Diego.

**August 11-14:** Community Antenna Television Association's CCOS-83, Arlington Hotel, Hot Springs, Ark.

**September 7-9:** Great Lakes Cable Conference, Indianapolis Convention and Exposition Center.

**September 8-10:** Eastern Show, Georgia World Congress Center, Atlanta.

**September 11-14:** The United Kingdom's first "International Cable and Satellite Television Exhibition and Conference, CAST 83," The National Exhibition Centre, Birmingham, England.

**October 10-11:** The Iowa Cable Television Association 1983 Cable Convention, Stouffers Five Seasons Hotel in Cedar Rapids, Iowa.

**Nov. 1-3:** Atlantic Cable Show, Atlantic City, N.J.

**Dec. 13-15:** Western Cable Show, Anaheim Convention Center, Anaheim, Calif.

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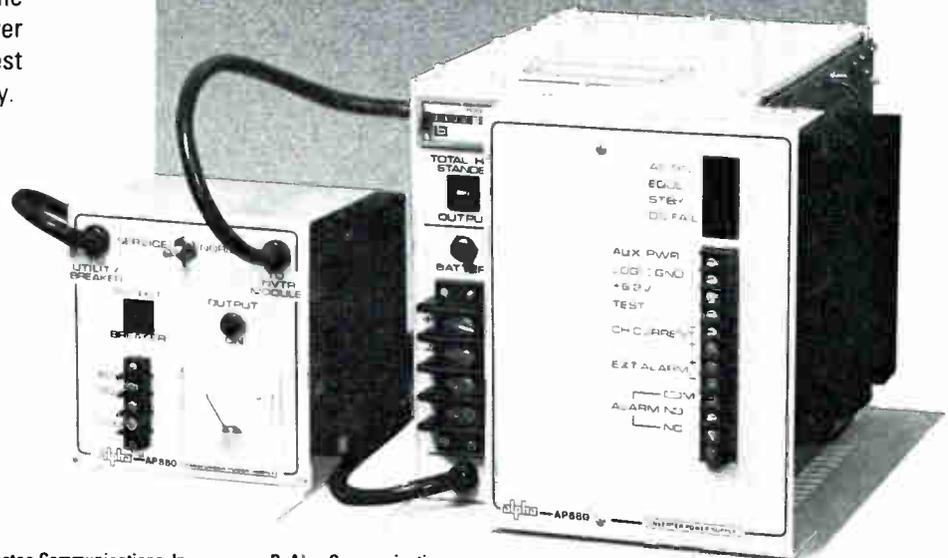
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## FYI

We noticed at the Texas Show that there was a curious absence of studio production and post-production equipment from major manufacturers like Sony, RCA, Ikegami and the like. We don't know why that was, but it prevented us from getting a first-hand look at the state-of-the-art in studio gear. All this leads to nothing more than noting that this issue of *CED* provides some information on engineering aspects of studio production and post-production. Associate editor Gary Witt set about contacting engineers who work for some of the major programming services, pay and basic, to find out how they set up a large-scale studio operation. The differences between a major programming studio and a local system studio operation are evident, but Witt has uncovered some elements of production and post-production that any system operator can take under advisement in building or upgrading a studio. Local and remote origination have rapidly become a major force in the industry as a franchising element and as an important aspect of community service. So, the role of a studio, particularly a well equipped and efficient one, is worth examination.

Along those lines, contributing writer Toni Barnett uncovered the fact that M/A-COM has developed and completed testing on its 23 GHz portable microwave gear. The 23 GHz equipment is a low-cost alternative to the commonly available 13 GHz units now in use for commercial broadcast newsgathering. Affordable portable microwave links could bring cable systems up to par with the remote newsgathering ability of local broadcasters and expand the ability of systems to carry local news and features both inside and outside of its franchise area(s). Barnett found out the only drawback is that the FCC has not approved the 23 GHz equipment for cable applications. But make no mistake about it, remote origination and local production will be a strong marketplace force in the 1980s.

The creation of flexible communication links is the basis of our business and as we rely on our systems for new business, we have to ensure that those links will work when we need them, all the time. Our product profile, featuring standby power supplies, is a timely one for the industry and specifically for the cable system that offers communications links in the form of data transmission, home and business security and hospital or medical monitoring. In **TECH II** this month, we touch on the development of maintenance schedules for operating systems and this not only encompasses preventive maintenance, but day-to-day optimal system performance as well.

Naturally, a cable system is like any other 24-hour business; it needs to have backup in case the primary system, for whatever reason, ceases to function. And we've seen cases recently where, whether by an act of God or vandalism, a standby power source is particularly valuable. More so when there's a life at stake.

About the Texas Show, Bill Arnold and his crew deserve another hearty congratulations for a well-run and genuinely fun show. We did wonder about the lack of video equipment exhibitors. They generally make a splash at the bigger trade shows, notably NCTA and the Western, but the Texas show has always been hardware-oriented and it seems unnatural not to exhibit cameras, switchers and post-production units at the big show down in Texas.



Volume 9, No. 3

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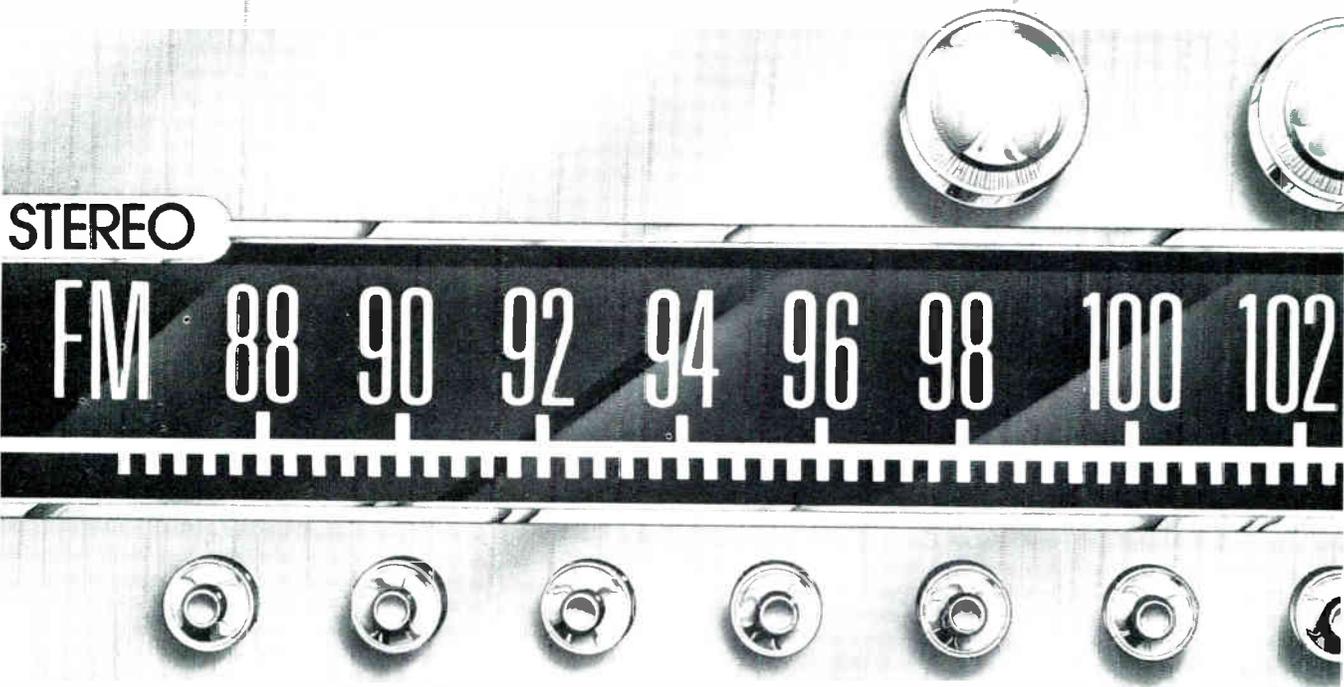
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## Hybrid fiber/coax network planned for Paris

PARIS, FRANCE—The hybrid coaxial/fiber optic switched network approach to CATV signal distribution has been embraced by Mayor Jacques Chirac in an ambitious plan calling for the complete wiring of Paris over the next six years.

In a move widely interpreted as an effort to upstage the socialist-run national Ministry of Posts and Telecommunications, Chirac has positioned the city to take the lead in getting a national cable television network off the ground. The national government's plan calls for the launch of a TDF-1 satellite by 1985 and installation of earth stations and headend facilities in many suburban and rural localities. Larger cities such as Paris are being counted on to begin building their own systems for

eventual interconnection with the national network.

According to the Chirac plan, Paris would be wired in three phases of development at a total cost of about \$400 million. The first phase would provide six channels of programming to 10,000 homes and businesses in the urban core by the end of 1984 at a cost of \$14 million. Phase two would expand the service to 12 channels with some 130,000 homes to be wired by late 1986 at an added cost of \$112 million. The final phase, bringing 60 channels of entertainment and interactive services to 360,000 additional homes, would cost \$280 million, with completion set for 1989.

The Parisian plan reflects growing

French acceptance of fiberoptic technology, which is being employed in a full-scale, interactive system scheduled to go on line in Biarritz later this year. The mayor's plan also acknowledged the findings of British government telecommunications experts, who are calling for hybrid coaxial/fiber systems employing the star, switched network design. This configuration, currently used in the U.S. by Times Fiber in its mini-hub horizontal and vertical distribution systems, differs from traditional CATV designs in that signals to and from households are switched at numerous hub sites, obviating the need for signal scrambling or extensive in-home signal processing.

Chirac indicated he expects the French government to contribute up to a third of the \$400 million construction cost. The city will underwrite another third and hopes the Parisian newspaper groups will come up with the remainder as an investment in two-way information technology.

## Alternative to microwave

# Laser link developed for short-haul

NEW YORK—General Optronics, a specialist in laser technology, has developed a laser-based alternative to microwave for certain applications in short-haul, over-the-air transmission. The company has developed what it calls the Atmospheric Optical Communications System (AOCS) for transmission of video, voice and data channels up to a distance of 16 kilometers (10 miles). Channel capacity of the system varies according to transmission distance, but the company says that, typically, laser can deliver eight video channels with minimal degradation through all types of atmospheric conditions.

The first commercial user of the system is MITRE Corp., a non-profit systems engineering and research organization based in Boston. The AOCS has been installed at MITRE's McLean, Va., facilities just outside Washington, D.C., to link the communications system in a new building to the broadband cable bus network operating in the company's two older buildings.

According to Milton Harper, systems engineer for MITRE, the company chose the AOCS as a cost-effective alternative to underground coaxial wiring or microwave transmission to bridge a 200-meter distance across a major thoroughfare.

Harper said the unit has been delivering one data and six video channels at a signal to noise ratio of 40 dB. He noted

that an important advantage of the technology in comparison to microwave products he had examined was there was no need to modulate signals to different frequencies. According to Harper, the system has transmitted signals ranging from the 40 up to 270 MHz. Monitoring through a variety of weather conditions, including fog and the February blizzard,

showed no significant degradation in signal quality.

Harper said the chief problem with the unit, which was installed a year ago, has involved sensitive line-of-sight adjustments that were required as a result of wind impact. A retrofit is in progress, he said, which should do away with the need for such adjustments.

## Jerrold hit with injunction

NORRISTOWN, Pa.—After listening to 17 days of testimony, a Pennsylvania court has handed down a preliminary injunction to prevent two former Bell Labs employees from working on videotex systems development for General Instrument's Jerrold division. The order comes in a suit filed by Bell Laboratories last October, which alleges that Jerrold is receiving confidential and proprietary information relating to videotex frame creation terminals from former Bell employees Arthur Mansky and John Gaby. Mansky and Gaby have been ordered not to participate in further research and development of PLP coding display algorithms for Jerrold at least until May 1. PLP stands for presentation level protocol and is a computer language

format for transmitting videotex information. It is an essential link connecting videotex system databases.

The court order was handed down without opinion, so the exact basis for the order is unclear. Also unclear is the question of why the injunction will remain effective only until May 1; Bell Labs' attorneys had asked that the order be effective until the date of trial. It is highly unlikely that trial in the matter can be scheduled before May 1, given the courts heavy docket.

Attorneys for Jerrold are considering an appeal of the order. A spokesman for Jerrold said the injunction would not affect the company's previously announced timetable or its ability to meet commitments.

# MCI makes largest transponder buy in history

WASHINGTON—MCI Communications Corp. has announced the largest transponder purchase in telecommunications history. The company has signed an agreement in principle with Hughes Communications Inc. to purchase a total of 24 transponders on the Galaxy II and III satellites. According to MCI Chairman William McGowan, the transponder purchase will, "help prepare us for the anticipated increase in demand for our services which will occur when we have equal access to local telephone subscribers."

According to the company, the 24 transponders, 12 on each of the Galaxy satellites, will provide more than 48,000 circuits to increase MCI's total capacity for data and voice services by nearly 50 percent. Gary Tobin, senior manager of public communications for MCI, said that the company will spend nearly \$200-\$300 million over the next two years not only on the transponders but also for additional earth stations and existing circuit leases.

MCI is anticipating that an impending communications explosion encompassing voice, data, nationwide paging and cellular radio mandates their commitment to

the new information technologies. "We don't see anyone else making a commitment to the new technologies in light of the AT&T divestiture that will begin on Sept. 1, 1984," Tobin said. Terms of the divestiture will provide MCI with access to some 60 percent of the nation's telephones that are rotary dial and currently cannot use the MCI system. "Our anticipated circuit demand by 1984 will immediately cost-justify the (transponder) purchase," McGowan said.

## RCA to launch 40-watt K-band satellites

SAN FRANCISCO—RCA has announced that it will launch two 40-watt K-band satellites in 1985 as part of a plan to expand their services to existing markets such as data and voice transmission and to develop new services related to the expansion of the SMATV market. RCA will build and operate the satellites, designated Satcom K-1, K-2 and K-3, in hopes that

the higher power and frequency of the K-band satellites (12/14 GHz) will enable them to transmit directly to smaller rooftop antennas for the distribution of network and syndicated television programming, teleconferencing, and for private voice and high-speed data networks. Each of the satellites would have 16 transponders with four backups. A third launch is planned for 1987.

## Business Notes

■ **Anixter Communications and Sachs CATV Division** have announced an agreement that makes Anixter the distributor of Sachs' full line of drop hardware. Sachs CATV Division, a unit of **Sachs Canada Inc.**, manufactures a complete line of CATV drop installation hardware.

Anixter Communications also received a contract from **Telecommunications Inc.** for the supply of a minimum of 100 complete TVRO systems. The order will include 5.0-meter TVRO antennas, manufactured by Anixter Mark, and receivers and low noise amplifiers, manufactured by Scientific-Atlanta and M/A-COM. Anixter will coordinate the installation of these earth stations, which will be used throughout the country to receive additional services from Westar 5 and to transmit data. Installation of the initial 100 earth stations

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is scheduled to be completed by March 1, 1983.

■ According to a recent agreement, **Jerrold** will furnish \$1.4 million worth of CATV converters to **Coaxial Communications** of Columbus, Ohio. The equipment, which is expected to go to five new systems and system rebuilds in and around Columbus through the next year, will include mid-band set-top converters, 36-channel converters, converter/descramblers and 58-channel converter/descramblers. When construction of the systems is completed in 1983, 1,000 miles of plant will pass 110,000 homes, bringing 35-channel service to approximately 65,000 subscribers.

■ **AM Cable TV Industries Inc.** received a turnkey contract from **Rogers U/A Cablevision** for the construction of approximately 500 miles of distribution system in Fort Smith, Ark. Work for the contract, valued at \$5 million, began this past January. Century III electronics are being used in the system.

■ **Avantek Inc.** has announced unaudited results of its 1982 fiscal year ended Jan. 1. Sales were slightly more than \$100 million, an increase of approximately 23 percent over sales for 1981. Year-end backlog for the company increased to approximately \$53 million, 20 percent over the backlog reported at the end of 1981. According to an Avantek spokesman, company profits will be announced in

early March, soon after the normal audit process is completed.

■ **Texscan Corp.** has announced the signing of a warranty and repair service agreement with **RO VAL Technical Services Inc.** of Torrance, Calif. According to officials from both companies, the contract will provide Texscan with an authorized warranty and repair base for its test equipment on the West Coast.

■ **Klungness Electronic Supply (KES)** has established a full-service repair facility at its headquarters in Iron Mountain, Mich. This repair facility will be operated by Ralph Wesala and equipped with a complete on-premise testing laboratory and an in-stock computerized parts inventory. Testing and repair service on all makes of CATV and TVRO headend equipment will be offered.

■ The division of microwave communications products of **Hughes Aircraft Co.** has received an order for an eight-channel FM microwave system from Suburban Cablevision of East Orange, N.J. The microwave system will be used to transmit video programming from Suburban's new TV-3 public access studio and satellite earth station site in Avenel, N.J., to its headend site in Woodbridge, N.J. Since frequency interference at the Woodbridge site impedes earth station coordination, an AML multi-channel AM microwave system will be installed to distribute signals received at this site to

other area Suburban systems. The full order from Suburban includes an eight-channel low-power transmitter, a multi-channel AML receiver and FM modulators and demodulators.

■ **Pioneer Communications of America Inc.** has sold 6,000 BC-2301 and BC-2311 cable television converters to **Continental Cablevision Inc.** The BC-2301 58-channel standard alignment and BC-2311 52-channel custom-aligned converters are both 400 MHz, set-top, rotary-dial tunable converters. Both units are covered by a Pioneer two year warranty. The order is the first of its kind that Pioneer has received from Continental.

■ **TOCOM Inc.** has announced price reductions of up to 33 percent on its 3000 home alarm terminal and remote arming control station. The amount of these price reductions, which became effective this past February, depends upon configuration. TOCOM's arming control station now is being offered at \$36.50—a 33 percent reduction from its previous price—when ordered in quantities of 1,000 or more. The TOCOM 3000 home alarm terminal, equipped with an RF modem, has been reduced 12 percent to \$243 per unit, while the price of the home alarm terminal has been cut 18 percent to \$225. For redundant operation, the TOCOM 3000 can be configured with both an RF modem and digital communicator for \$285, 15 percent less than the previous price.

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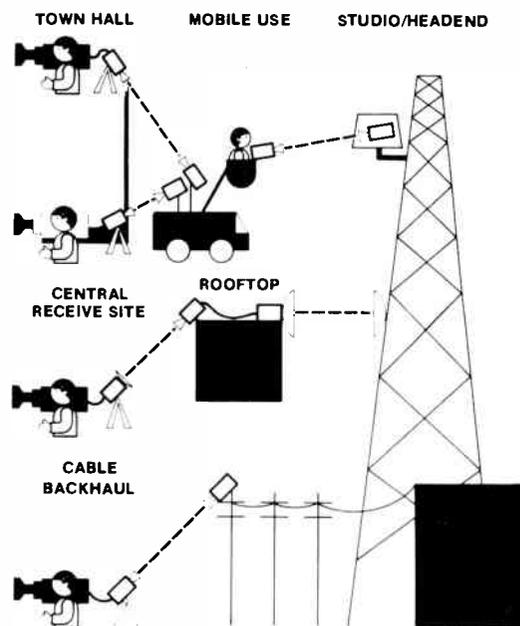


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# THE PORTABLE MICROWAVE REVOLUTION



**Portable microwave technology isn't just for broadcasters anymore. M/A-COM has devised a Community Access News system for local origination that cable operators can use to their advantage.**

By Toni Barnett

Portable microwave equipment makes the vast majority of remote newsgathering possible for today's broadcasters. M/A-COM equipment is in use for live broadcast via helicopter or mobile van for broadcasters nationwide, but it was not until recently that the company began testing the equipment for use by cable operators.

Don Sicard, northeast regional sales manager, CATV Satellite Group, for M/A-COM, feels the time has come to integrate portable microwave technology with cable. Sicard played a major role in designing the MA-13CP transmitter/receiver, which is the heart of M/A-COM's Community Access News (CAN™) system. More than 500 of these ultra-portable units presently are being used by broadcasters across the country. Used on their own, or with the MA-12X or MA-12G fixed link equipment, these devices provide wide flexibility to the cable operator.

"The CAN system is an application that's just starting to catch on in the cable industry," Sicard explained. "It's a concept that can be integrated with cable for live local origination, advertising, subscriber satisfaction and for franchising."

#### The CAN system

The Community Access News system is used to provide local origination (live or taped) from a mobile van or from a remote location back to the cable system's headend for distribution over the local origination or access channel.

The basic CAN system is a hand-carried unit which includes two separate tripods, a transmitter/receiver and a set of transmit/receive horn antennas—all for about \$15,000.

The MA-13CP system provides the cable operator with a lightweight, compact microwave link for live coverage of news and sporting events. A "live" microwave relay eliminates the transportation delays of camera tape coverage, and active relay to the headend/studio puts fast-breaking news "on-the-air" or on videotape for playback whenever needed. The MA-13CP transmitter is used with a miniature, portable TV camera and battery pack. Using this system, a cable operator can provide instant community access news.

The MA-13CP system features the advantages of FM transmission with quality video and high fidelity program

audio. Both the transmitter and receiver have waveguide connections and can accept a variety of antennas. They are normally equipped with small 18 dB gain horns (selected right-handed circular, left-handed or linear polarization) for ranges up to one mile. Ranges up to five miles or more can be achieved by equipping one end of the link with a two- or four-foot parabolic antenna.

Advantages of this system include the use of less expensive video cameras. While the MA-13CP can't improve camera images, it will reproduce accurately. High performance specifications include audio and video signal-to-noise ratios at 60 dB (weather permitting). Ambient operational temperature range is -30 degrees to 50 degrees. Relative humidity is 0 to 95 percent (+10 to +40 degrees).

Options for the MA-13CP ultra-portable microwave link include: a remote-control positioner with radome; two- or four-foot parabolic antennas; GaAs FET receive preamplifiers for extended range; and customized equipment transportation cases and tripods.

Applications for this new system vary from combining the portable microwave with cable for remote areas to utilization of older systems that do not have an

*Continued on page 24*

*Toni Barnett is a communications industry consultant living in Denver, Colo.*

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## Find signal leakage before the FCC fines you.

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RF signal leakage is not a new concern for cable system operators.

Loose connectors, hairline cracks in expansion joints, loose or corroded covers on equipment housing can all lead to signal leakage problems.

What is new is the crackdown on violators of the FCC regulations.

Vitek can help you avoid costly penalties and repairs with the Tracers. Both the compact TR-1 and TR-2 RF Detection Receivers locate and measure leakage and determine whether radiation exceeds FCC limits.

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# Signal Quality

## Getting it and keeping it

By Gary Witt  
Associate Editor

Sometimes it's a matter of squeezing those last few dBs out of your available equipment. Sometimes it means upgrading that hardware or creating an entirely different equipment array. But whatever the approach, signal quality is of crucial importance to a successful cable operation. And concerns with signal quality literally follow the signal itself, from the production and post-production end of it all the way through the local plant. To be competitive, a system must provide the clearest, sharpest reception possible—after all, that's essentially how cable started, as a way to improve poor reception and provide reception where there was none.

In today's systems and for today's programmers, quality control has become a very specialized area. Where once the chief engineers of programming services and MSOs were responsible for a wide variety of engineering concerns—everything from system design and installation to maintenance—video engineers today are narrowing the scope of their attention. And some of the more established engineers find their jobs have changed from the role of chief tech to that of vice president, with administrative responsibilities outweighing their technical responsibilities.

One result of this specialization process is the creation of separate quality control centers within programming services; and one company that seems to be constantly upgrading its quality control procedures is Turner Broadcasting. As TBS' Vice President of Engineering Gene Wright explains, "We are right now involved in redoing our quality control operation for incoming satellite feeds for CNN. The incoming operation will be a whole new facility that will be ready by April 15. All feeds will be set up just as they are in any

other network; that would entail the use of special vectorscopes and waveform monitors, and constant communication with the bureaus when they make the feeds."

When the bureaus get ready to make a feed, says Wright, from just about anywhere in the world, an engineer at CNN's downlink facility will be in contact with the remote, setting up the levels prior to the feed. When they make the feed, the tape will be played back immediately to check quality once again. If there's a crease in the tape, or if the signal quality deteriorates during the feed, the tape can be rerun. To facilitate matters, Wright recently has brought in an additional quality control engineer for CNN, CNN Headline News, and WTBS to ensure compatibility among them.

"We're constantly striving to improve quality control," said Wright. "We use ¾-inch tape coming from the field, which is not the best quality in the world, so we

have to be very careful not to add anything to the signal as it comes in—since that's as good as we're going to get.

At present, TBS has secured a second transponder on Westar IV for incoming news. Feeds also are made over standard telco lines, the same way affiliates of the three broadcast networks are able to criss-cross the country. The telco video lines allow switching between the New York and Washington, D.C., studios.

In 1979, the FCC inspected WTBS for signal quality. Measuring the signal off the air with a mobile technical unit, they went through the plant and found no technical deficiencies at all. The inspection resulted in a number 1 TAOS rating for TBS, putting the station in the top 1 percent of broadcast stations nationwide.

### Paying attention to RF

Most news-oriented services have similar problems, concerns and solutions. Just as CNN monitors its tape quality, and



Group W's Satellite News Channel studio was designed to accommodate a number of different programming formats

signal quality, so Group W's Satellite News Channel has its own quality control mechanisms in place.

The Group W transmission control facility in Stamford, Conn., was designed to accommodate a variety of programming services—not just SNC or the Nashville Network. In fact, as Altan Stalker, Group W's manager of transmission systems and quality control, says, the facility is generic, and not geared for any one service or type of service.

According to Stalker, Group W's efforts in the field of quality control do not stop at just the video and audio aspects of the signal. The RF aspects, he says, receive a great deal of attention. "We spend a lot of time on RF," said Stalker, "because that's an area that seems to have more potential for problems these days than the video or audio does."

Group W's Stamford facility—which utilizes spectrum analyzers, audio and video monitoring, and deviation test sets—allows the technical staff to look at the carrier of a signal to check saturation power levels of the transponder as well as audio and video deviation.

"Audio deviation is the item which seems to give people the most problems," says Stalker, "since there really is not a good standard for that in the industry yet. What we have done is simply adopted what we feel is probably the most commonly used standard for audio deviation, and then we've insisted that all stations doing business with us adhere to that."

Not many companies have on line audio deviation test sets, but Group W does. Stalker says that the result of this capability, though, is that the viewer, whether at the headend or in the home, receives uniform audio levels. The monitoring is important, particularly to SNC, to eliminate variations in levels from one satellite feed to another.

As for the video and audio monitoring, Stalker says there is a separate position devoted to checking incoming material quality. "As discrepancies are noted, we log those, and if it's something that has to be corrected immediately we contact the station right then."

According to Stalker, the Group W uplink facility in Stamford—which is connected to the transmission control room by microwave—is the largest video uplink in the U.S., consisting of two 11-meter antennas and a 10-meter antenna, linked to 10 high powered amplifiers (HPAs). It's capable of uplinking eight simultaneous programs with complete protection.

On a lesser scale than CNN or SNC is C-SPAN, providing gavel coverage of the US House of Representatives as well as a public affairs and features-oriented package. The change in emphasis—and a change in budget—accounts

## Digital technique is key

# HBO Scrambling Choice Brings Ancillary Benefits

For engineers ever on the lookout for ways to enhance their signal quality, HBO's selection of M/A-COM's VideoCipher scrambling/descrambling technology is something of a windfall. And it could eventually provide system operators with a wider array of choices in nationally delivered teletext services.

HBO's long-awaited choice of a security system, announced in late January, was, of course, predicated on the pay service's desire to eliminate unauthorized signal reception in as secure a way as spending limits would permit. But the selection of M/A-COM subsidiary LINKABIT's digital time-shuffling technique brings important ancillary benefits as well.

As explained by Klein Gilhousen, assistant vice president of engineering for LINKABIT, VideoCipher transmits two digital audio channels during the horizontal sync interval, eliminating the need for audio subcarriers and the resultant signal degradation. Tests have shown, he said, that without the subcarriers, the video signal-to-noise ratio improves by one and a half dB.

The complex scrambling process first transfers the HBO analog video and audio signals to a digital mode and then scrambles both before bringing the video back to analog for uplink to the satellite. At the cable system headend, the descrambling unit processes the analog signal back to digital, decodes it and then translates it back to analog video.

Because the descrambling unit has outlets permitting both analog and digital dissemination of the unscrambled audio signal, Gilhousen said, cable operators will have the option of offering subscribers digital stereo into the home, assuming, of course, they acquire the necessary transmission equipment. As for analog distribution of the audio signal, operators will be able to use FM modulators together with the television set's audio system to provide analog stereo as a special option.

The potential for further development of national teletext services stems from the fact that pay TV programmers could opt to use the usual audio subcarriers for delivery of teletext signals. This would mean the 1.5 dB improvement in signal quality, intrinsic to the scrambling technique,

would be lost, but it would permit delivery of new teletext services without the need to acquire additional transponder space.

Although a spokesperson for HBO said the service has no plans to employ the technology in this fashion, other providers may do so. M/A-COM is marketing VideoCipher to several pay television suppliers and reports it is encouraged at the initial reception.

M/A-COM is especially interested in winning new adherents to VideoCipher in light of LINKABIT's efforts to develop an in-home descrambling device. According to Gilhousen, one reason the descrambling units purchased by HBO will cost \$2,000 each is the fact that LINKABIT is using off-the-shelf digital integrated circuits, which means more circuits are used than will be necessary once the firm develops its own custom LSI (large-scale-integrated) circuitry. He said LINKABIT hopes eventually to handle the descrambling task with two or three custom integrated circuits, using ten to twenty thousand transistors per silicon chip. Once this is accomplished, he said, the price of a unit will drop dramatically, making it possible to offer in-home units for mass market consumption.

VideoCipher can only handle one channel per unit when the unit is in the headend, since descrambling must be done in parallel. In the home, however, only one channel needs to be descrambled at a time, making it feasible to use the unit with any number of pay services that choose to employ VideoCipher scrambling. Gilhousen estimated it would take one to two years to develop the custom circuitry.

The VideoCipher descrambler is addressable, which will permit HBO to control service to all 4,400 affiliates from the pay service's new Satellite Communications Center in Hauppauge, Long Island.

HBO intends to implement the scrambling system in two stages. The first will begin in the third or fourth quarter of 1983 with the installation of units in cable systems in the Mountain and Pacific time zones. Following installation and testing, which is expected to take several months, affiliates on HBO's East Coast feed will receive the descramblers.

*continued on page 29*

# THE OPTION THAT KEEPS SUBSCRIBERS HOOKED ON CABLE



# TOCOM 55 PLUS®

## BASEBAND FULL-FUNCTION REMOTE CONTROL

Sometimes cable subscribers are fickle. They may like the cable programming one month, then dislike it the next. Sometimes they think about stopping their cable service . . . and sometimes they do stop it. Disconnects are costly and lost revenues are painful to any cable operation.

Every cable operator needs to find as many ways as possible to keep subscribers on cable month . . . after month . . . after month.

TOCOM's 55 PLUS full-function remote control is the smart enhancement that helps keep subscribers hooked on cable. It transforms any TV set into a super set with many excellent state-of-the-art features and provides an outstanding new marketing opportunity for the cable operator.

### INSTANT TV UPGRADE

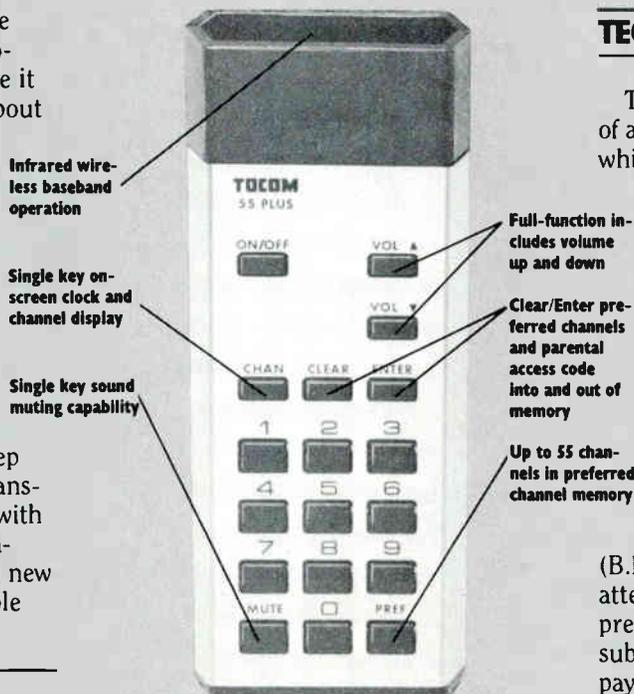
Subscribers who've never had a remote control for their TVs are quickly spoiled by the convenience of wireless control. Subscribers who have owned a remote are impressed with the 55 PLUS, rather than disappointed with a limited-function, no-volume-control RF unit for cable use.

Only baseband operation can provide a truly full-function wireless remote control. TOCOM's remote control has on and off, volume up and down, sound muting, a preferred channels memory and electronic A/B switch. With a touch of the remote's keypad, the subscriber has a digital clock and channel display on the TV screen. And a keypad code allows parental access to adult programs. Excluding the optional electronic A/B switch all of these are standard features with TOCOM's remote control.

TOCOM's two-way addressable systems also offer wireless remote control



On-screen clock and channel number display are standard features of TOCOM's one-way and two-way 55 PLUS addressable converters.



Infrared wireless baseband operation

Single key on-screen clock and channel display

Single key sound muting capability

Full-function includes volume up and down

Clear/Enter preferred channels and parental access code into and out of memory

Up to 55 channels in preferred channel memory

of interactive functions as well.

With so many superior features, the 55 PLUS remote control is easy to market. And once subscribers use it, they won't want to be without it. It's a genuine people pleaser that helps keep them hooked on cable.

### NEW REVENUE POTENTIAL

While subscribers are finding that TOCOM's remote control is a valuable enhancement to TV viewing enjoyment, cable operators are generating impressive new revenues.

Operators are selling remote controls for \$45-\$55 and/or leasing them for \$4-\$5 per month. Coupled with TOCOM's new lower prices, the margins are quite attractive. Subscribers find the baseband remote control an attractive bargain with a sale price of about half that of a remote control purchased with a new TV.

A TOCOM sales manager can develop a system cost/revenue analysis of baseband vs. RF addressability for you. He'd like the opportunity to show you how marketing TOCOM remote controls can pay the full cost of a 55 PLUS addressable control system equipped with one-way addressable converters in less than three years.

### TECHNOLOGY UNSURPASSED

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# TOCOM

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Continued from page 18

institutional loop. In newer, two-way active systems, the signals are transmitted via cable, but there's still an umbilical cord. In some instances, even in two-way active systems, there may be an event a cable company wants to cablecast live but the use of cable is impractical. In this case, portable microwave may be a good alternative. The CAN system also complements the institutional loop and it seems a must if a cable operator can't feed back via cable.

Sicard explained that this system was originally designed for window microwave. "If you wanted to do a news story at the top of the World Trade Center, and the mobile van is down in the parking lot, obviously that's a lot of cable to string. What you would do," he continued, "is use the portable microwave set-up. The MA-13CP transmitter would be aimed out the window down at the van (short-haul), and now you can use this set-up as a communications link between inside the building and the mobile van without the engineering problems of physically stringing cable."

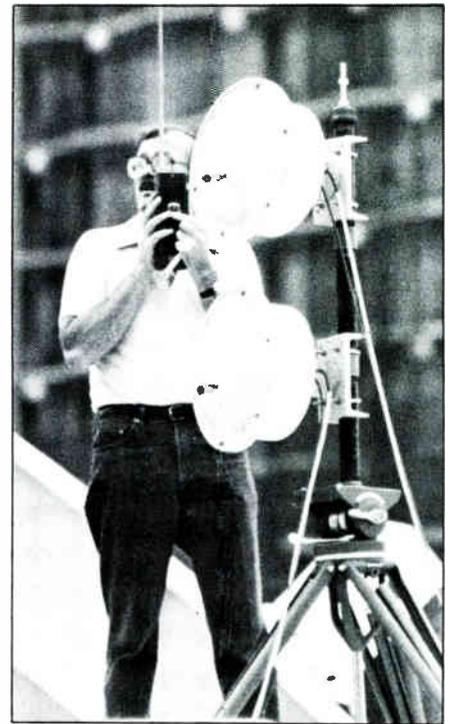
Typically, the line-of-sight range for the CAN system is three to five miles. Bad weather conditions (fog and rain) however, are limiting factors. "That's part of the reason," Sicard suggested, "why the CAN system has been a little slow in taking off."

Cable operators are limited to operating in the 13 GHz band, which in itself immediately limits their range. This has been a problem as far as using microwave for local origination primarily because of the spectrum allocation available to the cable operator. Broadcasters typically use the 2 GHz and 7 GHz range to get 40-50 miles.

All CAN systems are really custom-designed. Depending upon a cable operator's budget, a dish antenna as opposed to a horn antenna can be used, which increases the range to ten miles. Items such as preamplifiers can be put into the system to increase the range to up to 15 miles. Cable operators presently using a horn-to-horn antenna system are limited because of these low-gain antennas.

#### **Flexibility**

Configurations using the CAN system run the gamut. The basic CAN system goes primarily from a remote location (a mobile van or facility) back to the headend. The MA-13CP system's flexibility, however, encourages a variety of system configurations. Signal paths may be line-of-sight or reflected. In reflected paths, a right-handed circularly polarized antenna may be matched with a left-handed circularly polarized antenna for best reception. The receiver may be mounted in a variety of locations; on an automatic positioner in a radome either on the headend tower or at a convenient microwave relay point, at a convenient cable tap



**M/A-COM's MA-13CP and MA23-VFM portable microwave transmit/receive units provide flexibility for remote origination and short haul applications**

location for feed back to the headend, or in a mobile studio van.

In mobile use, a van equipped with CAN equipment can serve as a link between the cameraman and the headend. This allows for remote shots even from inside buildings with the line-of-sight link being made through a window.

When the headend is located several miles from the community areas of prime interest (local skyline permitting), a central receive site can be permanently established. In this application, a portable MA-13CP transmitter sends the signal to the steerable, rooftop-mounted MA-13CP receiver. From there, the signal is relayed to the headend with MA-12X fixed link equipment.

Another powerful application is the use of CAN equipment to tap into the operator's cable system. This cable backhaul use requires that the pole-mounted MA-13CP be equipped with a cable modulator.

To give the van more flexibility of coverage, a rotatable antenna can be added at the headend. Instead of having someone set-up a receive site, the headend becomes a fixed location. The antenna can then be oriented from whichever directions the signals are coming. The fixed antenna can be operated by remote-control, electronic control or radio control.

"This type of set-up," Sicard said, "is a more deluxe-type system. The cable operator has to look at this system and figure out his cost-per-subscriber. A medium to large system can support this arrangement. But," he cautioned, "a 20-channel system with 2,000-3,000 subscribers isn't really feasible."

#### **Dedicated lines vs. portable microwave**

Sicard claims that the CAN system can be flexibly used in place of dedicated lines for hard-wiring various access points. He has already raised the issue of using portable microwave vs. hardwiring facilities. "Most of the cable operators I've spoken to," he explained, "have already wired their institutional loop. However, this equipment could be used for all the sites that haven't been wired or are just too remote. Had these access points not been prewired," Sicard added, "then the cable operators would have had that flexibility right up front."

There are hundreds of small systems that haven't been upgraded for two-way capability. "M/A-COM's portable microwave CAN system could be perfect for integrating into those systems," Sicard suggested. "However, part of the problem in using the CAN set-up in older systems," he added, "is usually either a reluctance or the inability to make the capital investment."

#### **23 GHz FM Microwave Video System**

Realizing that the CAN system isn't economically practical for small CATV systems, M/A-COM has recently introduced its MA-23VFM 23 GHz FM microwave video system. The 23VFM GHz system is being tailor-made for small-and medium-size cable systems.

The MA-23VFM system is a budget-priced solid-state FM microwave radio system that provides reliable, short-range video communications links in the 21.8 to 22.0 GHz and 23.0 to 23.2 GHz frequency

bands. This system is capable of transmitting full color video plus two high quality subcarrier program channels with all of the advantages that only FM microwave systems can offer.

The MA-23VFM is an economical alternative to conventional coaxial cable links, especially where cable installation is impractical, such as congested downtown areas, across landscaped grounds or locations where trenching and aerial lines are not permitted. In these instances, the MA-23VFM system eliminates not only the prohibitive installation costs of cable systems but also the lengthy delays encountered in obtaining municipal construction permits.

The compact, lightweight MA-23VFM system incorporates transmitter and receiver subsystems comprised of weather-resistant RF units equipped with integral high-gain antennas designed for outdoor use. Also included is a control/interface unit containing power supply and baseband circuits. Distances of 250 feet between the control/interface unit and RF heads are possible with no signal degradation.

Sicard announced, "Presently, we're running experiments with the 23VFM with Adams-Russell to gauge the practicality of using that product in the cable marketplace for local origination programming." The MA-23VFM system is not currently available for licensing by cable operators.

It was originally designed for industrial use in security and surveillance equipment. Cable operators, however, now view this system as a very desirable product for the cable industry. "We're setting-up test programs around the country to pull the information together and determine how practical the new system is. We'll then petition the FCC," Sicard added, "to get approval for cable operators to use it."

M/A-COM has already had the 23VFM GHz system type-accepted by the FCC, but it's primarily for the PSIT band, which is for industrial, not cable, applications. A cable operator can't apply for those licenses unless the Commission grants a waiver. "Before the FCC starts granting waivers," Sicard said, "they want to determine the practicality of our 23 GHz system being used in the cable industry and how well it is going to serve the public interest."

Sicard explained that the range of the MA-23VFM system and the MA-13CP is similar, but because of the lower costs, the MA-23VFM system makes it more practical for the cable operator to increase his range by cascading these units. The MA-23VFM will cost about \$8,000-9,000 vs. \$15,000 for the MA-13CP basic system.

"I think this is the product (the MA-23 GHz system)," Sicard stated proudly, "that's going to open up the community

and the CAN marketplace to the cable operator."

The first application in which M/A-COM used the 23VFM system, other than on paper, was in conjunction with the Adams-Russell company. That pilot program was M/A-COM's first application combining the 23VFM system with the MA-13CP.

#### The future

The MA-23VFM 23 GHz FM microwave radio system used in the experiment with Adams-Russell was a first-generation prototype. "The problem right now," Sicard stressed, "is getting this equipment approved for cable applications. Then, the market will dictate what bells and whistles they need in addition to that."

M/A-COM isn't sure what the time-frame will be for getting FCC approval for cable applications. "I think we're talking between six months and one year," said Sicard. "The key thing is we need to provide the Commission with data to prove its usefulness before they move."

Should the FCC approve the MA-23 GHz system, cable operators will begin to have the versatility of the broadcasters. Not only will live local sports and local news be available, but cable operators will have a sound franchising tool that just might win a new franchise or help ensure that their present franchise is renewed.

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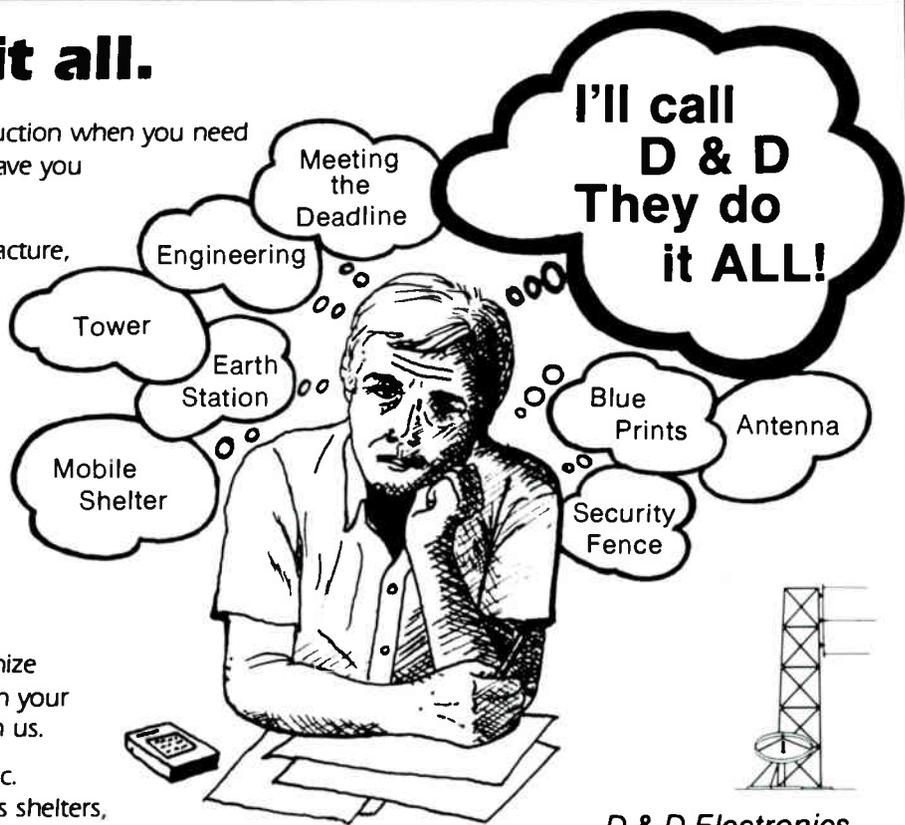
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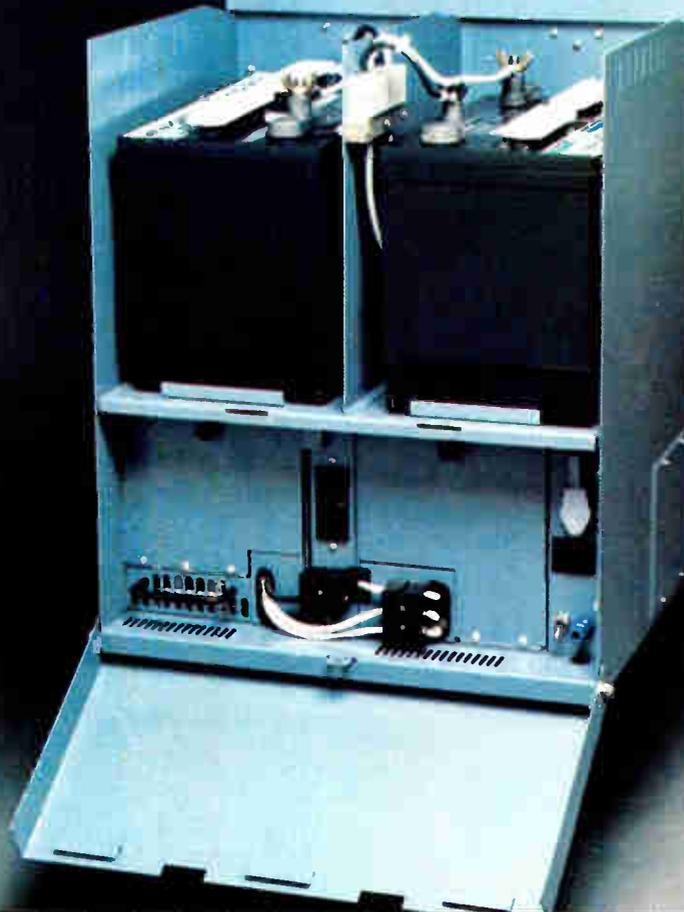
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continued from page 21

for the different approach used by C-SPAN engineers.

According to Richard Fleeson, chief engineer for C-SPAN, "there are two types of engineers out there—dB chasers and non-dB chasers. The dB chaser is always after that last little bit, in getting things just right. That's good to a certain extent, but if you don't have the time or the money, that extra little bit of signal quality isn't going to mean that much. You try and go after the problems you can see and hear first, and then take it from there." If you don't get rid of the rough edges first, Fleeson maintains, getting the finer points will be impossible. Fleeson notes that C-SPAN does not have a lot of test equipment. So it is forced to rely on RCA for the final word on whether the uplink is of good enough quality. "RCA has control over the video level on our uplink," said Fleeson. "We basically try to keep everything as flat as possible on the way out. But if our video level is off at all, RCA has the final word."

"For in-house use, all our equipment is 3/4 inch. So there isn't a lot of tweaking to do—you just have to keep after the problem machines. We have 20 VTRs here, so you have to monitor them and figure out which machines are giving you the problems and then backtrack to see if it's a people problem or a machine problem. It ends up about 50-50."

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**'We spend a lot of time on RF... because that's an area that seems to have more potential for problems these days than the video or audio does.'**

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**—Altan Stalker  
manager of transmission systems  
and quality control  
Group W**

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To boost the quality of the 3/4 inch tape, Fleeson says C-SPAN utilizes frame-syncs, with noise reduction features on them. "They can pull a lot of the noise off the tapes," said Fleeson, "as well as eliminate some of the noise from the cameras themselves, especially if you're in a low-light situation."

Over the past two years, C-SPAN has upgraded its cameras, installed frame-syncs to clean up the signal and installed distribution amplifiers to transmit to the uplink facility, instead of doing all its equalization at the uplink. Fleeson says one of the most important developments in terms of C-SPAN's signal quality would be the use of high quality half-inch format machines. The idea of smaller, lighter equipment, with the possibility of better signal quality, has obvious appeal—especially for C-SPAN, with its use of remote locations.

Like C-SPAN, another company dependent on RCA for much of its quality control is Showtime. Bill Riker, director of engineering for Showtime, explains that although RCA performs quality control procedures on the signal, Showtime has its own people monitoring and supervising those operations. In addition, Showtime has a number of systems across the country monitoring the signals, in conjunction with Viacom, which presently owns Showtime 100 percent.

"There are three basic areas of quality



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control," said Riker. "Before the tape goes to air, Showtime staff screens it, first as a film and then as a tape. Then, the film is monitored while it is being aired, with access to downlink monitoring both audio and video. Finally, there is the regional feedback from local engineers." Showtime maintains a regional engineering staff to deal with problems as they arise locally.

### One fine signal

The Disney Channel, which is presently scheduled to go on the air April 18, has already set up extremely stringent control standards relating to the quality of its signal. As Vince Roberts, broadcast operations engineer for Disney explains, the quality control aspects for the new service have been developed in two directions—internally and with respect to incoming material.

"We have very strict incoming specifications for produced material," said Roberts. "We want to encourage the use of one-inch equipment wherever possible for remote productions. There are a lot of reasons for that—lower audio noise, the available bandwidth and editing simplification."

Paramount to the Disney Channel's programming though is a degree of audio quality, which is equal to the video quality in terms of clarity, total harmonic distortion, and signal-to-noise. "We want to spec as high a level of front-end production quality and value as possible," said Roberts, "before we even receive the tape to air it."

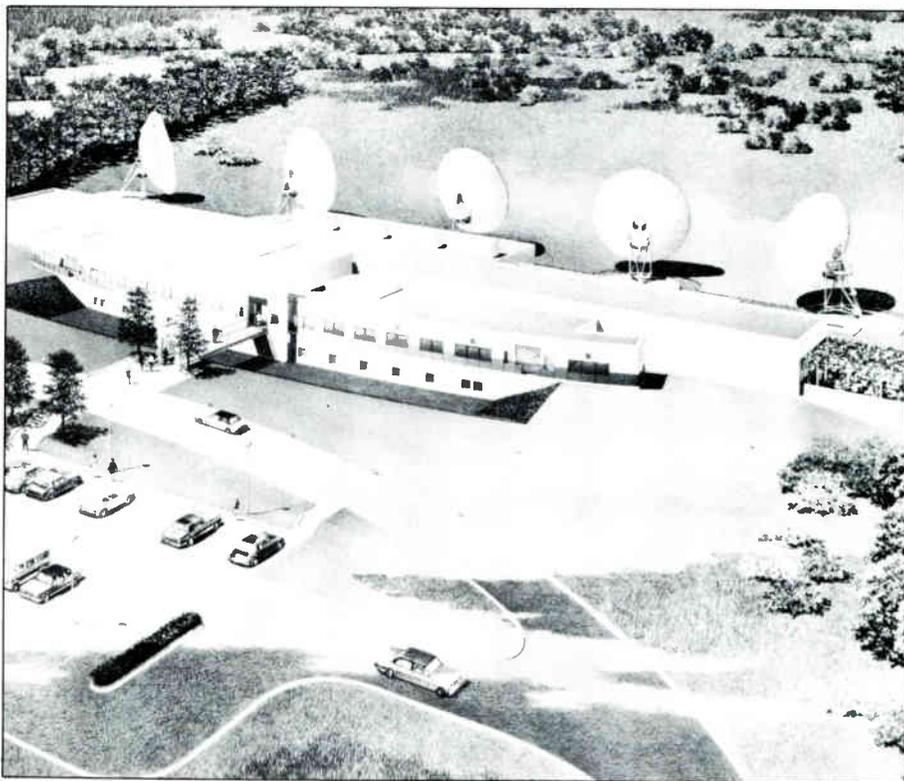
The production and transmission facilities construction for Disney is right on schedule, although Roberts declined to discuss details. "We're going to go with a one-inch origination center located in Hollywood. Back-up will be three-quarter. Beyond that, let's just say we're going to be on the air the 18th with one fine signal."

In stereo, that is. Disney engineers have opted for a Leaming stereo system for uplink origination. It will be compatible with Leaming and Wegner 1600 demodulators.

"We're encouraging our downlink receivers—our MSO clients—to maximize receiver sensitivity, and antenna gain, and make sure the look angle is correct, along with LNA and system noise. What we're trying to do is establish a good technical base here to disseminate correct and accurate information to the MSOs. We'll follow that up with consultation by members of my staff who will serve as technical liaison between myself and the MSOs, discussing problems as they arise and solving them as expediently as possible," said Roberts.

### Quality control

In this regard, probably one of the most particular organizations going, when it comes to quality control, is HBO. To begin with, any product that is ready to air must first go through an elaborate evaluation



HBO's new uplink facility will be completed sometime in 1984

process at the studio. As Dom Serio, vice president and general manager, studio and origination, explains, incoming items are charted with a progress "report card," which is filled out separately by two "graders," who view the film when it's received. If it doesn't pass, HBO rejects the film, and will go back to the vendor with instructions to make certain corrections.

"It's like a car coming off the assembly line," said Serio. "It goes through a lot of checks. Until we get it the way we prefer, we won't air it." Serio estimates, in fact,

tape transfer, and searching for the best available print and the best audio-track—hopefully an original without prior release. The staff then cleans and corrects the print, preparing it for transfer.

HBO is currently building a new origination center in Long Island. When completed, this summer, the new facility will allow HBO to originate the programming and uplink it through its own antennas. That added capability is bolstered by HBO's recent purchase of a \$300,000 film-to-tape transfer unit. All told, the latest expenditures by the company for quality control exceed \$750,000.

"A lot of time and effort goes into this," said Serio. "We have people on both coasts, working to get the best product available." Even if the product is done in-house, such as an HBO special, it still goes through the same process. "The only difference," said Serio, "is that the in-house stuff doesn't have to go as far to be corrected."

According to Serio, the HBO technical staff has earned itself a reputation for toughness in the quality control department. "They answer to no one but themselves," said Serio. "And they have extremely high standards. Sometimes they're too tough; they won't let any flaw get by."

The future of the cable industry may not depend exactly on quality control. But to a large extent, if cable is to compete with alternative technologies, it will be by providing the kind of high quality picture that is possible only with cable. And in that sense, quality control may be one key to enhanced profit pictures.

CEO

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**'We're constantly striving to improve quality control.'**

**—Gene Wright  
vice president of engineering  
Turner Broadcasting**

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that between 30 and 40 percent of incoming films are rejected the first time they come through the door.

"When they come back the second time," said Serio, "we take them through the entire process again, from beginning to end."

HBO has installed a technical quality control department with three full-time engineers. In addition, there are 14 other people in quality control checking film to

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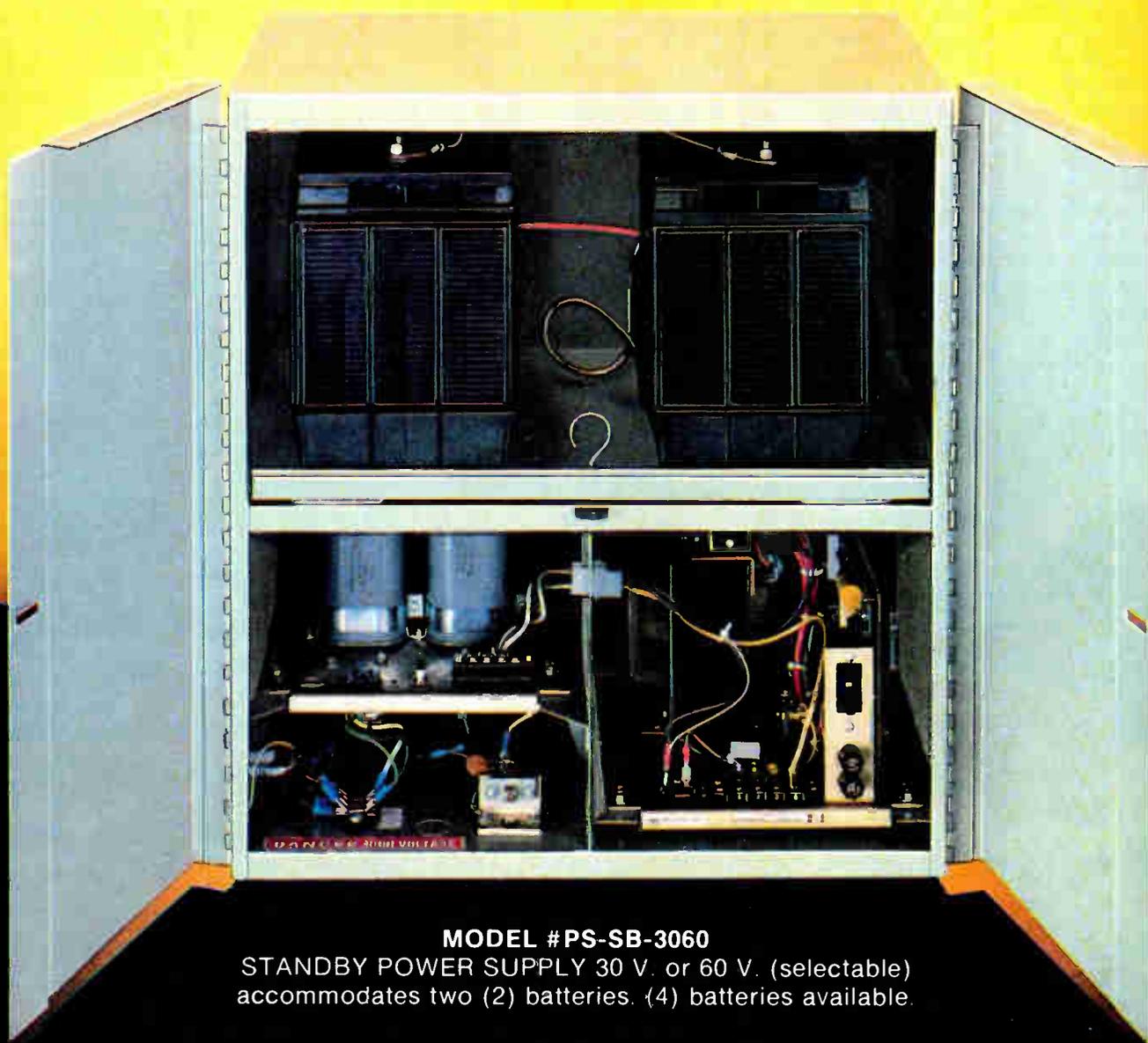
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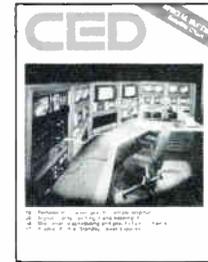
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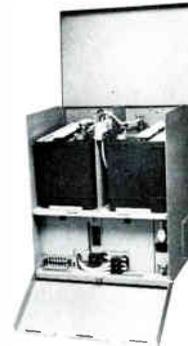
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# TECH II

**TOPIC:**

## Maintenance schedules

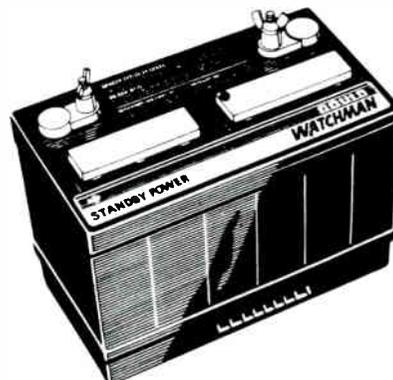


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# Troubleshooting and choosing standby power

System operation and quality control are hard enough these days without having to worry about the everyday performance of equipment and FCC proof of performance standards. Maintaining a system at full optimum levels requires a very large and dedicated engineering staff, and while some systems are able to take that for granted, others operate with a minimum maintenance crew and have trouble sticking to a maintenance schedule that allows for optimum performance.

When we called a number of engineers associated with some of the larger systems around the country, we found that the pivotal area of system maintenance is not how you develop the schedule but how well you stick to that schedule, once it has been implemented, and how well it works for your system. This is not to say that the developmental stage isn't important. Everyone we contacted felt that without

the planning, they wouldn't be in a position to take care of the system as it grows and changes and as the demands for operational quality expand. We called the larger systems because we figured that any problems a large system has, a smaller system may also have, but to a lesser degree or possibly not at all.

Depending on the number of plant miles and the number of homes served, we found each operator has to do a tremendous amount of troubleshooting (day-to-day maintenance). Service calls for preventative maintenance are by far the most time-consuming effort for operating systems. Over 95 percent of those calls have to do with problems from the tap in, in other words, from the drop line to the back of the subscriber's TV set. Leakage and ingress, caused by bad connections, are the troubleshooter's worst enemies.

The subject of system maintenance is an important aspect of our Product

Profile this month as we look at standby power supplies. There are a lot of companies claiming to manufacture standby power for cable television, but, as we reviewed spec sheets, we were able to narrow the field down to those manufacturers that make gear especially optimized for rugged CATV use. A pole- or pedestal-mounted unit has got to be tough, reliable and suited to year-round outdoor use. We believe that the models we're comparing can satisfy any standby power need for just about any cable operator. Bear in mind that there are a lot of variables, and we have been able to cover only a few of the most obvious ones.

Following the Profile chart, we have included information on all of the manufacturers, including addresses and phone numbers. So, if you have a specific question or requirement, you'll be able to reach them quickly and easily. One of the most important aspects of a standby power supply is the type of battery that goes into it, so we have also included a list of battery manufacturers on page 65.

Next month, look for our expanded Product Profile to bring you the information you need on computerized billing systems.

## System maintenance

# Ensuring signal quality

Establishing a maintenance schedule for quality control may be the toughest task facing a cable operator once the system is up and running. Troubleshooting for distribution failures and maintaining the quality of service to subscribers is the goal of every cable system, but there are a number of elements related to system maintenance that can ultimately ensure signal quality. Microwave, headend and distribution maintenance all require constant attention, and operators have developed maintenance programs for these sections based on their specific needs.

Jim Randolph, director of engineering for Warner Amex Dallas system says, "we have a program whereby a technician is assigned to every BCU, what we call a bi-directional communications unit." The BCUs represent a certain number of miles in the distribution system and Warner Amex currently has 12 BCU areas in Dallas, consisting of about 50 trunk stations each.

"The technician responsible for that control system must visit every station in his BCU every month, and he might

not do anything," says Randolph, "but he has to check the input and output levels and the voltage, and every quarter he must sweep his BCU to verify the flatness of the system."

In addition to checking the BCU's, each technician also carries a signal detector with him to check for leakage. Every time the detector goes off, the technician stops and logs the location of the leak. Then when they fix it they describe exactly what they had to do to fix it, whether they replaced a bad connector or a cracked sheath or whatever. These logs are for system records only but the maintenance is required by part 76 of the FCC rules and regulations and the records are kept on file pending FCC inspection.

The Dallas system utilizes a very large headend, supplying 80 channels of programming to the Dallas area including two-way interactive. Headend and microwave (earth stations, AML links, etc.) maintenance is done daily, weekly and monthly according to maintenance procedures but, says Randolph, "every day, signal levels are logged and verified, and a gross error

will be repaired right away, but if it's just a slight change, the RF engineer won't make the adjustment until he performs his weekly check."

In addition to a well-qualified and highly motivated technical staff, the Dallas system uses a Tektronix 1980ANSWER test set to automatically measure the video parameters of each outgoing channel on a day-to-day basis. The automated testing system provides them with a constant log to verify parameters and allows them to detect most irregularities before they become problems.

According to Randolph, "The ANSWER system takes all the human error out of video baseband measurements. It makes a printout of all the particularly gross errors, and it can ring a remote telephone location to alert someone to a problem."

Randolph believes that the most important part of maintenance is the scheduling. Assigning people specific tasks and then making sure they get the job done is, in his opinion, the best way to ensure consistently high performance from the system.

Randolph points out that in the Dallas QUBE system, there are a lot of things they have to watch that wouldn't rate attention in a one-way setup. The ingress of the reverse bandwidth is the primary consideration and most of the problems there arise from CB's (mobile radios) operating in the 5-30 MHz band.

"You can have a system very tight from 50-400 MHz, but when it gets down to 5-30 MHz, you have problems with the feeder lines (ingress), so you have to make sure that the taps are terminated at all times and that the drop cable is double or quad-shield," he said.

Joe Gregory, a microwave staff engineer at UA-Columbia's San Antonio system is responsible for the upkeep of 21 channels of AML microwave links and an additional 19 channels on the CARS frequency servicing outlying hubsites. The AML transmitters are checked several times each day, and the relay system is monitored constantly from 8 a.m. to midnight.

According to Gregory, "If everything at the headend is running right, we just have to monitor the system. Of course there are always corrections that have to be made as far as levels go, but we're constantly on top of it. My staff makes all the visits to the hub sites, recording the parameters of the AML receivers, checking their vital signs and checking the carrier-to-noise of the receivers. We work on the AML transmitter twice a year. Only one checkup is required by the FCC, but we do it twice to be sure that they are operating at the proper power."

Gregory feels that the bulk of system maintenance is done at the headend and in the field. Field technicians are concentrating primarily on preventive maintenance, troubleshooting and sweeping. With a staff of five in the office and another 29 service repair technicians in the field, Gregory and his staff have their work cut out for them. "There's a lot of work to do," says Gregory, "on a daily basis, we're continually checking subjective picture quality and noise levels on all our channels."

Larry Williams, plant maintenance manager at Cox Cable in San Diego, is responsible for 2,200 miles of plant, serving about 200,000 subscribers. The basic structure of his department begins with repair dispatch, taking the incoming service calls and coordinating the paperwork and the scheduling of service calls. The system's standards of operation were established in 1979. The preventive maintenance program for the system entailed actual plant maintenance, headend maintenance, microwave maintenance, bench repair and new plant quality control for the turn on, test and calibration of new

equipment. Williams feels that one of the key areas of their testing program is the FCC proofs that they perform.

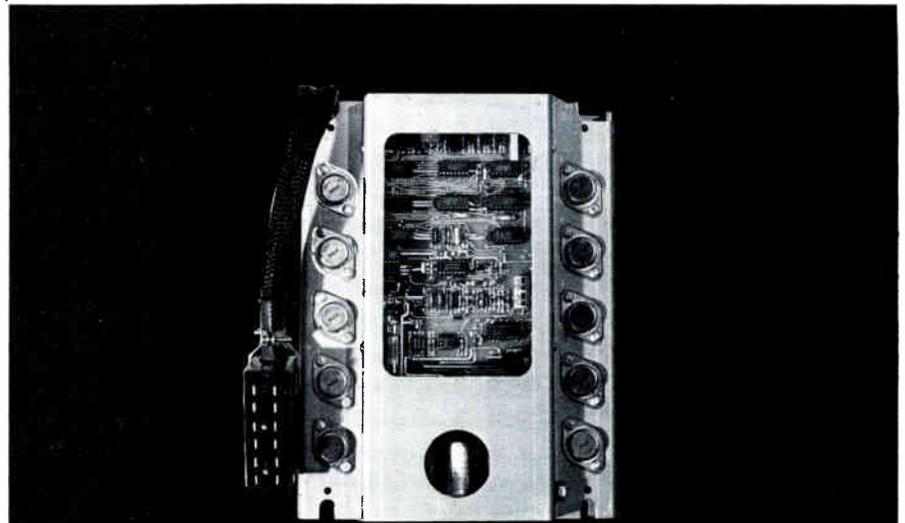
"We're required by the FCC to conduct 30 proofs for our system and we do, in a years time, close to 100. These are actual FCC proofs and we've developed a set schedule," says Williams. Like Gregory, he agrees that the bulk of the maintenance work is preventive.

"In the routine maintenance we cover about 300-350 miles of plant per month for problems that effect more than one subscriber. But, we key around the FCC proofs. Twenty documented radiation checks per week and then route sweeping of about 70-75

miles per month, per sweep unit, and I have about four sweep units."

Williams claims that, historically, 95 percent of the service calls are from the tap in, dealing with taps, drop lines, converters and set problems. He says that his system is looking for a quicker response time and that in the three areas that he monitors—dispatch, response time, and system problems per mile—he wants to see in the area of a .22 failure rate. Williams has set some pretty tough standards for himself but then it's his job to keep the system running as smoothly and effectively as possible. With that kind of an error rate, he's got his work cut out for him.

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# FCC trend means 'hands off'

WASHINGTON—With the Federal Communications Commission in the midst of a deregulatory trend, engineering requirements are taking a backseat to marketplace forces.

The FCC Office of Science and Technology is said to be conducting a thorough review of all technical specifications to determine whether some are no longer necessary and can be eliminated. Some observers are expecting rule-makings later this year, which would reduce the cable technician's paper load. The one exception to this deregulatory approach is the area of signal leakage, about which the FCC has vowed to take a hard line.

Despite the "hands off" policy of the FCC, those in the engineering field believe cable systems need to keep maintenance schedules and monitor their own specifications in order to provide clear reception and good service.

Cliff Paul, senior engineer in the FCC Cable Bureau, said the commission's official stance basically is that it should not concern itself with maintenance schedules. But Paul, a longtime industry engineer, understands the need for engineers to watch adequately over their own system.

"My own personal view is that cable systems are getting so sophisticated that the cable operator will be required, because of his own economic survivability, to have to perform systematic maintenance," Paul said. "Maintenance is sometimes disregarded until the system has deteriorated so much that the operator panics to keep subscribers. In cable systems today, it is almost imperative that they have some maintenance system."

Under the FCC's Technical Standards (Subpart K, Sec. 601-617), cable systems are required to keep proof of performance records in the event of an inspection by an FCC field crew. The inspections are made on a random basis and some observers believe that these inspections are becoming less frequent due to the FCC's budget and manpower constraints. The main exception to this, once again, is the area of signal leakage.

The "annual proof" requirements are minimal standards and only apply to Class 1 signals, which are the over-the-air broadcast transmissions. Wendell Bailey, vice president of the National Cable Television Association's Office of Science and Technology, notes that cable systems could not provide their subscribers with adequate reception if they operated at these minimal levels.

The NCTA has developed its own

booklet of standards, specifications and testing procedures to aid engineers in maximizing the technical capabilities of their systems. The NCTA's booklet is entitled *Standards of Good Engineering Practices for Measurements on Cable Television Systems*.

Currently, NCTA's standards subcommittee, chaired by Mike Jeffers, vice president of engineering for General Instrument, is revising the standards booklet. Bailey said the new publication will contain a wider range of technical information, much of it based on what has worked best for cable engineers over the past years. NCTA is hoping to have the booklet printed in time for distribution at the NCTA convention in Houston this June 12-15. Bailey estimated that it will

cost about \$20.

Paul was asked whether the NCTA's guidelines would prompt the commission into further deregulation of engineering standards. He said it was unclear which direction the FCC may take in that regard. In either case, the FCC likely will continue to protect Class 1 signals and crack down on signal leakage, Paul said.

"The commissioners may say that (cable systems) should still strive to meet these requirements" Paul said. "Or it could go the opposite way. The commission may look at (NCTA's standards) and say, 'This looks good. We don't need further rules.' I will say this: No matter what happens, there'll be rules in on signal leakage. I don't think we'll eliminate those rules for a long, long time."

CEB

## Test equipment can ANSWER for your system

Tektronix has found a way to alleviate some of the time-consuming and mundane features of monitoring signal quality at the headend.

The firm has developed software, compatible with its 1980 Automatic Video Measurement Set (ANSWER), to tie standard asynchronous terminals, printers, plotters and modems to the system, thereby permitting a continuous charting and display of signal characteristics. In addition, the system can be used to set up an automatic alert system, employing printouts, telephone calls or alarm devices to alert cable system operators of developing problems.

The software, marketed under the name Option 03 and Option 04 software, can also be used to automate monitoring for testing new equipment, such as converters and amps, and can be used to facilitate studio maintenance routines.

The 1980 ANSWER was designed to put total video measurement capabilities in one unit, including monitoring of sync, burst and bar amplitudes, differential gain and phase and timing measurements.

According to the manufacturer, the Option 03 and 04 software has three functional parts: initialization, which allows the operator to set

RUNNING 7-JAN-82 15:01:24

```
15:01:50
CHANNEL A (4) BURST AMPLITU
CHANNEL A (6) AMPL ERROR
CHANNEL A (6) CHR/LUM RATIO
CHANNEL A (6) CHR/LUM RATIO
CHANNEL A (9) SERRATION WID
CHANNEL A (11) LUM NL DIST
CHANNEL A (12) MB6
```

alarm limits and times for automatic measurement logging, to select measurements for continuous monitoring and specified VITS and zero-carrier locations, and to define one or two video inputs; monitoring, the primary mode of operation, which permits the 1980 ANSWER to monitor signals, report alarms and log signal characteristics at specified times; and graphics, allow users to request a graphic display of any video line.

The 1980 ANSWER with the Option 03 or 04 NTSC transmitter monitoring software costs \$26,000. With a graphic display terminal and a hard copy unit, a complete ANSWER system costs about \$34,000.

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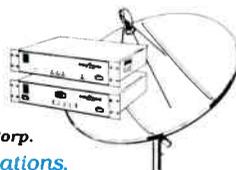


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## Product Profile

# Standby power supplies

For any cable operator, the name of the game is system operation at full efficiency. Every operator does a lot of troubleshooting to make sure that the system is running smoothly and that the subscribers are getting the kind of picture quality they expect from cable television. Yet all systems are fundamentally dependent on a steady stream of commercial AC utility power for their operating needs. When that power is gone, a system is down, and as cable systems move beyond being merely a means for retransmitting television signals and become telecommunications systems for full video, voice and data, the ability to sustain transmission becomes ultimately more critical.

Standby power for operating cable systems may no longer be just another option in today's competitive markets. It is important for a cable system to be able to survive transients and glitches in commercial power and to be protected from lightning storms and other natural and unnatural electrical spikes.

In its present form, a standby power supply is either a pole- or pedestal-mounted unit in an aluminum enclosure. It consists of batteries, a battery inverter and battery chargers. With these few basic elements, standby power supplies can be made compact, lightweight and modular for ease of installation and maintenance.

Operationally, the batteries provide ready power in the event that there is a failure in the utility source. The battery chargers recharge the batteries and keep them charged, and the inverter draws power from the batteries and converts the current form DC to AC. Power failures are detected by means of a relay energized by utility power. When commercial power is lost, contacts that connect the system to the inverter close and turn the inverter on, which then begins taking power from the batteries. Standby power systems can restore power in anywhere from 8 to 50 milliseconds so that there is no discernable interruption in the signal.

### Batteries

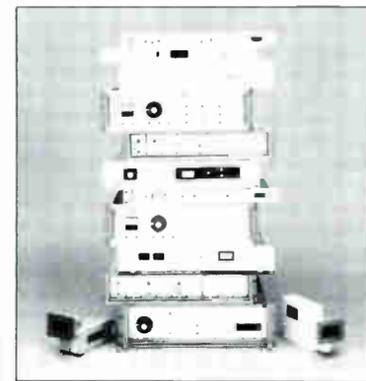
Batteries are the heart of any standby system and the lead-acid variety have been optimized for CATV service. They are available in either a liquid or



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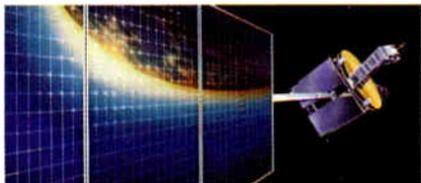
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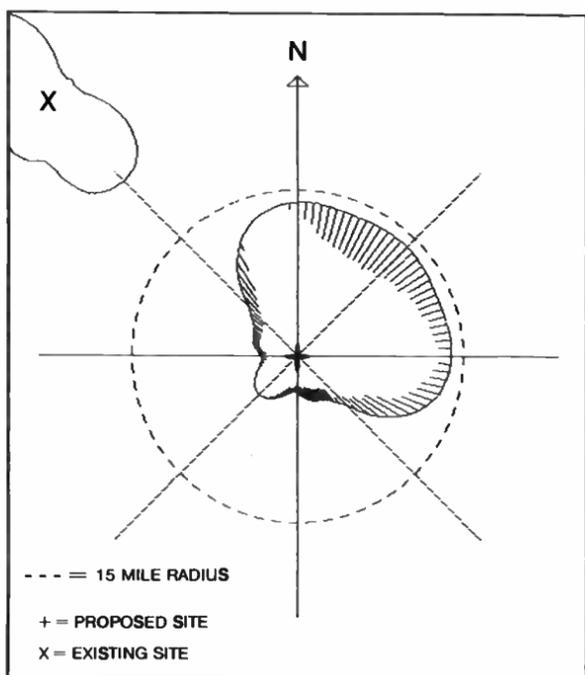
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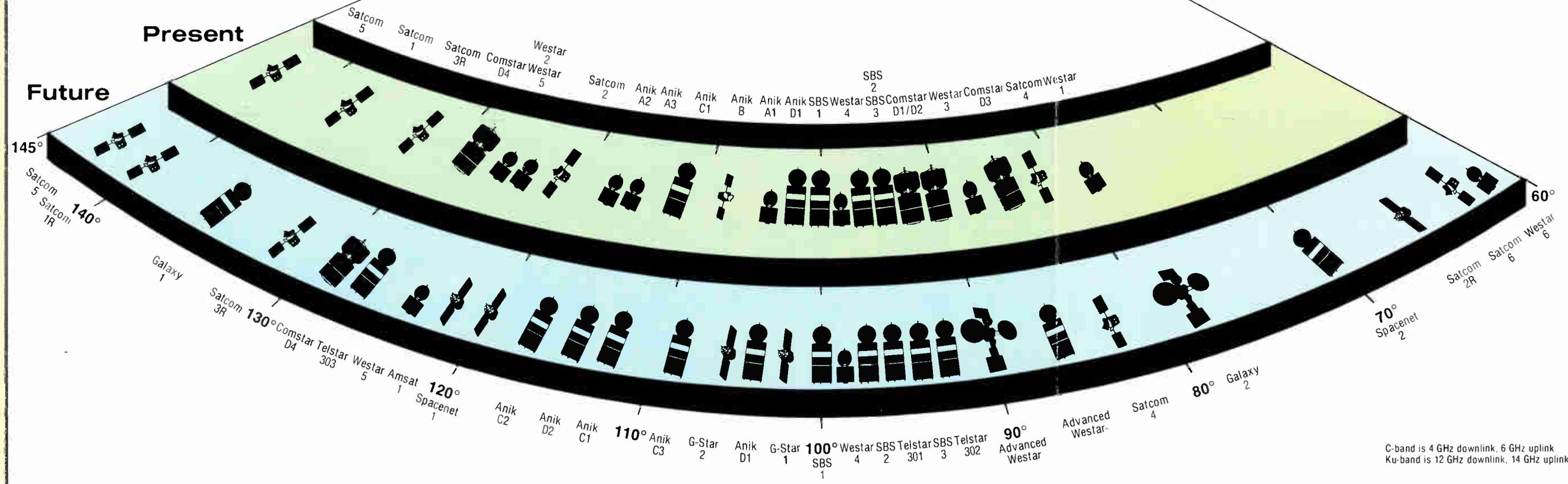


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| W. Long Position | Name            | Operator                   | Launch Date | Frequency Band | Number of Transponders |
|------------------|-----------------|----------------------------|-------------|----------------|------------------------|
| 66               | Satcom 2R       | RCA                        | 1983        | C              | 24                     |
| 70               | Spacenet 2      | Southern Pacific Comm.     | 1984        | C/Ku           | 18-C/6-Ku              |
| 74.5             | Galaxy 2        | Hughes                     | 1983        | C              | 24                     |
| 79               | Advanced Westar | Space Communications Co.   | 1983        | C/Ku           | 12-C/4-Ku              |
| 79               | Westar 1        | Western Union              | 1974        | C              | 12                     |
| 83               | Satcom 4        | RCA                        | 1982        | C              | 24                     |
| 87               | Comstar D3      | Comsat (For AT&T)          | 1978        | C              | 24                     |
| 87               | Telstar 302     | AT&T                       | 1984        | C              | 24                     |
| 91               | Advanced Westar | Space Communications Co.   | 1983        | C/Ku           | 12-C/4-Ku              |
| 91               | Westar 3        | Western Union              | 1979        | C              | 12                     |
| 94               | SBS 3           | Satellite Business Systems | 1982        | Ku             | 10                     |
| 95               | Comstar D1      | Comsat (For AT&T)          | 1976        | C              | 24                     |
| 95               | Comstar D2      | Comsat (For AT&T)          | 1976        | C              | 24                     |
| 95               | Telstar 301     | AT&T                       | 1983        | C              | 24                     |
| 97               | SBS 2           | Satellite Business Systems | 1981        | Ku             | 10                     |
| 99               | Westar 4        | Western Union              | 1982        | C              | 24                     |
| 100              | SBS 1           | Satellite Business Systems | 1980        | Ku             | 10                     |
| 103              | G-Star 1        | GTE                        | 1984        | Ku             | 16                     |
| 104              | Anik A1         | Telesat (Canada)           | 1972        | C              | 12                     |
| 104              | Anik D1         | Telesat (Canada)           | 1982        | C              | 24                     |
| 106              | G-Star 2        | GTE                        | 1984        | Ku             | 16                     |
| 109              | Anik B          | Telesat (Canada)           | 1978        | C/Ku           | 12-C/6-Ku              |
| 109              | Anik C3         | Telesat (Canada)           | 1985        | Ku             | 16                     |
| 112.5            | Anik C1         | Telesat (Canada)           | 1982        | Ku             | 16                     |
| 114              | Anik A2         | Telesat (Canada)           | 1973        | C              | 12                     |
| 114              | Anik A3         | Telesat (Canada)           | 1975        | C              | 12                     |
| 114              | Anik D2         | Telesat (Canada)           | 1984        | C              | 24                     |
| 116              | Anik C2         | Telesat (Canada)           | 1983        | Ku             | 16                     |
| 119              | Satcom 2        | RCA                        | 1976        | C              | 24                     |
| 119              | Spacenet 1      | Southern Pacific Comm.     | 1984        | C/Ku           | 18-C/6-Ku              |
| 122              | Amsat 1         | American Satellite Corp.   | 1984        | C/Ku           | 18-C/6-Ku              |
| 123              | Westar 5        | Western Union              | 1982        | C              | 24                     |
| 123.5            | Westar 2        | Western Union              | 1974        | C              | 12                     |
| 127.5            | Comstar D4      | Comsat (For AT&T)          | 1981        | C              | 24                     |
| 127.5            | Telstar 303     | AT&T                       | 1984        | C              | 24                     |
| 131              | Satcom 3R       | RCA                        | 1981        | C              | 24                     |
| 135              | Galaxy 1        | Hughes                     | 1983        | C              | 24                     |
| 136              | Satcom 1        | RCA                        | 1975        | C              | 24                     |
| 139              | Satcom 1R       | RCA                        | 1983        | C              | 24                     |
| 143              | Satcom 5        | RCA                        | 1982        | C              | 24                     |
| TBD              | Satcom 6        | RCA                        | 1985        | C              | 24                     |
| TBD              | Westar 6        | Western Union              | 1983        | C              | 24                     |

C-band is 4 GHz downlink, 6 GHz uplink  
Ku-band is 12 GHz downlink, 14 GHz uplink

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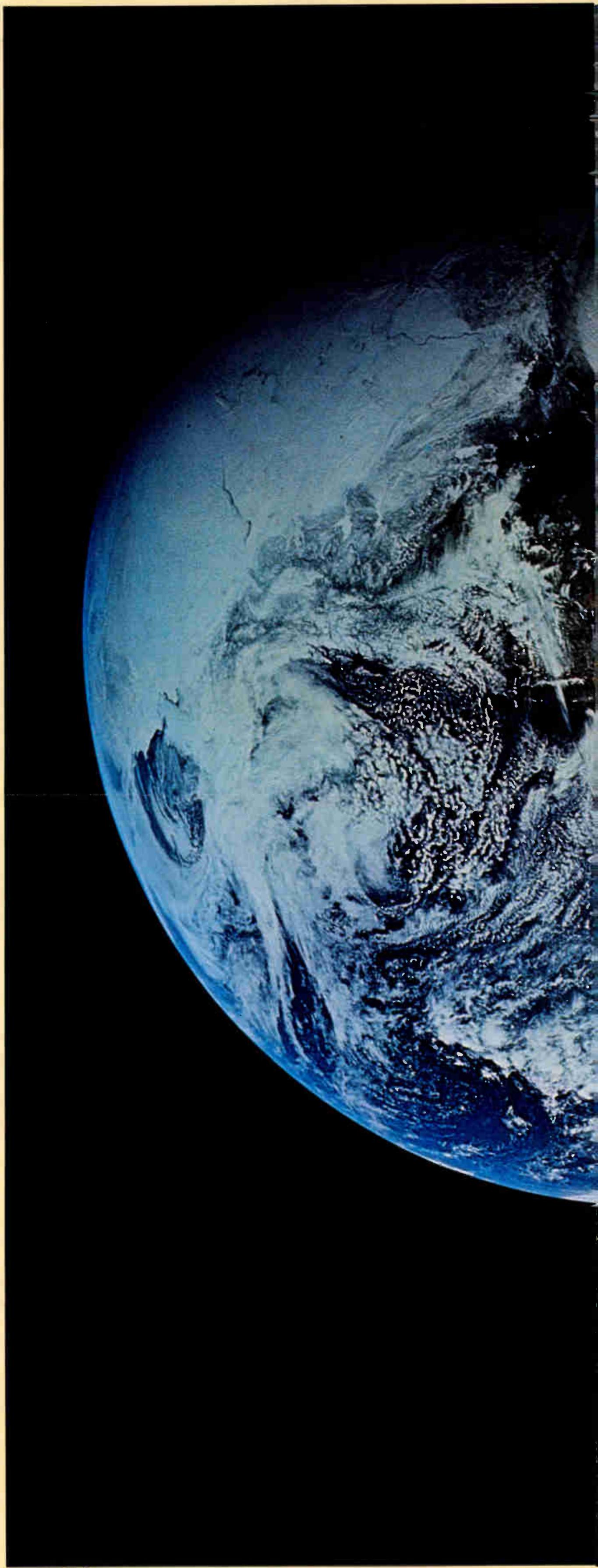
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gelled electrolyte. A list of battery manufacturers appears on page 65.

Standby power in the cable industry means that a moderate amount of power is needed, say 30 to 50 amperes, over several hours. Batteries for CATV standby power must have thicker lead plates for deep cycling and a weaker acid for reduced corrosion than commonly available in automotive batteries. Some operators use automotive batteries that are designed for short term high peak powering and can't provide long-term sustained power in the absence of utility power.

Configurations of power supplies and battery packages should be tailored to the specific needs of the operator. The majority of power supplies on the market today are configured for three battery operation. Generally speaking, standby power supplies should be placed every 3-5 miles of cable plant, offering up to four hours of standby power to the system. The longevity of the battery and hence the effective life of a standby power supply is predicated upon the battery's ability to withstand the constant charging required. Ambient temperature ranges vary for batteries. Their performance is diminished by cold temperatures but that doesn't effect their longevity. Heat, on the other hand, allows the battery to perform better but shortens it's life. Therefore, the flexibility and capability of the charging system is one of the most important aspects of the standby power supply. In a good standby charging system, the batteries must be charged either automatically or remotely. The charger must know when and when not to charge the batteries.

#### Other factors

Transfer time, voltage regulation, current limiting, low voltage shutoff and some form of status monitoring are all crucial to the operation of a standby power unit. The transfer from utility power to inverter supplied power in the event of a utility failure must be short enough to sustain uninterrupted transmission. Some inverters come on with full voltage instantaneously. Others have an option known as "soft start" which reduces the stress on the inverter.

An inverter also should have some form of voltage regulation. As the battery supplies power to the inverter, its voltage begins to fall off. Inverter voltage regulation will meter the flow of current to the line amplifiers. A voltage regulator should maintain voltage at  $\pm 5$  percent of efficiency. A low voltage shutoff feature will leave residual voltage so the battery can sit for 24 or 48 hours before recharge without damage. A low voltage shutoff

at the inverter will prevent the battery from dropping down to zero by shutting it down if it drops to about 10 percent of its energy.

Status or remote monitoring is available in different formats. Some systems have an onsite "go-no-go" indicator that is mounted on the pole or at the base of the pedestal. Other systems offer complete status monitoring functions with a headend microcomputer interface and plug-in modules for the standby unit interface. Software is available for complete maintenance and testing from remote

locations. For the purposes of comparison, input voltage is presumed to be 117V, 60 Hz AC from standard utility lines. The manufacturers should be consulted in all cases as to the specific requirements and/or options for their systems.

For the purposes of comparison, input voltage for all models and manufacturers is presumed to be 95-135 VAC standard commercial power. In all cases, the manufacturer should be consulted for the specific requirements, features, options and/or configurations of their units.

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## Standby power manufacturers

### Alpha Technologies Inc.

1305 Fraser Street, D-5  
Bellingham, Wash. 98226  
(206) 647-2360

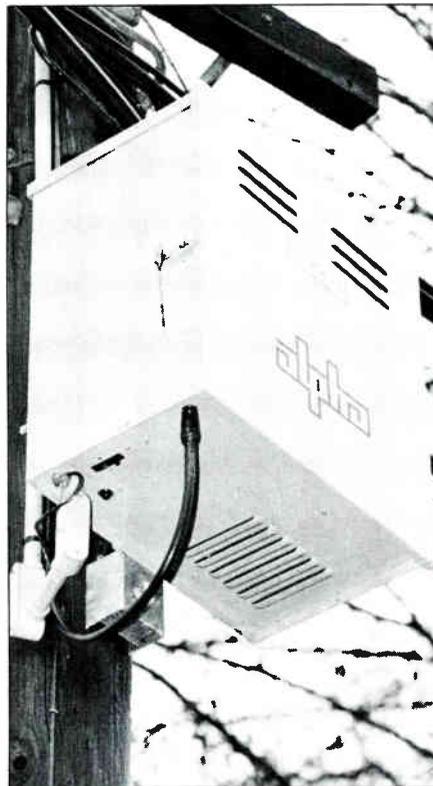
Formed as a means for consolidating several CATV and industrial power conversion enterprises under one corporate title, Alpha Technologies began as a manufacturer of both the hardware and software used in standby power supply remote status monitors and other power conversion products. It has been manufacturing the same

types of products ever since. The company has plants located in Washington, Arizona and British Columbia and has its own research and development, engineering, manufacturing and marketing departments. Ten manufacturers representatives are located throughout the U.S. and Canada, with post-sale service provided through four authorized service centers on the East and West coasts and through those centers located at every Alpha manufacturing plant. The company's forecast for 1983 total sales is eight-to-ten million dollars.

### Cable Power Inc.

14860 Northeast 95 Street  
Redmond, Wash. 98052  
(206) 882-2304

Cable Power Inc., formerly Philtek Electronics Ltd., has been manufacturing CATV power supplies since 1978. Exclusively a manufacturer of CATV power supplies, Cable Power is best known for its generation 707 system, which, according to a company spokesman, has achieved a reputation for its reliability, compactness and other standard features. In February 1982, the company relocated to Redmond, Wash., from British Columbia, Canada. Since then, the company has expanded its standby power supply line to include the 727 A + B and 737 A + B models. These units are available from two to six batteries and offer two to four hours of standby time. Two other products Cable Power recently has developed are two headend rack-mounted non-standby power supply units that will be released at this year's NCTA show.



Alpha Technologies AP960

*continued on page 61*

# Product Profile

## Alpha Technologies

| Model | Power | Current/voltage   | Regulation | Battery voltage | Charge current | Recharge time | Transfer time | Standby time         | Dimensions      | Weight                       | Price |
|-------|-------|-------------------|------------|-----------------|----------------|---------------|---------------|----------------------|-----------------|------------------------------|-------|
| AP960 | 900w  | 15 amps at 60 VAC | ± 3%       | 36 VDC          | 8 amps max.    | 12-24 hours   | 12-15 ms      | 3.5 hours at 10 amps | 25h x 21w x 13d | 97 lbs. (with-out batteries) | \$850 |

**Options:** Heavy duty lightning arrestor, externally visible red warning light to indicate operation or fault, elapsed time meter to indicate total number of hours inverter was operational, automatic performance monitor that checks power supply and standby operation, plug-in board for remote status monitor (headend interface separate).

**Features:** Fully automatic operation, squarewave output with inherent current limiting in both modes, short circuit proof, corrosion free and compact enclosure, modular design, inverter crystal controlled and line synchronized, phase locked transfer of less than one cycle, temperature compensated charging, output metering, CSA and UL approved.

## Ametek, Sawyer Division

| Model   | Power | Voltage current   | Regulation | Battery voltage | Charge current | Recharge time | Transfer time             | Standby time       | Dimensions      | Weight                       | Price |
|---------|-------|-------------------|------------|-----------------|----------------|---------------|---------------------------|--------------------|-----------------|------------------------------|-------|
| CTF3000 | 900w  | 15 amps at 60 VAC | ± 2%       | 36 VDC          | 5 amps         | 20 hours      | zero (fully floating UPS) | 3 hours at 10 amps | 31h x 13w x 15d | 200 lbs (with-out batteries) | N.A.  |

**Options:** Battery heaters, status monitoring (local and remote), input circuit breaker box, Gould Watchman batteries, pole or pedestal mount.

**Features:** Lightning surge protection, modularity and compact design, safety line cord for auxiliary input, output current/voltage meters, heavy gauge steel, clam shell double locked enclosure.

## Cable Power Inc.

| Model | Power | Current/voltage   | Regulation | Battery voltage | Charge current                 | Recharge time | Transfer time | Standby time       | Dimensions      | Weight                       | Price |
|-------|-------|-------------------|------------|-----------------|--------------------------------|---------------|---------------|--------------------|-----------------|------------------------------|-------|
| 737A  | 840w  | 12 amps at 60 VAC | ± 2%       | 36 VDC          | 5 amps adjustable (soft start) | 8-10 hours    | 15 ms         | 4 hours at 12 amps | 16w x 23h x 14d | 95 lbs. (with-out batteries) | N.A.  |

**Options:** Auxiliary power input, external mounted input circuit breakers, utility meters, output circuit breaker, battery cooling/ventilation, battery guardian option for self-test, status monitoring, output/short sensing, surge protection, wide variety of packaging/configuration options with minimum 25-unit order.

**Features:** SRC regulated battery charger with automatic boost control, phase locked transfer, uni-ferreroresonant transformer, reverse transfer time delay, external visible status lamps, all power transistors socket mounted, low voltage cutoff.

## Control Technology Inc.

| Model  | Power | Current/voltage   | Regulation          | Battery voltage  | Charge current | Recharge time | Transfer time | Standby time   | Dimensions              | Weight                       | Price         |
|--------|-------|-------------------|---------------------|------------------|----------------|---------------|---------------|--|-------------------------|------------------------------|---------------|
| Data 1 | 720w  | 12 amps at 60 VAC | line ± 3% load ± 3% | 24 VDC or 48 VDC | 3 amps         | 15-17 hours   | 10 ms typical | 2 hours at 12 amps (2 battery)<br>4 hours at 12 amps (4 battery) | 16.25w x 18.4h x 15.25d | 58 lbs. (with-out batteries) | \$1080 (list) |

**Options:** Auxiliary power input, battery options, pedestal mount, battery heater, spare modules, circuit breaker cover, self-test, status monitoring package-provides three programmable scanning modes, eight outputs and two control functions.

**Features:** Patented cycle charging and pulse width modulation, constant regulated output in both modes, self resetting short circuit protection, lightning surge protection, visible output current indicator.

## Electra-Motion Inc.

| Model        | Power | Current/voltage   | Regulation | Battery voltage | Charge current                  | Recharge time        | Transfer time   | Standby time                               | Dimensions          | Weight                       | Price |
|--------------|-------|-------------------|------------|-----------------|---------------------------------|----------------------|-----------------|--|---------------------|------------------------------|-------|
| METRO MS1000 | 900w  | 15 amps at 60 VAC | ± 3%       | 24 VDC          | constant current 3-step charger | 6 hours (worst case) | zero (true UPS) | 1.5 hours at 15 amps<br>2 hours at 12 amps | 19h x 16.7w x 15.3d | 108 lbs (with-out batteries) | N.A.  |

**Options:** Standby event counter, elapsed time meter, input/output voltage and/or current meters, surge protection devices, add-on battery capacity in separate cabinet.

**Features:** Status indicator lights, removable battery trays, outlet with "fail safe" line cord, bypass switch, UL/CSA approved input circuit breaker, overload protection, factory burn-in, five year warranty, positive isolation from utility during standby mode.

N.A.—not available

## Larson Electronics

| Model | Power | Current/voltage   | Regulation | Battery voltage | Charge current | Recharge time    | Transfer time | Standby time       | Dimensions          | Weight                       | Price |
|-------|-------|-------------------|------------|-----------------|----------------|------------------|---------------|--------------------|---------------------|------------------------------|-------|
| LE60  | 840w  | 15 amps at 60 VAC | ± 2%       | 36 VDC          | 3 amps max.    | approx. 20 hours | 50 ms         | 4 hours at 12 amps | 23w x 19.5h x 14.5d | 100 lbs (with-out batteries) | N.A.  |

**Options:** Available with or without ferroresonant transformer

**Features:** Test/status indicator, sufficient room in housing to mount your own ferroresonant transformer, batteries accessible from top, heavy duty transfer relays, solid state time delay circuit.

## Lectro Standby Power Systems

| Model  | Power | Current/voltage         | Regulation | Battery voltage        | Charge current | Recharge time | Transfer time | Standby time           | Dimensions      | Weight                       | Price        |
|--------|-------|-------------------------|------------|------------------------|----------------|---------------|---------------|------------------------|-----------------|------------------------------|--------------|
| Sentry | 840w  | 14 amps at 30 or 60 VAC | ± 2%       | 24 VDC at 35 amps max. | 2 amps         | 4-6 hours     | 15-20 ms      | 2 hours at 14 amp load | 27h x 16w x 15d | 88 lbs. (with-out batteries) | \$940 (list) |

**Options:** Adjustable transfer time (battery to line power), counter for standby mode operation, heavy duty lightning arrestor, status monitoring capability, low-voltage brown-out card.

**Features:** Low voltage shutdown, status indicator lights, constant voltage battery charger, aluminum pole mount or pedestal housing, slide out battery tray, minimum wiring required, keyed locks on doors, accommodates group 31 batteries.

## PowerVision

| Model  | Power | Current/voltage   | Regulation          | Battery voltage               | Charge current | Recharge time | Transfer time                                  | Standby time       | Dimensions        | Weight                      | Price                   |
|--------|-------|-------------------|---------------------|-------------------------------|----------------|---------------|--|--------------------|-------------------|-----------------------------|-------------------------|
| NB113C | 840w  | 14 amps at 60 VAC | line ± 2% load ± 2% | 36 VDC (32-42.5) (adjustable) | 5 amps max.    | 18-24 hours   | 16 ms line to battery; battery to line-30 sec. | 4 hours at 14 amps | 24h x 23w x 12.5d | 98 lbs (with-out batteries) | \$930 (single quantity) |

**Options:** Status monitoring for normal and standby modes, low battery cutoff warning, tamper switch, elapsed time meters, input lightning arrestors, side mounted battery tray, automatic cycling of inverter section, TRANSORB on output for amplifier protection.

**Features:** Modular, automatic operation, ferroresonant output in normal mode, transient free square wave inverter output, non-floating battery charger, programmable regulator time, brownout protection, surge protection, 30 second time delay before retransfer, metering and test points panel mounted.

## RMS Electronics Inc.

| Model      | Power | Current/voltage   | Regulation | Battery voltage | Charge current | Recharge time    | Transfer time                                  | Standby time      | Dimensions               | Weight                       | Price        |
|------------|-------|-------------------|------------|-----------------|----------------|------------------|--|-------------------|--------------------------|------------------------------|--------------|
| Power-King | 720w  | 12 amps at 60 VAC | ± 2%       | 24 VDC          | 4 amps         | approx. 35 hours | line to battery-25 ms; battery to line-10 sec. | 3 hours at 9 amps | 23.25h x 21.25w x 14.75d | 160 lbs (with-out batteries) | \$975 (list) |

**Options:** "Piggy-back" housing for four battery usage.

**Features:** Time delay relay, primary input circuit protection, on-off primary overload circuit breaker, input and output pilot light indicators, locking pin to secure battery trays, quick disconnect between AC power supply and inverter section.

## Siltron Illumination Inc.

| Model | Power | Current/voltage   | Regulation | Battery voltage | Charge current | Recharge time      | Transfer time              | Standby time       | Dimensions      | Weight                       | Price |
|-------|-------|-------------------|------------|-----------------|----------------|--------------------|----------------------------|--------------------|-----------------|------------------------------|-------|
| CA369 | 900w  | 15 amps at 60 VAC | ± 3%       | 36 VDC          | 6 amps         | 12 hours (typical) | 16-20 ms (line to battery) | 2 hours at 10 amps | 24h x 24w x 16d | 105 lbs (with-out batteries) | \$950 |

**Options:** Pole or pedestal mounting, 12V hybrid battery (calcium and antimony), local status monitoring, rolling or non-rolling battery tray.

**Features:** SCR type inverter, quasi squarewave regulated output in both modes, short circuit protected, modular construction, isolated output, electro-mechanical isolation from utility line in standby mode, automatic equalization, low voltage battery cutoff, transient protection, removable standby section, LED status indicators.

## Texscan/CCT

| Model     | Power | Current/voltage   | Regulation          | Battery voltage | Charge current | Recharge time | Transfer time                             | Standby time          | Dimensions      | Weight                       | Price         |
|-----------|-------|-------------------|---------------------|-----------------|----------------|---------------|---|-----------------------|-----------------|------------------------------|---------------|
| Series 90 | 840w  | 14 amps at 60 VAC | line ± 2% load ± 3% | 36 VDC          | 6 amps         | 10-12 hours   | 8.3 ms (AC to batteries; batteries to AC) | 3.75 hours at 10 amps | 23w x 18h x 14d | 88 lbs. (with-out batteries) | \$1195 (list) |

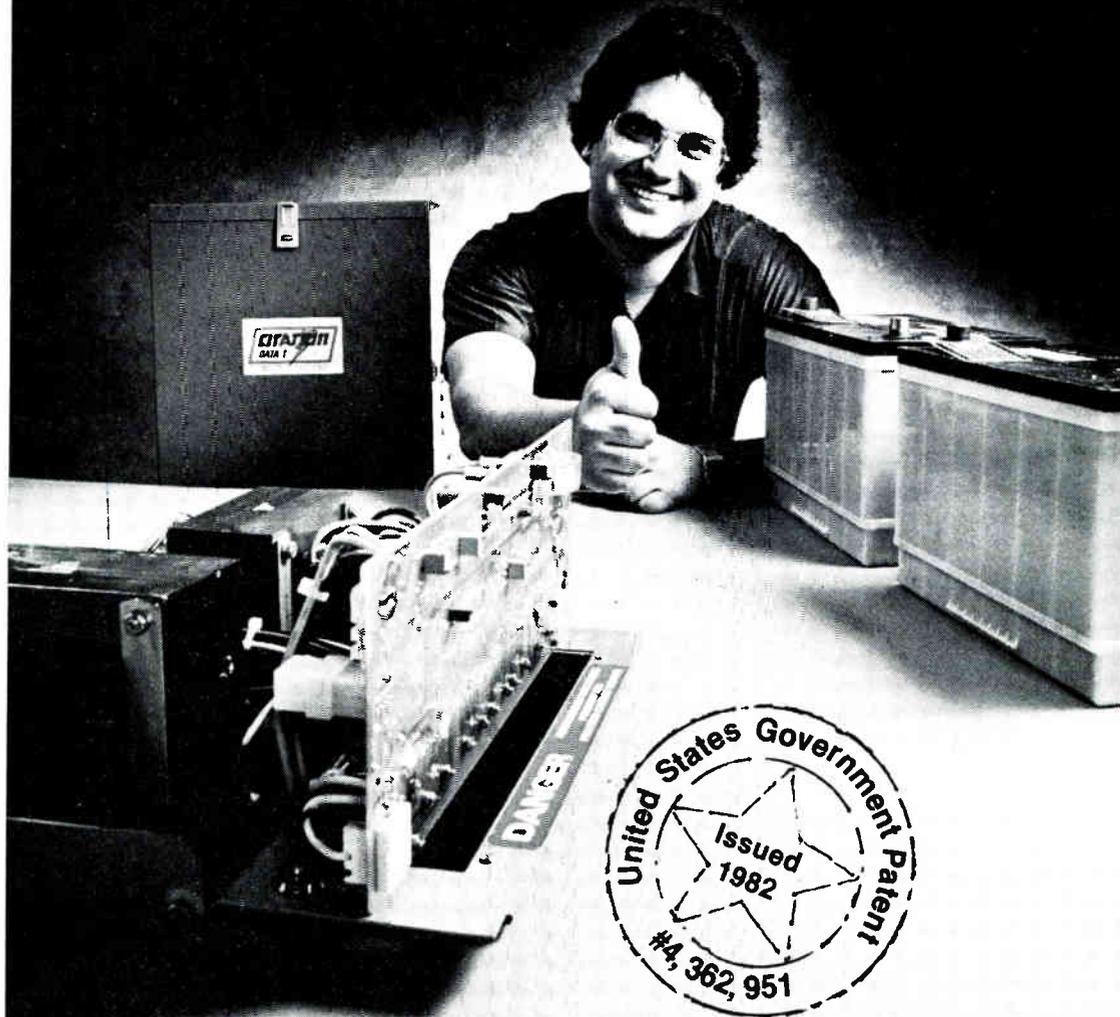
**Options:** Status/performance monitoring.

**Features:** Modular design, solid state switching, retransfer time delay, battery charger (dual mode float circuit), ferroresonant transformer, phase lock loop, circuit breakers, visual monitoring, top mounted batteries.

N.A.—not available

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### Cable and Computer Technology Inc.

2621 E. Katella  
Anaheim, Calif. 92806  
(714) 937-1341

Founded in 1979 by two brothers, Kirk and Clark Hollingsworth, Cable and Computer Technology Inc. was acquired three years later, on Nov. 1, 1982, by Texscan Corp. Initially, the company manufactured CATV power supplies and computer components for government applications. Since the merger with Texscan did not change the company's business purpose, CCT, as Cable and Computer Technology commonly is referred to, continues to manufacture the same types of power supplies and computer parts as it has in the past. The merger with Texscan, however, afforded CCT with the opportunity to interface its products with the Texscan Theta-Com amplifier.

### Control Technology Inc.

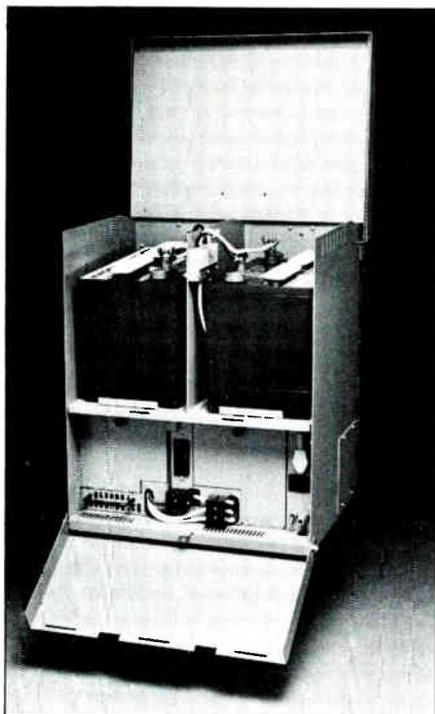
1881 State Street  
Garland, Texas 75042  
(214) 272-5544

Founded in 1969, Control Technology Inc. originally was conceived of as a company that would provide a full-range of engineering and manufacturing services to the electronics industry. While Control Technology has not reneged on its commitment to the electronics industry, it has expanded its product line to reach other markets, including cable TV. In 1975, the company manufactured its first cable TV standby power supply and, since then, has continued to upgrade and develop this product. Charles Turner, a former design engineer with General Electric Co. and Recognition Equipment Inc., was the company's founder and is now its president. The company operates out of one complex in Garland, Texas, and houses a precision sheet metal shop, a complete printed circuit board shop, other manufacturing shops and an engineering department in one facility.

### Electra Motion Inc.

40 North Daisy Avenue  
Pasadena, Calif. 91107  
(213) 449-1740

Electra Motion Inc. was founded in March 1979 by four of its principal present-day owners: W. Paul Nader, Dan Cartwright, Jim Balch and Jerry Graydon. Together, these men brought over 35 years of experience in the cable TV industry to Electra Motion. The privately owned corporation began by designing and manufacturing cable TV



**Electra-Motion MS1000**

equipment and the company's business purpose has remained unchanged ever since. While the company initially manufactured only distribution types of power supplies, it started to develop its own standby power supply system after recognizing the need for such equipment in metropolitan CATV systems. According to the company, it is trying to overcome the bad reputation standby power supply systems have had in the past by incorporating new and improved technology and design features into its standby power supply systems. Today, the company manufactures standby power supply units designed specifically for metropolitan CATV systems as well as other cable TV equipment. The company is located in one facility in Pasadena, Calif.

### Larson Electronics

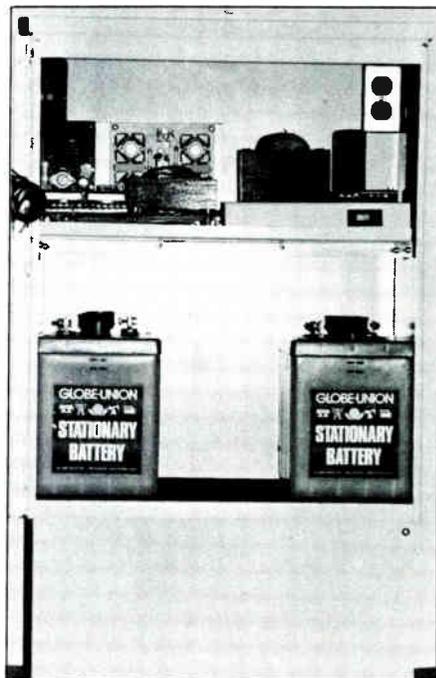
311 South Locust Street  
Denton, Texas 76201  
(817) 387-0002

In 1972, Ernie Larson and two other business associates formed a partnership and established I.T.E. Inc. in Dallas. Approximately three years later, Larson founded his own company, which he named Larson Electronics. Since its inception, Larson Electronics has manufactured power supplies for cable systems. Recently, the company has been researching output power supplies and the requirements for these systems. Larson Electronics provides field service, which it deems a top priority, and considers itself a leader in sine-wave standby power systems.

### Lectro Products Inc.

650 Athena Drive  
P.O. Box 567  
Athens, Ga. 30603  
(404) 353-1159

Jerry Schultz, whose manufacturing operations began in a store-front building in Sarasota, Fla., was the original owner of Lectro Products Inc. An engineer from the aerospace industry, he sold the company to Ron Livesay in early 1976, becoming vice president of the company with responsibilities for all the engineering and manufacturing aspects of the firm. Since Livesay's acquisition of the company, its passive manufacturing, sales and administration offices have moved to a 24,000 square-foot facility



**Lectro Sentry**

and its power supply manufacturing operations have relocated to a 48,000 square-foot facility in Athens, Ga. The November 1981 acquisition of the company by Burnup & Sims did not change Lectro's management infrastructure or its business purpose. Lectro still continues to manufacture standby power supplies and passive and alert devices for the cable industry. In 1981, it reported sales of \$5 million, well above the \$10,000 it had reported for 1975.

### Powervision Inc.

2840 Coronado Street  
Anaheim, Calif. 92806  
(714) 630-2260

Powervision Inc. was acquired in October 1979 by Condor Communications. Two months later, Condor Communications acquired Lester Equipment Manufacturing Inc. Both Power-

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**AMETEK**  
SAWYER DIVISION



vision and Lester Equipment operate as separate divisions within Condor. Powervision specializes in CATV standby power supplies; while the Lester Equipment division, known as the Power Products division, designs and manufactures industrial battery chargers, cathodic protection rectifiers and power supplies. Since Condor handles most of the administrative and marketing responsibilities for all of its divisions, correspondence to either the Powervision or Power Products divisions of Condor should be addressed to Condor Communications, Inc. Condor Communications Inc. is located at 1240 Blue Gum, Anaheim, Calif. 92806

### RMS Electronics Inc.

50 Antin Place  
Bronx, N.Y. 10462  
(800) 223-8312

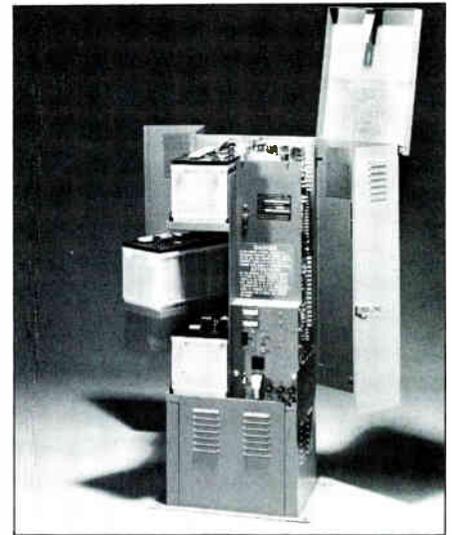
In 1981, RMS Electronics shifted its business focus away from being primarily a marketing company to being both a manufacturing and marketing company. The company's product line was expanded by the April 1978 formation of Poleline Corp., a wholly owned subsidiary that markets hardware for the tele-communications industry, and by the May 1981 acquisition of Kenyon Magnetics Inc., a manufacturer of transformers and

other allied products. According to a company spokesman, RMS Electronics now designs, manufactures and distributes a complete line of RF passive devices, connectors and accessory hardware for the cable industry. The company also manufactures and distributes products for the video cassette recorder and video disc playing industries.

### Sawyer Industries

5649 Peck Road  
Arcadia, Calif. 91006  
(213) 442-5981

Sawyer Industries is owned by AMETEK Inc., a publicly owned company headquartered in New York City. AMETEK is a diversified industrial manufacturer comprised of four operating divisions: industrial materials, electro-mechanical, precision instruments and process equipment. Sawyer Industries itself operates within this structure as a manufacturer of cable TV power supplies, including standby, non-standby and UPS systems. Currently, AMETEK/Sawyer is designing a new product that will be based on specific requirements from major MSOs. According to the company, the criteria for this unit will be reliability, longevity and easy maintenance. Features of the unit will include: a corro-



**Ametek-Sawyer CTF3000**

sion-resistant cabinet, battery-acid protection and options for remote and local status monitoring and self-testing.

### Siltron Illumination Inc.

1960 West 139 Street  
Gardena, Calif. 90249  
(213) 770-0985

Founded in 1966 by Jerry Silvers, Siltron Illumination Inc. has been manufacturing emergency lighting and power supply equipment ever since. It was acquired in the early '70s



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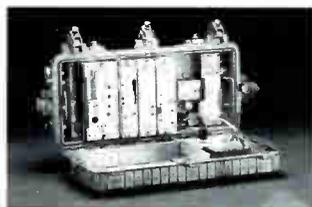
Thousands of miles of Magna 440 MHz are up, and operating ... the widest bandwidth cable system ... proven in the field.

The technical assistance we offer with our systems is proven too - thousands of miles are being logged by our Magna 440 Mobile Training Center to give systems engineers and technicians "hands on" training.

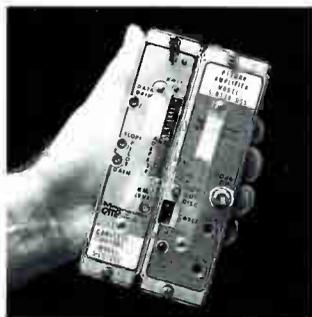
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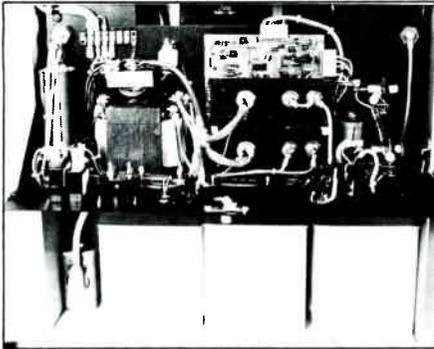
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**CITV** SYSTEMS, INC.

A NORTH AMERICAN PHILIPS COMPANY  
100 FAIRGROUNDS DR., MANLIUS, N.Y. 13104



*The Leader With Commitment*

by Data Design Laboratories Inc. and, today, functions as a subsidiary of that corporation. Siltron's principal markets are the emergency lighting, power and cable TV industries. Having introduced its first CATV standby power supply system in early 1982, Siltron is a relative newcomer to the cable industry. Other products the company manufactures include: emergency backup, UPS and interruptible power systems; a wide range of emergency lighting and ancillary equipment; a self-contained and two-headed unit; and 600 Va-12.5 kVa inverters. The company estimates its current sales at \$5 million. Anixter Communications is the exclusive distributor of the Siltron A.C./standby power supply system for U.S. CATV interactive systems.



Siltron Illumination CA369

## Manufacturers

Alpha Technologies  
 American Technology Co.  
 C-COR Electronics Inc.  
 Cable and Computer Technology Inc.  
 Cable Power Inc.  
 Control Technology Inc.  
 Electro Motion Inc.  
 Larson Electronics Inc.  
 Lectro Products Inc.  
 Power Conversion Products Inc.  
 PowerVision Inc.  
 RMS Electronics Inc.  
 Sawyer Industries Inc.  
 Siltron Illumination Inc.  
 Sola, A Unit of General Signal Terado Corp.  
 Topaz Electronics Division, Topaz Inc.  
 Tripp Lite, A Division of Trippe Mfg.  
 Wilmore Electronics Co. Inc.

## Distributors

Anixter Communications  
 Cable Services Co. Inc.  
 Cablevision Equipment Co.  
 Century III Electronics Inc.  
 Communications Supply Inc.  
 D B CATV Supply Inc.  
 Elan Enterprises  
 EM Electronics Inc.  
 Graybar Electric Co. Inc.  
 Greater Distributing Service Inc.

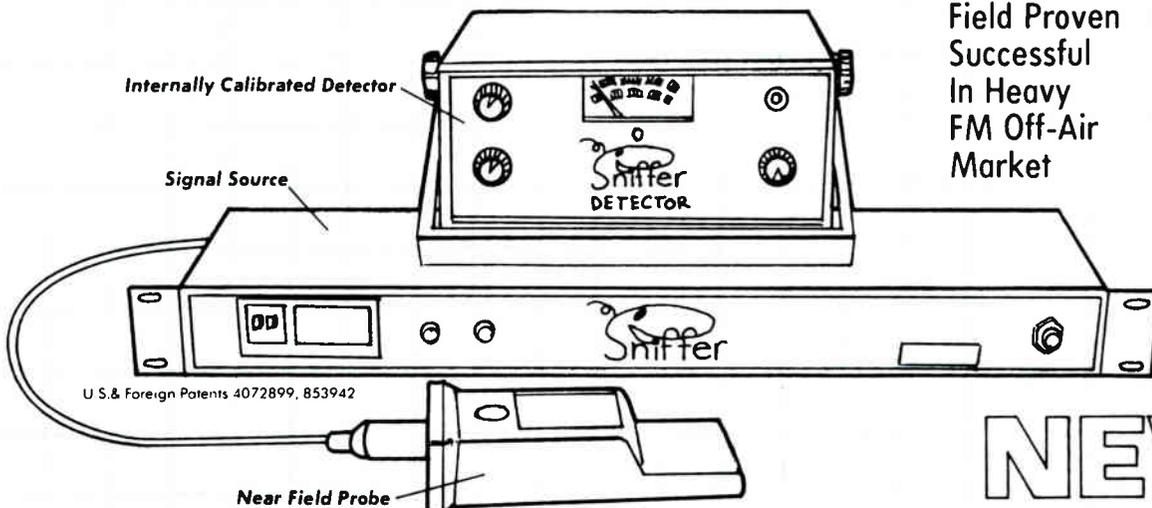
Jerry Conn Associates Inc.  
 Karnath Corp.  
 Klungness Electronics Supply Inc.  
 Mega Hertz Sales Inc.  
 Micro-Sat Communications Ltd.  
 Midwest Corp.  
 Mpcs Video Industries Inc.  
 NCS Industries  
 Priester Supply Co. Inc.  
 Roscor Corp.  
 Satellite Communications Systems  
 Skaggs Video Denver  
 Sparks Equipment Co.  
 Tele-Wire Supply Corp.  
 Toner Cable Equipment Co.  
 Victor Duncan Inc.  
 Westec Engineering Sales Co.  
 Western CATV  
 XCEL Communications Inc.

## Battery Manufacturers

American Technology  
 C&D Batteries, An Allied Co.  
 Control Technology Inc.  
 Electro Battery Manufacturing Co.  
 GNB Batteries Inc.  
 GTE Products Corp.  
 Globe Battery Division, Johnson Controls  
 Power Conversion Products Inc.  
 Ratelco Inc.

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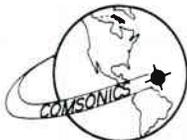
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This precisely controlled conductor interface layer provides an effective moisture shield without sacrificing handling ease. T4 strips quickly and conveniently for reliable, scrape-free connections.

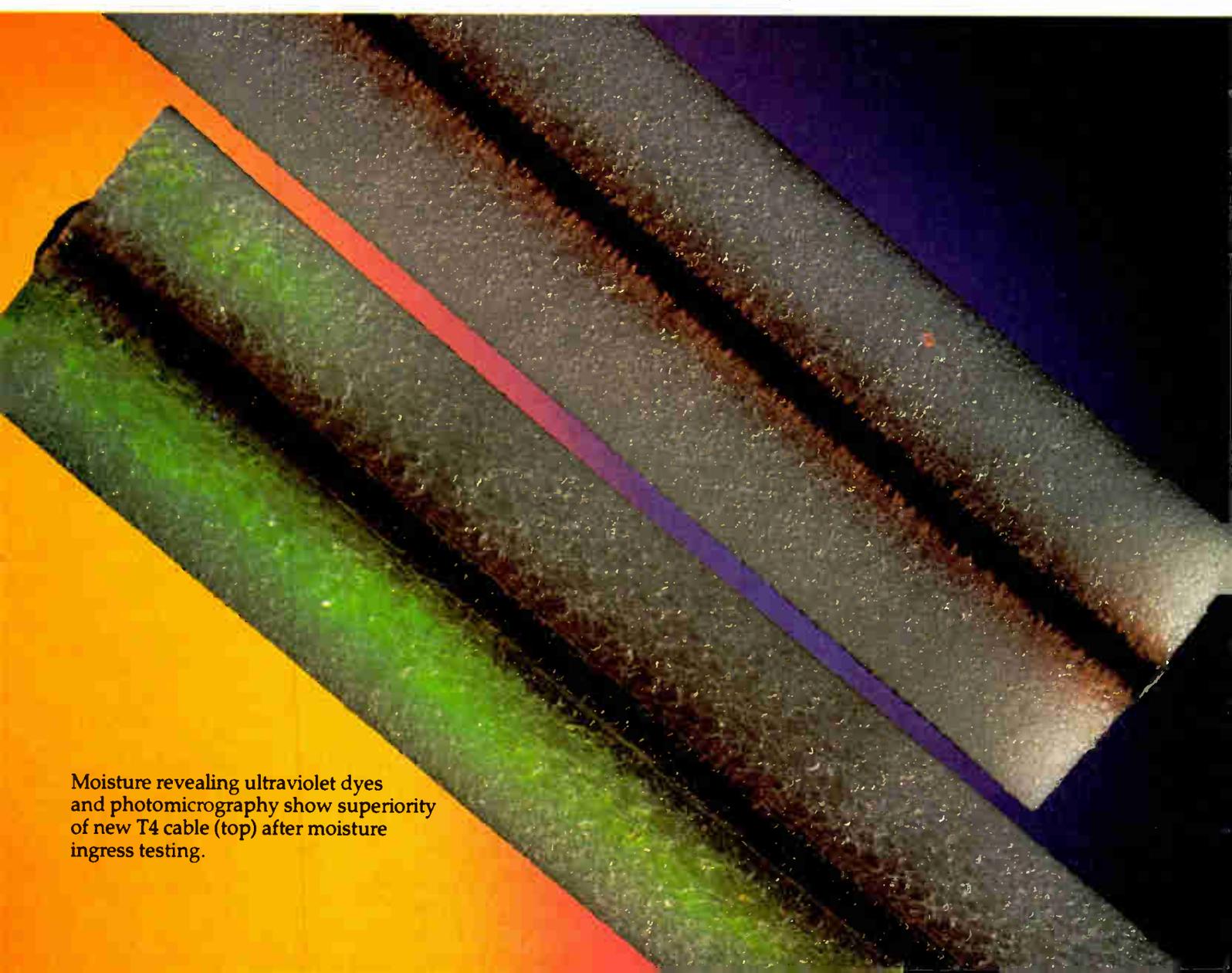
T4's cell structure is formed by the use of proprietary nucleating agents combined with advanced foam processing technology. The result is an

ultra-fine, moisture blocking, closed cell matrix. Cell integrity is maintained from the conductor coating through the outside surface and remains moisture resistant through the stresses of drawing, installation and environmental exposure.

For a sample of this remarkable new T4 cable, contact TFC today at P.O. Box 384, Wallingford, CT 06492, (203) 265-8500.



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A photomicrograph showing a cross-section of a cable. The central conductor is a thin, dark line. It is surrounded by a thick, porous, greyish material (foamed dielectric). The outermost layer is a smooth, dark grey or black coating. The image is set against a background of orange and purple gradients.

Moisture revealing ultraviolet dyes and photomicrography show superiority of new T4 cable (top) after moisture ingress testing.

■ **The Society of Cable Television Engineers Inc.** has named **John Kurpinski**, a 19-year veteran of the cable TV industry, as its 1983 SCTE Member of the Year. Kurpinski, currently a vice president and partner in Eastern Cable Communications (Jamison, Pa.), began his cable career in 1963 with Jerrold Electronics Corp. With Jerrold, he held various positions in microwave test engineering, production, plant management, customer service and sales. Kurpinski also worked for Cable Services and General Cable Co.: was president and general partner in an upstate New York cable system; and served for five years as a director of the New York Cable TV Association. A member of the Society of Cable Television Engineers since 1974, Kurpinski was active in the former Upstate New York Chapter and is a founding member of the SCTE Delaware Valley Chapter of which he is currently president.

■ **American Cable Television (ACT)** has announced four appointments in the management staff of its Tempe/Chandler, Ariz., regional office. **Ivan Johnson** has been named regional operations manager; **Andrew McCarthy**, technical services manager; **Virginia Norton**, community affairs coordinator; and **Victoria Renzulli**, special assistant.

Johnson previously managed ACT's Bullhead City, Needles and Kingman, Ariz., area operations and was vice president of ACT's public affairs department. Prior to joining ACT, Johnson was vice president, franchising of Times Mirror Cable Television of Arizona and vice president of operator services for the National Cable Television Association



**Ivan Johnson**

Chandler offices. During her six years in the cable communications industry, Norton has served as community relations coordinator for Storer Cable and as local origination director for Teleprompter (now Group W). Currently, she is president of the Arizona Chapter of Women in Cable and legislative key contact to the Arizona Cable Television Association.

In her new position, Renzulli will be responsible for overseeing consumer affairs for the Tempe and Chandler offices as well as for assisting Johnson and Norton in all areas of community relations. Prior to joining ACT, she was assistant traffic manager for Cablevision Programming Services in Long Island, New York.

■ The recently appointed **Zenith Radio Corp.** executive director and general manager of cable TV, subscription TV and videotex, **James Faust**, used to be the company's general manager, CATV/STV/Videotex. Prior to being named general manager of these divisions, Faust served as director, sales and marketing, cable and subscription TV; corporate manager, diversification planning; marketing consultant, Zenith International Sales Corp. subsidiary; and director, sales and marketing for the company's hearing aid division. He has been with Zenith since 1966.

■ **Bill Winslow**, former inside sales representative in **North Supply Co.'s** CATV department, has been promoted to product marketing manager, CATV. As product marketing manager, Winslow will be responsible for North Supply's line of cable television products. Winslow has been an account manager in the company's international division and a cable television product engineer.

■ **John Tinsley** has been appointed general manager of the **Jerrold International** division of **General Instrument Corp.** Tinsley is based in Brussels, where he is responsible for Jerrold's European and distribution operations and for company's product engineering staff, based at High Wycombe, England. Possessing an extensive background in electronics general management in Europe, Tinsley most recently served as general manager of Allen-Bradley's European headquarters in Brussels.

In addition to Tinsley, Jerrold has noted **Christopher Sophinos** to director, sales administration and customer service and transferred him to the company's Hatboro, Pa., headquarters. Since 1979, Sophinos had been the manager of material planning and inventory control in Jerrold's Tucson, Ariz., manufacturing plant. Sophinos joined the

company in 1977 as production planner at the company's manufacturing plant in Chicopee, Mass., and was promoted to production planning manager before the Chicopee plant was moved to Tucson.

■ **John Dahlquist** has been named director of system technology at Jerrold. Formerly director of marketing for Jerrold's distribution systems division, Dahlquist now will be responsible for



communicating product technology to Jerrold's sales force and customers. This responsibility will require Dahlquist to manage system design, new system architecture analysis, applications engineering, proposals and technical publications.

■ **Geoffrey Roman** recently became vice president of engineering and marketing for **RF Systems Division of General Instrument Corp.** As vice president of engineering and marketing, Roman will be responsible for Canadian and U.S. design and development activities for the RF Systems product line. He also will manage the development of specialized distribution components to support the LAN business of the General Instrument Corp. and will market the RF Systems product line in the U.S. In June 1982, Roman joined RF Systems as director of network planning. He later was named director of networking and shortly thereafter assumed the added responsibility of director of marketing. Since 1975 up until the time he joined RF Systems, Roman was associated with Mitre Corp., where he was involved in network planning and engineering and was held principally responsible for the planning and implementation of a number of local area networks in various government facilities.

■ **Alan Kartes** has joined **Fortel Inc.** as central states regional manager. Kartes' qualifications include seventeen years of experience in video electronics design and video production and as regional sales manager for another TBC (time base corrector) manufacturer. In this position, Kartes will be responsible for all Fortel distribution in the Central U.S. including: Wyo., Colo., N.D., S.D., Neb., Kan., Minn., Iowa, Mo., Wis., Ill., Ind., Ohio and Southern Nevada.

■ **Tribune Cable Communications Inc.** promoted three men in its New York systems to the position of system manager and appointed two others to the positions of regional coordinator and controller.



Those promoted are: **Daniel Carr**, **Charles Himelrick** and **Ernest Young**. The man appointed regional coordinator is **James Lazor**; the man named controller, **Glen Koach**.

Dan Carr, promoted to system manager of the Fredonia, N.Y., system, joined the company in 1976. Before that, he spent 12 years in the cable industry at Comac Telcom, Buffalo, N.Y.; Q.C. Construction, Horsham, Pa.; and A-M Communications, Quakertown, Pa.

Chuck Himelrick, with the Glen Falls system since 1972, will now be systems manager of that system. His prior cable experience was with Jerrold Electronics.

Ernest Young has been with Tribune Cable's Oneida, N.Y. system since 1974. Previously, he worked for the B.R. Lanz Construction Co. in Vernon, N.Y.

The new regional coordinator of Tribune Cable's Glen Falls system, Jim Lazor, has been with Tribune Cable since 1982. Before that, he worked for the Green Mountain Cable system, Burlington, Vt., and for People's Cable Co., Rochester, N.Y.

Glenn Koach, the new controller of Tampa Cable Television Inc., Tribune Cable's Florida cable TV subsidiary, joined Tribune Cable in March of 1982 as director of financial planning and analysis. His responsibilities in that position included acquisition, franchise analysis, and cable system data base evaluation. Koach's

previous cable experience was with Warner Amex Cable Communications Inc., where he was manager of financial analysis. He also has served as associate manager of financial planning for The Dun & Bradstreet Corp. in New York City and as senior accountant at Peat, Marwick, Mitchell & Co. in Fort Lauderdale, Fla.

■ **NewChannels**

**Cable Television** has made **Thomas Staniec** chief engineer. His responsibilities will include supervising all of the technical aspects of the NewChannels operation, including the company's two most recent ventures: Cable Alarm Systems and Data Transmission. Staniec began with the Syracuse, N.Y., based company in 1972 as a field technician in its Rome, N.Y., system. For the past eight years, he has served as a field engineer for NewChannels cable systems in New York, Pennsylvania and Alabama.



**Thomas Staniec**

■ **Ken Lawson** has joined **Computer Video Systems Inc.** (CVS) as vice president of marketing. Lawson, who has extensive experience in marketing and selling products to the CATV industry, will assist CVS in implementing its expanding product development program. He also will be responsible for future marketing

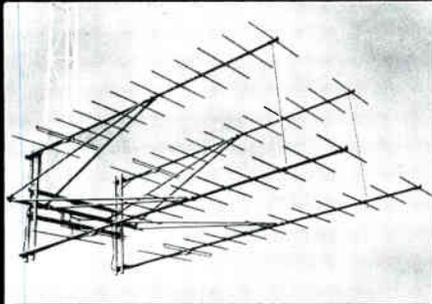
plans, advertising and budgets and will work closely with Randy Wegner, CVS' former director of marketing.

With the restructuring of the marketing department and the recent appointment of Lawson to vice president of marketing, **Randy Wegner** has been made national sales manager for CVS. In this position, he will be responsible for the management of all sales representatives and major national character generator accounts.

■ **Diamond Communications Products Inc.** has promoted **Frank Pepe** to manager of marketing and advertising. After joining Diamond in 1979, Pepe held positions in distribution, traffic and sales.

■ **Ann Kirschner** has been named director of new services for **Group W Cable**. As director of new services, Kirschner will be responsible for development and implementation of teletext services and other advanced cable services in the company's nationwide systems. She joined Group W Cable in 1981 as a proposal supervisor and later became director of new markets development, where she oversaw preparation of the company's franchising proposals. Before joining Group W Cable, Kirschner was director of the 1980 Houston Conference on Business and the Humanities, an assistant director and managing editor for the Modern Language Association and a lecturer in the department of English at Princeton University.

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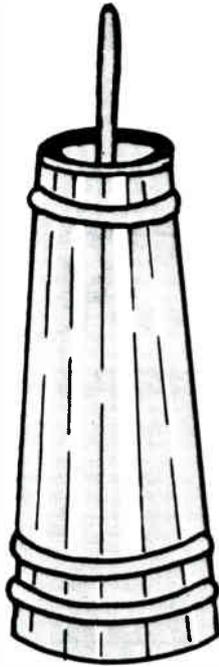
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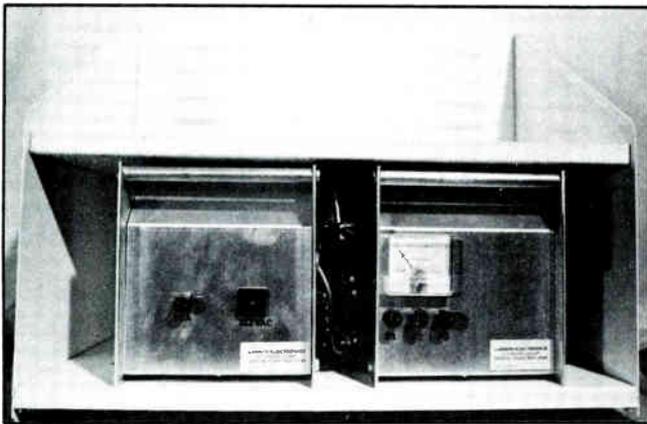
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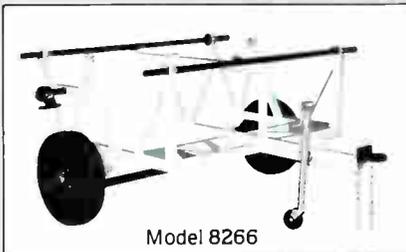


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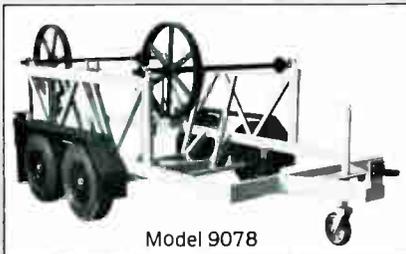
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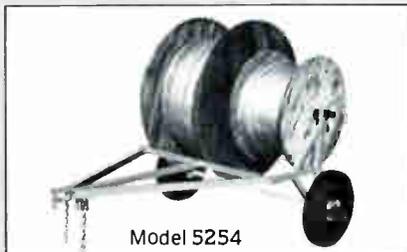
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■ **McCaw Communications Companies Inc.** named **Douglas Beach** regional vice president for the McCaw Cablevision's northern region. In this position, Beach will be responsible for overseeing 12 systems, serving approximately 50,000 basic subscribers in Washington, Alaska and northern Oregon. Possessing more than 17 years of cable TV experience, McCaw was vice president of operations at CommuCom, a Southern California MSO, before taking the position offered him by McCaw.

McCaw Communications also has promoted **Cal Cannon** to the position of regional vice president of southern Oregon for McCaw Cablevision. Prior to his promotion, Cannon was regional manager for the southern Oregon cable properties. Cannon has had more than 15 years of cable TV experience with the McCaw organization and approximately nine years of experience with the California division of Viacom. In 1968, he was trained as a technician for the San Diego area's Mission Cable, which now is known as Cox Cable, and, 10 years later, became general manager for Viacom in Snohomish County, Wash. During his tenure with McCaw, Cannon served as regional manager of four southern Oregon regions.

■ **Bob Williams** is the new director of operations for **The Disney Channel**. His duties as director of operations include systems planning; coordination of origination, videotape and uplink facilities; maintenance of broadcast and quality control departments; and supervision and development of future operations planning. Williams previously served as a production manager for CBS Cable and as a senior unit manager for NBC Sports.

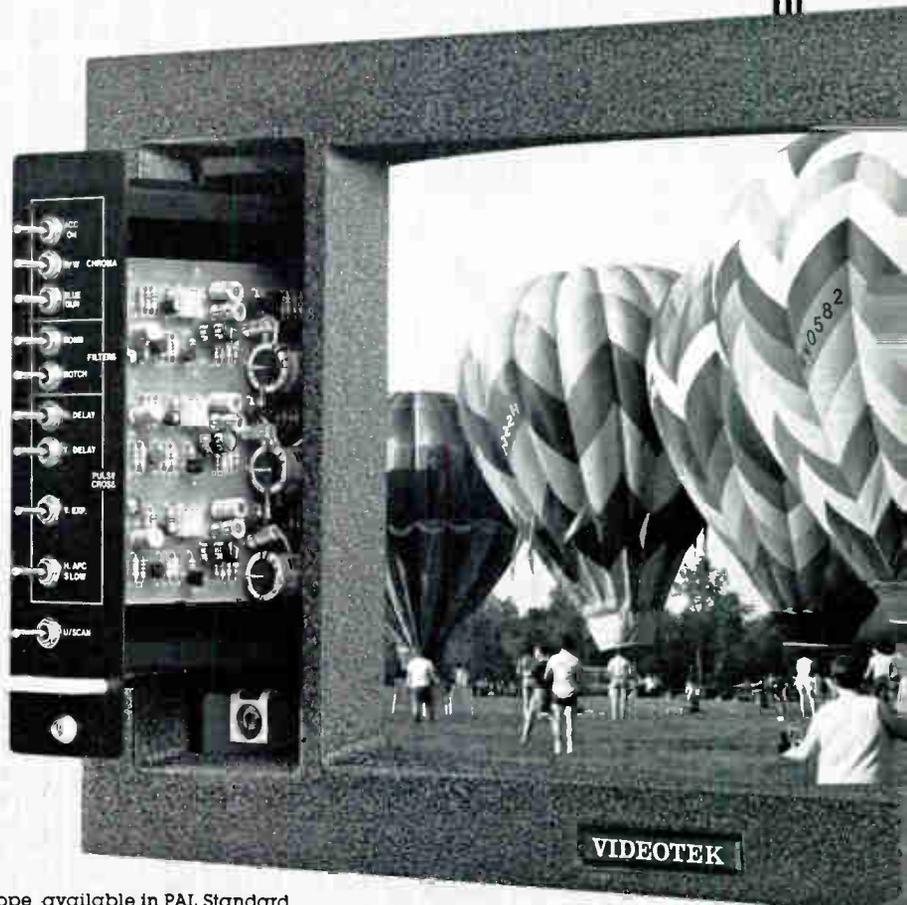
■ **Richard Smith** has been appointed vice president of information systems and data services for **Warner Amex Cable Communications**. Smith, who previously led a project team for Warner Amex to oversee the recent installation of a new FDR (First Data Resources) computer system, will now be responsible for managing all data processing systems development, systems implementation and operations for Warner Amex. He joined Warner Amex in January 1981 and went on to hold various positions in the areas of finance, operations and administration, before being promoted to his present position. Prior to Warner Amex, Smith worked for Xerox Corp. for 13 years.

■ **Martin Siskel** has been promoted to senior vice president at **Blonder-Tongue Laboratories Inc.** Formerly vice president of operations, Siskel will retain those duties in addition to assuming responsibility for the management and direction of sales for the company's general line of products and systems. Siskel joined Blonder-Tongue in 1980 after being vice president of manufacturing at the signal-stat division of Abex Corp.

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■ **C-COR Electronics Inc.** announced that it is accepting applications for a new company position, president and chief operating officer. Due to the growth the company has experienced in the past several years, separation of executive functions into two positions—chief operating officer and chief executive officer—has become essential. Under the new organizational structure, James Palmer, who presently holds the positions of president, chief executive officer and chairman, will retain the position of chairman and chief executive officer. He will be concerned primarily with the company's long-range growth plans and expansion activities. The new president and chief operating officer, once chosen, will handle the daily management of continuing operations.

In addition to creating a new position, C-COR has hired **Charles Franzetta** as international sales manager. In this position, Franzetta will be responsible for introducing the company's cable television and data transmission products to the international market, including Europe, South America and Asia. Prior to joining C-COR, Franzetta accrued 13 years of experience in international sales and marketing. He was general manager of Ohio Valley for The Flying Tiger Line Inc. and director of distribution for *Newsweek*.

■ **Hazel Kahan** has been appointed vice president, research, for **Warner Amex**

**Cable Communications.** As vice president of research, Kahan will be responsible for all research activities including subscriber sales and marketing, programming and advertising sales. Prior to this appointment, Kahan worked for Warner Amex as director of research. Before joining Warner Amex in February 1982, she was president of Market Behavior, a market research company that she founded, and also served as a researcher for several firms including Oxtoby-Smith, Lieberman Research and Avon Products.

Warner Amex Cable Communications also promoted **F. Raymond McDevitt** to senior vice president of technical operations and named **Larry Parks** advertising sales manager of its Dallas system. McDevitt came to Warner Amex Cable two years ago as vice president of technical operations after working at ITT's Electro-Optical Products division. Parks was in sales management at KVIL Radio in Dallas.

■ **Rogers Cablesystems** announced the promotion of **Jim Vandergriend** to the position of construction coordinator for its east Portland Ore., operations. He will be involved in directing and coordinating all construction activities of Cablesystems Pacific.

■ **William Tlemann** was named sales manager for Satellite TV Reception Systems by **General Instrument, RF**

**Systems Division.** Prior to joining RF Systems, he held the position of Southern regional sales manager.

■ **Mucip Cable TV Services** has appointed **Jackie Jeffery** regional manager. Jeffery will be based at Mucip's regional office in Westland, Mich.

■ **Robert Sadler** was named general manager of cable operations for **Joyce Cable Inc.** In another appointment at the company, **John Ameluxen** was named service department manager. He previously held the position of site supervisor.

■ Two promotions at **Cablevision Program Enterprises:** **Robert Pollichino** to vice president, operations and finance; and **Michael DiPasquale** to controller. Before the promotions, Pollichino was director of finance, programming; DiPasquale was accounting director.

■ **WTBS** promoted **R.D. (Pooch) Johnson** to production and operations director. An employee at the superstation since 1975, Johnson recently served as production manager. In his new position, Johnson also will work with Cable News Network as an on-location production consultant.

■ **Leonard Strauss** was appointed vice president of finance and administration for **Tuned Intelligence Inc.**, a Kansas City-based firm specializing in software computer systems for the cable television industry. For 35 years, Strauss was president of Inland Cold Storage Co.

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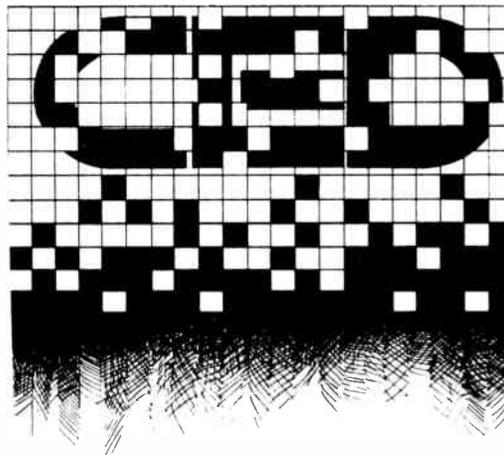
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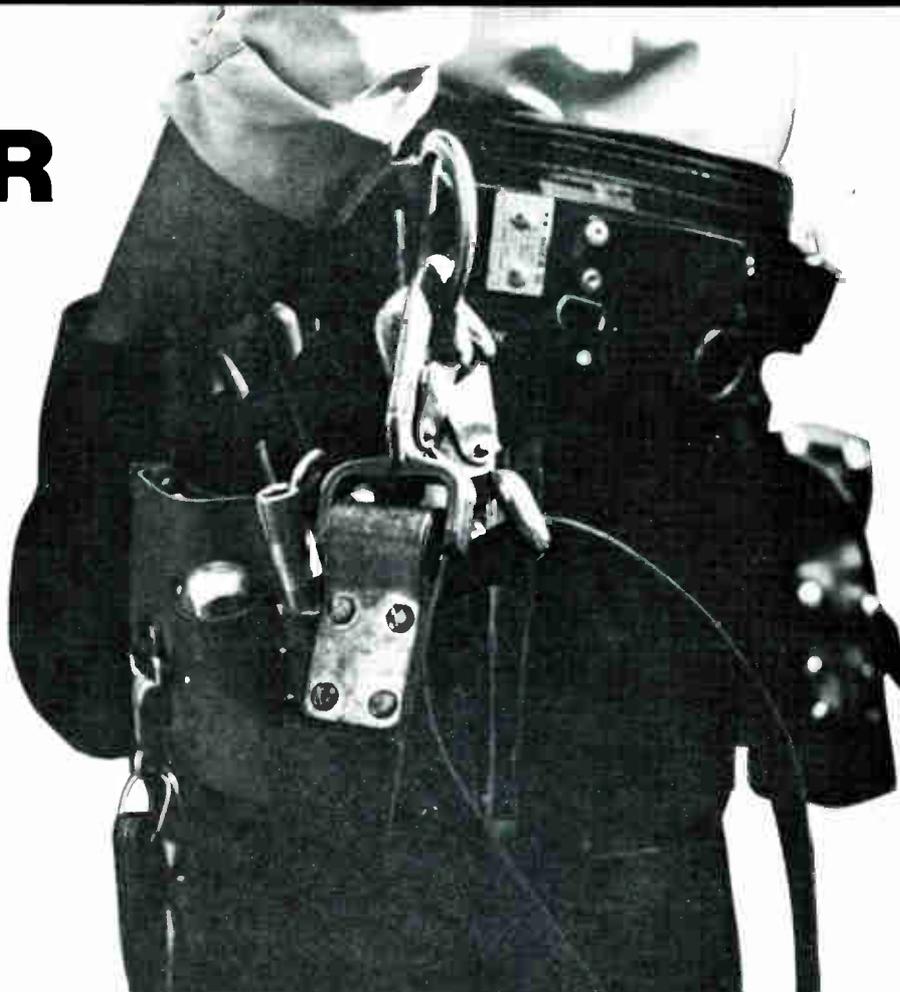
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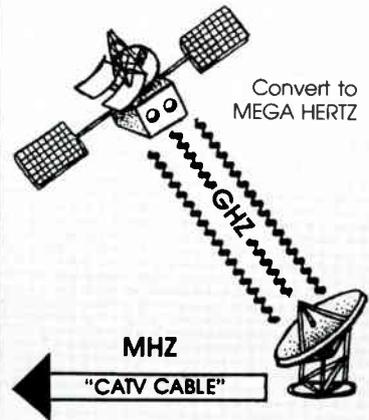
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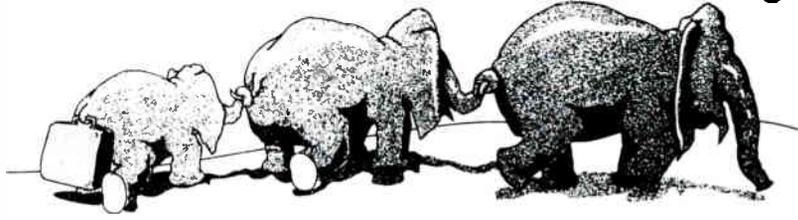
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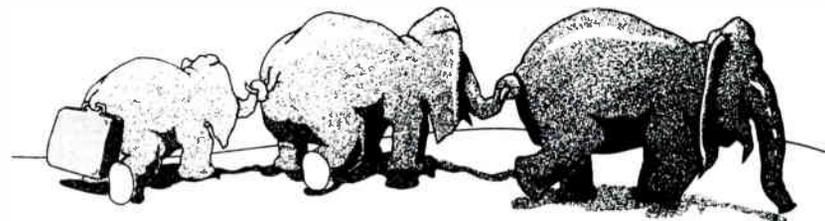


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# Product News

## Jerrold introduces four products

Phaselock and non-phaselock COMMANDER signal processors with surface acoustical wave (SAW) filter for either HRC or IRC operation are now available from Jerrold. The C4P and C4PP phaselock processor models offer enhanced mechanical and thermal stability and fewer coil or trimmer adjustments than previous processor models. Standard components of the C4P and C4PP are: IF switching with loss-of-signal sensing, AGC for substitute signals, built-in override alert switching and a built-in standby for 30 VDC backup power. According to the company, these processors offer superior input overload, noise control and spurious output performance. The processors feature the following options: a carrier signal replacer plug-in module for applications where the processor is used on pilot channels, a second IF module, a video/audio baseband source switch, a phaselock board, a video/audio separator and a 4.5 MHz sound trap for microwave applications.

In addition to the COMMANDER signal processors, Jerrold has designed a new COMMANDER alert system that permits full audio and video override from any touch-tone telephone. Named the model CAS-2, the alert system is comprised of an automatic answerer; a tone decoder; and a COMMANDER modulator, which, according to the company, can drive an entire headend. By dialing a preset multi digit code, a caller can broadcast his voice over all channels of the cable system. Additionally, a character generator can be connected to the system at the headend to broadcast an emergency announcement, an accompanying video message and special emergency information for deaf viewers in the audience. While the system is designed to revert to normal operation automatically after a pre determined time chosen by the operator, it can be turned off before the maximum time limit by entering a one-digit pre-selected cancellation code.

The complete CAS-2 COMMANDER emergency alert system can be added to any Jerrold headend without modification. It lists for \$3,465, subject to standard discounts, and is immediately available from stock.

Jerrold also has added a 65 dB signal cut-off switch to its addressable Starcom 450 product. This switch is activated on any non-authorized or parentally-controlled channel so that, instead of seeing a scrambled picture and hearing clear audio, no signal is received at all. According to a company spokesman, the switch stops reception to the point where the



## Jerrold COMMANDER IV processor

viewer cannot tell whether there is programming on the channel. As a result, the temptation to open the box and alter the circuitry to steal services is reduced. The switch works in accordance with the parental control key lock Jerrold introduced last year to selectively lock out 25 to 50 percent of the program tags. To operate the key switch, the subscriber turns the key and removes it; thereby locking out all the pay channels preset for lock-out by the system operator.

For more information, contact Jerrold, (215) 674-4800.

## Catel PAS-2000, Tomco SR-500

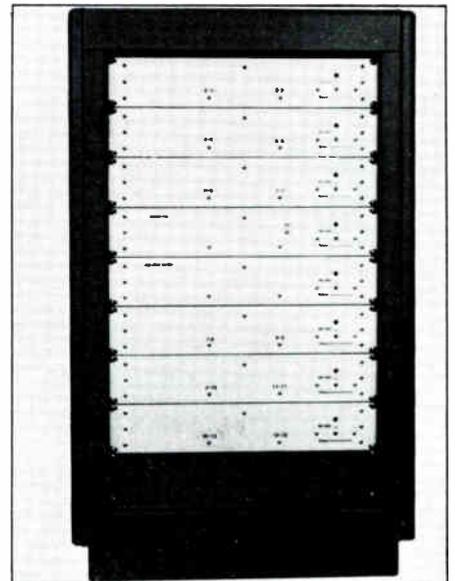
A high-security, premium audio scrambler/descrambler system for cable FM services has been developed by CATEL. The PAS-2000 system, designed to operate within a two-tier CAFM service, protects against theft, while also, according to the company, increasing revenue opportunities from cable FM. The system, which will be available by the end of this year's first quarter, features a headend unit that uses SAW filter technology to process cable FM stereo signals into a dual frequency block. One of the blocks carries regular FM signals in designated frequency assignments; the other carries premium signals at A-1 (114.1 - 119.1 MHz) for conversion to 102.9 - 107.9 MHz at the subscriber receiver. The in-band scrambler system allows operators to transmit an annoying warbler tone or promotional messages on scrambled premium channels. The unit will be priced at \$2,995; and the corresponding PAD-2000 descrambler unit, including a special FM splitter, will be priced at less than \$30.

The Tomco SR-500 multichannel signal processing system selects desired services from a standard cable drop and reprocesses them into a combined 12-channel output. Because, according to the company, the SR-500 offers low-cost per-channel in a prepackaged system, it

is best suited for use in hotels, motels, hospitals and schools and for similar applications. Furthermore, its "selectivity" characteristic provides enhanced service to systems limited to 12 channels and reduces the potential of equipment theft since no converters or descramblers are required in individual rooms.

Other features of the system include: a broadband AGC amplifier and single high-level output amplifier; heterodyne processors that not only incorporate SAW I.F. filtering but also accept any standard CATV channel; input level from the cable drop from  $\pm 0$  to +20 dBmV; maximum output level of +45 dBmV per channel at the single output port; individual channel gain trim of  $\pm 5$  dB minimum; and an open-frame equipment rack in which the system is packaged. Available with commercial-quality descramblers that use crystal control for increased frequency stability, the SR-500 can be delivered within 45 days and is backed by a one-year warranty.

For more information, contact Catel/Tomco, (408) 988-7722.



Tomco SR-500

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### Comtech CDM 1160 modulator

Comtech Data Corp. has introduced a new low-cost modulator called the CDM 1160. Designed specifically for the SMATV market, the modulator uses the "unishelf" concept for housing up to seven modulators. The CDM 1160 is a crystal-controlled fixed frequency modulator that incorporates a saw filter for optimum adjacent channel filtering and performance. It is available for operation on any channel in the low-, mid- or VHF-bands of frequencies and provides up to seven channel modulators in one 7-inch high-rack mount package. Standard features of the modulator are: a card shelf, a plug-in power supply module, a hinged front panel and from one to seven plug-in modulator boards. The system can be used for a wide range of applications, including apartment complexes, hotels and motels, MATV systems, security systems and for educational and training purposes.

For more information, contact Comtech Data Corp., (602) 949-1155.

### Fortel adds CCDHP and CCDHPS

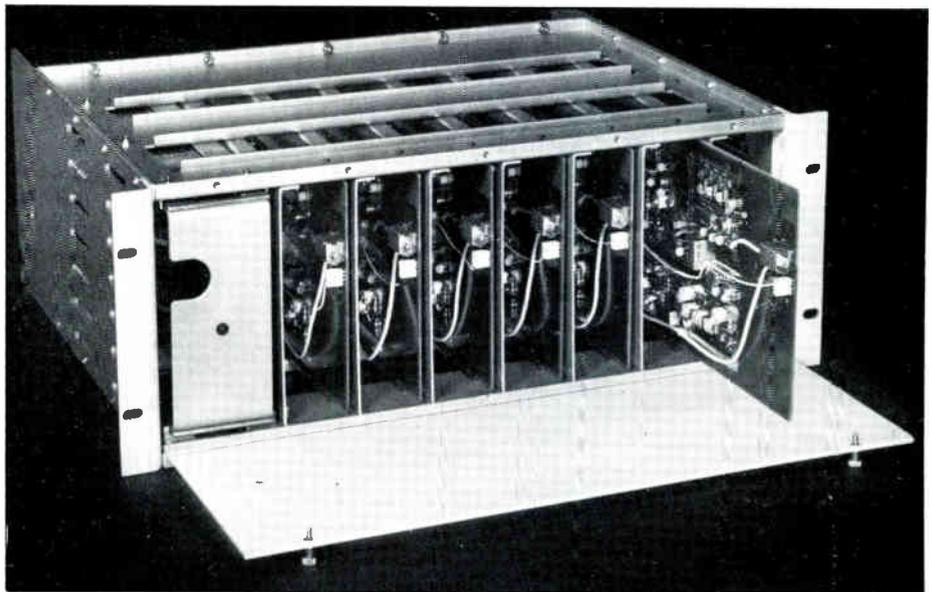
Fortel Inc. has made two additions to its line of time base correctors and frame synchronizers: the CCDHP and the CCDHPS. The CCDHP, equipped with a new Y/C separator, meets all FCC requirements. Other features include 60 dB signal-to-noise ratio, 0.5 degree differential phase, 1.5 percent differential gain, 2 percent K factor and 2.8 MHz bandwidth. Designed to achieve highest performance standards from the grade U-Matic Type VTRs, the CCDHP lists for \$5,995.

Fortel's CCDHPS incorporates all of the same features as the CCDHP with the exclusion of the 2 percent K factor. The CCDHPS substitutes a 1 percent for the CCDHP's 2 percent K factor. Also designed to operate with U-Matic type VTRs, the CCDHPS offers noise reduction, preset and manual proc amp control and full sync drive capability. The unit lists for \$6,995.

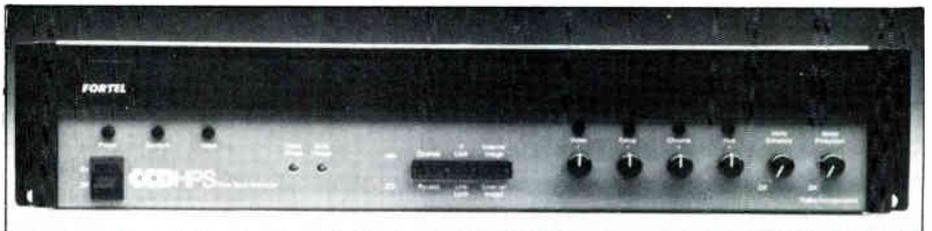
For more information, contact Fortel Inc. (404) 449-4343.

### Full-hydraulic ArmLift line

TG Industries has introduced a fully-hydraulic ArmLift aerial series. Designed for a one-ton chassis and for one-man operation, the ArmLift "H" series contains a full-pressure hydraulic system that can be powered by either a truck PTO or fanbelt pump. The aerial unit provides precision speed control and a dual control system, bucket and base (with over-ride). Working heights from 32 to 38 feet are available, depending on the model selected. Models also can be ordered with a fiberglass upper-boom section that is insulated for working voltages to 68 KV. Other optional equipment includes a continuous rotation feature, a hydraulic



Comtech CDM-1160



Fortel CCHPS TBC

tool circuit at the bucket, an emergency 12V DC descent system, A-frame outriggers, and a stop-start and/or throttle control at the bucket.

For more information, contact TG Industries Inc., (712) 864-3737.

### Lectro presents Lectrolert

Lectro Products Inc. has completed the development of a digitally controlled warning and information system, which has been named Lectrolert. This system consists of an unattended answering device; a digitally controlled transmitter, to be located in the headend at a cable system; and receivers, which should be placed in the subscriber's home. Lectrolert is capable of 16 input codes to serve various alert purposes. Each receiver is available with a one address receiving capability; a second address receiving capability is, however, optional. When the proper code is received, the receiver produces an audible alarm and flashes a light. The receivers also are equipped with a nine VDC battery for power back-up in case of commercial outages.

For more information, contact Lectro Products Inc., (404) 353-1159.

### V-1880 single-box video processor

BP Electronics is offering a new video processor, the Model V-1880, which stores a stabilizer (video guard remover), image enhancer, video to RF converter, video fade in and out and a dual output distribution amplifier in one compact

table-top box. The unit's stabilizer has a lock control feature that corrects the entire range of copy guard distortion to provide a more stable picture. By converting video signals from any video component to usable RF signals that can enter TV antenna terminals, the model's RF converter permits the TV set to receive video and audio signals from the image enhancer, guard stabilizer, video camera, computer and VCR. A detail-controlled enhancer reduces grain to allow the user to choose the best picture according to his preference, while a video fader provides a gradual transition from full-video to black and back again to full-video. The single-box processor lists for \$250 and offers easy-dial operation.

For more information, contact BP Electronics, (516) 752-0313

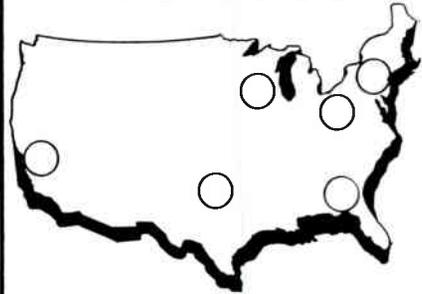
### User guide to antenna patterns

A "Users's Guide to Antenna Patterns" is being offered by MCL Inc., a manufacturer of earth station ground transmitters. This guide was designed for installers and designers of satellite communications earth terminals. It can be mounted on the wall and is available in chart form. To obtain this guide free of charge, write on your company letterhead, "User's Guide to Antenna Patterns," and address your letter to MCL Inc.

For more information, contact MCL Inc., 10 North Beach Avenue, La Grange, Ill. 60525.

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### Intercept hybrid splitter series

A series of two-, three- and four-way hybrid splitters from Intercept Corp. features a quad-mounted housing that, according to company officials, provides for increased flexibility and ease of installation. Available in three models—the HS200, HS300 and HS400—these splitters are pretested for full-CATV range. Strand, eave, flush-wall or horizontal mounting options are made possible by the quad housing and offer increased convenience when drops come up from the floor or when all ports are in a face-down position in cabinets. The units offer sealed die-cast housing and clear-chromate finish to withstand variable weather conditions and machine-threaded ports to ensure a positive "f" connector fit.

For more information, contact Intercept Corp., (800) 526-0623.



Intercept 2-, 3- and 4-way hybrid splitters

### Via Video introduces new products

Via Video has introduced two encoders, the S-100 color graphics encoder and NTSC color encoder and sync generator, and one turnkey/video graphics system.

The S-100 color graphics encoder, which encodes the RGB signal into an RS-170A NTSC color broadcast signal, is contained in a single printed circuit board and is plug-compatible with the Cromemco SDI color graphics computer system. According to the company, the unit features special design techniques that minimize RF noise, color crawl, chroma smearing and interference between chrominance and luminance signals to produce a clear and high-quality NTSC composite video signal. A switch-selectable integral broadcast quality color bar contained within the unit assists in system set-up. The encoder is priced at \$1,795 and is available for delivery upon receipt of order.

The second encoder Via Video has introduced is the NTSC-1 color encoder and sync generator. This encoder produces NTSC signals from computer graphics systems and character generators. Similar to the S-100 encoder, the NTSC-1 encoder minimizes RF noise, color crawl, chroma smearing and interference between chrominance and luminance signals. As a single rack unit, it can be used with most RS-170 compatible color graphics computer systems. It also can generate RS-170A NTSC color broadcast signals for systems having RGB (red, green, blue) and sync only for outputs. Priced at \$3,495 and available for delivery within 30 days after receipt of order, the NTSC-1 features the same integral broadcast quality color bar generator contained in the S-100 encoder.

In addition to these two encoders, Via Video has unveiled the System One, a turnkey computer/video graphics system for the advertising, broadcast and cable industries. The system features real-time frame, stop-frame and color-map anima-

tion; unlimited fonts; full-color slide and transparency production capabilities; video output; and direct output to red, green and blue. A high-resolution digitizing camera subsystem permits input of existing two- or three-dimensional artwork objects. An electronic easel, consisting of a bitpad or digitizing tablet and a pen-like stylus, allows artists and graphic designers to create original images with the use of more than 4,000 colors. Other components of the system include: a microcomputer, 13-inch high-resolution monitor, dual eight-inch floppy disk drives, digitizing camera and stand, and RGB/NTSC outputs. System One peripherals that are of particular interest to the cable industry are an animation package, a video editing package and an output camera system for instant prints and transparencies.

For more information, contact Via Video, (408) 996-2055.

### LNR synthesizer-tuned converter and local converter

LNR Communications has presented a new series of synthesizer-tuned agile converters for satellite earth stations. The C-band up and down converters, Models UC6L-D3 and DC4L-D3 respectively, were designed for use in 4 and 6 GHz SCPC and TDMA transmission systems. The converters use digital PSK or FM modulation for transponder switching and "1-for-N" protection for those times when frequency agility within a transponder is desired. Standard step size is 2.5 MHz. Besides eliminating the need to change frequency in a fixed-tuned converter and to stock long lead-time crystals, the converters feature microprocessor-controlled front panel tuning. Up to 30 different frequencies or transponder numbers may be stored in the user-programmable microprocessor memory, and channel frequency assignments may be reviewed and changed while the converter is online without interrupting traffic. Designed for ultra-low phase

noise, without need for any motorized tuning, the converter is 1 3/4 inches high. It is completely self-contained; has full monitoring and alarms; can be used for data, FDM, video and audio; and comes with a remote control option.

As a complimentary device for its synthesizer-tuned converters, LNR's model AL013-M multi-frequency local oscillator not only can be used with LNR's Ku-band model UC14 and DC12 dual conversion up and down converters but also with earth stations utilizing the SBS satellite. When the AL013-M is used with LNR's frequency converters, the converters can be tuned to the center frequency of any of the 10 SBS transponders. Available in two versions with output frequencies to accommodate either upconverters or downconverters, the local oscillator is completely self-contained including power supply, oscillator circuitry, controls and alarms. The units employ the same modular design as the UC14 and DC12 converters and are constructed in such a way that two units can fit adjacent in a 7-inch high shelf within a standard 19-inch rack. The unit can incorporate a Ku-band local oscillator for conversion to Ku-band output. On the unit's front panel, a thumbwheel is located to assist in tuning to any of the ten transponders with a frequency stability and an ability to reset within  $\pm 100$  Hz.

For more information, contact LNR Communications, (516) 273-7111.

### Anixter multibeam feed system

The Mark Antenna Division of Anixter Communications has designed a multi-beam feed system for 4.0 and 5.0 earth station antennas. The system can accommodate up to five prime focus feeds and can receive simultaneous programming from the current four-degree-spaced satellites. Shallow F/D ratio allows the off-access feeding to maintain efficiency and consistency. Gain of the four-degree off-boresight beam is within 0.5 dB down from the original antenna, while gain of the eight-degree off-boresight beam is less than 1.5 dB down from the original antenna. The system is available in a complete antenna package or as a retrofit kit for existing 4.0 and 5.0 Mark antennas.

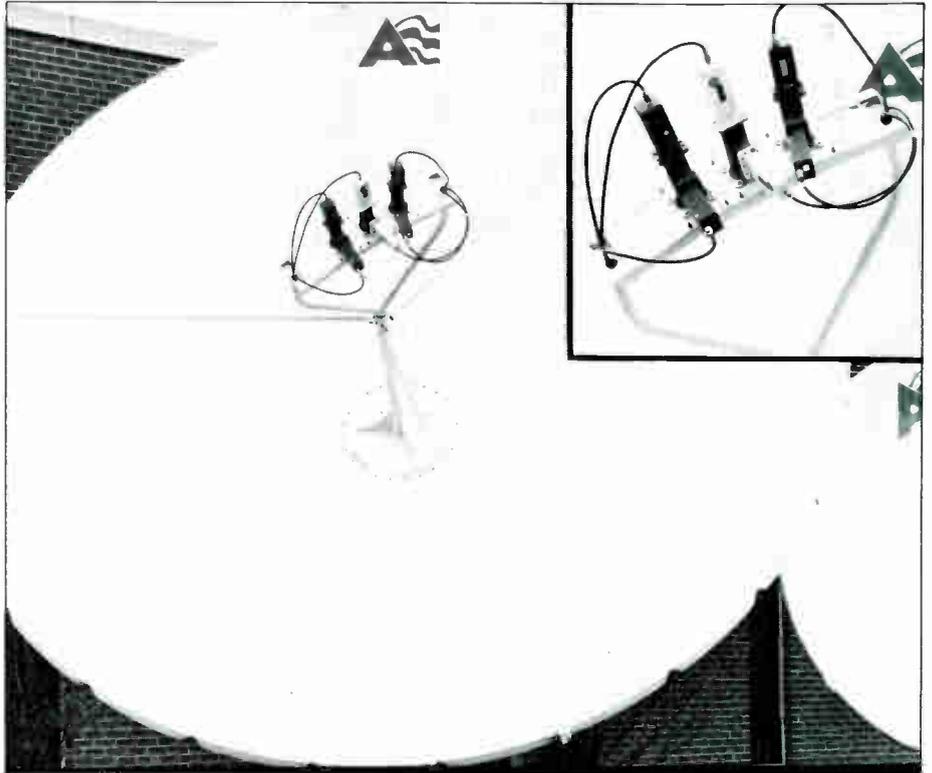
For further information, contact Anixter Communications, (312) 677-2600.

### Artel T/R-2010 fiberoptic data set

Artel Communications Corp.'s latest plug-in fiberoptic communications module set, the T/R-2010, transmits high-speed TTL/ECL digital data signals over the entire range of DC to 50 Mbps. According to the company, the system has a one-mile distance capability at data rates of 50 Mbps and a two-mile distance capability at 25 Mbps. In addition to accommodating either TTL or ECL level digital data, the T/R-2010 has dual 50 ohm BNC inputs/outputs and T-2010 transmitter and R-



The DC4L-D3, LNR's synthesized-tuned downconverter



Anixter multibeam feed system for 4- and 5-meter earth stations

2010 receiver modules that plug directly into a SL-2000 universal card frame. Other standard features of the module set are proprietary circuitry; a test switch that activates a test pattern, which is recognized by the R-2010 receiver; a remote loopback test component that verifies transmitter/receiver operation; synchronous flashing lights that are located on both the receiver and near-end transmitter to indicate normal operation; and automatic alarms that detect loss of optical signal due to intrusion or malfunction.

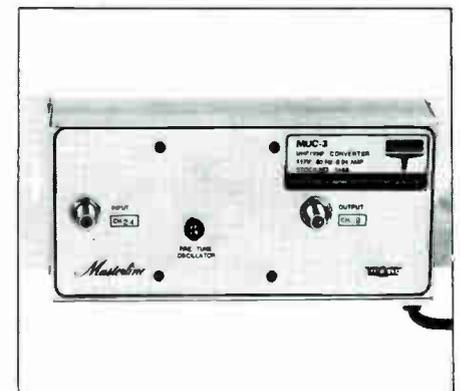
For more information, contact Artel Communications Corp., (617) 752-5690.

### The Masterline converter

The Masterline™ MUC-3 is a single-channel UHF to VHF converter recently announced by Blonder-Tongue Laboratories Inc. The converter is factory-tuned for a specific customer-selected conversion and is designed with a temperature compensated L-C oscillator. Uniform gain is made independent of channel conversion to ensure stable operation. A sealed

RF reduces radiation and isolates the RF module away from undesired signals. All the system's components are protected by a rigid extruded aluminum base and cover. Additionally, the system's high-input capability and low noise figure help achieve a wide dynamic range over the entire UHF band.

For more information, contact Blonder-Tongue Laboratories, (201) 679-4000.



Blonder-Tongue Masterline MUC-3

### Time Mfg. expands product line

Time Manufacturing Co. has added the Tel-29-1 insulated telescoping aerial lift to its VERSALIFT product line. The Tel-29-1 features an insulated lower-boom tip section that provides a minimum 42-inch insulation gap even when the upper boom is fully retracted. Built to mount on any 10,500-pound G.V.W. or larger chassis, the unit has a 300-pound bucket capacity, a working height of up to 35 feet and a horizontal reach of 23 feet. All controls, including truck engine start/stop, are located at the bucket, with exception of the override controls, which are mounted on the pedestal. Hydraulic power is provided by either a truck engine fan-belt driven pump, a PTO/pump, an engine/generator or a 12-volt DC pump. Both the upper boom and lower boom tip are constructed of fiberglass, tested at 100 KV per OSHA and ANSI A92.2 and rated



Tel-29-1 aerial lift from Time Mfg.

for work on line voltages of up to 69 KV. Design criteria is based on a 3-to-one safety factor for all steel portions and a 5-to-one factor for fiberglass portions. Options include emergency power, a hydraulic tool power circuit and hydraulic bucket leveling.

For more information, contact Time Manufacturing Co., (817) 776-0900.

### ATI adds polarity control

A front panel polarity control switch has been added to Automation Techniques' GLR-500, GLR-520 and GLR-560 satellite receivers to provide polarity control from the receiver unit. Since the current configuration of Automation Techniques' receivers is not easily adaptable to many of the latest satellite systems, this switch will make changing polarization easier and quicker for the end user. Until the switch is manufactured, the company will send instructions, which explain how to make the change with rear panel wire interconnections, to those owners of current receivers who request it.

For more information, contact Automation Techniques, (918) 836-2584.

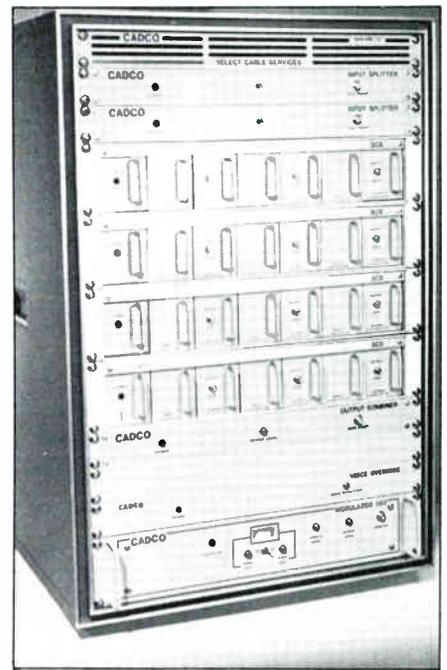
### Drop Shop passives

The Drop Shop is offering a new line of 5-450 MHz passives. These top mount 2-, 3-, 4-, 6- and 8-way splitters pass 5-450 MHz signals indoors or outdoors, provide RF shielding and are individually packed with mounting hardware.

For more information, contact The Drop Shop, (800) 526-4100.

### Cadco unveils select cable service

Select Cable Service (SCS) is an off-cable institution headend from Cadco Inc. It was designed for use in hotels, hospitals and other multi-outlet locations where converters are not economically viable.



Cadco SCS headend

Twelve channels of superhet processors with "front ends" were made specifically to operate with equal or slightly greater adjacent channel signal levels. These receivers, combined with flat hybrid amplifiers and SAW filtering, cover 54-400 MHz and are available in a 30-inch relay rack that, according to the company, requires no field assembly, wiring or set-up. Input is designed for +12 dBmV with up to 8 dB positive or negative slope; maximum combined output level is 55 dBmV. While SCE offers the operator the option of a modulated channel for in-house movies and character generation, its input and output frequencies also can be changed in the field.

For more information, contact Cadco Inc., (214) 271-3651.

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### TBCs without input clock

Due to a recent development in high-speed microprocessor and filtering technology, Digital Video has removed the input clock from digital time base correctors. The DPS-103 digital processing system, designed by Digital Video, uses a microprocessor sync separator and a digital time base correction interpolator, instead of an input clock, to reduce analog circuitry to a minimum and, according to the company, to yield instantaneous and precise correction at the output. By storing video in a buffer memory, the microprocessor examines the position and length of each TV line (phase and frequency) on a line-by-line, "look-ahead" basis to correct both time

base and velocity errors. Error data is stored, examined, compared with previous and upcoming lines and then applied to the video data for time base correction in the digital interpolator. The system provides locked video at 40 times normal speed in forward and reverse, holds color at 10 times normal speed and has a 16-line memory for handling gyro errors frequently associated with portable VTR usage.

The DPS-103 is designed for use with heterodyne 3/4-inch and 1/2-inch VTRs. In addition, its luminance and chroma components are processed separately to provide RS 170A outputs that are automatically color-framed to house sync. Priced at \$8,950, the DPS-103 can be delivered

from stock within 30 days.

For more information, contact Digital Video, (416) 499-4826.

### The Intersat IQ-160

The IQ-160, designed by Intersat Corp. for the cable industry, is a microprocessor-based receiver equipped with remote control. According to the company, the receiver's memory capacity exceeds that of most home computers, making it one of the most advanced TVRO systems on the market today. The system can provide sixteen preset programs and allows parental lock-out of objectionable programming. Besides offering complete control over satellite and channel selection, the IQ-160 offers complete volume

## How in the world are you supposed to get these off?

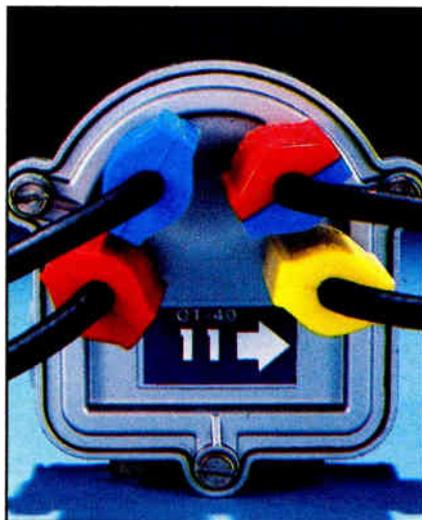
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- Keeps honest people honest
- Is inexpensive enough to secure even matching transformers
- Must be destroyed to be removed
- Is impervious to weather conditions
- Labels apartment drops
- Has distinct colors that may be easily observed from a car or truck
- Tags condition of drop
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General Cable's 13.0mm (.500") Fused Disc M-III coaxial cable is now  listed and classified for plenum installation. Receipt of  listing for all sizes is anticipated in the near future.

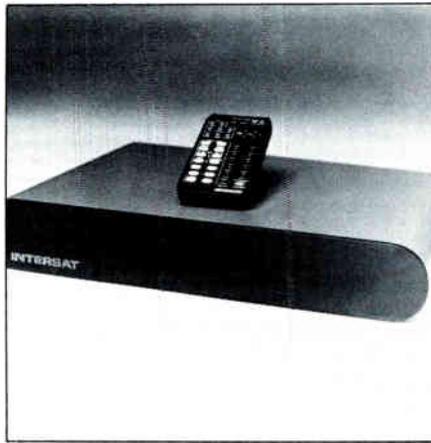
Contact your General Cable Sales Representative for a catalog and a sample or call the Customer Service Center at 800-526-4385 or in New Jersey 201-636-5500.

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control (including mute), preprogrammed video and audio and the capability of selecting any audio subcarrier between 5.5 and 9.0 MHz. Based on an integrated system design approach, the system can use more than one receiver on a single antenna, has quartz-synthesized tuning; and includes: bass, treble and balance controls; mono, matrix stereo and direct stereo capability; and selectable narrow- or wide-band filtering with 12 watts per channel RMS with .05 total harmonic distortion. Encased in a modern steel cabinet, the system's exterior can be finished in a variety of ways, depending on the customer's preference.

For more information, contact Intersat Corp., (800) 325-6122.



Intersat IQ-160

### Samsung exports cable products

Samsung Electronics Co. Ltd. of Korea, one of Korea's leading manufacturers and exporters in the electronics field, is exporting two cable TV products to the U.S., including: a cable TV tuner assembly and cable TV converter.

Samsung's cable TV tuner assembly, the CAT-1750AE, is for use with a CATV converter. It features 64-channel capacity, a built-in prescaler circuit for synthesized tuning; an optional plug-in descrambler; automatic fine tuning, built-in surge protection and a built-in diplexer. Input frequency range is 54-440 MHz with return loss of 6 dB minimum. Power supply voltage is 24 V  $\pm$  10 percent, and output gain is 7 dB maximum with a return loss of 14dB minimum.

The CATV converter module Samsung also is marketing overseas is a varactor-tuned frequency converter module that converts cable TV signals in the frequency range of 54-440 MHz to a intermediate frequency. The module consists of an up and down converter assembly. Its frequency range is 54-440 MHz, with a 13 dB maximum input noise figure and input return loss of 6 dB minimum. Its output gain is 7 dB maximum and image rejection, 55 dB minimum. Its oscillator radiation does not exceed U.S.A. FCC or Canadian DOC limits.

For more information, contact Samsung Electronics Co. Ltd., C.P.O. Box 2775, Seoul, Korea; telephone: 752-9536 28-3305.

### Alexander VTR battery pack

Alexander Manufacturing Co. has introduced a new rechargeable nickel-cadmium battery pack for video recording equipment. The new BP90 pack, which can replace either a Sony BP90 or an Alexander BP40, features a taped case to provide easy access for on-the-spot repairs. The pack also contains an internal fuse, a rugged plug and cord and a pull tab for quick removal from the equipment.

For more information, contact Alexander Manufacturing Co., P.O. Box 1645, Mason City, Iowa, 50401, (515) 424-0191.



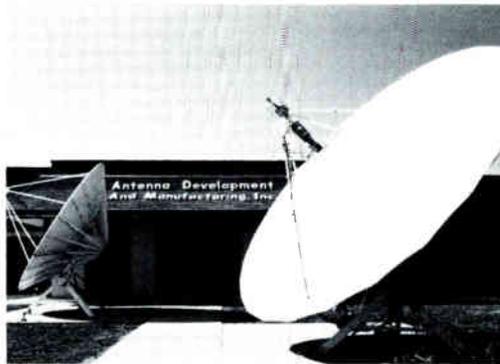
Alexander Mfg. BP90

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Manufacturing, Inc.**

P.O. Box 1178, Poplar Bluff, MO 63901 (1-314-785-5988)

### Pace self-contained repair system

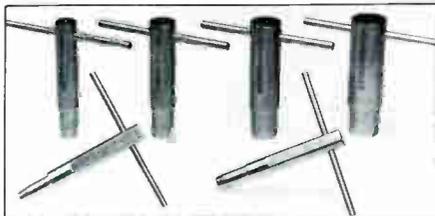
Pace Inc.'s most recent addition to its product line is the PRC-151, a completely self-contained repair system for rework, repair and modification of printed circuit boards. The PRC-151 uses zero-power switching to ensure safety while working on sensitive boards and components. It can be used for either factory or field work and uses a new power source that features Thermo-Drive heat control. Among other components, the system is comprised of a "No Clog" Dual Path Solder Extractor™, a precision miniature machining unit with tool set, a thermal wire stripper, cleaning brushes, a resistance tweezer and a probe for conformal coatings.

For more information, contact Pace Inc., (301) 490-9860.

### Cable sizing and drive torque tools

Lemco Tool Corp. has introduced two new tools: a cable sizing tool and a ¼-inch drive torque limiting tool.

Lemco's cable sizing tool was designed to accommodate all standard size trunk and feeder cable. Designated the model CST, this tool ensures proper connector seating to the cable. In addition, lost production with out-of-round cable is eliminated. The sizing tool should be used once the cable has been cored to correct any irregularity in the aluminum sheath. The tool is constructed of nickel-plated steel and tapered for easy insertion.



Lemco CST cable sizing tool



Lemco T-60 drive torque limiting tool

The Lemco ¼-inch drive torque limiting tool, the T-60, is used for tightening equipment cover bolts. Bolts are tightened through a full ratcheting action to eliminate cracked or loose covers on mainstations, amplifiers, splice cases and line extenders. The tool's factory calibrated preset 60-inch and-pounds maintains the proper tightness but "slips" when additional torque is applied. The tool comes with a reversing collar to permit the loosening of bolts with one-hand operation.

For more information, contact Lemco Tool Corp., (717) 494-0620.



Pace PRC-151 repair system



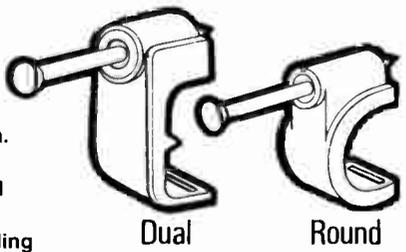
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| Signal   | Day             | Start/Stop                           | Alert Tone  | Transponder  | Signal                     | Day      | Start/Stop       | Alert Tone                     | Transponder          |
|--|-----------------|--------------------------------------|---|--|----------------------------|----------|------------------|--------------------------------|----------------------|
| <b>Satcom 3R</b>   |                 |                                      |   |  | <b>The Movie Channel</b>   |          |                  |                                |                      |
| ASCN-The Learning Channel                                    | Weekdays        | 6 a.m./4 p.m.                        | 192*/#  | 16   |                            |          | 24 hrs           | None                           | 5                    |
|  | Weekends        | 6 a.m./1 p.m.                        |   |  | Modern Satellite Network   | Weekdays | 10 a.m./1 p.m.   | 243*/#<br>421*/#               | 22                   |
| ARTS   | Daily           | 9 p.m./12 a.m.                       | 311*/#<br>(E,C,M)<br>519*/#(P)                          | 1  | MTV: Music Television      |          | 24 hrs           | None                           | 11                   |
| Cable Health Network   |                 | 24 hrs                               | 361*/#  | 17   | National Jewish Television | Sundays  | 1 p.m./4 p.m.    | None                           | 16                   |
| CBN  |                 | 24 hrs                               | None  | 8  | Nickelodeon                | Daily    | 8 p.m./9 p.m.    | 311*/#<br>(E,M,C)<br>519*/#(P) | 1                    |
| Cinemax  |                 | 24 hrs                               | None  | 20 (E,C)<br>23 (M,P)   | PTL                        |          | 24 hrs.          | None                           | 2                    |
| CNN  |                 | 24 hrs                               | 024*/#  | 14   | Reuters                    | Weekdays | 4 a.m./8 p.m.    | None                           | 18                   |
| CNN Headline News  |                 | 24 hrs                               | 635*/#<br>541*/#  | 15   | Showtime                   |          | 24 hrs           | 576*/#                         | 12 (E,C)<br>10 (M,P) |
| C-SPAN   |                 | 24 hrs                               | 195*/#  | 19   | Spotlight                  |          | 24 hrs           | None                           | 4                    |
| Daytime  | Weekdays        | 1 p.m./5 p.m.                        | None  | 22   | USA Blackout Network       |          | O/V after 5 p.m. | 295*/#                         | 22                   |
| ESPN   |                 | 24 hrs                               | 048*/#  | 7  | USA Cable Network          |          | 24 hrs           | 438*/#                         | 9                    |
| Eternal World Television Network                             | Daily           | 8 p.m./12 p.m.                       | 762*/#  | 18   | WGN                        |          | 24 hrs.          | None                           | 3                    |
| HBO  |                 | 24 hrs.                              | Program 729*/#<br>Scramble 835*/#<br>Duplication 940*/# | 24 (E,C)<br>13, 22 (M,P)   | WTBS                       |          | 24 hrs           | None                           | 6                    |
| HTN Plus   | Daily           | 4 p.m./4 a.m.                        | 207*/#  | 16   | The Weather Channel        |          | 24 hrs           | None                           | 21                   |
| <b>Major Communications Satellites Serving North America</b> |                 |                                      |   |  | <b>Satcom 4</b>            |          |                  |                                |                      |
| Location:  |                 | Satellite                            |   |  | The American Network       |          |                  |                                |                      |
| Degrees West Longitude                                       | Present         | Future                               |   | Daily  |                            |          |                  |                                |                      |
|  |                 |                                      |   | 5 p.m./5 a.m.  |                            |          |                  |                                |                      |
| 66   |                 | Sat com 2R (Dec 83)                  |   | None   |                            |          |                  |                                |                      |
| 70   |                 | Southern Pacific-2 (Oct. 84)**       |   | 19   |                            |          |                  |                                |                      |
| 74   |                 | Galaxy-2 (Mid 84)                    |   | BizNet   |                            |          |                  |                                |                      |
| 79   |                 | Advanced Westar-2** (Mid 83)         |   | Weekdays   |                            |          |                  |                                |                      |
| 83   | Satcom-4        |                                      |   | 9 a.m./2 p.m.  |                            |          |                  |                                |                      |
| 87   | Comstar-D3      | Telstar-2 (1984)                     |   | None   |                            |          |                  |                                |                      |
| 91   | Westar-3        | Advanced Westar-1**                  |   | Bravo  |                            |          |                  |                                |                      |
| 94   | SBS-3**         |                                      |   | Daily  |                            |          |                  |                                |                      |
| 95   | Comstar-D2 & D1 | Telstar-1 (Mid 83)                   |   | 8 p.m./6 a.m.  |                            |          |                  |                                |                      |
| 97   | SBS-2*          |                                      |   | None   |                            |          |                  |                                |                      |
| 99   | Westar-4        |                                      |   | The Entertainment Channel  |                            |          |                  |                                |                      |
| 100  | SBS-1*          |                                      |   | 24 hrs.  |                            |          |                  |                                |                      |
| 103  |                 | GTE-1* (1984)                        |   | None   |                            |          |                  |                                |                      |
| 104.5  | Anik D-1        |                                      |   | HBO  |                            |          |                  |                                |                      |
| 106  |                 | GTE-2* (1984)                        |   | Mon-Fri 5:30 a.m./12 p.m.<br>Saturday 6:30 a.m./5:20 a.m.<br>Sunday 6:15 a.m./1 a.m. |                            |          |                  |                                |                      |
| 108.5  | Anik C-1        |                                      |   | 18   |                            |          |                  |                                |                      |
| 109  | Anik-B**        |                                      |   | The Playboy Channel  |                            |          |                  |                                |                      |
| 114  | Anik A-3        | Anik D-2 (1984)<br>Anik C-2 (Mid 83) |   | 8 p.m./6 a.m.  |                            |          |                  |                                |                      |
| 116  |                 |                                      |   | None   |                            |          |                  |                                |                      |
| 117.5  | Anik C-3        |                                      |   | 7  |                            |          |                  |                                |                      |
| 119  | Satcom-2        | Southern Pacific-1 (Feb 84)**        |   | National Christian Network   |                            |          |                  |                                |                      |
| 123  | Westar-5        |                                      |   | 6 a.m./8 p.m.  |                            |          |                  |                                |                      |
| 123.5  | Westar 2        |                                      |   | 073*/#   |                            |          |                  |                                |                      |
| 127  | Comstar-D4      | Telstar-3 (1986)                     |   | 7  |                            |          |                  |                                |                      |
| 131  | Satcom-3R       |                                      |   | Trinity Broadcasting Network   |                            |          |                  |                                |                      |
| 135  |                 | Galaxy-1 (Mid 83)                    |   | 24 hrs.  |                            |          |                  |                                |                      |
| 136  | Satcom-1        |                                      |   | None   |                            |          |                  |                                |                      |
| 139  |                 | Satcom-1R (Mid 83)                   |   | 17   |                            |          |                  |                                |                      |
| 143  | Satcom 5        |                                      |   | <b>Westar 4</b>  |                            |          |                  |                                |                      |
| *Ku Band   |                 |                                      |   | Eros   |                            |          |                  |                                |                      |
| **Dual Ku/C Band   |                 |                                      |   | Thurs-Sat  |                            |          |                  |                                |                      |
| Orbital slots and launch dates often change without notice   |                 |                                      |   |  | 11 p.m./2 a.m.             |          |                  |                                |                      |
|  |                 |                                      |   |  | 10D                        |          |                  |                                |                      |
|  |                 |                                      |   |  | Financial News Network     |          |                  |                                |                      |
|  |                 |                                      |   |  | Weekdays                   |          |                  |                                |                      |
|  |                 |                                      |   |  | 10 a.m./5 p.m.             |          |                  |                                |                      |
|  |                 |                                      |   |  | 975*/#<br>738*/#           |          |                  |                                |                      |
|  |                 |                                      |   |  | 9X                         |          |                  |                                |                      |
|  |                 |                                      |   |  | GalaVision                 |          |                  |                                |                      |
|  |                 |                                      |   |  | Weekdays                   |          |                  |                                |                      |
|  |                 |                                      |   |  | 4 p.m./4 a.m.              |          |                  |                                |                      |
|  |                 |                                      |   |  | Weekends                   |          |                  |                                |                      |
|  |                 |                                      |   |  | 24 hrs.                    |          |                  |                                |                      |
|  |                 |                                      |   |  | 12X                        |          |                  |                                |                      |
|  |                 |                                      |   |  | SelectTV                   |          |                  |                                |                      |
|  |                 |                                      |   |  | Weekdays                   |          |                  |                                |                      |
|  |                 |                                      |   |  | 8 p.m./4 a.m.              |          |                  |                                |                      |
|  |                 |                                      |   |  | Weekends                   |          |                  |                                |                      |
|  |                 |                                      |   |  | 2 p.m./4 a.m.              |          |                  |                                |                      |
|  |                 |                                      |   |  | 9X                         |          |                  |                                |                      |
|  |                 |                                      |   |  | SIN                        |          |                  |                                |                      |
|  |                 |                                      |   |  | 24 hrs                     |          |                  |                                |                      |
|  |                 |                                      |   |  | None                       |          |                  |                                |                      |
|  |                 |                                      |   |  | 8X                         |          |                  |                                |                      |
|  |                 |                                      |   |  | SPN                        |          |                  |                                |                      |
|  |                 |                                      |   |  | 24 hrs                     |          |                  |                                |                      |
|  |                 |                                      |   |  | 429*/#                     |          |                  |                                |                      |
|  |                 |                                      |   |  | 11X                        |          |                  |                                |                      |
|  |                 |                                      |   |  | <b>Westar 5</b>            |          |                  |                                |                      |
|  |                 |                                      |   |  | BET                        |          |                  |                                |                      |
|  |                 |                                      |   |  | Daily                      |          |                  |                                |                      |
|  |                 |                                      |   |  | 8 p.m./2 a.m.              |          |                  |                                |                      |
|  |                 |                                      |   |  | 406*/#                     |          |                  |                                |                      |
|  |                 |                                      |   |  | 12X                        |          |                  |                                |                      |
|  |                 |                                      |   |  | CBS Cable                  |          |                  |                                |                      |
|  |                 |                                      |   |  | Weekdays                   |          |                  |                                |                      |
|  |                 |                                      |   |  | 4:30 p.m./4:30 a.m.        |          |                  |                                |                      |
|  |                 |                                      |   |  | Weekends                   |          |                  |                                |                      |
|  |                 |                                      |   |  | 5 p.m./5 a.m.              |          |                  |                                |                      |
|  |                 |                                      |   |  | 524*/#<br>531*/#           |          |                  |                                |                      |
|  |                 |                                      |   |  | 4D                         |          |                  |                                |                      |
|  |                 |                                      |   |  | Satellite News Channel     |          |                  |                                |                      |
|  |                 |                                      |   |  | 24 hrs                     |          |                  |                                |                      |
|  |                 |                                      |   |  | None                       |          |                  |                                |                      |
|  |                 |                                      |   |  | 4X, 6D<br>7X, 8X, 9X       |          |                  |                                |                      |
|  |                 |                                      |   |  | WOR                        |          |                  |                                |                      |
|  |                 |                                      |   |  | 24 hrs                     |          |                  |                                |                      |
|  |                 |                                      |   |  | None                       |          |                  |                                |                      |
|  |                 |                                      |   |  | 2D                         |          |                  |                                |                      |

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