CED

Communications Engineering & Design/Th

June 1984

Special: Product, NCTA Tech Review

Cable and computers

The TEN DEMANDMENTS

With the FCC's intensified enforcement of signal leakage limits, you can't afford questionable quality or erratic sensitivity in a leakage detector for your system. That's why it pays to heed our Ten Demandments and not simply settle for any leakage detector.

I

Demand High Sensitivity.

You'll need all you can get, so demand *the* detector with -86 dBmV sensitivity.

II

Demand Ease-of-Use.

Make sure it's lightweight and portable. With simple controls. And no separate transmitter required for operation.

III

Demand Quality.

With proven reliability. Documented field success. Plus support from a major US CATV/electronics company.

IV

Demand Full Frequency Capability.

Be sure you can choose a detector for *any* channel frequency—from 54-300 MHz.

V

Demand Metered Readings.

For quantifiable results and measurements—not just basic "leakage/no leakage" indications.

VI

Demand Frequency Trim Adjustment.

From a front-panel control. For accurate readings of the *exact* frequency you're tracking, not a "nearby" frequency.

VII

Demand Audible Tone Alarms.

For fast tracking and location-sensing. With a pleasant, non-abrasive tone.

VIII

Demand "Standards," not "Accessories."

Be sure you get all necessary equipment—a near-field probe, tuned dipole antenna, AC charger/adapter, headphones, and 50-hr.-rated rechargeable batteries—as standard.

IX

Demand Quick Delivery.

Be sure you can get your detectors in a matter of weeks—not months.

X

Demand the Tracer.

Don't take chances with either the FCC or with any other detector. Demand the *only* leakage/detector that can meet the Ten Demandments. Demand The Tracer.

For more information, or a demonstration at your system's offices, contact your nearest VITEK sales representative, or call (201) 287-3200.

AUGAT VITEK

Quality and Innovation

Vitek Electronics, Inc., 4 Gladys Court, Edison, New Jersey 08817 (201) 287-3200

Reader Service Number 1

If you've had to bear the expense of replacing your entire mainstation every time you needed to add new features, that's too bad.

Too bad you didn't choose Magnavox originally. We've understood the economics of upgradability ever since we built our first mainstation. We designed it to set-up fast, easy and economically; and inserted compatible, plug-in modular components ever since.

Today, cable operators using Magnavox look very smart because our new Power Doubling™ and Feedforward fit into the original housing to do wonders to reduce noise and distortion. Our new Parallel Power Doubling™ retrofits nicely so it can push profitable signals into more subs homes, too.

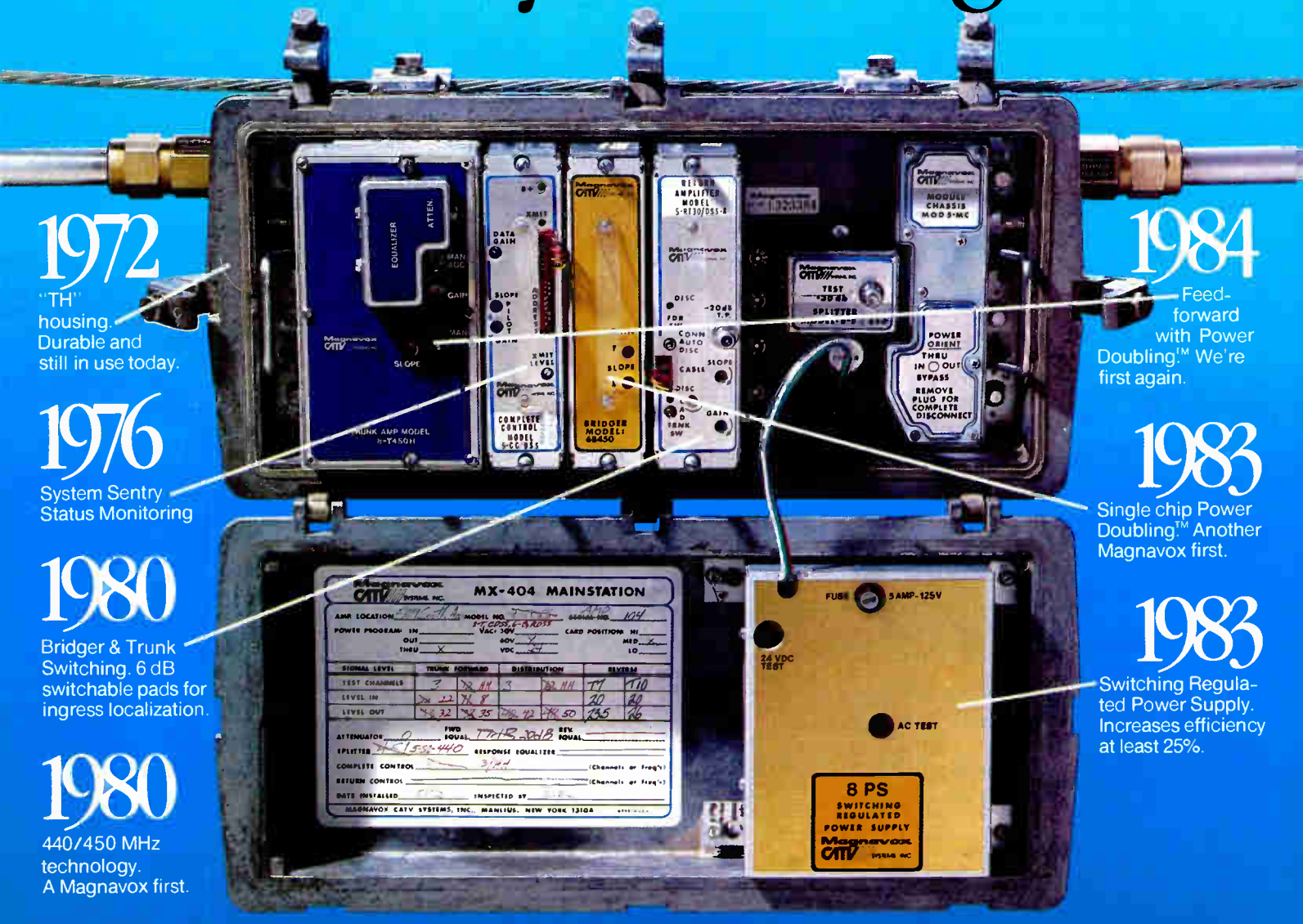
The point being, it's never too late to begin with, or rebuild with, Magnavox.

For more cost-effective data please call our Marketing Department toll-free for our upgrade update.

Magnavox CATV SYSTEMS, INC.

A NORTH AMERICAN PHILIPS COMPANY
100 FAIRGROUNDS DR., MANLIUS, N.Y. 13104
TOLL-FREE 800-448-5171 (IN NY, 800-522-7464)

Our mainstation has held its own since 1972. How's yours doing?



1972 "TH" housing. Durable and still in use today.

1976 System Sentry Status Monitoring

1980 Bridger & Trunk Switching. 6 dB switchable pads for ingress localization.

1980 440/450 MHz technology. A Magnavox first.

1984 Feed-forward with Power Doubling.™ We're first again.

1983 Single chip Power Doubling.™ Another Magnavox first.

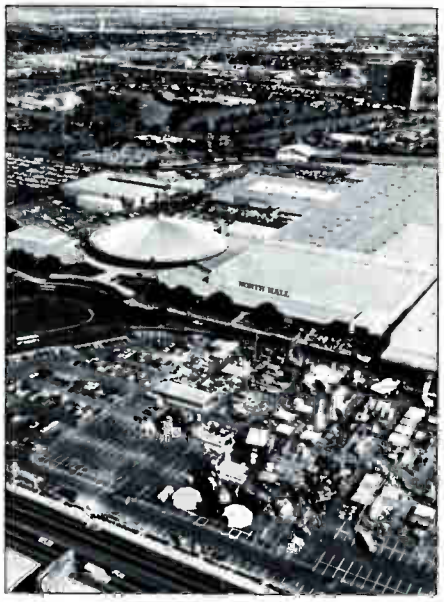
1983 Switching Regulated Power Supply. Increases efficiency at least 25%.

Get our upgrade update in Booth #801 at the NCTA.
Reader Service Number 2

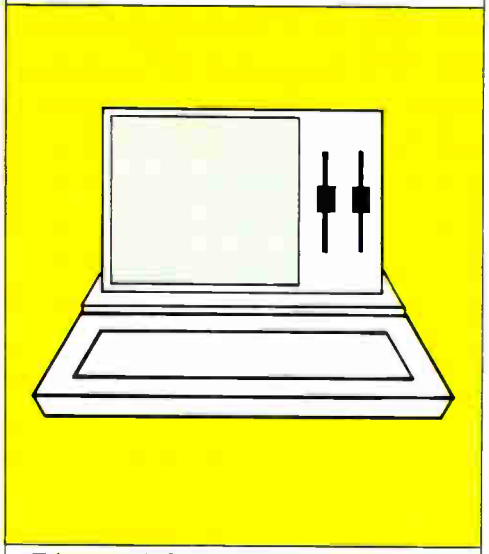
CED™

June 1984

About the cover
Countess Ada Lovelace helped develop the world's first computer during the mid-1800s. Artist Malcolm Farley also depicts other computing devices that led up to our modern computers. See story on page 46.



Cable industry members will congregate in Las Vegas this month for the 33rd NCTA convention. See Communications News, page 19, and NCTA Technical Sessions, page 34.



This month's feature focuses on cable and computers. See pages 43, 46 and 96.

 CED, (USPS 300-510) (ISSN 0191-5428) is published monthly plus periodic special editions by Titsch Communications Inc., 1621 18th St., Denver, Colorado 80202. ©June 1984, Volume 10, Number 6. Subscription Price: 1 year, $26.00; 2 years, $43.00; 3 years, $63.00. OUTSIDE USA 1 yr. $64.00; 2 yrs. $89.00. MUST BE PREPAID IN US FUNDS ONLY! Second-class postage paid at Denver, CO. *CED* is published on behalf of all parties, including the Society of Cable Television Engineers (SCTE). POSTMASTER: Please send address changes to P.O. Box 5727-TA, Denver, Colorado 80217-5727. MEMBERS OF THE BPA.

BPA

HOW WE BECAME THE FRONTRUNNER IN THE ROUTING SWITCHER BUSINESS.

While everyone else was making minor refinements, we went back to the drawing boards. We took the best that modern hybrid technology had to offer and designed it into our Series H Switching Systems.

The result is a new state-of-the-art in every respect. We offer the best performance specs available. Reliability is unquestioned. Maintenance is reduced. And expansion is easier than ever.

There's a 300% increase in crosspoints-per-rack-unit. So what used to fill an entire room can now fit inside a closet.

And The Series H is available in the configuration you need to make the system practical.

Best of all, we can offer these advantages at a price that's actually less than the price of conventional switching systems.

If you'd like us to prove how far out in front we are, call us toll-free at 1-800-328-1684. In Minnesota, call toll-free 1-800-792-1072. Outside the continental U.S., call International Operations collect at 1-612-736-2549.

We'll give you the best run for your money.

Professional Audio/Video Equipment

3M hears you...

Reader Service Number 3

3M

Bathroom of the future

The nation's bathrooms are the key to the future of videotex, says the May 8, 1984 issue of VideoPrint, a newsletter covering the videotex industry. "Most people read while otherwise engaged in the bathroom, and there's not a whole lot else to do in there," says Steven Weissman, assistant publisher of the newsletter.

"The battle to keep newspapers and magazines nice and dry and in one pile cries out for an electronic solution," he argues.

Advertisers might appreciate the audience: it's captive. But Weissman admits he hasn't got the answer to the user interface problem. Touch screens might not fly.

But the business possibilities are worth plumbing. He speculates on a joint venture between AT&T and American Standard, which might elbow aside competitors with a "bathroom of the future."

The joint venture could "bowl over the competition by being able to monitor the water level in the tank and provide videotex and downloading services," he says.

Nielsen reports

In general, households subscribing to pay cable services watch more TV than non-cable or basic-cable households, says the latest annual *Nielsen Report on Television*. During prime time, network viewing still dominates, but pay cable attained a 13.6 rating, or a 19 share. Nielsen also says that cable churn among its test households was minimal: only nine percent upgraded and a scant three percent dropped basic cable.

Broadband to clobber baseband

Broadband local area networks will have 85 percent of the market by 1988, while baseband nets hold only 15 percent, says Strategic Inc., a San Jose, Calif.-based consulting firm. The company also forecasts that Japanese firms will stay out of the fiberoptic local net market until 1986. When the Japanese finally do enter, the firm says to watch out.

Cable grows, TVRO booms

Cable television growth is returning to the projected long-term level of 10-15 percent after a roller coaster during the last five years, says a report by L.F. Rothschild, Unterberg & Towbin. The study predicts that certain emerging sectors within the equipment supply industry will show faster growth. Sales of addressable converters should be strong, the report says. Overall industry growth is being spurred by new builds as well as rebuilds.

The study also sees an easing of margin pressures in coaxial cable, with a similar trend to follow in electronic equipment.

The TVRO antenna market is booming, with some companies reporting 100-300 percent sales gains, the report says.

CCS quits cable

CCS Cable, a division of CCX Corp., is closing its doors after about 10 years in the cable industry. Executive Vice President Jim Connolly said overcapacity in the cable portion of the industry was the reason for the firm's withdrawal from the field.

"We were losing our shirt in cable," Connolly said. The firm had done abut $10 million worth of business last year, he said.

Quadralite satellite TV dish inventor Rick Eye (right) awards Quadralite satellite TV receiving system to Bob Crean

TVRO record set

As Los Angeles prepares for the upcoming Summer Olympics, Bob Crean of White River Junction, Vt., has jumped the starting gun and set a record of his own. At the Satellite Electronics Show held in Las Vegas in March, he assembled a Quadralite PD satellite dish system in eight minutes, four seconds.

The 45-pound, 55-inch antenna can receive Galaxy I signals from any location in the United States. Crean plans to carry the dish around in his Saab when not using it at home.

European cable could falter

Cable development in Western Europe could be undermined by burdensome government policies, says a report by CIT Research Ltd., a London-based research firm. The new report is less optimistic than a similar study released by the company 18 months ago.

At that time, CIT concluded that "the economics of cable are fragile, the risks speculative, the demand unproven and the effects uncertain."

Holding up European cable development are:

- over-ambitious technology
- high costs for underground construction
- lack of high quality programming
- financial and legal restrictions

"There is a danger that the whole European cable industry is being oversold," says CIT Managing Director Patrick Whitten.

TLC carries NCTA show

A special hour-long wrap-up of the NCTA convention in Las Vegas will be cablecast June 11 at 11 a.m. EST on The Learning Channel, with a repeat on June 15 at 11 a.m. EST.

News summaries, panel session reports and interviews from the floor will be included in the special. Demonstrations of new hardware as well as information on new products and services will be featured.

Comtech's High-Speed Broadband Modem.

Its Only Limitation is Your Imagination!

Unequalled Performance:

- Field-selectable transmit/receive frequencies from 5 MHz to 400 MHz.
- Data rates of 56 KBPs to 10 MBPs including T1, T1C and T2.
- Interfaces: V.35, DS-1, DS-2, RS449, MIL 188, CEPT.
- Totally modular construction.
- Multiple Power Source Options including 110 VAC, 230 VAC, 48 VDC and 24 VDC.

Comtech Data's new 505 high-speed agile RF Modem removes the limitations from your data communication system. *All the limitations* - except your imagination.

The 505 is the only frequency-agile modem of its kind with the throughput and data rates necessary to make *any* broadband-based or local area network operate at top efficiency. It is ideal for PBX interconnection, CAD/CAM remote graphics, remote terminals, process automation, robotics and data acquisition and control.

The 505's flexibility allows the modem to easily adapt to your application. It provides access to field-selectable carrier frequencies up to 400 MHz. This means more on-line time covering more applications with a minimum of spares required.

Field-Changeable Data Rates. With the 505, you select the data rate that best fits your system. Now you can change data rates when your needs change. And you avoid buying unnecessary multiplexers to make your equipment fit the modem. *No other product offers you the data rate flexibility of the 505.*

Low Spurious Signal Content. With fewer stray signals, there is less interference with other signals on the cable. All of your signals stay strong and clean. Consistently low bit error rates and low sensitivity to stray signals are the trademarks of Comtech's 505.

Advanced Diagnostics. The 505 keeps running. Numerous test points, indicators, signals and built-in test equipment make system diagnosis clear and easy. Comprehensive field maintenance documentation and Comtech's backup support keeps you on line.

Put your imagination to work for you. Let us help you use the 505 to increase the productivity of your cable system. Call or write Comtech Data Corporation, 350 North Hayden Road, Scottsdale, AZ 85257, (602) 949-1155, or TWX 910-950-0085.

COMTECH *Data Corporation*

A Subsidiary of Comtech, Inc.

Reader Service Number 4

RMS

DIRECTIONAL COUPLERS

THE CHOICE IS YOURS

RMS

Innovation and Quality!

RMS ELECTRONICS, INC. CATV DIVISION • 50 ANTIN PLACE, BRONX, NY, 10462
TOLL FREE: (800) 223-8312 (Continental U.S.A., Puerto Rico, U.S. Virgin Islands) CALL COLLECT: (212) 892-1000 (N.Y. State)
WESTERN OPERATIONS: 2901 W. GARRY AVE., SANTA ANA, CA 92704, (714) 662-1041, TOLL FREE (800) 247-8435—in Calif. only;
(800) 624-2511—Continental U.S.A., Puerto Rico, U.S. Virgin Islands, Alaska and Hawaii.

Reader Service Number 5

Seminars

June

1-3: A National Cable Forum event, sponsored by **National Cable Forum,** will be held at the Arizona Biltmore Hotel in Phoenix. Contact Louise Rauscher, (213) 655-4150.
3-5: The design engineering division of the the **American Society of Mechanical Engineers** will sponsor the Eastern Design Engineering Show & Conference, to be held at the Bayside Exposition Center in Boston. Contact (203) 964-0000.
3-6: The annual convention of the **National Cable Television Association** will be held at the Las Vegas Convention Center. Contact (202) 775-3629.
5-7: ABC TeleTraining, Inc. offers a course in microwave radio system engineering in Chicago. Contact ABC TeleTraining, Inc. at (312) 879-9000.
5-7: ABC TeleTraining, Inc. offers a comprehensive course in developing a strategic telecomunications marketing program in Chicago. Contact ABC TeleTraining, Inc. at (312) 879-9000.
10-15: The 10th annual Northeast Cable Television Technical Seminar sponsored by the **New York State Commission on Cable Television** will be held at Camp Topridge, Saranac Lake, N.Y. Contact Bob Levy, (518) 474-1324.
11-13: A continuing education course in interactive computer-based systems design and development is offered by **George Washington University** in Washington, D.C. Contact George Harrison, (202) 676-6106.
11-13: TeleStrategies Inc. will sponsor a one-day seminar and a two-day conference on telecommunications at the Sheraton National Hotel in Arlington, Va. Contact, (703) 734-7050.
11-14: The **Canadian Cable Television Association** annual convention will be held at the Capital Congress Center in Ottawa. Contact (613) 232-2631.
12-14: An introductory seminar on telecommunications is offered by **Business Communications Review** in Boston. Contact Marcia Kaplan, (800) 227-1234.
12-14: ABC TeleTraining, Inc. offers a course in mitigation of power line interference in Chicago. Contact ABC TeleTraining, Inc. at (312) 879-9000.
12-14: ABC TeleTraining, Inc. offers an introductory course in fiber optic communications in San Francisco. Contact ABC TeleTraining, Inc. at (312) 879-9000.
13-15: A **Community Antenna Television Association** basic technical training seminar will be held at the Best Western Arlington Inn, Chicago. Contact (305) 562-7847.
18-19: Business Communications Review offers a data communications: basic concepts seminar in San Francisco. Contact Marcia Kaplan, (800) 227-1234.
19: The **Southern California Cable Association** luncheon, featuring speaker Ed Allen, will be held at the Los Angeles Airport Hilton at 12:15. Contact (213) 684-7024.
19: A **New York Women In Cable**'s chapter meeting will be held at the Viacom Conference Center, N.Y. Contact Maureen Pressel, (212) 988-9117.
19: The **International Radio and TV Society Follies** will be held at the Waldorf-Astoria Hotel in New York. Contact Joyce Tudryn, (212) 867-6650.
19-21: The Trans Atlantic Satellite Consultancy will hold a TASC EXPO for U.S. equipment manufacturers and cable TV programmers at the U.S. Embassy in London. Contact TASC, (904) 237-6106.
19-21: A **Jerrold** technical seminar will be held in Kansas City, Mo. Contact Kathy Stangl, (215) 674-4800.
19-21: ABC TeleTraining, Inc. offers a course in fundamentals of telecommunications for the non-technical manager in Chicago. Contact ABC TeleTraining, Inc. at (312) 879-9000.
19-21: ABC TeleTraining, Inc. offers a comprehensive course in traffic concepts in Chicago. Contact ABC TeleTraining, Inc. at (312) 879-9000.
20: The **Delaware Valley Chapter of the Society of Cable Television Engineers** will sponsor a seminar on TVRO and two-degree spacing at the George Washington Motor Lodge in Willowgrove, Pa. Contact John Kurpinski, (717) 323-8518.
21-22: A seminar on international communications: products, technology and regulations is offered by **Business Communications Review** in San Francisco. Contact Marcia Kaplan, (800) 227-1234.
24-26: The annual meeting of the **Oregon Cable Communications Associations** will be held at the Rippling River Resort in Wemme, Ore. Contact Mike Dewey, (503) 362-8838.
25-26: Business Communications Review offers a seminar on Data Communications II-Digital Communications Systems in Chicago. Contact Marcia Kaplan, (800) 227-1234.
26-28: ABC TeleTraining, Inc. offers a comprehensive workshop in transmission and signaling design of switched voice-band special services and private switched networks in Chicago. Contact ABC TeleTraining, Inc. at (312) 879-9000.
26: Cable Television Network will hold its annual fall presentation at the Capital Plaza Hotel in Trenton. Contact (609) 392-4360.
29: Public Service Satellite Consortium offers a seminar on the issues and implications of 2-degree spacing at the Washington Marriott Hotel in Washington, D.C. Contact PSSC, 1660 L St., N.W., Ste. 907, Washington, D.C. 20036.

July

9-11: Business Communications Review offers a data communications: basic concepts seminar in Chicago. Contact Marcia Kaplan, (800) 227-1234.
9-12: The 1984 National Computer Conference, sponsored by the **American Federation of Information Processing Societies, Association for Computing Machinery, Data Processing Management Association, IEEE Computer Society** and the **Society for Computer Simulation,** will be held at the Las Vegas Convention Center. Contact Ann-Marie Bartels or Marty Byrne, (703) 620-8926.
10-12: A **Jerrold** technical seminar will be held in Williamsport, Pa. Contact Kathy Stangl, (215) 674-4800.
10-12: Cable '84, an international conference and exhibition on satellite and cable TV sponsored by **Online Conferences Ltd.,** will be held at the Wembley Conference Centre in London. Contact Online in England, 01-868 4466.
10-12: An introductory seminar on telecommunications is offered by **Business Communications Review** in N.Y. Contact Marsha Kaplan, (800) 227-1234.
11-12: Local Area Networks will be the subject of a **Business Communications Review** seminar in San Francisco. Contact Marsha Kaplan, (800) 227-1234.
11-13: A **Magnavox** CATV training seminar will be held in Portland, Ore. Contact Ms. Mancini, (800) 448-5171; in N.Y., (800) 522-7464.
12-14: Montanta Cable Television Association will hold its 25th annual meeting and convention in Big Sky, Mont. Contact Tom Glendenning, (406) 586-1837.
15-19: The annual convention of the **Community Antenna Television Association,** CCOS-84, will be held at the Tan-Tar-A Resort, Lake of the Ozarks, Osage Beach, Mo. Contact CATA (703) 691-8875.
16-18: A **Magnavox** CATV training seminar will be held in Portland, Ore. Contact Ms. Mancini, (800) 448-5171; in N.Y., (800) 522-7464.
16-18: CATACABLE Operators Seminar '84, sponsored by **Community Antenna Television Association,** will be held at the Marriott Tan-Tar-A Resort and Golf Club in Osage Beach, Mo. Contact, (703) 691-8875.
17-19: A technical seminar sponsored by **C-COR Electronics** will be held in State College, Pa. Contact Deb Cree, (814) 238-2461.
19-21: The annual convention of the **National Federation of Local Cable Programmers** will be held in Denver. Contact Susan Miller Buske, (202) 544-7272.
19-24: The national conference of the **National Federation of Local Cable Programmers** will be held at the Sheraton Denver Tech Center in Denver. Contact (202) 544-7272.
21-22: Satellite Reception Systems Inc. will hold its second annual Great Lakes/Ohio Valley Satellite Technical Showcase

at the Marriott Inn in Cincinatti. Contact Connie Willett or Rose Farhi at either 1-800-592-1956 or 1-800-592-1957.
23-25: A workshop for PC/ SMATV operators sponsored by the **National Satellite Cable Association** and **Eagan & Associates** will be held in Washington. Contact Larry Hannon, (904) 237-6106.
23-25: A course in basic CATV systems will be offered by the **University of Wisconsin** in Madison Contact Francis Drake, (608) 263-7427.
23-27: The 11th annual conference on computer graphics and interactive techniques, ACM SIGGRAPH '84, sponsored by the **Association for Computing Machinery's Special Interest Group on Computer Graphics** will be held in Minneapolis. Contact (312) 644-6610.
31-Aug. 2: New England Cable TV Association convention will be held in Sturbridge, Mass. Contact Maureen Murphy, (603) 224-3373.

August

1-3: Business Communications Review offers a data communications: basic concepts seminar in Boston. Contact Marsha Kaplan, (800) 227-1234.
8-10: A **Magnavox** CATV training seminar will be held in Chicago. Contact Ms. Mancini, (800) 448-5171; in N.Y., (800) 522-7464.
10: A video music seminar will be sponsored by **Rockamerica of N.Y.** Contact Lyn Healy, (212) 475-5791.
12-15: The 10th annual conference of the **Cable Television Administration and Marketing Society** will be held at the Waldorf-Astoria in N.Y. Contact (404) 399-5574.
13-14: A digital communications systems seminar will be held by ***Business Communications Review*** in San Francisco. Contact Marsha Kaplan, (800) 227-1234.
13-15: A **Magnavox** CATV training seminar will be held in Chicago. Contact Ms. Mancini, (800) 448-5171; in N.Y., (800) 522-7464.
21-23: A **Jerrold** technical seminar will be held in Denver. Contact Kathy Stangl, (215) 674-4800.
27-28: Business Communications Review offers a digital communications systems seminar in Boston. Contact Marsha Kaplan, (800) 227-1234.
28-30: The sixth annual Satellite Communications Users Conference sponsored by **Satellite Communications** will be held at the Louisiana Superdome. Contact Kathy Kriner or Cheryl Carpinello, (303) 694-1522.
24-27: The **Florida Cable TV Association** will hold a convention at The Breakers in Palm Beach. Contact Bob Brillante, (813) 688-3787.

Looking ahead

July 15-19: Community Antenna Television Association convention, CCOS-84, Tan-Tar-A Resort, Osage Beach, Mo.
Aug. 12-15: Cable Television Administration and Marketing Society convention, Waldorf-Astoria, N.Y.
Sept. 6-8: Eastern Show, Georgia World Congress Center, Atlanta, Ga.
Oct. 16-18: Mid-America Show, Hilton Plaza Inn, Kansas City, Mo.
Oct. 30-Nov. 1: Atlantic Show, Atlantic City Convention Hall, Atlantic City, N.J.
Nov. 17-20: The American Market For International Programs trade show, Miami.
Dec. 5-7: Western Show, Anaheim Convention Center, Anaheim, Calif.
Dec. 4-6: Jerrold offers a technical seminar in Philadelphia, Pa. Contact Kathy Stangl, (215) 674-4800.

Sure, you've seen Head End Cable before, but not like this...

Comm/Scope's new S59 We're making it...better!

Better because we're building in two exclusive features:

SILVER-PLATED SOLID COPPER center conductor, 22 AWG (.0253" dia.) Gives you better signal transmission than the usual silver-plated copper-covered steel.

BONDED ALUMINUM TAPE SHIELD: laminated aluminum tape bonds to the polyethylene dielectric and to itself, to give an extra 100% shield. Plus two layers of 34 AWG tinned copper braid, each with 95% coverage. The tough but flexible PVC black jacket is clearly marked for easy identification.

ADDED CONVENIENCE: now order all your cable needs from the one complete quality source—Comm/Scope. In 500 foot and 1000 foot reels.

Make the better Head End connection... order your S59 HEC from Comm/Scope today.

M/A-COM

CABLE HOME GROUP

COMM/SCOPE Coaxial Cable Products

P.O. Box 1729, Hickory, NC 28603 Phone: 800/438-3331, 704/324-2200 Telex: 802-166

Reader Service Number 6

CED

Your turn to march

The stunning woman on our cover is Countess Augusta Ada Byron Lovelace—the daughter of Lord Byron, the famous English poet.

But the Countess is a star in her own right, not just a pretty face. She was a gifted mathematician and helped develop what most historians consider the world's first computer.

She, and the devices artist Malcolm Farley has depicted, represent the history of computing machines—from the abacus to the microprocessor.

The focus of this issue is computers and cable hardware, and we easily could have filled the whole book with stories about the many ways computers and integrated circuits are used in our industry.

We have highlighted a few of these applications, ranging from office automation to materials management and proof-of-performance testing.

But we also wanted to give you something to think about, so we've included a few articles with a somewhat more global sweep.

On our pages, you'll find stories about the history of computing, the development of the modern microprocessor and even the birth of artificial intelligence.

None of these stories are standard fare for *CED*, and we included them for a reason.

When you're sweeping up after the horses, it's easy to forget that the pageant going by is very grand.

Immersed as we are in the day-to-day details of keeping the industry running, we often forget that our work affects the lives of millions of people.

To cite but one example, Daniel Schorr, Cable News Network senior correspondent, recently told delegates at Sat Expo '84 that CNN has forced the networks to take news seriously. Heady stuff.

But Schorr also emphasized a wider point. "Your technology will change the face of the world as we know it," he said.

We may be grains of sand, but it's a mighty big beach.

Our technology also is a link to the past and a bridge to the future. The processors in our headends and receivers aren't just bits of silicon and gallium arsenide.

They're the embodiment of all the knowledge we humans have gleaned since we began counting on our fingers so very long ago. That's our link to the past.

Our bridge to the future, however, lies not in the technology but in how we use our tools to secure a place in the exploding telecommunications marketplace.

We're a part of the great revolution in communication and knowledge processing that is sweeping the planet. It's just a little hard to see the whole sky when you're sitting at the bottom of a well.

So the next time you get tired of sweeping, take a look at the parade. It started out thousands of years ago, and now it's your turn to march.

FROM JERROLD

A MEGALEAP IN DISTRIBUTION AMPLIFIER TECHNOLOGY

STARLINE X SERIES, THE FIRST ALL NEW AMPLIFIER IN 10 YEARS

• Advanced technology for lower system cost.
Starline X matches technology to your system needs. The most advanced conventional hybrid amplifiers for most system applications; power doubling for larger system reach applications. Only Jerrold offers both...and with years of field proven reliability and with a design that has an eye on the future.

• Failsafe™ redundancy. Your signal is never lost.
Starline X **FAILSAFE**™ redundancy backed by station bypass means you need never lose your signal. Even if an amplifier module should fail, the redundant back up module is there. And behind that is automatic station bypass. Your signal is truly protected.

• Starline X reduces operating costs.
Our switching power supplies save you energy costs. And Jerrold System Commander® status monitoring and control systems can save you even more. Command a station into bypass. Switch off a noisy feeder. Maintenance can be scheduled during normal working hours, reducing expensive overtime.

• Easier to install, costs less to maintain.
Starline X Series Amplifiers are designed to include pedestal mounting. Right angle entry ports simplify installation. Double hinged housings always open to the roadside. No need for acrobatics.

• 550 MHz can save you millions.
Do you really need a dual cable plant? Starline X can deliver 80 channels. Think about it.

Don't risk paying more and getting less. Call our system engineering team to show you how Jerrold can put you dollars ahead.

Call 1-800-523-6678, (in PA 1-800-562-6965) or write General Instrument Corporation, Jerrold Division, 2200 Byberry Road, Hatboro, PA 19040.

JERROLD
Amplifier Systems

MATCHING YOUR NEEDS • RIGHT TO THE BOTTOM LINE

GENERAL INSTRUMENT

Reader Service Number 7

Cable to dominate pay TV

Market share may exceed 83 percent in 1990

DENVER—Although most of the 1,000 delegates who attended Sat Expo '84 did so because of their interest in DBS, SMATV or backyard TVROs, they were told on the first day that "cable will be the overwhelmingly dominant pay TV system for the future."

The prediction that cable would claim 82 to 87 percent of the pay market in 1990 was made by Jack Pottle, director of Browne, Bortz & Coddington, the Denver research firm.

His 1990 numbers were stark:

- Cable 43.9-50.9 million subs
- DBS 3.6-5.8 million subs
- MMDS 2.0-3.3 million subs
- LPTV .2-.6 million subs
- SMATV .4-.6 million subs
- STV .2-.6 million subs.

"Two big changes in the video landscape have occurred in the last two years," Pottle said. "People are being asked to pay for something that they are used to getting for free. There also has been a proliferation of the number of channels available."

As the contenders grapple for position, six arenas will be critical, he said. Channel capacity, speed of market entry, signal and programming quality, marketing and features such as addressability and PPV will be key.

Assessing cable's fortune, Pottle predicted that the industry would win any head-to-head contests. "The others will largely be niche technologies, flourishing whre cable isn't competitive," he said.

The real issue for newer systems, however, is the need for high revenues to achieve break-even, he said.

STV is collapsing, although it is currently the second largest pay industry, Pottle said. "The basic problem is that STV is a single-channel service. It isn't price competitive, nor is it a major long-term player."

Single-channel MDS may survive as a low-priced provider, while multichannel MDS "will be among the strongest competitors to cable in some large, urban markets," Pottle argued.

Rapid market entry is essential if MMDS is to have a fighting chance at survival, he said. "MMDS has to go operational by the end of this year or the first quarter of 1985."

Access to major cable programming at reasonable rates also will be an issue, he said.

Unlike some other observers, Pottle doesn't see capital as a major problem for the DBS industry. Marketing and servicing, however, are key issues, he said. "I also suspect that DBS programming will be going to cable, private cable and MMDS headends."

Pottle was skeptical about the prospects for LPTV. "It might be viable as a provider of satellite-delivered, rather than locally-originated programming, in rural and small-town areas," he said. "It might also be successful as an urban specialty service—possibly offering a foreign language—but overall, it will be a tough business."

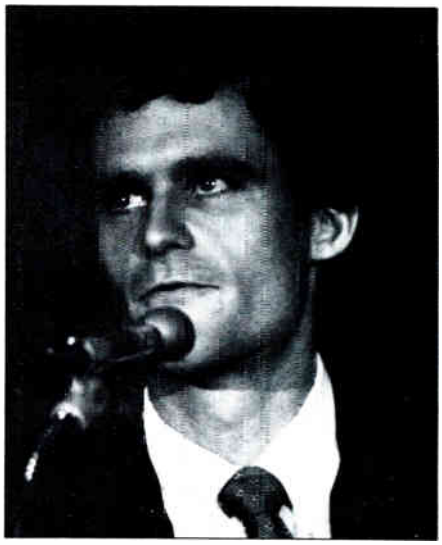
The sleeper will be VCRs. "Four million units were sold in 1983, and that number may double in 1984," he said. "If so, 20 percent of all U.S. TV households wil have them by the end of the year. The question is how competitive VCRs are with subscription services."

"At low rental rates, VCR cassettes are a viable alternative for light movie watchers," he said.

Pottle called private cable a good technology, although the applications will be limited. He also cautioned his audience that DBS and MMDS may change the economics of the business.

The threshold for a stand-alone service is about 250 units, he said. "But it really isn't much of a business until systems are aggregated to, say, 5,000 units in a single urban area. That allows the operator to spread fixed costs over a wider subscriber base."

But SMATV is quite vulnerable to poor service, Pottle said. "As long as things are going sweetly, there's no problem. But few property owners will put up with problems caused by the operator."



Marketing and service will drive the pay-TV business, says analyst Jack Pottle

Pottle admitted he hadn't spent much time examining the fortunes of the TVRO business, but noted that it appears to be growing.

"With 300,000 in place in 1984, it isn't much smaller than MDS and is very close to paid SMATV subscription numbers," he said.

He'll be watching for the impact of DBS and signal scrambling on the TVRO market, Pottle said.

But in the final analysis, "the consumer couldn't care less which technology delivers the programming. Marketing and service will ultimately decide which service prosper and which falter," he said.

—Gary Kim

Two-way window closing

Despite all the hype about two-way, cable remains primarily a one-way video transmission purveyor

CUPERTINO, Calif.—Is two-way cable a shooting star? One moment, brightly shining; the next, gone from view?

Perhaps, says *Two-Way Cable: Conflict Shapes a Market*, a new report by Strategic Inc.

Findings from the report show that, despite all the previous brouhaha about two-way, the cable industry remains "primarily a one-way provider of video transmission service." Only about 20 activated two-way systems exist today, serving 5 percent of the current subscriber market.

Strategic estimates that by 1990 this number will have grown by an increment of 20 to 25 percent of the subscriber market.

What has hindered the cable industry from preceding with its two-way plans?

According to the Strategic report, there are a variety of reasons. First of all, new entrants such as the telcos and telco bypass companies are surging ahead in the two-way data transmission market. As a result, cable systems are confronted with the question of whether they can preempt the BOCs rush to upgrade their plants to provide broadband services.

Second, cable companies fear state and federal regulation, which may either restrict its provision of two-way data services or impose common carrier status on these services.

And third, plant and cable costs are escalating. Pole attachment costs, alone,

New from Warner Software and LIST magazine for IBM PC owners:

A way to try expensive software before you buy!

Presenting SOFTWARE MASTER for the IBM PC.

It's a buying guide and a "trying" guide designed to introduce you to the full range of computing possibilities and help you select software, peripherals, even a second computer that will perfectly suit your needs.

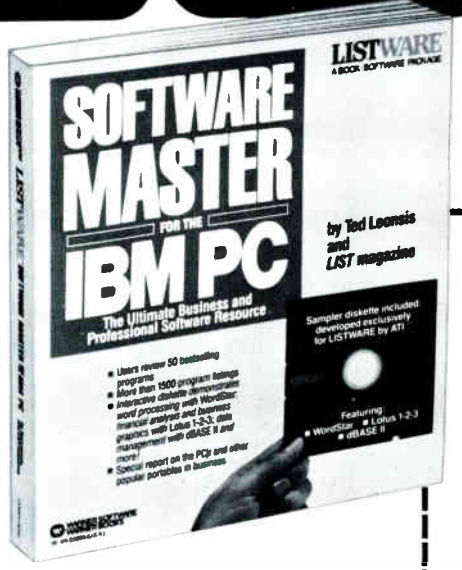
- **Provides** a "Software Master List" of today's top 50 IBM programs with evaluation from people like you—from large and small companies, professions, education and science—who give you firsthand impressions of each program's capabilities, ease of use.
- **Covers** the best available software for accounting, word processing, data management, numeric analysis, integrated packages, decision support systems, business graphics, communications, education.
- **Recommends** printers, plotters, color monitors, keyboard alternatives, diskette and fixed disk drives, modems, plug-in memory boards and other peripherals which users have endorsed. Provides guides to IBM compatible hardware like Compaq, Hyperion, Gavilan, Eagle, Columbia, IBM PCjr, to help you choose a second computer.
- **Includes** a FREE sampler disk for Lotus 1-2-3, dBASE II, Wordstar, VisiCalc. So you can experience these highly touted programs in your own office, on your own machine.
- **Furnishes** a directory of more than 1,500 business and professional programs, cross-indexed by application and industry. From advertising and agricultural management to veterinary medicine and wholesaling.
- **Offers** $15, $30, $45 savings and more on on-disk training aids from ATI. These training disks can bring you one-hour proficiency on software like Lotus 1-2-3, dBASE II, Peachtree Accounting, Wordstar, PC DOS 2.0, Supercalc. And you can save $15 on each one you buy. So your savings can amount to far more than the price of the Software Master for the IBM PC.
- **Guarantees** your satisfaction. The cost of Software Master is only $39.95 delivered. (Tax deductible if you use your computer for business.) But even with this incredibly low price, you don't risk a cent. Software Master comes to you on a 10-day trial basis. Examine, read, use it for 10 full days. If you are not delighted, return it for a complete refund. You have nothing to lose and everything to gain by looking at Software Master before you buy your next program for the IBM PC. Send for your copy today.

FREE SAMPLE SOFTWARE FOR YOUR IBM PC

1,500 ITEM DIRECTORY OF ALL AVAILABLE IBM SOFTWARE

$15, $30, $45... AND MORE SAVINGS. TAKE $15 OFF EVERY ON-DISK TRAINING AID FROM ATI

THE 50 TOP-SELLING PROGRAMS REVIEWED BY ACTUAL USERS



A gift for you if you order now

John Naisbitt's *Megatrends*—Best-selling study of today's trends and what they mean for tomorrow's opportunities and choices. Yours to keep, even if you return Software Master.

Warner Software Inc.
Software Master for the IBM PC
Dept. Z
666 Fifth Avenue
New York, NY 10103

YES! Rush me _____ copies of SOFTWARE MASTER for the IBM PC at $39.95 each. Also send my free copy of John Naisbitt's *Megatrends*. I understand that I may examine SOFTWARE MASTER for 10 full days and if not delighted, return it for credit or a full refund of my money. *Megatrends* is mine to keep in any case.

Check one:
☐ Payment enclosed ☐ Bill my: ☐ Visa ☐ MasterCard ☐ American Express

Card # _____ Expiration date: _____

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Signed _____ Date: _____
MUST BE SIGNED TO BE VALID FOR CHARGE 764CDS

Mail coupon or call toll-free
1-800-621-5559
(in Illinois call 1-800-972-5858)

dBASE II is a trademark of Aston-Tate • IBM PC is a trademark of International Business Machines Corp. Lotus 1-2-3 is a trademark of Lotus Development Corporation • Peachtree Accounting is a trademark of Peachtree Software Inc • PC DOS 2.0 is a trademark of International Business Machines Corp. Supercalc is a trademark of Sorcim Inc • VisiCalc is a trademark of Visicorp • Wordstar is a trademark of Micropro International Corporation

Reader Service Number 8

Eliminate the weak link... with Alpha Standby Power.

- Alpha is the FIRST and ONLY UL/CSA approved Standby Power Supply in the industry — proof of our commitment to product safety and reliability.
- Alpha has Remote Status Monitoring systems in operation with many M.S.O.'s. Simple plug-in upgrading and compatible with any CATV amplifier maker. Two configurations to choose from.
- Alpha has the fastest battery recharge time in the business. Nearly twice as fast as our nearest competitor.
- Alpha has authorized service centres located throughout the nation. Just in case you need them. Fast turn around by qualified technicians.
- Contact us and find out about the many other IMPORTANT features.

SO DON'T MAKE STANDBY POWER THE WEAK LINK OF YOUR SYSTEM. SPECIFY ALPHA... YOUR BEST BUY IN THE LONG RUN.

ALPHA TECHNOLOGIES

1305 Fraser St., D-6
Bellingham, WA 98226
TEL: 206-671-7703

7305 East Evans Rd.
Scottsdale, Arizona 85260
TEL: 602-948-4484

7033 Antrim Ave.
Burnaby, B.C. V5J 4M5
TEL: 604- 430-1476
TELEX: 04-356760

Reader Service Number 9

For Sales and Service In Your Area:

Westec Communications, Inc.
Scottsdale, Arizona
TEL: 602-948-4484

Westec Communications, Inc.
Napa, California
TEL: 707-255-2010

NCS Industries, Inc.
Willow Grove, Pennsylvania
TEL: 215-657-4690

Micro-Sat s/e inc.
Marietta, Georgia
TEL: 404-971-1021

R. Alan Communications
Indianapolis, Indiana
TEL: 317-849-7572

A & M Communications
Minneapolis, Minnesota
TEL: 612-881-1311

Cable TV Services
Garland, Texas
TEL: 214-494-3348

In Canada:
Anixter-Micro-Sat
Pickering, Ontario
TEL: 416-839-5182
1-800-263-4655
TELEX: 06-981256

have risen over 500 percent in the last 15 years, Strategic reports.

And perhaps most important, the industry is suffering from an identity crisis. It is not sure which services it should offer: high-speed data, low/medium speed data, one/two-way video, voice, energy management, videotex, teletext or all of the above.

The industry also is being attacked on other fronts. DBS, MMDS, Digital Termination Service and SMATV threaten cable's traditional video programming market, as well as its delivery of two-way services. The industry currently is trying to assess the impact these emerging technologies will have on its existing business.

Despite these worries, Strategic reports that cable still is eyeing two-way. The industry is looking at database delivery, computer interconnection and software downloading as major markets. The industry has reversed its former position on transactional services such as home banking and home shopping.

Another concern is how to provide these two-way services. According to the report, the industry is busy determining whether it should offer the services exclusively via its broadband plant or over leased phone lines. It also is considering providing these services through joint ventures and acquisitions.

But regardless of which position it takes on these issues, the industry must move soon, the report cautions: "The window for opportunity for cable operators in the two-way market essentially extends only through 1986."

Provided the industry does pursue two-way aggressively, Strategic says there will be ample opportunity for manufacturers and others to reap handsome profits from the cable operators. Gear expected to be of most interest to the cable two-way market includes LAN configurations and interconnections, data management services and software.

—*Constance Warren*

Some 15,000 delegates will descend on Las Vegas June 3-6 for the annual NCTA convention

NCTA meets in Las Vegas June 3-6

LAS VEGAS—As laser beams paint intricate designs against the background of the Las Vegas Hilton Pavilion, conventioneers will gather for the plenary session of the 33rd NCTA convention.

Gus Hauser, NCTA convention chairman and chairman of Hauser Communications Inc.; Monroe Rifkin, NCTA board chairman and president of Rifkin and Associates; NCTA President Thomas Wheeler; and NCTA President-Elect James Mooney will speak at this opening forum.

In addition to the laser beam show, the first day of sessions will feature a special luncheon address by Rep. Timothy Wirth (D-Colo.), chairman of the subcommittee on telecommunications, consumer protection and finance of the House Energy and Commerce Subcommittee. Directly following the luncheon, 35 Congressional members will participate in six public policy panel discussions.

On the morning of June 5, a videographics display will illustrate the results of an International Communication Research customer satisfaction national survey during a session entitled "Keeping the Customer Satisfied: Components of Cable Service."

This will be followed by a luncheon at which Sen. Barry Goldwater (R-Ariz.), chairman of the communications subcommittee of the Senate Committee on Commerce, will address the audience via satellite. Three public policy sessions will be held later in the day.

Advertising, marketing, technical (see page 41) and management topics will be covered in meetings scheduled for June 4-6. Programming sessions will be held during the National Programming Conference, set for June 6.

At the conference, a simulated game show, "Satellite Showdown," will feature teams of operators, programmers and studio executives, responding to a variety of programming and customer satisfaction questions. A "Programming Leaders Meet the Press" panel is scheduled for 1 p.m. the same day.

The NCTA expects more than 15,000 to attend the show. Registration will begin at noon June 3. The 200,000 square foot exhibit hall officially will open at 11 a.m., June 4, although a sneak preview and welcome reception is set for 4-7 p.m., June 3. The theme of this year's show is "Cable: The Consumers' Choice."

—*Constance Warren*

Private cable update

Industry maturation brings declining hardware prices and operator consolidation

DENVER—Dropping hardware prices and operator consolidation are two of the key trends in the private cable industry, a battery of speakers said at Sat Expo '84.

Slumping or nonexistent profits are the cause of the industry shakeout, acording to Ed Eagan of Eagan & Associates.

"Right now there are 20 to 30 large companies with over 15,000 units wired; 50 medium-sized companies with 5,000 units; and about 200 small companies passing 2,500 units or less," Eagan said.

He predicted that by 1990, there would be 20 large companies passing over 100,000 units; only 10 companies in the 25,000 unit range; and fewer than

100 small "mom-and-pop" firms.

"The industry's future hangs on the development of DBS and MMDS, financing, experience and the availability of programming," he said.

Rapidly-declining hardware prices, driven by the growth of the consumer TVRO market, are a definite trend, said Scientific-Atlanta's David Chance. "And the trend will continue, fueled by the high volume of purchases."

"During the next two years, the price difference between a low-end commercial receiver and a high-end consumer unit will narrow to about $300 or $400," Chance said.

Overall, prices for electronic components such as signal processors and modulators could drop 15 to 20 percent in the next few years, he said. Chance didn't expect headend products to decline in cost quite so much.

Chance cautioned his audience not to use consumer quality equipment for commercial applications.

"It isn't the same thing to drive one TV set as it is to supply signal to 300 or 400 sets," he said.

Chance also suggested that private cable operators keep flexibility in mind as they purchase equipment.

"The technology is changing extremely rapidly, and operators need to be aware of the implications of scrambling, for example," he said. "Composite video is essential to display a scrambled signal."

But much remains the same, suggested Peter Sutro of Patmar Technologies. "In the past year there has been no significant change in private cable penetration or addressable technology. The same holds for scrambling systems and programming," Sutro said.

He did, however, agree with Chance on advancements in technology. "The four to six-foot dishes on display were inconceivable six months ago," Sutro said. —*Gary Kim*

Can cable contenders cooperate?

DENVER—Can cable, SMATV, DBS, MMDS and VCRs coexist amicably? Maybe, said panelists at a Sat Expo '84 session on the subject.

Omar Duwaik, president and CEO of American Box Office, thinks it's a matter of perspective.

There are certain conditions under which these alternative delivery systems can cooperate rather than compete.

An example: CATV and SMATV operators can use MMDS to reach those areas that are uneconomical to wire.

United Cable is one MSO that has followed this approach. It has filed for 117 MMDs applications with the FCC in the hope that it can use MMDS to provide cable programming services to remote households.

United stands to gain in three ways from this approach, says David Drucker, corporate counsel for the MSO. "MMDS will allow United to provide programming services to remote areas, meet its franchise requirements in those locations and save money. It also will enable United to avoid problems where it is uneconomical to serve those areas."

Fears, however, were raised that cable operators would squander and sit on these licenses and use them to stifle competition.

Drucker said this will not happen because the FCC requires the MMDS systems to be constructed within a certain time frame. He also believes the only option for cooperation between the two is for the cable operator to lease the MMDS station to deliver programming to areas where it does not have the cable franchise.

Duwaik also said there are two chances for DBS operators either can deliver the programming to the MMDS station, which retransmits the signals to subscribers homes, or the MMDS operator can supply construction, maintenance and marketing services to the DBS operator.

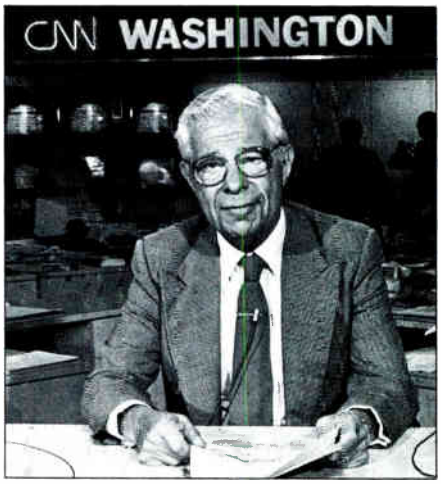
Otherwise, he said, the future of both technologies will depend on which one enters the market first and shuts the other out.

Calling DBS an "especially viable delivery system," Drucker argued that DBS and cable are more allies than adversaries. "They complement each other," he said. Both can coexist in those markets which are too expensive to cable. The DBS operator can provide the programming and the cable system can supply the construction and support services.

While the growing use of VCRs appears to be threatening cable's market share, panelists said there was nothing to fear.

Duwaik pointed to statistics that show cable pay TV subscribers own and use more VCRs than non-subscribers.

Jack Pottle, director of Browne, Bortz and Coddington, disagreed. If cable and SMATV continue to offer programming in tiering packages on a monthly subscription basis, VCRs will pose a threat, he said. But, if cable begins offering pay-per-view programming on a wider scale, the VCR market will become less appealing, he argued. —*Constance Warren*



CNN has changed network news, Daniel Schorr told delegates at Sat Expo '84

Schorr on satellites

DENVER—As CNN has forced network news programming to change, so will the spread of satellite technology alter the face of the world as we now know it, Daniel Schorr, CNN senior news correspondent, told Sat Expo '84 delegates in a keynote luncheon address May 7.

"The satellite revolution is not over yet," he continued. Having changed domestic politics, it also will revolutionize international politics, he said.

With the growth of satellite technology and the proliferation of high-powered Ku-band birds and smaller receiving dishes, the Soviet Union will not be able to keep Western and European satellite footprints from entering the country, he explained. This could be the first step toward breaking down the "old world" division between the East and West, and between communist nations and democracies.

Satellite technology also will continue to positively influence network news coverage.

In the past, Schorr recalled, the greatest adversary to broadcast journalism was air time. Journalists were forced to make their stories fit a limited amount of time.

But, the advent of cable and new satellite technology has brought journalism back to its roots, he explained. The existence of CNN has compelled the other networks to take news more seriously.

Because CNN is live, the networks have stopped delaying the broadcast of news programs. They also are expanding their news coverage and the amount of live television they air, Schorr said.

—*Constance Warren*

for broadband network interface...

ZETA OFFERS THE INDUSTRY'S MOST COMPREHENSIVE FAMILY OF FREQUENCY-AGILE AND FIXED FREQUENCY MODEMS FOR CATV DATA COMMUNICATIONS!

MODEL	Z9	Z19	Z56	ZT1
DATA RATE	9600 BPS	19.2 KBPS	56 KBPS	1.544 MBPS
INTERFACE	RS-232C	RS-232C	RS-232C/RS-449/V. 35	DS1
SUBCHANNEL SPACING	50 KHz	50 KHz	150 KHz	1 MHz
SUBCHANNEL AGILITY	NO	YES	YES	NO
MODULATION	FSK	BPSK	BPSK	QPSK
PRICE (QTY 100)	$525 EACH	$915 EACH	$1,630 EACH	ON REQUEST
PRICE (QTY 10)	$525 EACH	$1,045 EACH	$1,850 EACH	ON REQUEST

FEATURES:

- Switch Selectable Subchannels
- Error Free (10^{-9} BER or better)
- Synchronous or Asynchronous
- Frequency Coverage to 500 MHz
- Spectrally Efficient
- Flexible Channel Pairing
- Internal Diagnostics

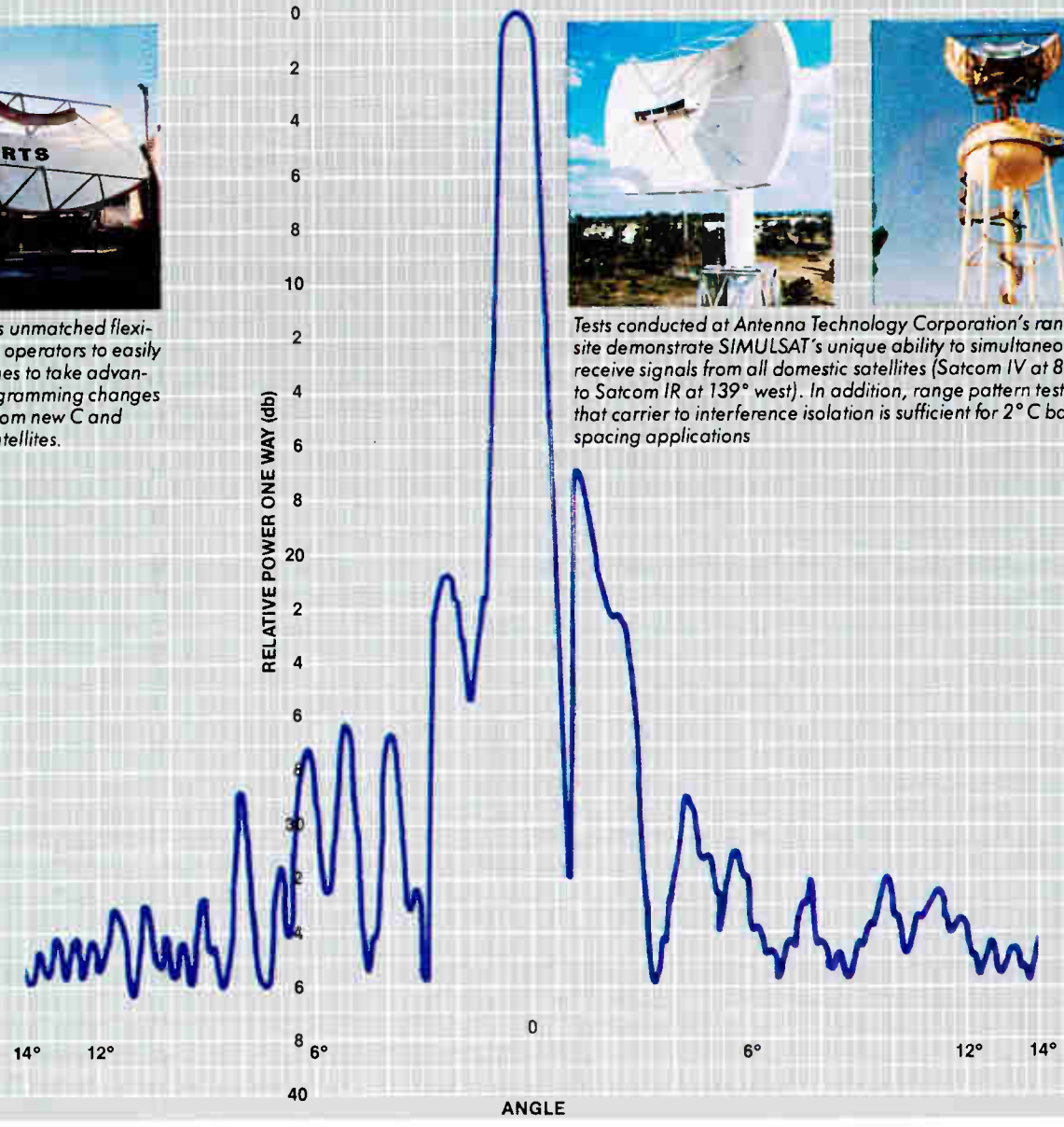
Model Z19.
19.2 KBPS Modem
with 120 switch-
selectable
subchannels.

ZETA, a leader in RF and microwave products since 1968, offers standard or custom configurations to suit your needs. Stock to 45 day availability. Call or write, today.

ZETA LABORATORIES, INC.
A SUBSIDIARY OF CCT
3265 Scott Blvd., Santa Clara, California 95051
(408) 727-6001 TWX 910-338-7336

SIMULSAT's unmatched flexibility allows operators to easily add feed lines to take advantage of programming changes or signals from new C and KU band satellites.

Tests conducted at Antenna Technology Corporation's range site demonstrate SIMULSAT's unique ability to simultaneously receive signals from all domestic satellites (Satcom IV at 83° west to Satcom IR at 139° west). In addition, range pattern tests show that carrier to interference isolation is sufficient for 2° C band spacing applications



SIMULSAT: Range-tested and job-proven quality and flexibility

Independently monitored far range tests prove that SIMULSAT can see all domestic satellites simultaneously with the consistent broadcast quality of a conventional parabolic antenna capable of viewing only one satellite. In fact, SIMULSAT quality is a reality now, and it will continue to be a reality even with the FCC ruling allowing satellites to be positioned at 2° orbital increments.

SIMULSAT OPERATIONAL AT 2° SATELLITE SPACING.

While many earth station operators are concerned about the FCC's 2° orbital allocation, most C band spacings will occur at 2.5°, 3° and 4°, with the majority at 3° and 4°. In addition, signals will be transmitted on two separate bands: the C band (3.7GHz to 4.2GHz) and the new KU band (11.7GHz to 12.2GHz). This means that C band and KU band satellites will be interwoven throughout the orbital arc. As a result, the incidence of satellites spaced at 2° transmitting on the same band will be substantially reduced.

Flexibility Key to SIMULSAT superiority.

SIMULSAT's unique one-antenna concept combines high performance and unmatched flexibility. That means you'll save money on real estate now (one foundation, one installation, one site), plus you'll save even more as C band "and" KU band satellites are added or programming is changed. You can easily add a feed to SIMULSAT in minutes to take advantage of extra profit-opportunities.

SIMULSAT's unequalled advantages have been demonstrated repeatedly on our test range and on the job. We welcome the opportunity to prove SIMULSAT's capabilities to you with test data and user testimonials.

Please send me additional technical data and benefits on SIMULSAT 3, 5 & 7 meter equivalent earth stations and their two-year warranty.

Name _____

Company _____

Address _____

City _____ State ____ Zip ____

Phone Number _____

CED6/84

See us at the NCTA Booth #1237

Reader Service Number 11

ANTENNA TECHNOLOGY CORPORATION

8711 East Pinnacle Peak Road
Suite C-103
Scottsdale, Arizona 85255
602/264-7275
TLX 165-782 INTELEX-SCOT

ANIXTER
COMMUNICATIONS

STOCKS

Channell
PEDESTALS

Channell

Channell pedestals are constructed of the highest quality, field proven ABS plastic and are designed to meet all the requirements of the CATV industry.

The extreme strength of ABS plastic (this is the same material used to produce such high impact items as football helmets, racing car crash helmets, automobile dash boards etc.) and the dome type structure of Channell pedestals provide incomparable durability in all phases of installation.

The CPH-658 will house any tap, filter, equalizer or splitter.

Dimensions: 6.5" diameter, 11" - 16" above grade
Weight: 4.5 pounds with stake
Shipping: 8 per carton
Basic Unit: Shipped complete with stake attached and hasp lock.

The CPH-1016 will house any tap, and line extender combinations or small amplifiers.

Dimensions: 10" diameter, 21" - 29" above grade
Weight: 11 pounds with stake
Shipping: 2 per carton
Basic Unit: Shipped complete with stake attached, hasp lock and designated drop holes in base.

The CPH-816 will house any tap and splitter combination.

Dimensions: 8" diameter, 21" - 29" above grade
Weight: 8 pounds with stake
Shipping: 4 per carton
Basic Unit: Shipped complete with stake attached, hasp lock and designated drop holes in base.

The CPH-1022 will house any tap, splitter and line extender combinations.

Dimensions: 10" diameter, 21" - 35" above grade
Weight: 13 pounds with stake
Shipping: 2 per carton
Basic Unit: Shipped complete with stake attached, hasp lock and designated drop holes in base.

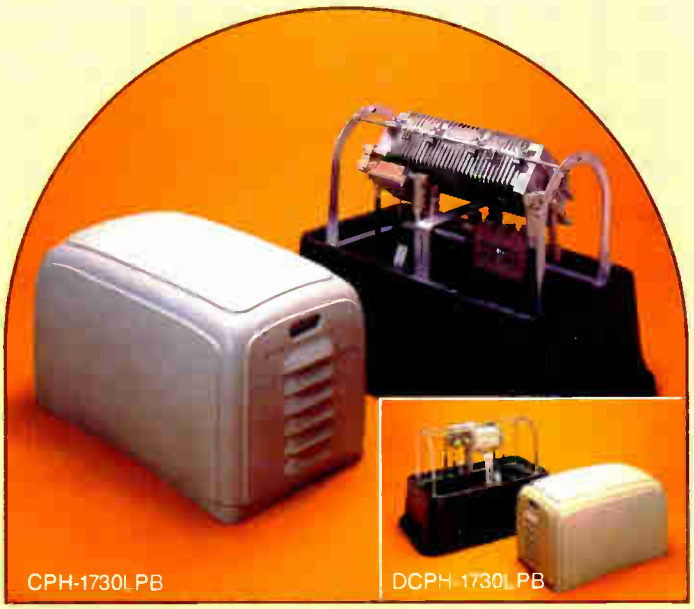
Channell pedestals provide the following advantages:

- Unaffected by severe temperatures ranging from – 60°F to + 160°F.
- Corrosion proof
- Will not draw and hold heat
- Extremely durable
- Vented to minimize condensation
- A very low profile

The dome structure facilitates 360° access, and is supplied to the field with **factory installed hot-dipped galvanized stakes.**

All Channell pedestals are available with hasp or the intertite locking system.

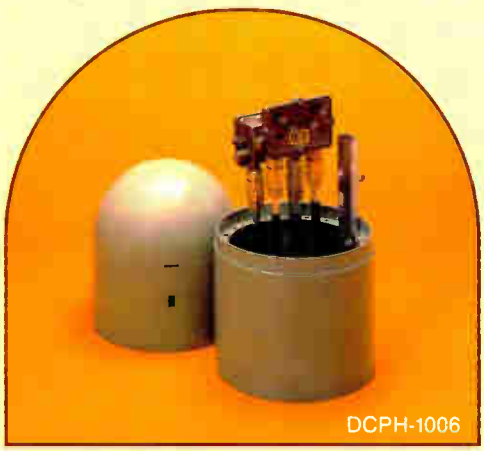
ANIXTER COMMUNICATIONS



The CPH-1730LPB is an extremely versatile low profile, trunk amplifier housing with enough room for taps and splitters. This asthetically pleasing pedestal sits only 17" above ground and will house any trunk amplifier.

Dimensions: 17" diameter, 16" - 24" above grade
Weight: 50 pounds
Shipping: 1 per carton
Basic Unit: Shipped complete with ground skirt, hasp lock and mounting bracket.

The DCPH-1730LPB (INSET) will house any dual line extender combination. (Dimensions same as CPH-1730LPB.)



The DCPH-1006 dual plant pedestal will house two taps or two couplers.

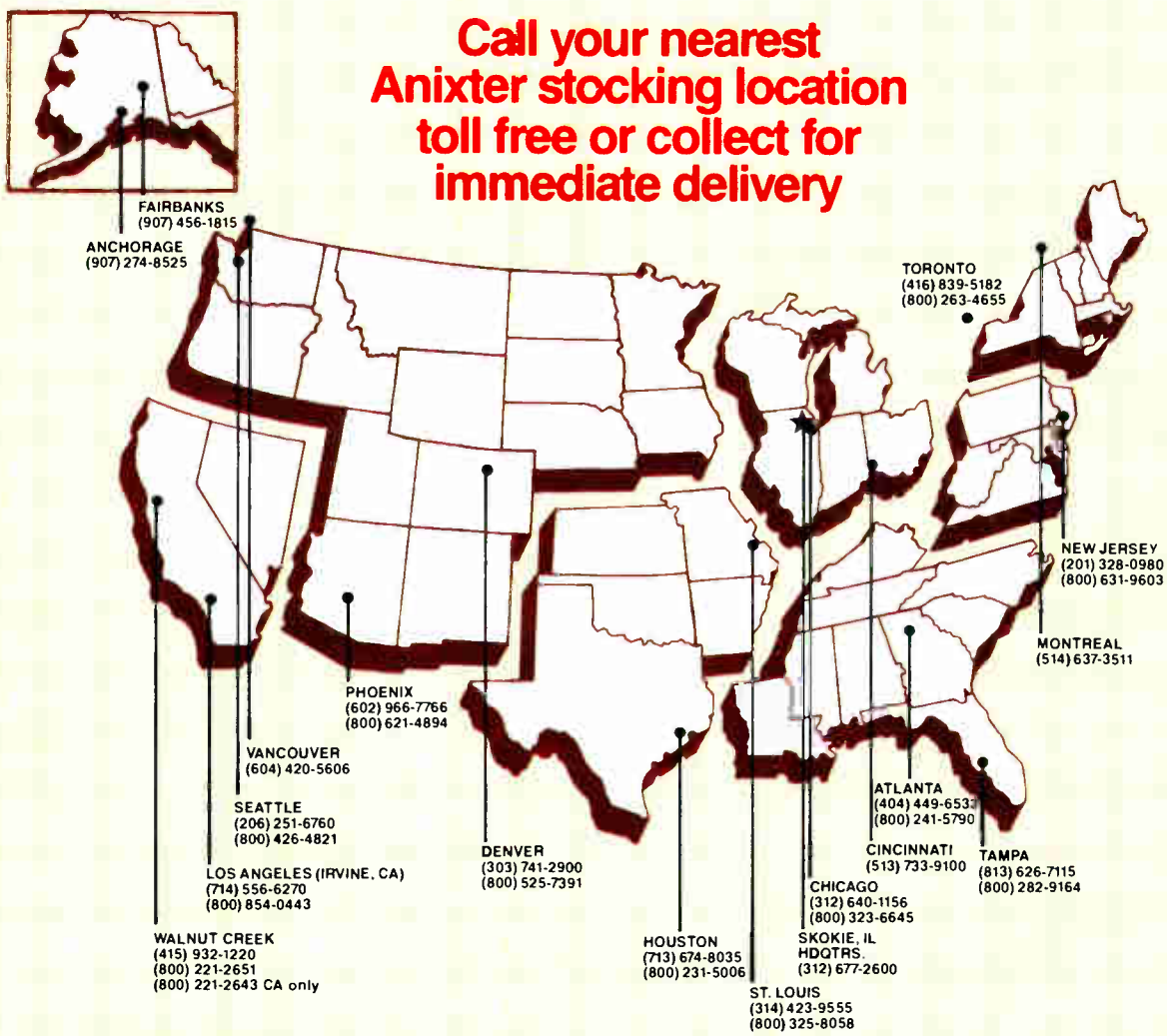
Dimensions: 10" diameter, 11" - 19" above grade
Weight: 8.4 pounds with stake
Shipping: 2 per carton
Basic Unit: Shipped complete with stake attached, hasp lock and designated drop holes in base.

The DCPH-1016 dual plant pedestal will house any two tap and splitter combinations.

Dimensions: 10" diameter, 21" - 29" above grade
Weight: 11 pounds with stake
Shipping: 2 per carton
Basic Unit: Shipped complete with stake attached, hasp lock and designated drop holes in base.

ANIXTER COMMUNICATIONS...Your No.1 source for Channell pedestals

Call your nearest Anixter stocking location toll free or collect for immediate delivery



ANIXTER COMMUNICATIONS

Service is Our Technology

In an emergency, weekends and holidays or after 5 p.m., call toll free 1-(800) 323-8166

Corporate Offices: Anixter Bros., Inc.
4711 Golf Road, Skokie, IL 60076 (312) 677-2600

France goes fiberoptic

PARIS—After nearly two years of debate, the French Council of Ministers approved on May 3 a plan to cable 128 cities by the end of the decade. An initial 320,000 homes will be wired by the end of the year, at an anticipated cost of $165 million.

In a move that didn't surprise U.S. cable manufacturers and suppliers active in the European market, the French government decided that all plant would be fiberoptic rather than coaxial.

Reportedly, mayors of most towns had pushed for cheaper coaxial cable, fearing the added construction costs. But as a concession to the mayors, France's Postes Telephonique et Telegraphique, the government-controlled telecommunications department, agreed to fund most construction costs.

The PTT will oversee construction of all systems, and also will enjoy substantial powers to control programming. Foreign films, for example, will be limited to 30 percent of the total schedule. Locally-originated programming will make up 15 percent of the schedule, and cable systems also will be limited in the total number of films that can be shown. This last constraint was a government concession to theater owners.

An earlier plan that called for the wiring of 1.4 million homes by 1985 was dropped. Instead, 1.5 million homes will be cabled by 1987, and six million by the mid-1990s.

Although the PTT will retain a controlling interest in all of the systems, the new plan calls for some private investment. The details have yet to be worked out.

The decision to install totally fiberoptic systems came as no surprise to Times Fiber, Tele-Wire or Texscan, all active in the European market. All had expected the decision for some time.

Officials at Times Fiber, which is marketing its Mini-Hub I star-switched, fiberoptic system in Europe, were cautious about the implications of the decision. "The Mini-Hub is the only system that can do the job, but nationalism is an issue in France," said Kirk Evans, vice president and treasurer.

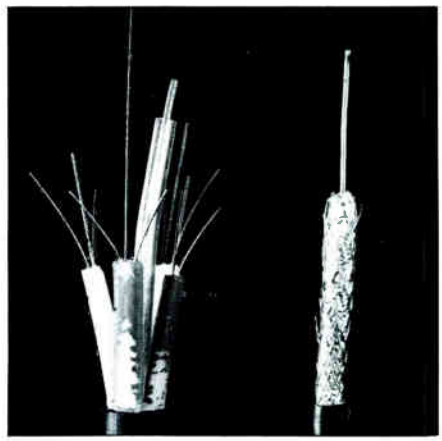
Times Fiber partner CIT-Alcatel has been mentioned as a potential beneficiary of the decision, but Evans cautioned that the political intricacies were important. "Even though Alcatel is big, it might not get big orders if an all-French firm makes a reasonable bid," he said.

Tele-Wire's Marty Ingram, who had expressed some reservations about the size of the European market earlier in the year, expected no changes in his company's business plans as a result of the announcement.

Although some knowledgeable observers in the cable industry are skeptical about fiberoptic plant, Ingram has "absolutely no doubts that the technology can be made to work."

On the other hand, some companies, such as Cable TV Supply, while optimistic about the future of fiberoptic technology, expressed reservations about the near-term potential.

"Choosing fiberoptics indicates the French are looking to the future, and Cable TV Supply would hope to supply the products needed by fiberoptic systems. However, coaxial cable is presently a more economical, proven and practical medium," said John Hyde, a Cable TV Supply spokesman.



French cable systems will use fiberoptics for distribution and trunk

"Indeed, the practical application of fiber throughout a cable system may still be some time away," he said. Hyde suggested that the French might wish to evaluate their decision in a year or so, after some experience has been gained.

—Gary Kim

NewsSweep

- Anixter Bros. has been named materials manager and distributor for Ameritech Mobile Communications Sales Inc.'s cellular telephone products.
- Zenith Radio Corp. is changing its name to Zenith Electronics Corp.
- Ortech Electronics, a new company that will produce addressable off-premises systems, was recently formed by former Vitek President Robert Geissler and former Vitek Executive Vice President Carmine D'Elio.
- Scientific-Atlanta has received a $586,000 order for digital Ku-band earth stations from ISACOMM Inc.
- San Jose, Calif.-based Space Age Video Distributors has released a line of satellite and MDS encoding, decoding and receiving equipment as well as parabolic antennas.
- Harris Corp. has reported third-quarter net income 27 percent higher than for the same period last year.
- Times Fiber Communications Inc. has reported first quarter net income 23 percent lower than for the same period last year.
- C-COR Electronics, Inc. has announced a drop in unit price for all of the company's feedforward products.
- Prime Cable Corp. of Atlanta will purchase $20 million worth of Scientific-Atlanta addressable converters.
- Texas-based TCA Cable TV will purchase $224,000 worth of addressable converters and other equipment from TOCOM Inc.
- Satellite Syndicated Systems has announced first quarter net income 89 percent higher than for the same period last year.
- A new report by Frost & Sullivan predicts that almost 48 million North Americans will be viewing DBS programs by 1994.
- Texas-based Telecable of Plano Inc. plans to introduce premium audio services in three systems on a test basis. Pioneer Communications is supplying the FM block converters to be used in the test.
- General Instrument reported a drop in net income for the past fiscal year. The company made $36,030,000 compared to $102,181,000 last year.
- Oak Industries Inc. has announced an agreement with Leitch Video Ltd. of Toronto, Canada that gives Oak an exclusive license to make and sell Leitch encryption technology.
- The FCC has granted an additional 49 LPTV licenses, raising to 156 the number of companies holding permits.
- Continental Cablevision is now providing cable service to the Westin O'Hare Hotel.
- Scientific-Atlanta has reorganized its satellite communications operations. The new Satellite Communications Division will be headed by John Lappington.
- Bell Cable Corp. of Highland Park, Mich. has ordered 5000 tunable converters from Pioneer Communications.

LECTRO POWER SYSTEMS BEAT THE OTHERS COLD.

Whatever requirements your cable system is likely to face, Lectro has the power system that's right for you.

From Mini Brutes to Add-Ons to the new Sentry II, Lectro offers over 50 different models—nobody else even comes close.

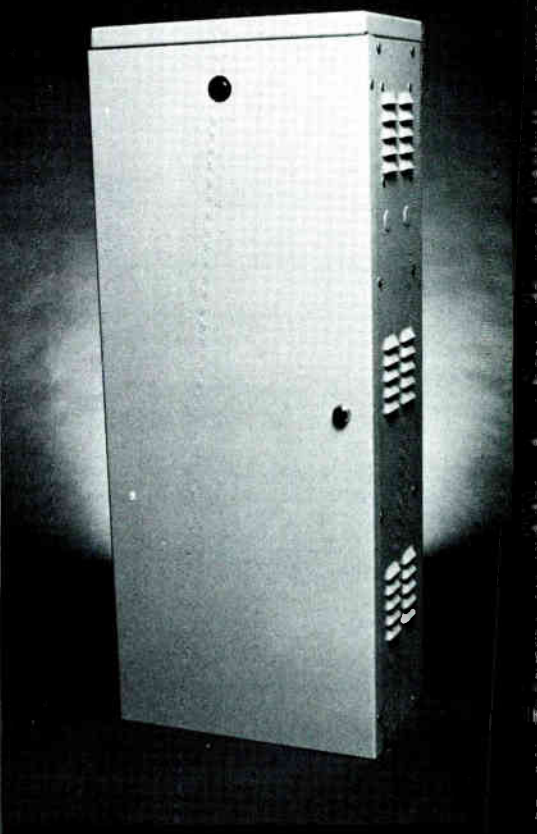
Our computer-aided design and manufacturing capabilities are the most advanced in the industry. So we have the flexibility to meet a wider range of standard and standby power needs—including our ability to custom build cabinets to your specifications.

Pole mount or ground mount. Batteries on top or on the bottom. Lectro's design is the most flexible on the market.

Call for complete specs on our whole family of power supply products. Compare for yourself and you'll agree, for quality, price, flexibility and serviceability—Lectro standard and standby power systems are the natural choice.

SENTRY II
Features:
- Total modular construction, customized to your needs.
- Automatic switchover when either module is unplugged.
- Auto restart overload protection.
- Constant voltage taper charger.
- Under-voltage protection.
- Top or bottom battery position, optional.
- Accommodates group 31 batteries.
- Ground or pole mount.
- Status indicator lights.
- Metered battery voltage & output current.
- MOV surge protection, standard.
- Optional heavy-duty surge protection available.
- Optional daily battery exercise charge available.

MINI BRUTE
Features:
- 89.4% operating efficiency (tops in the industry).
- Fan cooled for extended life.
- 5% load regulation.
- 1% line regulation.
- Modular design.
- Positive disconnect for added safety.
- MOV surge protection standard.
- Time delay and current limit options available.
- 7"W x 8"D x 15½"H
- Wt.—37 lbs.



ADD-ON STAND-BY UNIT
Features:
- 60 Volts output or optional 30 volt.
- 720 Watts.
- 2 Hr. 20 min. operating time at full load.
- Compatible with any standard make Ferro supply.
- Dual battery operation.
- 5% load regulation between 3 & 5 amps.
- Automatic low voltage shut down.
- Plug-in connectors for simple installation.
- Built in fan for longer life, standard.
- 13"W x 8"D x 33"L
- Wt.—38 lbs. (without batteries).

Burnup&Sims
Lectro
The Natural Choice.
Sales Office (800)551-3790/(404) 353-1159
Reader Service Number 12

Study claims MMDS no threat

NEW YORK—Do multichannel MDS services pose much of a threat to the established cable television industry? Not in the opinion of LINK Resources Corp.

In a research memo slated to be released in May, analysts at LINK Resources conclude that despite its low capital cost, multichannel MDS will be complementary —not competitive— to cable. "It's just not going to work in any cabled markets," comments Senior Analyst Arlene Zeichner.

After the Federal Communications Commission reallocated eight Instructional Television Fixed Service (ITFS) channels to MMDS last year, it has been deluged with nearly 16,500 applications for multichannel MDS licenses. Early entrants Microband and Contemporary Communications Corp. have been joined by cable MSOs, broadcasters, SMATV operators, satellite common carriers, newspaper publishers and telephone companies in the quest for the two licenses that will be granted for each MMDS market. Among the cable companies that have filed for such licenses are American Television and Communications, Group W Cable, Warner Amex, Cox Cable, Colony Communications, Daniels & Associates and Capital Cities Cable.

LINK questions whether MMDS can survive as a delivery channel independent of cable operator support, especially in view of the facts that 40 percent of current MDS channels are programmed by cable operators and 75 percent of today's MDS subscribers receive only Home Box Office. LINK's cost projections dispute the claims by MMDS applicants that they will be able to offer programming equivalent to cable fare at a lower cost. Indeed, the firm predicts that subscriber fees for MMDS programming probably will be almost identical to those for cable.

"In LINK's view, MMDS can survive only if offered in an unwired part of a major urban area—most successfully in conjunction with a cable operator, but, in some cases, in competition with a slow-wiring cable operator"—assuming that interested cable operators will be able to convince municipal authorities to allow MMDS as well as SMATV in lieu of cable in unprofitable areas of franchises, the memo states.

Present-day MDS operations have an estimated 500,000 subscribers, a sizable drop from the 750,000 who subscribed at mid-year 1982. According to LINK, these subscribers are clustered in areas that aren't presently served by cable systems. When cable does come into an area served by MDS, the disconnect rate for single-channel MDS usually reaches 90 percent.

After the 16,500 MMDS applications are processed, the FCC plans to grant 10-year licenses to operate MMDS stations as common carriers. Like TV stations and current MDS providers, multichannel MDS operators will be required to lease transmission time on a first-come, first-served basis. The FCC will regulate and control carrier charges and terms of service. In addition, operators will be prohibited from providing more than 50 percent of their on-air time to programmers that have financial or business affiliations with those carriers.

On the cost side, LINK expects present trends in the MDS industry to carry over into multichannel MDS, with carriers providing only transmission equipment. Programmers and/or subscribers will pay for the reception equipment. Upfront costs for transmission equipment will run about $300,000 for a four-channel MMDS operation and $500,000 for an eight-channel operation.

LINK estimates that maintenance costs will run 7 to 9 percent of the capital cost each year, or $24,000 for a four-channel operation and $40,000 for the eight-channel version. In addition, overhead and operating expenses will run approximately 30 percent of each year's gross tariffs received. Interest and depreciation will account for $102,000 a year for four-channel services and $170,000

MMDS programmer cost and revenues

Costs:

Capital costs:

reception equipment $250-300 per new sub

Operational costs:

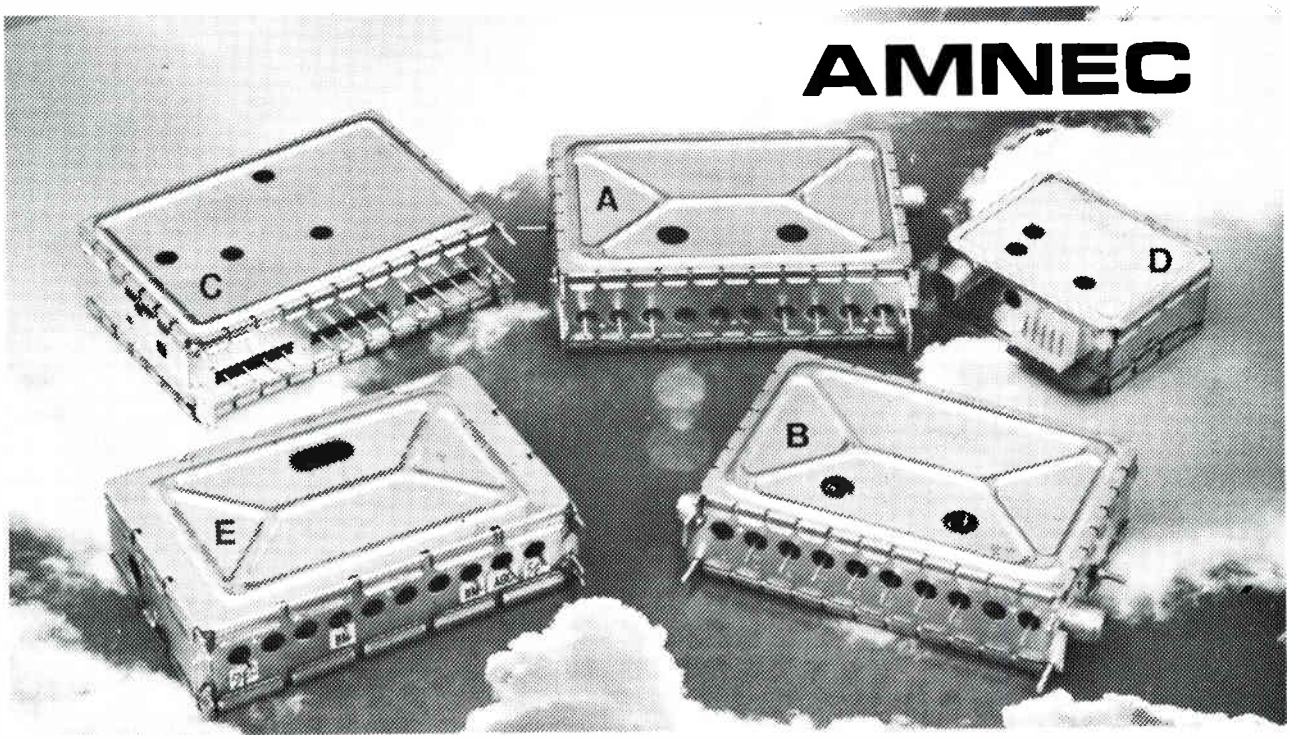
installation	$65.00/new sub
disconnects:	$35.00/
programming fees:	$4.60/pay channel/month $0.10/basic/month
advertising/sales:	$28.00/new sub
program guide/billing:	$12.00/sub
service fees:	$3.50/sub
tariffs:	$12,000.00/month 4-channel + $1.00/sub/month $25,000.00/month 8-channel + $1.00/sub/month
other fixed costs: (salaries, rent travel, legal, utilities, insurance, etc.)	$180,000.00

Revenues*:

subscriber monthly fees:	$25.00-$35.00/sub/month
disconnect fees:	$25.00/sub
installation fees:	$50.00/sub

*Possible additional revenues from advertiser-supported basic services have not been included as they are impossible to determine at this time. It is unlikely that they will be significant before 1990.

Source: LINK



A EPU-202 UHF Tuner Ch. 14-83 75 ohm Input
B EPU-303 VHF Tuner Ch. 2-13 75 ohm Input
C PIF-45MO1 Picture IF. (45.75 MHz)
D RF-3400 RF Modulator Video 1VPP Audio .5
E EPU-253 UHF Tuner Ch. 3 Output

EPD
ELECTRONICS INC.

16921 S. Western Ave., #110
Gardena, CA 90247
Telex: 691738 EPD GARDENA
(213) 515-4996

Reader Service Number 55

yearly for eight-channel operations. Based on LINK's calculations, four-channel operators will spend $169,000 a year with eight-channel service providers paying $300,000 each year.

On the other side of the balance sheet, MMDS operators can expect programmers to pay them between $10,000 and $15,000 each month to four-channel systems and $20,000 to $30,000 for eight-channel operations. In addition, MMDS operators should receive an additional dollar per subscriber each month. Therefore, LINK says, MMDS common carriers have a low risk business with potential for high income, assuming they can find programmers to lease time to.

Several prospective MMDS operators plan to lease ITFS frequencies from educational licensees to get a head-start in the business. However, LINK believes the success of these hybrid entertainment/ educational systems will be limited in the face of cable competition because it is unlikely consumers will accept pay stations that provide educational programming by day and entertainment by night.

In addition, such MMDS operators plan to show traditional cable fare with little system specific programming at costs equal to those associated with cable. LINK does believe, however, that these hybrids will be successful in uncabled urban markets, with penetration rates as high as 20 percent—until the area is wired. At that time, LINK analysts predict, disconnects will run as high as 90 percent.

Programming on present-day MDS operations is undifferentiated and mostly devoted to the satellite delivered fare of HBO, Showtime and The Movie Channel. In LINK's view, cable has conditioned the MDS market, with the majority of MDS stations relying on cable fare and cable operators providing the programming to 40 percent of MDS subscribers. —*Sally Russell*

Download

■ **Channell Commercial Corp. has developed a new set of base map symbols for identifying pedestals in the field.** The company is giving away a plastic template containing the new symbols as well as the existing symbols. It is available free to cable personnel who contact the company.

■ **AT&T and CBS have signed a 10-year agreement under which AT&T provides the network with satellite transmission services.** A similar contract with ABC has been extended from five to 10 years.

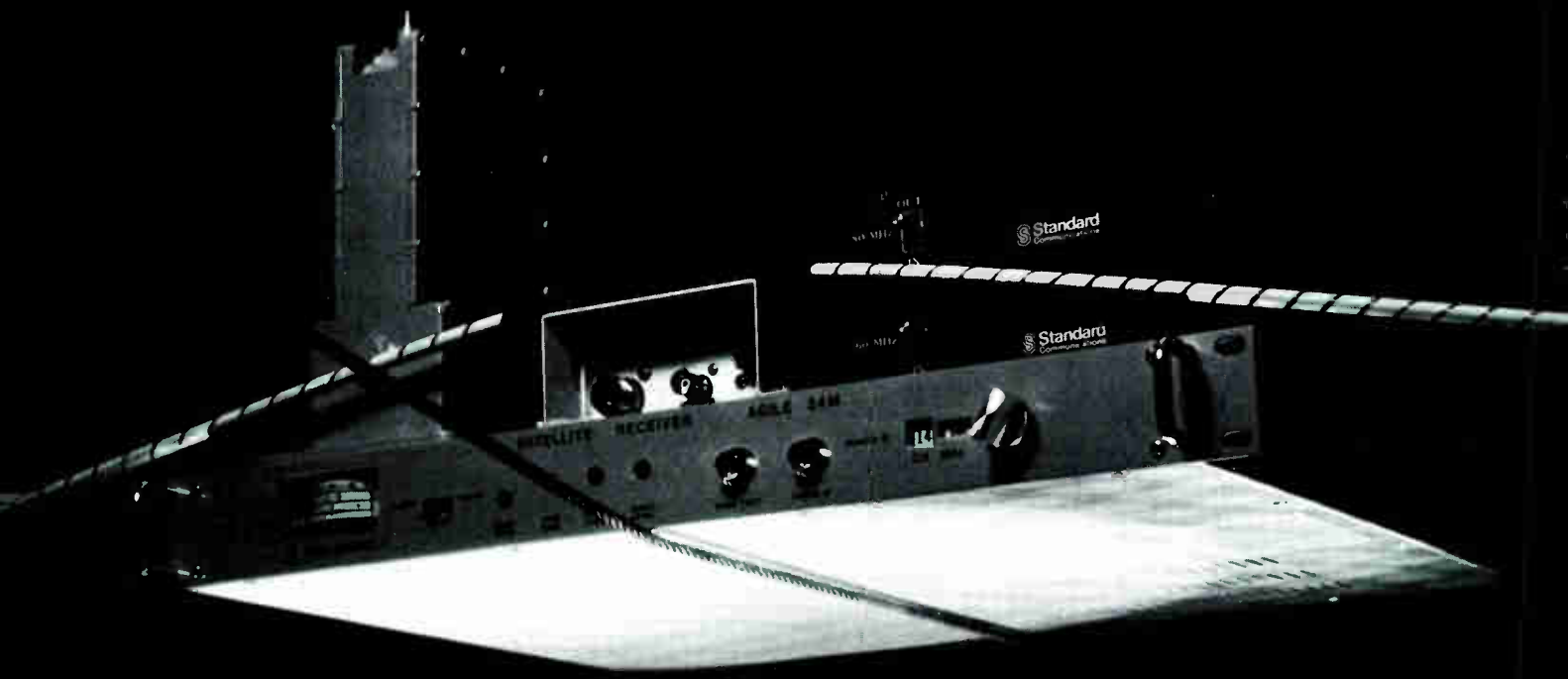
■ **Nationwide maintenance services for microwave, satellite earth station, mobile radio, fiberoptic, video and switching systems are now available from Harris Corp.** The company's FCC-licensed field engineers are on-call 24 hours a day, and Harris guarantees customers a two-hour dispatch time.

■ **A laser-based fiberoptic system is now available from Artel Communications Corp.** The system transmits video, audio and data on a single optical fiber as far as 20 miles without repeaters.

■ **Long-haul transmission technologies will be tracked by a new research service.** Compucon Inc. will follow fiberoptic, satellite and microwave services and report annually on new developments.

The First Year's On Us

We'll take the risk.
If any Standard TVRO component malfunctions we won't just repair it, we'll replace it immediately.



Just a simple phone call. And an immediate replacement is on its way. That's the replacement option you have on all Standard TVRO Agile 24 satellite receivers and low-noise amplifier/block-down converters (LNBC).

It's part of the one-year warranty Standard offers on its TVRO equipment. And for years two through five, Standard's warranty allows for next-day replacement for a total cost of only $100, plus freight.

If avoiding downtime and the risk of annoyed customers is important to you, this warranty is another good reason to go with Standard for your TVRO needs.

Of course, the best reason has to do with why we can offer this kind of warranty in the first place.

It's because our failure rate is a mere one-half percent. With this low rate we're not taking much of a risk and neither are you.

For full information on Standard's complete line of TVRO components, write or call Telecommunications Division of Standard Communications Corp., P.O. Box 92151, Los Angeles, CA, 90009-2151. (213) 532-5300.

Standard Communications

... the TVRO System people

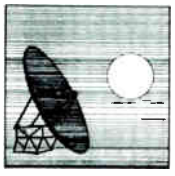
Reader Service Number 15

NCTA Technical Sessions

Monday, June 4

Commercial Insertion 2-3:30 p.m.

Speakers: Scott Tipton, HBO; Paul Olivier, ATC; Ned Mountain, Wegener Communications; Roger Strawbridge, Adams-Russell Telecommunications; Ernest Tunmann, Tele-Engineering Corp.; and Vern Bertrand, Channelmatic Inc.



Technical Papers:

Bill Killion discusses Channelmatic insertion equipment and systems, giving special attention to traffic control and accounting applications.

Tunmann takes a look at how the commercial insertion business evolved and how it has changed over the past two years. He also talks about equipment and software features: production, insertion, random access, programming, logging, fail safe, remote operation, expansion, automated billing and management operation.

Olivier focuses on the need for partnership between cable operators, programmers and manufacturers. He takes a close look at signaling methods, pre-roll times and signal measuring as well as local availabilities.

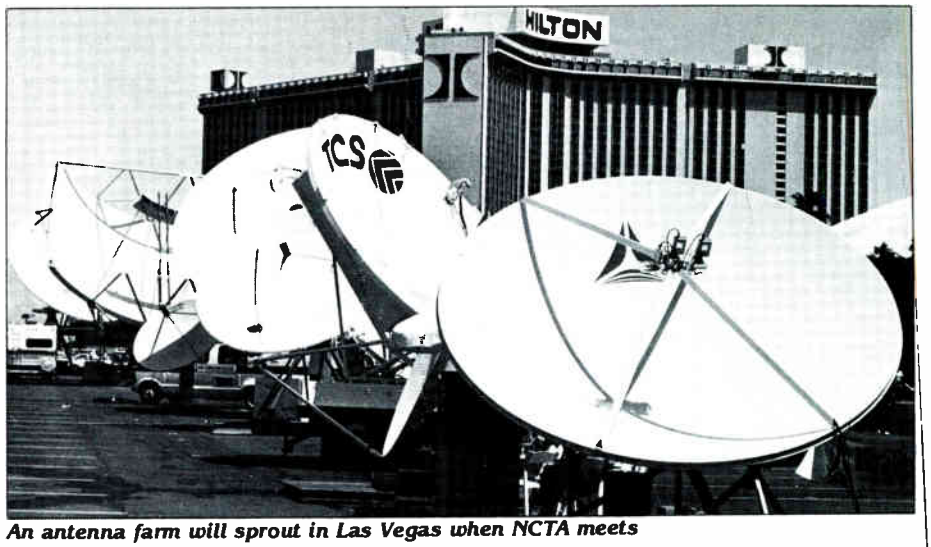
Tests and Measurements 2-3:30 p.m.

Speakers: Tom Polis, Communications Construction Group; Bradford Kellar, Raychem Corp.; Kenneth Crandall, Zeta Laboratories; Warren Braun, ComSonics; Donald Groff, General Instrument, Jerrold Division; and David Kelma, also of Jerrold.

Technical Papers:

Kellar examines intermodulation caused by corroded or loose connections in cable systems. He reports on the types and levels of intermod produced by various connections, as well as the reasons for each type of distortion.

Crandall talks about simple tests that can help operators spot faulty RF modems. Some of the specifications he discusses are mechanical shock, frequency translator drift and intermod.



An antenna farm will sprout in Las Vegas when NCTA meets

Braun focuses on echo testing equipment that goes beyond older instruments testing monochrome sources. He argues that newer equipment can define chrominance visual degradation.

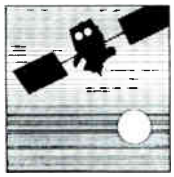
Groff discusses a technique for measuring the noise figure of a cable distribution system, and contrasts it with conventional tests of carrier-to-noise ratio. In addition to describing the advantages and drawbacks of each method, he also talks about simple instruments and calibration techniques that can be used. Finally, he touches on possible sources of error when conducting such tests.

Kelma reports on signal purity considerations for frequency synthesized headend equipment. As more frequency agile headend converters have come into use, phase noise, spurious signals, residual frequency and phase modulation have become greater concerns. Kelma talks about the relationship between picture degradation and headend synthesizer noise.

Tuesday, June 5

Advances in Signal Relay by Satellite and Microwave 9-10 a.m.

Speakers: Jeffrey Krauss, M/A-COM; Dom Stasi, Warner Amex Satellite; Thomas Straus, Hughes Aircraft Co.; Jerrold Heller, M/A-COM and Jamal Saraff, Hughes Aircraft Co.



Technical Papers:

Stasi discusses the impact of recent developments in satellite communication, including higher power, solid state transponders and encryption schemes. He also talks about new modulation formats and low-cost receivers.

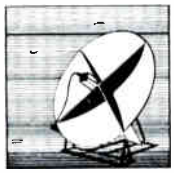
Straus and I. Rabowsky outline the performance tradeoffs of using various configurations of low-noise amplifiers. They address the situations in which AGC is necessary.

Heller reports on new developments in satellite television scrambling by describing the VideoCipher system.

Sarraf and Irving Rabowsky review the cable industry's role in pont-to-point voice and data networks, making the argument for cable's involvement in the local area network market. They also talk about the use of AML microwave links to interconnect dispersed LANs.

Cable Revolutionaries: Scanning the New Blue Skies 9-10 a.m.

Speakers: Wendell Bailey, Jr., NCTA; Georg Luettgenau, TRW; Gary Arlen, Arlen Communications; Israel Switzer, Media General Cable of Fairfax and; Dr. Frank Marlowe, RCA Labs.



Technical Papers:

Luettgenau discusses the use of hybrid cable transmission schemes for the range between 40 and 900 MHz. He talks about feedforward and other transmission techniques useful for specific applications.

Arlen talks about teledelivery of video and data software on demand. He argues that both will be increasingly important to the cable industry, and describes systems that are being tested. He also reviews teledelivery systems being tested by the broadcasting and telephone industries.

Switzer argues that FM video transmission, with or without color encoding techniques, is the best way to deliver high quality 525-line video. Existing cable systems are not the best media for the distribution of high resolution, wide bandwidth images, he maintains. The present S/N ratio of VSB/AM transmission of 525-line NTSC signals is barely adequate, Switzer says.

Marlowe explains the workings of four new technologies and their

application to cable television. Included are: digital television, multiplexed analog components, high definition television and CCD cameras.

Bill Johnson of United Video proposes a modification of modulation techniques that could improve TVRO tolerance to poor C/I ratios. Specifically, he argues for changes in video sync and energy dispersal waveform standards.

(Re)Building for Cable's Future **10:30-noon**

Speakers: Ray McDevitt, Warner Amex Cable; Joseph Preschutti, C-COR Electronics; Paul Brooks, General Electric Cablevision Corp.; Neil Neubert, Warner Amex Cable; and Norman Slater, Cable Systems Engineering.

Technical Papers:

Broadband system design is strikingly different when feedforward amplifiers are used, argues Preschutti. Among the characteristics he discusses are output capacity, gain compression, temperature stability, noise figure, flatness, cross modulation and delay line placement.

Brooks talks about performance and cost considerations when channel capacity is increased. His paper focuses on the selection of cable plant between the headend and the subscriber tap.

Neubert traces the development of audio and video systems at Warner Amex Cable. He follows the early broadcast techniques through the onset of automation, and describes the company's latest designs in edit, control and transmission centers.

Slater and Douglas McEwen report on tests of second order distortion in systems carrying more than 50 channels. They also argue that active equipment using parallel or feedforward post amplifiers produces a "disappointing" improvement in second order distortion performance.

Audio: The New Playing Field **10:30-noon**

Speakers: Alex Best, Scientific-Atlanta; Dennis Waters, Waters and Co.; Charles Wong, Oak Communications; Yuichi Kojima, Sony Corp.; James Wonn, Group W Cable; and Craig Todd, Dolby Laboratories.

Technical Papers:

Cable audio standards are the subject of Waters' paper. Several incompatible systems, each optimized for a particular purpose, have been developed. Selecting a single standard will involve a

complex set of trade-offs, and Waters takes a look at them.

Wong discusses automated bit error rate testing, especially useful in monitoring a receiver's performance over long periods of time.

Kojima,Yasuhiro Hideshima, Masakatsu Toyoshima and Etsumi Fujita describe a system for transmitting digital data at 7.4 megabits/sec. using 6 MHz of cable bandwidth. The system can simultaneously transmit four ultra-high-fidelity stereo audio programs, game or computer software, facsimile data or still pictures. The system can be used by any CATV system without alteration.

Wonn's paper explains how stereo sound can be delivered over a cable system without the need for special TV sets or new terminal equipment. The system uses a special off-channel frequency band and is compatible with most existing set-top equipment.

Todd also talks about a digital audio system for use by broadcast, cable and satellite delivery systems. Playback circuitry—particularly its cost—is a major block to digital audio, he argues. To circumvent the problem, Todd would place the sophisticated circuitry in the encoder, using no precision components in the decoder.

Data Communications 3:30-5 p.m.

Speakers: Geoffrey Gates, Cox Cable Communications; Ernest Tunmann, Tele-Engineering Corp.; Lee Greenhouse, E.F. Hutton; John Hughes, The NABU Network; Leo Shane, General Instrument, Jerrold Division; and James Mollenauer, Codex Corp.

Technical Papers:

Tunmann reviews the technical standards for international packet switching networks as well as the bus access methods applicable to local area networks and cable wideband area networks. The LANTEC 8400 data communication system for cable applications is featured in his paper.

Greenhouse asks whether cable ever will be ready to deliver two-way data services. He talks about why cable was not selected as the delivery vehicle for Huttonline.

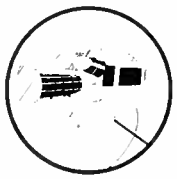
Shane describes three CATV data applications: videoconferencing, medical information networks and business communications.

Mollenauer writes about metropolitan data network standards and the need for cable industry participation in the setting of those standards.

Eric Rayman and William Schneck contribute a paper on the vertical blanking interval, FCC rulemaking

pertaining to the VBI and the effect of copyright laws on VBI teletext.

Distribution System Concepts **3:30-5 p.m.**



Speakers: Joseph Preschutti, C-COR Electronics; Robert Dickinson, E-COM Laboratories; Thomas Hunter, Data Transmission Devices; Robert Hoss, Warner Amex Cable; Harry Reichert Jr., General Instrument, Jerrold Division; and Thomas Saylor, Caltec Cablevision.

Technical Papers:

Dickinson discusses the merits of cable or home power for off-premises addressable converters.

Hoss and Ray McDevitt compare the cost and performance of FM video transmissions versus digital transmission over fiberoptic cable.

Reichert takes a look at the circuitry and performance characteristics of the Magic Tee amplifier, which uses two hybrid integrated circuits in parallel. He compares gain variation, distortion and noise figure performance with those of the single hybrid circuit, and highlights the operation of both types of circuits in amplifier cascades.

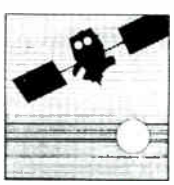
Saylor discusses the operation and maintenance of fiberoptic trunks.

Steve Westall of the Connecticut National Bank traces the development of cable distribution systems.

Steven Grossman of C-COR talks about surge waveforms and energy levels as they affect the modern broadband distribution amplifier. He explains how to use this knowledge to design circuits and use protective devices.

Wednesday, June 6

Radiation Measurement and Prevention **9-10 a.m.**



Speakers: William Petty, Capital Cities/Cable Communications General; Ted Hartson, Capital Cities Cable; Sandy Livermore, Magnavox CATV Systems; Jody Shields, United Artists Cablesystems Corp.; and Gregg Nydegger, Cardinal Communications.

Technical Papers:

Hartson describes the Average Leakage Index, a way of testing for signal leakage.

Livermore talks about how to measure RFI isolation, comparing several popular methods.

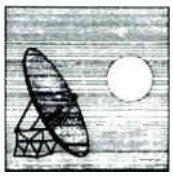
Shields explains how to use a United Artists Cablesystems RF chamber to measure the RF shielding of CATV

components other than cable.

Nydegger emphasizes the importance of preventive maintenance in his paper.

The Final Link: Home Terminals **9-10 a.m.**

Speakers: Stan Guif, Oak Communications; James Farmer, Scientific-Atlanta; John Schilling, General Instrument, Jerrold Division; Mircho Davidov, Oak Communications; and Dell Heller, Viacom Cablevision.



Technical Papers:

Farmer outlines the history of set-top converters, and traces the development of techniques used in these terminals. He talks about the architecture of terminals and highlights their principal characteristics. He also discusses the relationship between scrambling and stereo.

Schilling takes a look at baseband terminals from the standpoint of detectable degradation of signal qulaity.

Davidov and V. Bhaskaran present an overview of video scrambling techniques in terms of scrambling depth, security and residual effects on the descrambled video. They also talk about how different schemes can coexist with each other, and finally, compare the cost and performance trade-offs for each technique.

Heller examines home terminal units and their impact on system operations.

Cable Distribution Plant **3:30-5 p.m.**

Speakers: Robert Luff, United Artists Cablesystems; Richard Citta, Zenith Radio Corp.; Ronald Hranac, Jones Intercable; F. Ray McDevitt, Warner Amex Cable; and Roy Thompson, Warner Amex Cable.

Technical Papers:

Citta and Dennis Mutzabaugh take a look at two-way cable plant characteristics. Among these are white noise floor, the tunneling effect, ingress, unwanted external signals, common mode distortion, difference products resulting from forward plan recertification, impulse noise and amplifier nonlinearities.

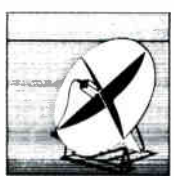
Hranac takes a look at the effects of single ended, push-pull and feedforward distribution systems on high-speed data and video signals. Three system configurations are tested: a 15-year-old, single-ended; 12-channel plant; a three-year-old, 35-channel, push-pull plant; and a one-year-old, 54-channel feedforward plant.

McDevitt and Peter Alden examine staffing levels as a function of cable plant miles, number of subscribers and staff abilities.

Thompson highlights the need for technical audits of large, metropolitan cable systems.

Addressability: Coming of Age **3:30-5 p.m.**

Speakers: Joseph Van Loan, Viacom Cablevision; Robert Rast, American Television and Communications Corp.; J. Curt Hockemeier, Cox Cable; Steve Lafferty and Mike Burgess, Wegener Communications; and Graham Stubbs, Oak Communications.



Technical Papers:

Rast, Walter Ciciora and Sherwood Campbell discuss how one MSO developed an off-premises addressable system.

Hockemeier weighs one-way addressable technology, suggesting how and when to introduce it.

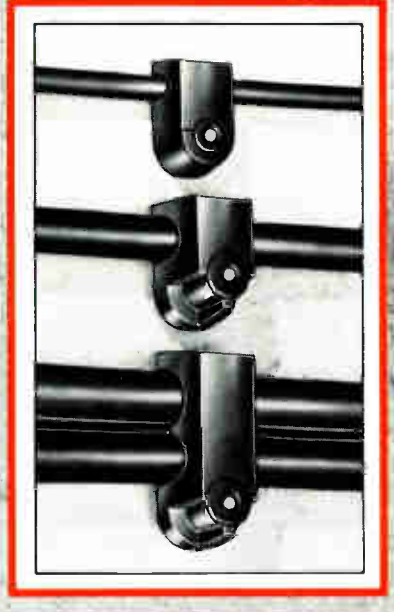
Ray St. Louis discusses the applications of active trap technology to addressability.

Stubbs and John Holobinko outline the requirements for a hybrid addressable system that meets the needs of both the individual residence as well as the high-density market.

GET OUT OF THE HOLE DRILLING BUSINESS!

ONETAP™ CLIP NEEDS NO HOLES

Holes cost 50¢ each! ONETAP™ CLIPS cost 10¢ each —and fasten coax cable to poured concrete!



ONETAP™ CLIP is the 10¢ solution.
No holes to drill—no need for special tools. One tempered steel pin easily penetrates poured concrete, cinder blocks, mortar, bricks, hardwood floors. 3 sizes fit all coax cable installs.
Patent Pending.

Shown actual size.

CONTACT YOUR NEAREST DISTRIBUTOR

CABLE TV SUPPLY COMPANY
5933 Bowcroft Street
Los Angeles, CA 90016
213-204-4440
800-421-4699

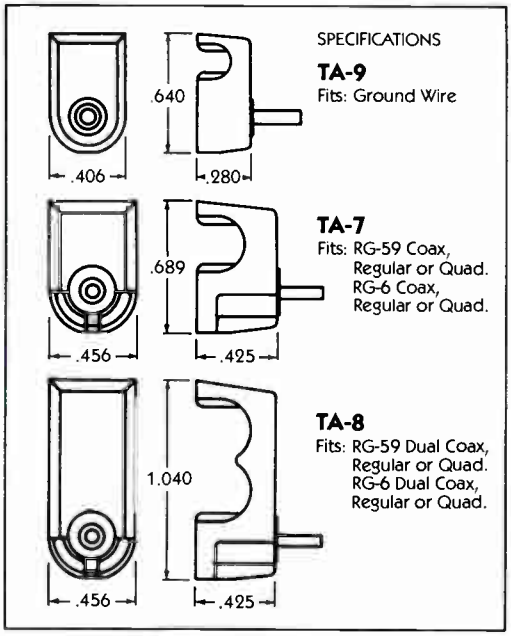
NCTA Booth No. 805

ITW Linx™ INSTALLER PRODUCTS
Illinois Tool Works, Inc.
195 Algonquin Road
Des Plaines, IL 60016
Telephone 312-996-5469

NO MORE HOLES TO DRILL!

ONETAP™ CLIP NEEDS NO HOLES

CLIPS SHOWN ACTUAL SIZE

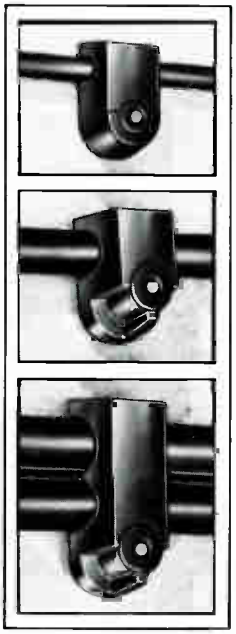


SPECIFICATIONS

TA-9
Fits: Ground Wire

TA-7
Fits: RG-59 Coax, Regular or Quad. RG-6 Coax, Regular or Quad.

TA-8
Fits: RG-59 Dual Coax, Regular or Quad. RG-6 Dual Coax, Regular or Quad.



ONETAP™ MASONRY CLIP

One hammer blow drives one steel pin into concrete! Strain relief grip holds ONETAP™ CLIP on cable while pin is driven—route cable as you install. 3 sizes fit all coax cable installs.

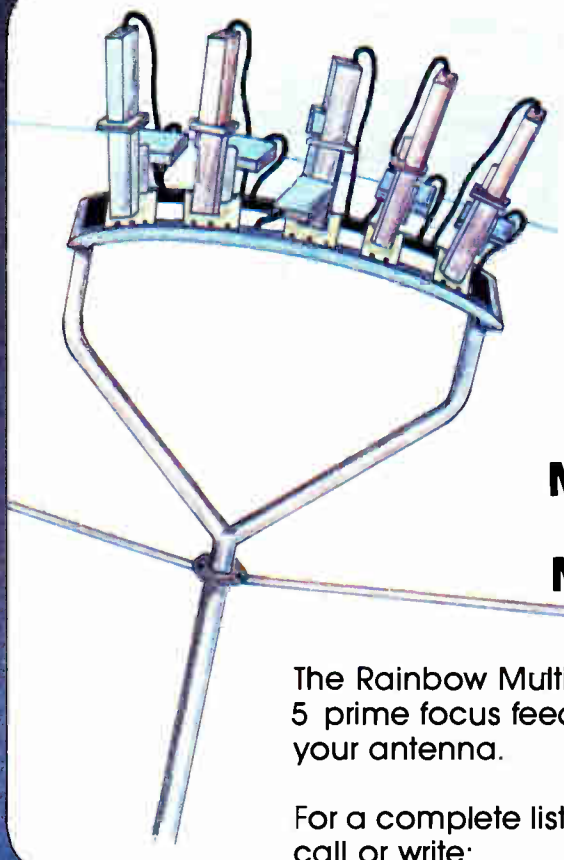
Patent Pending.

CONTACT YOUR NEAREST DISTRIBUTOR

CABLE TV SUPPLY COMPANY
5933 Bowcroft Street
Los Angeles, CA 90016: 213-204-4440 or 800-421-4692
Decatur, GA: 404-981-9220 or 800-241-2339
Houston, TX: 713-681-6141 or 800-231-8220
Grand Prairie, TX: 214-988-1841 or 800-527-6482
Cinnaminson, NJ: 609-829-0100 or 800-257-7245
Brecksville, OH: 216-526-0919 or 800-321-8068
Addison, IL: 312-543-9800 or 800-323-1785
Woburn, MA: 617-938-1221 or 800-343-5811
Denver, CO: 303-922-4589 or 800-525-9701

ITW Linx™
INSTALLER PRODUCTS
Illinois Tool Works Inc.
195 Algonquin Road
Des Plaines, IL 60016
Telephone 312-296-5469

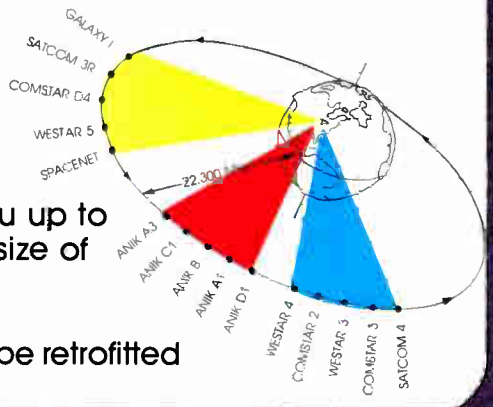
5 Star General



MULTI-BEAM FEEDS

- Maximize your programming capability, by receiving Galaxy I, Satcom III R, Comstar D-4, Westar 5 and Spacenet with the use of one dish.
- Add to system revenues, through tier expansion.
- Eliminate additional land acquisition and the installation costs of multiple dishes, while increasing your earth station investment.

MULTI-DISH? OR MULTI-FEED?



The Rainbow Multi-Beam Feed allows you up to 5 prime focus feeds, depending on the size of your antenna.

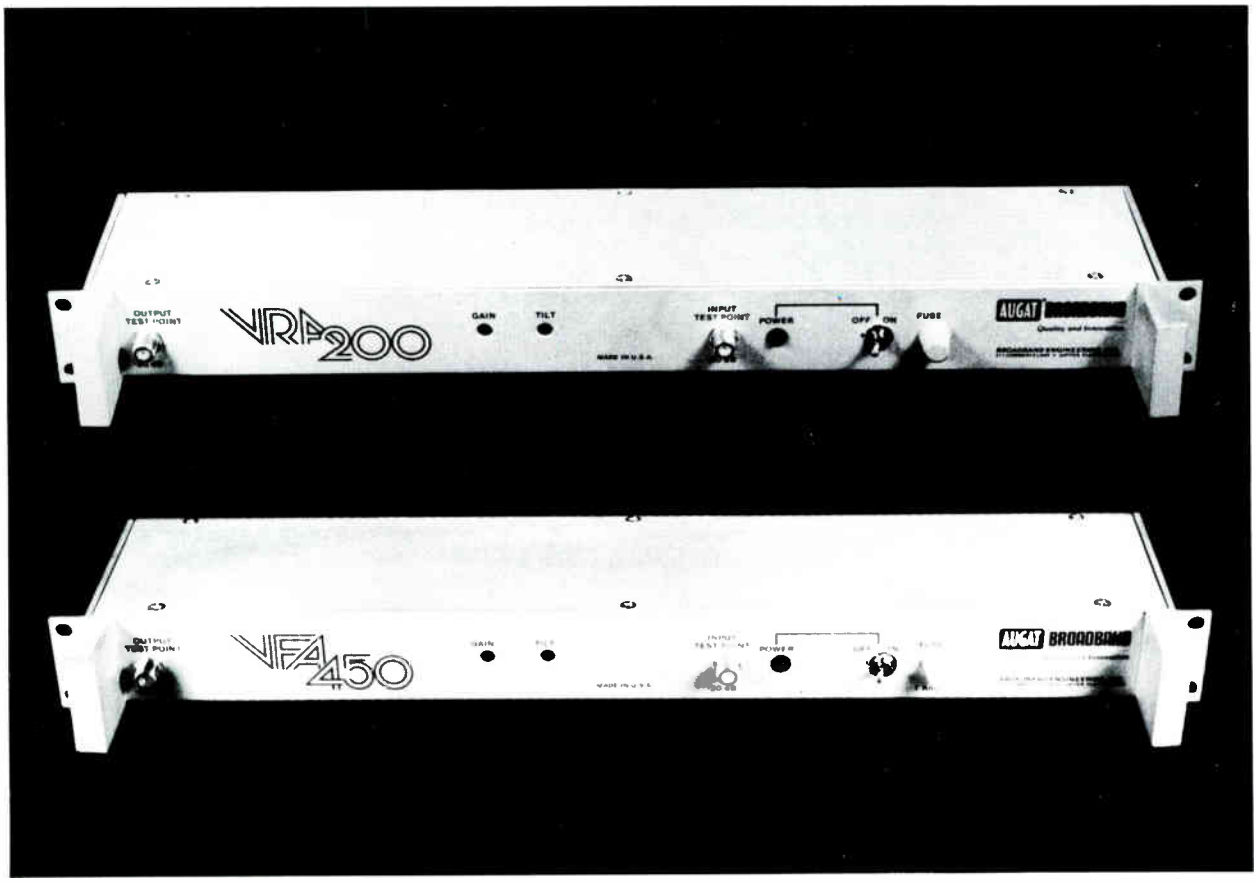
For a complete list of antennas that can be retrofitted call or write:

RAINBOW SATELLITE COMMUNICATIONS

Attn: Brian Wilkes
734 N. 3rd St. • Suite 417
P.O. Box 395 Leesburg, FL 32748
(904) 326-8030

Distributed by
Tele-wire Supply
7 Michael Ave.
E. Farmingdale, NY 11735
800-645-9510

Reader Service Number 57



Broadband's VRA-200 & VFA-450: New Versatility for Your Headend

New VRA-200 and VFA-450 are state-of-the-art, rack-mountable amplifiers designed for a variety of headend applications

Introducing the VRA-200: With 20 to 40 dB of gain in the 5 to 200 MHz range, the VRA-200 amplifies return signals at the headend in two-way cable, SMATV and local area network systems.

The VFA-450: This unit offers 20 to 40 dB of gain in the 5 to 450 MHz range. It provides amplification for the combined headend signals before insertion into the trunk cable.

The Pair: Working together, the VRA-200 and VFA-450 provide two-way amplification of forward and return signals. The forward and return bandwidths depend on the plug-in filter in the VFA-450, Sub-, mid-, and high-split filters are available.

The VFA-450 is also ideal for sweep systems, bench-test situations and field-sweep applications.

Broadband Engineered and Guaranteed: The VRA-200 and VFA-450 are quality engineered and equipped with push-pull hybrid circuitry for maximum output with minimum distortion. Tough and dependable, they deliver state-of-the-art performance and flexibility.

Call Toll-Free 800-327-6690: For additional information on specifications or pricing, call us toll-free at 800-327-6690, or write Broadband Engineering, P.O. Box 1247, Jupiter, Florida 33468.

Other Features:

- Plug-in pads & equalizers.
- Variable gain & slope controls.
- -20 dB test points at input & output.
- Response equalization for flatness control.
- 120 VAC or DC power. DC may be connected permanently as standby power.
- Three levels of surge protection.
- Return Loss:
  VRA-200: 18 dB typical
  (16 dB worst case)
  VFA-450: 18 dB minimum
- -12 dB directional coupler for inserting sweep or other signals at output. (VFA-450 only)

AUGAT® BROADBAND
Quality and Innovation

Reader Service Number 22

See us at the NCTA Booth #351, Section K

Apple bytes test costs

SARASOTA, Fla.—Operators now can benefit from a computerized proof-of-performance testing service that takes 36 hours to accomplish and costs $1,000 for most systems.

Key to Superior Electronics' service is a BASIC language program that runs on an Apple III computer. According to Ron Shadduck, FCC project director for the company, this program can read and evaluate all the measurements that must be taken annually to show compliance with FCC standards.

Three vans are equipped with Apple III computers, the company's frequency counters and signal level meters.

Once the van arrives at the system, the engineer turns on the computer, loads in the software program and a menu is displayed. If, for instance, the menu instructs the engineer to take a hum measurement the engineer simply screws one of the system's taps into the signal level meter.

At this point, the computer talks back and forth to the signal level meter, and takes the hum measurement.

"The engineer never really sees the actual measurements until he calls up the screen to edit the information," Shadduck adds.

Shadduck claims proof-of-performance tests can be finished within 36 hours for 12-channel systems serving 2,000 to 3,000 subscribers. For larger systems, testing takes longer.

The service costs $1,000 for the first 12 channels and an extra $25 for every additional channel. Systems with AML and microwave hub links pay an extra $800 for the first 12 channels.

For places where power outlets are not accessible, the engineer can perform the tests by activating back-up batteries that supply energy for 12 to 14 hours.

Shadduck also says the engineers are qualified to do proof-of-performance testing in case, for some reason, the computer goes down.

Since June 1983, Superior Electronics has administered approximately 150 proof-of-performance tests in systems located from Ft. Lauderdale, Fla., to Montana. The company also will be testing a system in California soon.

Shadduck says the primary advantage the service offers is that "we are able to give the operator the report before we leave the system." This allows the operator to review the test results with the engineer.

Superior Electronics testing van houses the Apple III computer—the heart of the company's computerized proof-of-performance testing service

It also reduces the possibility of human error.

"We've had a little bit of a problem with information loss," however, Shadduck concedes. "Three to four percent of the time we've had to repeat a test," he says, "but not the complete proof-of-performance."

Shadduck adds that "as far as I know, we're the only ones using the computer to do proof-of-performance testing."

The company currently is manufacturing a van that will be able to do sweeping as well as proof-of-performance testing. A Hewlett-Packard spectrum analyzer will be added to the already-standard equipment.

The company also is developing a PASCAL version of the program that will work with an Apple II, because "there are a lot of Apple IIs in cable systems," Shadduck says.

—*Constance Warren*

PC powered bulletin board

GROVE HILL, Ala.—What do you do when the mechanical slide switcher you're using to display community information on your cable system keeps breaking down?

Go buy a sophisticated character generator?

Not necessarily.

Alan Kilgore, president of Grove Hill Telecable Inc., came up with his own solution.

The solution was a cassette-driven, community bulletin board software program that functions much like a character generator.

The program, which is written in Basic, can be loaded into either a Commodore VIC 20 or Commodore 64 personal computer. Once loaded into the computer, the program interfaces with the cable system's modulator and can be combined with an FM receiver to deliver a video and audio signal to the subscriber's home.

Since the VIC 20 has a 3½K RAM memory capacity, community information usually is stored in cartridges that include internal back-up battery components. These cartridges can handle 8, 16 or 24 pages of information. Each page consists of 18 lines with 22 characters per line.

Community information can be entered onto the cartridges through the computer's keyboard. This information can either be displayed immediately or stored in the cartridge for future use.

Bulletin board information can be transmitted through the cable system by inserting the cartridges into the computer and pressing two buttons. Kilgore's software program tells the computer how long to display each line of information stored in the cartridge, depending on the amount of characters per line and the user's specifications. Lines are displayed from 7.5 to 30 seconds.

According to Kilgore, the "computer prints out one character at a time, but at a rate that looks like one line." Once a full page has been printed, the program calls up the next page entered in the cartridge.

In most cases, the first two pages of the bulletin board contain system and channel line-up information.

Another feature of the software package is that pages stored in the

Alan Kilgore, president of Grove Hill Telecable Inc., found a low-cost solution to character generators

cartridge can be disabled. Kilgore says "this information is retained and can be enabled at will."

One use of this application is for advertising. An operator, for instance, can store a number of ads in the cartridge and "enable" one for display.

In addition to alphanumerics, the hardware/software package offers some graphics capabilities, but Kilgore says "graphics aren't used a whole lot." The package with the VIC 20 comes with eight colors, while the one with the Commodore 64 makes 16 colors available.

Presently, users wishing to change community event data must "kill the whole page and replace it with another page," Kilgore explains.

Another version of the program, which will allow the user to modify only the piece of information that needs to be changed, is in the works, Kilgore says.

Kilgore also is developing a machine language version of the program that will include an automatic centering function. The program will be stored in a ROM cartridge and will be available with the Commodore 64 first and then with the VIC 20. Kilgore claims that with the machine language version, operators won't have to worry about maintaining batteries to secure the program in case the system goes down.

Other applications Kilgore is developing for the program include an interface with a weather instrument, which will enable the operator to display weather information along with the bulletin board; and an accessory connection that will allow operators to insert the bulletin board automatically into satellite-delivered cable programming services with ad insertion.

Kilgore expects to complete all of these projects, including the machine language software program, in a year.

The basic community bulletin program he's offering now can be ordered in a variety of configurations. The software itself costs $99. The software, with the Commodore VIC 20 and cartridge with two-to three-hour battery back-up is priced at less than $400. The complete package with the Commodore 64 instead of the VIC 20 costs approximately $550. The package with the VIC 20 and an 18-hour battery back-up for the entire system also sells for $550.

Kilgore presently is using the software program in two of his own systems and has sold it to systems in Mount Vernon, Ala.; Citronelle, Ala.; and Grand Bay, Ala.

—*Constance Warren*

Lap-size micros speed orders

FREMONT, Calif.—CATV Services took its new, computerized ordering system on line May 15. The Viacom Cablevision system in Dublin, Calif., placed the first order, using a Tandy TRS-100 "lap-size" microcomputer.

Using the TRS-100 and software that CATV Services has developed, customers can access the company's mainframe computer.

"In the future, we plan to modify the software so that any microcomputer can be used," said Richard Richmond, president of the company.

Some customers will receive their machines free from CATV Services, while others will be charged a fee on a sliding scale—depending on the volume of purchases made.

Customers also may buy their own machines. "We'll issue user identification numbers and passwords to all bonafide operators who buy their own equipment," Richmond says.

Each user pays for his own telecommunication charges, although Richmond says the company might evaluate this at a later date.

Chambers Cable Com Inc. is the next system scheduled for hook up.

Richmond says operators have been very receptive to the idea.

Anixter will show its computerized materials management system at NCTA

Materials management system shown

SKOKIE, Ill.—Computers, not cable, may be the biggest crowd drawer of this month's NCTA convention in Las Vegas. Or so hopes Anixter Communications.

The company will be displaying its proprietary on-line materials management system in its booth, number 620-I, at the show. The system is part of Anixter's Materials Management program introduced in 1983.

The demonstration will feature a computer terminal linked to the Anixter on-line, real time Business Information System. Observers will learn how the system can be used to computerize inventories, manage warehousing and distribution, computerize inventories for multiple locations and access Anixter's inventory.

According to company sources, the program benefits the operator by improving inventory control, providing product movement and computerized usage reports.

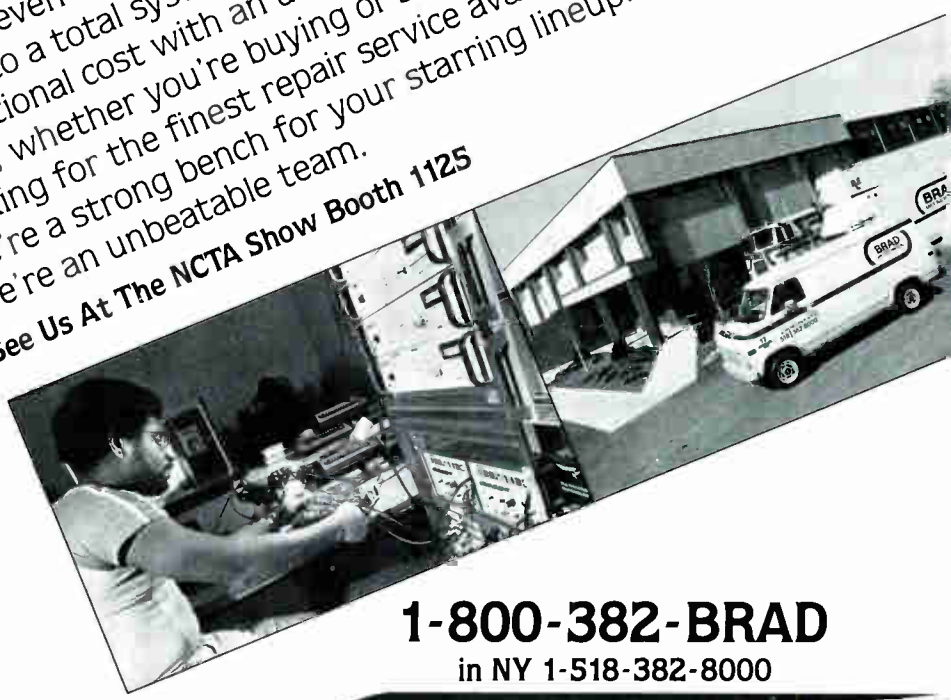
ADD A STRONG BENCH to your starring line-up

As a cable operator, you offer a strong line-up of viewing alternatives to your subscribers. But, when there's trouble with converters or descramblers, what you really need is a strong bench.

You'll find it at Brad Cable. We have over 200,000 reconditioned converters in all major brands and models. There are tens of thousands of factory-fresh spare parts for fast turnaround. And over 150 skilled technicians for quality repairs, even on the tightest schedule. From a single unit repair to a total system contract, we do it all — at an exceptional cost with an unsurpassed warranty.

So, whether you're buying or selling converters, or looking for the finest repair service available, call us first. We're a strong bench for your starring lineup. Together, we're an unbeatable team.

See Us At The NCTA Show Booth 1125



1-800-382-BRAD
in NY 1-518-382-8000

BRAD
CABLE ELECTRONICS INC.

THE CONVERTER MARKETPLACE™

9325 Bay Plaza Blvd.
Suite 209
Tampa, Florida 33619
(813) 623-1721

Corporate Headquarters
1023 State Street
Schenectady, New York 12301
Reader Service Number 45

4630 Pacific Hwy. East
Suite B-7
Fife, Washington 98424
(206) 922-9011

From beads to bits

The history of computing machines

The microprocessor revolution has burst upon us very swiftly—so swiftly that Alvin Toffler's best-selling book *Future Shock* makes no mention of it.

The omission wasn't intentional. The microprocessor, or computer-on-a-chip, simply didn't exist when he wrote the book.

So in a sense, the history of computing is a very short story, dating from the construction of ENIAC, the first multipurpose electronic calculator, in 1946 at the University of Pennsylvania.

But in a larger sense, the history of computing machines dates back thousands of years.

About 2,500 years ago, the Chinese discovered that they could speed up their calculations by stringing beads on wires. The abacus is a simple example of a digital computer, and the word "calculate" is derived from the pebbles, or calculi, which were strung on the wires of the abacus.

In 1617, John Napier invented Napier's rods—the predecessor of the modern slide rule. Napier also invented logarithms.

In 1622, William Oughtred, an English mathematician, invented an analog device that allowed rapid calculations using logarithms. His ideas also helped pave the way for the slide rule—the first analog computer.

In 1642, 19-year-old French philosopher Blaise Pascal, the son of a tax collector, invented an adding machine that mechanically added or subtracted numbers by the turning of wheels. The computer language Pascal is named after him.

A half-century later, the German mathematician Gottfried Wilhelm von Liebnitz added multiplication and division functions to Pascal's earlier machine. This was the forerunner of the pocket calculator.

In the late 1700s, a French weaving magnate named Joseph Jacquard used punched cards to control his looms. Jacquard's loom revolutionized the weaving industry—by 1812 there were 11,000 of his machines operating in France.

The idea of encoding instructions on punched cards was revived in 1890 by an engineer named Herman Hollerith, who persuaded the U.S. Census Bureau to store its data on cards. A New York firm later acquired Hollerith's small firm—and became IBM.

But the honor of having constructed the first real computer goes to Englishman Charles Babbage. In 1823 he made a two-ton machine that calculated mathematical tables to six decimal places. Unfortunately, the Difference Engine didn't work very well. Its rods and gears jammed constantly.

Unwilling to give up, Babbage continued his work, and in 1833, assured his place in history by conceiving a calculator with all the essential elements of a modern computer.

But Babbage never lived to see his Analytical Engine built. He worked on the machine for 40 years, and his work was continued by Lord Byron's daughter, Augusta Ada Byron Lovelace. Although the Countess never succeeded in building the machine either, her name lives on. The computer language ADA was named for her.

In 1850, another step toward the microprocessor was taken when George Boole devised Boolean algebra, which incorporated logic in algebraic form. Modern-day programmers working in BASIC will remember Boole each time they construct an IF-THEN statement.

In the 1930s a German engineer named Konrad Zuse built a simple computer. In 1939, George Stibitz, an engineer at Bell Labs, built a similar machine. That same year, John Atanasoff and Clifford Berry at Iowa State College also designed an electronic, digital computing machine.

At about the same time, a group of Harvard University scientists developed the Mark I, a computer operated by mechanical switches. It was 51 feet long, eight feet high, and contained over 500 miles of wire and 3,000 relay switches.

The first serious use of computers came during the Second World War, when a group of British scientists led by Alan Turing built Colossus 1. The machine helped the Allies break the German military codes.

In 1946, the first multipurpose computer was built at the University of Pennsylvania. The Electronic Numerical Integrator and Computer, or ENIAC, used vacuum tubes rather than mechanical switches. It had to be rewired by hand, just like an old telephone switchboard, before different operations could be performed.

Computer pioneer John von Neumann came up with the suggestion that the machine's operating instructions, or program, be coded in the same format as the data to be manipulated. Since that time, all computers have been known as von Neumann machines.

The first computer to embody the von Neumann method was Speery-Rand's Universal Automatic Computer, or UNIVAC. It was the first computer ever designed for commercial use, and was delivered to the U.S. Bureau of the Census in June 1951.

These early machines were bulky, slow and hard to maintain. ENIAC, for example, blew one of its tubes about every seven-and-a-half minutes.

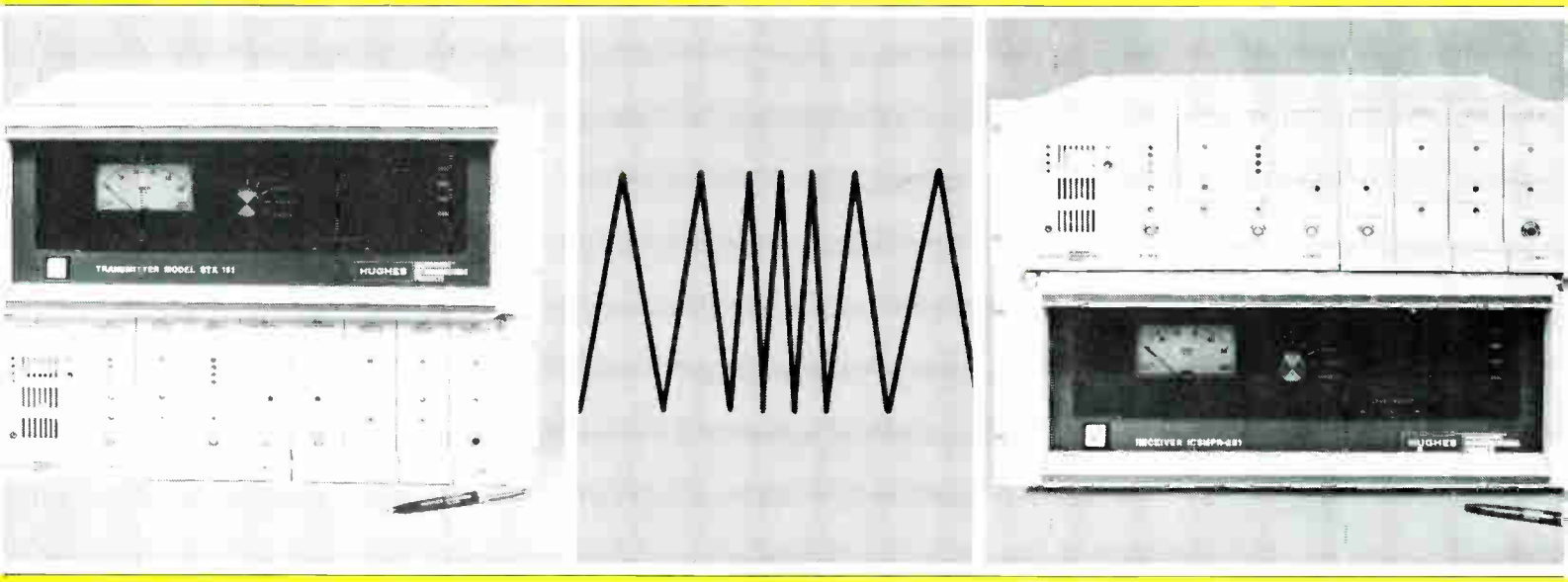
But in 1947, three scientists at Bell Labs ended that problem forever when they developed the solid state transistor. In 1970, semiconductor transistors began replacing the older, bipolar transistors, and the miniaturization race was on.

With the advent of large scale integration, hundreds of transistors were packed onto a single chip of silicon.

Finally, in 1971, a young engineer fresh out of Stanford University gave the computer industry a quantum leap in technology. Ted Hoff of Intel put the entire central processing unit of a computer on a single silicon chip. The microcomputer industry as well as "smart" devices of all types are the result.

—Gary Kim

Our new FM microwave systems give you cable compatibility and solid-state power



Hughes FM Microwave Systems

Now you can enjoy the greater range and flexibility of FM along with traditional Hughes AML system quality and dependability. Hughes **FM** Microwave systems' inherent broadband and transparent characteristics make them ideal for networking, interties, regional advertising, educational and TVRO to head-end applications. Hughes designed and manufactured GaAs FET amplifiers give you solid state power options from ½ watt to 2 watts. Or you can choose our new optional klystron with a design life in excess of **ten years** and 10 watts of output. These FM Microwave Radios are currently available from 10.5 GHz to 13.2 GHz.

For more information write or call **Hughes Microwave Communications Products**, P.O. Box 2999. Torrance, CA 90509. (213) 517-6233.

AML — ANY MODULATION LINK

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY

Five generations of computers

In February 1946, scientists at the Moore School of Engineering in Pennsylvania built the world's first electronic computer, ushering in the computer age. This first-generation computer was called ENIAC, for Electronic Numerical Integrator and Computer, and was a thirty-ton machine taking up a whole room.

ENIAC ran on some 19,000 vacuum tubes—very much like the tubes then found in televisions and radios. Like later machines based on vacuum tube technology, ENIAC was bulky, slow and hard to maintain.

By the early 1950s, IBM had begun selling its first small business machines, but it was still assumed that computers would never play a meaningful role in the lives of ordinary people.

Bell Telephone Laboratories changed those assumptions when it invented the transistor. A transistor is a small, solid-state device made of silicon or germanium which can amplify or switch an electronic signal. The transistor has numerous advantages compared to a tube: it uses less energy, takes up much less space, requires no "warming up" period, is faster, and more reliable.

Consequently, the second generation of computers developed in the 1960s, were transistor-based. They were faster, smaller, less expensive, and had larger memories than first-generation machines. Instead of being simple "number crunchers" like ENIAC, these second-generation machines became information-handlers, providing huge and even-cheaper storage for facts and data.

The third-generation of computers owes its existence to M.E. Hoff Jr., a research associate fresh out of Stanford, who found himself in charge of an Intel Corp. project designing calculator chips for a Japanese company. Making a bold technological leap, Hoff condensed an eleven-chip logic circuit to a three-chip configuration.

He put the computer's central processing unit, which coordinates and controls all the other circuits, on a single chip. This integrated circuit was introduced commercially in 1971, and became known as a microprocessor. Hoff's integrated circuit, a sixth of an inch long and an eighth of an inch wide, had all the power of the room-sized ENIAC, and is responsible for the explosion in home and small business computers we have today.

Hoff's circuit was followed in succession by increasingly complex chips: the small-scale integrated circuit (SSI), containing one to ten transistors per chip; the medium-scale integrated circuit of ten to 500 transistors (MSI); and the large-scale integrated circuit of of 100 to 20,000 transistors (LSI).

The existence of a fourth-generation computer has not yet been proclaimed, but some day we may refer to a computer using very-large-scale integrated circuits of 10,000 to 100,000 transistors (VLSI) as a fourth-generation machine.

In the meantime, worldwide attention is being focused on the development of a fifth-generation computer, distinguished less by miniaturization than by new capabilities. Fifth-generation computers will not only be faster than the fourth-generation, but will simulate human intelligence, see and hear.

Imbued with artificial intelligence, or "AI," such machines will make logical inferences from collections of facts. They will translate foreign languages, learn from their own experiences and interpret graphic and photographic input as well as words.

—Gary Kim

Comband™ Update #3: Field Test In Hattiesburg, Mississippi.

Before our premiere in Hattiesburg, catch our preview in Vegas.

The Test.

Our show at NCTA in Las Vegas promises to be one of the best.

But the real blockbuster will be opening in Hattiesburg, Mississippi. Until now, the fully addressable Comband™ system has been tested in the lab. Now, we're taking it on the road.

In July we're putting Comband on-line at General Electric's Hattiesburg system. Not only is this big step right on schedule, but we fully expect to expand testing to other cable systems during the first quarter of 1985.

Stop by our booth in Las Vegas for a full demonstration of the Comband system that adds channels not cable. We'll even give you an on-the-spot computer analysis of how the Comband system can save money in your own upgrade plans.

The Contest.

We'll have 8 TV sets in our booth. On one or more of the sets a Comband processed signal will be displayed. The others will display standard, off-air NTSC signals.

All you'll have to do is pick the Comband picture(s). If you guess correctly, your name will be included in the drawing for a free 25" console color television. There will be a TV given away every day of the show.

So stop by Booth 537 in Las Vegas. Get the big picture of our Hattiesburg field test and judge Comband's picture quality for yourself.

Ask for more information, by writing to Ron Polomsky, General Electric Company, Video & Audio Business Operations, Mail Drop #17, Portsmouth, VA 23705 or you can call (804) 483-5064.

GENERAL ELECTRIC

Reader Service Number 26

FEATURE

Bullish on videotex

Financial analysts at Donaldson, Lufkin & Jenrette still are bullish on videotex. Despite the slow consumer acceptance of in-home services to date, both C. Patrick O'Donnell Jr. and Susan Skinner expect that videotex will be a big business someday.

Transactional services could well be the locomotive that pulls the industry, Skinner said at Videotex '84, the field's annual trade show. "Videotex is only a part of the evolution of the financial payment mechanism," she said.

Driven by costs, market share and revenue considerations, banks and retailers are looking for ways to replace paper-based, labor-intensive work with automated teller machines and point-of-sale devices.

Skinner emphasized that all the changes so far have been forced by business interests, not consumers. Furthermore, she argued that videotex is extremely cost effective.

"About $300 million has been spent so far to develop the technology, but the operating costs of banks were $61 billion in 1982. Electronic data processing accounted for $6-7 billion, while software added another $2 billion in costs," she said.

Although the best opportunities in the field will be found in new equipment sales, the entire field is attractive, Skinner said. "Of the $345 billion in financial transactions that took place in 1982, a mere two percent were handled electronically. By 1990, the volume will be $395 billion, and the electronic portion will amount to nine percent," she said.

If so, the market for electronic transactions would grow from $3 to $20 billion.

Focusing on text and messaging applications, O'Donnell said the financial community has been a bit confused about where the major players will shake out. But IBM's recent entry into the market has bolstered the industry's credibility, he said.

Which isn't to say he doesn't have questions. For one thing, the eventual positions taken by the telcos, computer firms and media conglomerates will be important.

It also isn't clear how much competition the players will face. "Generally, the companies in videotex have worked in franchise-type situations with high barriers to entry," he said.

Both the Wall Street Journal and newspaper companies in general are culturally attuned to oligopolistic situations, he argued. "They aren't used to competition, but IBM is."

The investment community also is looking at the impact of videotex on newspaper classified ad margins. "It's a very short step from electronic directories and messaging services to electronic classified ads, and this could severely affect many newspapers," he said.

Still, O'Donnell ventured the opinion that "newspaper managers who are sharp will retain their information franchises, which are normally held on a local level."

—Gary Kim

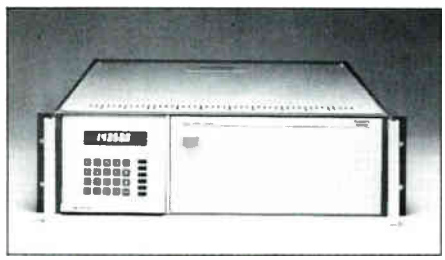
SPECIAL PRODUCT SECTION

Headend

CableBus enhances Micro-2

CableBus Systems Corp. has developed additional configuration features to its MICRO-2 automatic alarm controller for cable-based residential and commercial security. The enhancements to the MICRO-2, an alarm-polling and display device that monitors customers via cable plant, include plug-in circuit cards, which increase subscriber accounts, and a demographics custom software package for use in displaying any alarm message along with customer demographics and pending alarm information. The plug-in circuit cards increase the MICRO-2 polling and monitoring capacity in increments of 2,000 at a time, to a total of 5,000 subscribers. The demographics software package is operated on a modified IBM PC color computer and can plug into the system's RS 232 port. The software package also permits rapid alarm handling, alarm processing and dispatching.

For more information, contact CableBus Systems Corp., 7869 SW Nimbus Ave., Beaverton, Ore. 97005, (503) 643-3329.



Scientific-Atlanta 7555 video exciter

S-A expands product line-up

Scientific-Atlanta has introduced two products: a 7622 RF matrix for increasing the flexibility of a multi-antenna, multireceiver satellite earth station; and a Ku-band video exciter. The 7622 RX matrix replaces the power dividers and coaxial relays to connect as many as four receivers to two dual polarization antennas. The 7555 video exciter contains a microprocessor controlled Ku-band upconverter that is synthesized in 500 kHz steps from 14-14.5 GHz. The exciter complies with RS-250B and NTC-7 video specifications, utilizes sync tip referenced modulation to enhance system performance and features synthesized audio subcarrier modulators for greater flexibility.

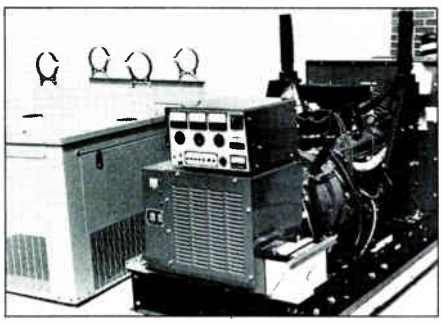
For more information, contact Scientific-Atlanta, One Technology Parkway, P.O. Box 105600, Atlanta, Ga. 30348, (404) 441-4000.

Audio amplifier system

A system that contains six separate broadcast quality transformerless audio amplifiers has been introduced by Channelmatic Inc. Each amplifier accepts a balanced or unbalanced high

impedance input and provides an adjustable level 600 ohm balanced (or 150 ohm balanced) broadcast standard output. The system, called the UAA-6A, has a frequency response of 20 Hz to 20 kHz ± .1 dBm and a THD of less than .05 percent at +24 dBm output. It costs $750.

For more information, contact Channelmatic Inc., 821 Tavern Rd., Alpine, Calif. 92001, (619) 445-2691.



Western Engine Co. standby power

Standby power supplies

Diesel-or natural gas-fueled generating systems for standby power applications in the telecommunications and cable industries are available from Western Engine Co.'s Power Systems Division. The Generac standby power systems are rated at 10 kW, 15 kW, 20 kW and 30 kW. All systems are based on an integrated solid-state control design. Transfer equipment is developed specifically for each system. The engine and alternator, and alternator and controls, are power-matched.

For more information, contact Western Engine Co., 500 South Lombard Rd., Addison, Ill. 60101, (414) 634-2351.

RF Systems' FAM-300

New audio/video modulator released

A frequency agile audio/video TV modulator, which can be tuned in the field to any channel within 54-300 MHz, has been released by the RF Systems Division of General Instrument. Called the FAM-300, this unit features 60 dBmV output, separate video and audio IF loop-through; a SAW filter; audio deviation, video depth and output carrier level control front panels; and LED bar graphs for video deviation and depth.

For more information, contact RF Systems Division, General Instrument Corp., 4229 South Fremont Ave., Tucson, Ariz. 85714, (602) 294-1600.

Modulator for CATV, SMATV use

A modulator for CATV, SMATV and MATV applications has been introduced by International Satellite Supply. This modulator, the GL 2500, consists of a SAW filter; a crystal controlled frequency source; IF loop throughs for audio, video and scrambling or processing; overload indicators for audio and video levels; and an adjustable control unit for audio video levels.

For more information, contact International Satellite Supply, 2225 Sharon Rd., Menlo Park, Calif. 94025, (415) 854-8987.

Ku-band upconverter system introduced

A Ku-band upconverter system that provides frequency agile signal conversion from 70 MHz to Ku-band frequencies has been unveiled by Harris Corp. The model 8220 upconverter converts a 70 MHz signal to 1080 MHz. The unit's frequency agile synthesizer controls the selection of one out of 99 preassigned channels in the Ku-band transmit frequency range. The model 8221 completes the up-conversion process by converting this L-band signal to the Ku-band channel indicated by the synthesizer. An interface to an optional external network processor is available for remote channel tuning.

For more information, contact Harris Corp., Satellite Communications Division, P.O. Box 1700, Melbourne, Fla. 32901, (305) 724-3174.

Winegard LNA has 53 dB gain

A 100 degree LNA with a gain of 53 dB minimum at 20°C has been unveiled by Winegard Co. At the same temperature, noise figure is 1.3 dB maximum. The unit's circuitry is protected against reverse polarity voltage, surge voltage and lightning. Each LNA is enclosed in a one-piece cast aluminum weatherproof housing.

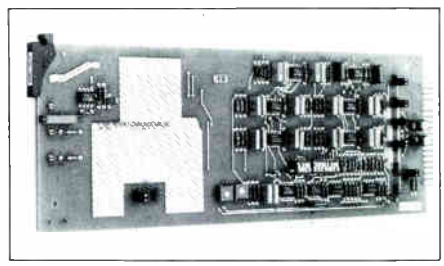
For more information, contact Winegard Co., 3000 Kirkwood, Burlington, Iowa 52601, (301) 753-0121.

'Design line' enclosures

A series of heavy-duty electronic rack enclosures that protect electronic and electrical controls, instruments and components from dust, water, oil and other contaminants are available from Hoffman Engineering Co. These "Design Line" enclosures come in five sizes (although all are 72 and 1/16 inches high). They are made of 12-gauge steel with continuously welded seams. Standard finish is textured beige polyester power coating over phosphatized surfaces. Front and rear doors are sealed with oil resistant gaskets and equpped with keyed latching mechanisms and removable print pockets.

Hoffman electronic rack enclosure

For more information, contact Hoffman Engineering Co., 714 Tyler St., Anoka, Minn. 55303, (612) 421-2240.



Wegener 1693 stereo synthesizer

Wegener stereo synthesizer debuts

A stereo synthesizer that converts balanced or unbalanced monaural audio signals into synthesized stereo audio output is available from Wegener Communications. This synthesizer, the 1693, can interface with the company's 1691 FM stereo modulator and 1600 mainframe. Distortion is less than 0.3 percent and audio frequency response is within the 30 Hz-20 kHz range. Audio input sources include satellite receiver demodulated audio, the Wegener 1630 subcarrier demodulator output audio and local origination programming. Other features include field programmable stereo depth and audio filter shaping.

For more information, contact

HOW TO TAKE THE RECALL OUT OF THE INSTALL

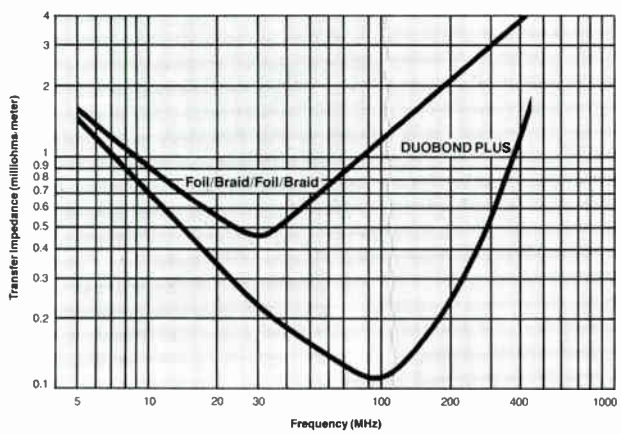
Belden's drop cable with DUOBOND PLUS™ shield helps you prevent costly call-backs. It's also the most shield-effective drop cable in the CATV industry.

Easier termination for maximum shielding integrity.

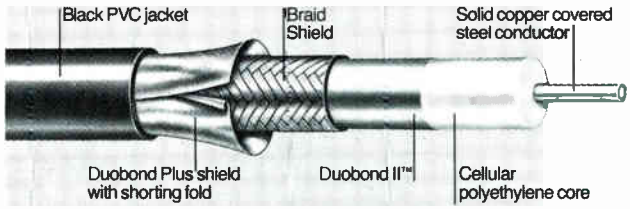
The DUOBOND PLUS shield features a foil/braid/foil construction with a shorting fold in the outermost foil which provides superior shielding effectiveness to typical 4-layer shield constructions. The transfer impedance graph demonstrates this effectiveness.

The added benefit is easier termination. This means less chance for error, resulting in greater shielding integrity and reliability. It also means fewer call-backs, lower operating expenses and more satisfied subscribers.

Cables with the DUOBOND PLUS shield require only half the steps for termination than 4-shield cables. Because it's less bulky, more flexible and its outer foil is bonded to the jacket, stripping and connectorizing are much simpler tasks. You can minimize your connector inventory to one size connector and one crimp tool.



Belden's unique shield protection.



The inner foil of the DUOBOND PLUS shield is bonded *directly* to the core. Foil pushback and signal leakage problems are eliminated. Protection from shielding degradation is eliminated during installation–where most shielding problems occur.

The unique shorting fold in the outer foil of the DUOBOND PLUS shield provides metal-to-metal contact for improved isolation. Traditional overlapping foils fail to reduce slot radiation as effectively.

Belden's exclusive shorting fold

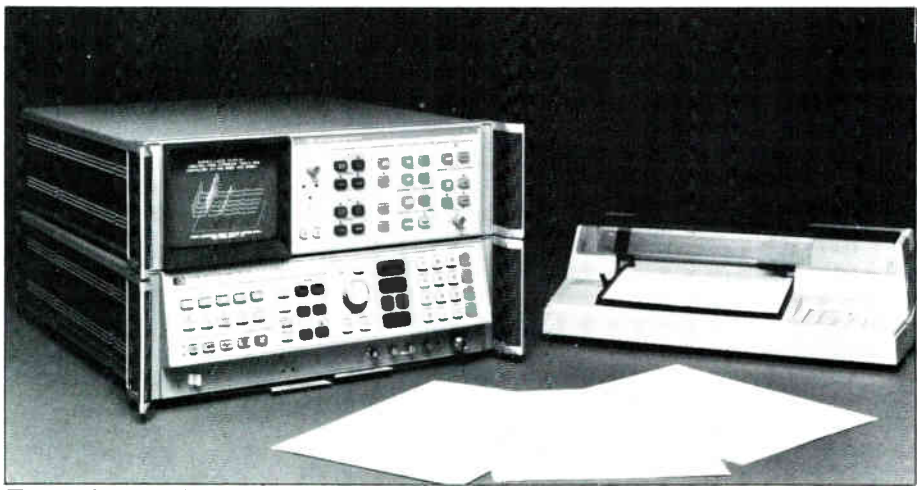
Drop cables with the DUOBOND PLUS shield are available in RG59, RG6 and RG11 constructions—messengered, non-messengered, dual and flooded versions. All cables are 100% sweep tested from 5 to 450 MHz with a minimum return loss of 23db for RG59 and 26db for RG6.

When it comes to shielding effectiveness and ease of termination, there is no equal to Belden in the CATV industry. Take the recall out of your install. Call Belden today for more information and a free CATV catalog. Belden Electronic Wire and Cable, P.O. Box 1980, Richmond, IN 47375. Phone: 317-983-5200.

There is no equal.

Reader Service Number 30

COOPER INDUSTRIES **BELDEN**



The HP 8566B microwave spectrum analyzer

Wegener Communications, (404) 448-7288.

Hewlett-Packard expands product lines

Hewlett-Packard has developed two spectrum analyzers and a waveform recorder/generator.

The spectrum analyzers are the HP 8566B (microwave) and HP 8568B (RF), respectively. Both spectrum analyzers feature signal processing functions that include fast-Fourier transforms and power bandwidth calculation of incoming signals. Trace-processing functions include storing of the minimum value of a trace and finding the standard deviation of trace data.

Other system features include softkey programming, which can be accessed from either the front panel of Hewlett-Packard's HP-IB system; "command flow" functions for automatic testing; 16 kilobytes of RAM; simplified hard copy output; the ability to store and plot more than eight full 1001-point traces or 80 compressed traces, without use of an external computer; and program compatibility with Hewlett-Pakard's B-version analyzers.

The microwave HP 8566B costs $55,000 and the RF HP 8568B, $34,600.

The HP 51282A waveform recorder/generator combines high-speed waveform capture with arbitrary waveform generation. Input waveforms are stored in the unit's digital memory, permitting either entire waveforms or selected portions of the waveform to be generated by the unit's 20 MHz, 10-bit D-to-A converter. This allows the signal to be reproduced as originally captured. Waveforms can be regenerated one at a time or in a "single-shot" mode. Through the addition of a computer, graphics tablet and the appropriate software package, waveforms stored in the HP 5182A can be modified. This enables the user to generate arbitrary waveforms or to capture, modify and replay existing waveforms. HP5182A applications include the design of read-recovery circuits in computer magnetic-storage devices, modems, medical devices and automative-ignition circuits. Other system features include an adjustable 50-ohm output amplifier; 16,385 words of memory, which can be segmented in as many as 32 separate records; front-panel controls that can be remotely programmed and two cursors for measuring waveform time interval and voltages and two additional cursors for selecting a portion of the waveform to be generated. The HP 5182A costs $23,000.

For more information, contact Hewlett-Packard, 3000 Hanover St., Palo Alto, Calif. 94304.

New digital transmission system available

A digital transmission system is being offered by Sansui Electric Co. Ltd. This system, the DC-PCM, successfully combines near-instantaneous companding PCM with differential PCM. This improves the signal-to-quantizing noise ratio in the lower frequency range and leads to higher transmission efficiency. The dynamic range that can be obtained is determined by number of the quantizing bits. Frequency response is flat up to nearly half of the sampling frequency. Both an 8-bit and 10-bit system are available.

For more information, contact Sansui Electronics Corp., 1250 Valley Brook Ave., Lyndhurst, N.J. 07071, (201) 460-9710.

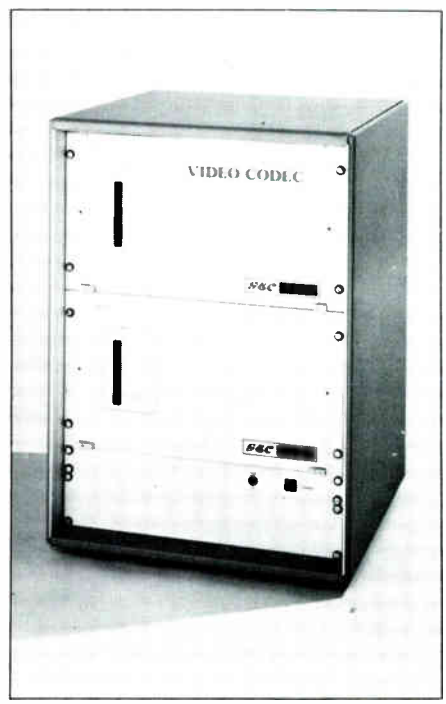
GI debuts three products

The Telecommunications Sales Division of General Instrument Corp. unveiled three products at the Global Teleconferencing Symposium held in Washington, D.C. the second week of April.

A full-motion video CODEC system was exhibited. This unit is capable of transmitting digitized video and audio signals over terrestrial and satellite digital networks. It uses an advanced bandwidth compression technique to provide two-way video and audio teleconferencing. GI claims it is the only unit of its kind able to provide international video conferencing without expensive standards conversion. The CODEC is offered as a 525-line TV system in North America and as a 625-line system in Europe.

In addition to the CODEC, GI introduced the modular "Rollabout" mobile video teleconferencing system at the show. This system can be transported to and from conference rooms, offices or other meeting facilities; is equipped with camera, audio and monitoring equipment and facilities for graphics display; and requires no special training to use or acoustical treatment of rooms.

The GEC-McMichael CODEC was the third product displayed at the GI booth. The system is capable of automatic translation between American and European TV standards, can be used in any application where real time TV transmission is required, and processes video and audio signals at a rate of 2 megabits per second or 1.5 Mbs for either real time moving images or high resolution graphics. Other system features include: full network compatibility over terrestrial and satellite links, color or monochrome operation, full resolution graphics, an encryption option for secure transmissions, and



CODEC system

Six more reasons to call CATEL

Customer service and reliable equipment are Catel trademarks. CATEL has strengthened those trademarks by recently acquiring the RCA Cablevision headend product line of television modulators, demodulators, processors and related accessories.

Now CATEL serves you as a total, full-line, full-service supplier of headend equipment—with production and delivery capabilities for our newly acquired RCA products:

- CTM20 Microcomputer-based Color Television Modulator—first in the industry to offer remote monitoring from a centralized control station.
- CCU20 Central Control Unit for the CTM20.
- CTM11 Color Television Modulators.
- CTD10 Series of solid-state Color Television Demodulators.
- Totally modular HSP1 Heterodyne Signal Processor.
- Headend accessories like the 8-channel Combiner, three-port Diplexer, and Hybrid Broadband Amplifier.

And these products now carry the standard CATEL warranty. For the full story on CATEL headend products and other signal processing equipment and systems, call CATEL collect at (408) 988-7722 or contact your nearest CATEL representative.

CATEL
TELECOMMUNICATIONS
DIVISION OF UNITED SCIENTIFIC CORPORATION

4800 PATRICK HENRY DRIVE
SANTA CLARA, CA 95054
(408) 988-7722 TWX 910-338-2263

Reader Service Number 29

built-in diagnostic aids and auxiliary data ports. Similar to the CODEC, this sysem is offered as either a 525-line unit for use in North America or as a 625-line system for Europe.

For more information, contact General Instrument Corp., 2200 Byberry Rd., Hatboro, Pa. 19040, (215) 674-4800.

Ledex surge suppressor catalog

A surge suppressor catalog from Ledex Inc. contains specifications, rating and descriptions of Lucas Semiconductor's surge suppressors. Surge withstanding capacity, physical dimensions and applications are outlined.

For more information, contact Ledex Inc., 801 Scholz Drive, Vandalia, Ohio 45377, (513) 898-3621.

Surge network available

A surge network that simulates lightening and switching transients in telecommunications equipment has been introduced by KeyTek Instrument Corp. This network, the P21, can be used with the company's 711 series mainframe to produce 10 x 700 and 100 x 700 us voltage impulses to 6 kV, as required by CCITT. The P21 also can produce a higher speed, 0.5 x 700 us, impulse. The desired wave can be selected via a front panel, high voltage switch. CCITT-specified output damping resistance of 0, 2.5 and 25 ohms are incorporated internally and can be selected from the unit's front panel. Complete systems for testing to CCITT Rec. K. 17 are available at $18,000 and up.

For more information, contact KeyTek Instrument Corp., 12 Cambridge St., Burlington, Mass. 01803, (617) 272-5170.

Portable standby power unit

A new portable, plug-in standby power source is being offered by Sola Electric, a unit of General Signal. The unit, which provides off-line battery/inverter backup power during blackouts, is designed for less critical applications where continuous, clean, uninterruptible power is not required. When line voltage drops below a preset level, the SPS switches from line power to battery/inverter power within a half-cycle. When AC voltage returns to within 10 percent of nominal, the unit switches back to line power within 2 to 4 milliseconds. The unit provides clean sine wave output, with voltage regulated to ±3 percent nominal and total harmonic distortion limited to less than 5 percent. It can be plugged into any

KeyTek P21 surge network

standard AC outlet and is available in 400 VA and 800 VA output models.

For more information, contact Sola Electric, 1717 Busse Rd., Elk Grove Village, Ill. 60007, (312) 439-2800.

Standard develops loop-through design

A built-in loop-through design has been developed by Standard Communications. The company claims that this design allows one single Agile 24 master receiver to drive as many as 100 Agile 24 slave receiver units. The Agile 24 master is a 24-channel dual conversion, 4 GHz input receiver that block-downconverts to 760-1260 MHz. The active loop-through design supplies the IF to the Agile 24 slave.

For more information, contact Standard Communications Corp., P.O. Box 92151, Los Angeles, Calif. 90009-2151, (213) 532-5300.

Sola Electric standby power source

Mobile production unit

A 45-foot mobile television production unit has been added to Total Communication Systems Productions' teleproduction package. Called the Video Voyager 2, this unit is equipped with an expandable side that creates 132-square feet of work space in 45-foot mobile television production unit has been added to Total Communicso features compatmentalized heating and air conditioning. Equipment includes the Audiotronics model 750/36 stereo audio console with 24-track recording capability and 20-input line level gain adjustments; six Canon 40:1 lenses; Grass Valley 300-3AN switcher wth E-MEM interface for digital effects and custom-wired for clean-feed; four Ampex VPR-2B 1-inch video tape machines; two Sony BVU-820 3/4-inch video tape machines; six Ikegami HK357AT cameras; three Ikegami HL-79D portable cameras; and the Chyron IV graphics system.

For more information, contact Total Communication Systems, 890 Constitution Blvd., New Kensington, Pa. 15068, (412) 339-7581.

Rhoades TE-500 stereoplexer

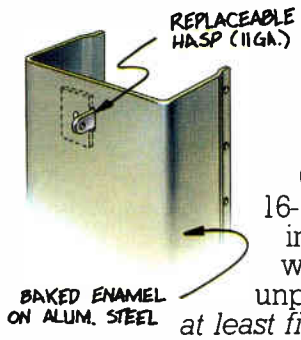
Stereoplexer released

A stereoplexer, called the TE-500, has been released by Rhoades National Corp. This system features easy hookup from the channel 2,3 or 4 RF output of any cable TV converter, matrix circuitry for stereo effect, a left and right output for plugging into any stereo system, and a multiplex output for use with any discrete stereo TV decoder. The TE-500 demodulates the audio on any cable channel to which the converter is tuned. Stereoplex hookups are available for sale or rental.

For more information, contact

We put the cable industry on its own pedestal

While others were adapting telephone pedestals for cable television applications, CWY was designing pedestals exclusively for the cable industry...a complete line of pedestals built to *your* specifications ...not someone else's.



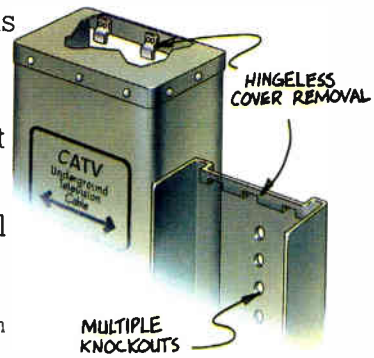
For example, CWY pedestals feature 16- and 18-gauge T2 aluminized steel construction, which tests show outlasts unpainted galvanized steel *at least five-to-one*. Plus, the rectangular design assures ease of installation and maximum use of interior space.

CWY pedestals are easier to service, too; the positive, secure, hingeless cover removal system allows the front cover and top to lift off as one unit, giving you full exposure of the pedestal interior.

And while other manufacturers bend out a piece of steel and call it a hasp, CWY pedestals feature tough, 11-gauge plated steel hasps that are rugged and fully replaceable.

Multiple knockouts for ease and flexibility in equipment mounting...interior lid guides for extra security...an innovative stake lock that keeps the pedestal right where you planted it...and a whole lot more. All at prices you'll find *very* competitive.

So why buy pedestals made for someone else? CWY designed them just for you. For more information about CWY's complete line of pedestals and other cable TV solutions, call or write today.



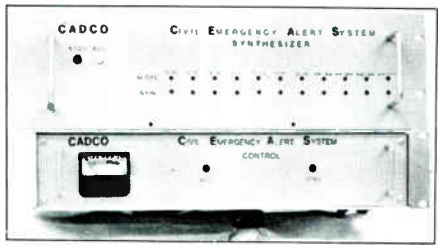
Standard sizes: 4"x5", 5"x8", 7"x7", 6"x9", 10"x14". Call with specifications for custom sizes.

Not just supplies. Solutions.

CWY electronics

P.O. Box 4519—Lafayette, IN 47903—Call Toll Free: 1-800-428-7596—Indiana: 1-800-382-7526

Reader Service Number 30



Cadco emergency alert system

Rhoades National Corp., P.O. Box 1316, Columbia, Tenn. 38402, (800) 251-8608.

Cadco updates alert system

Cadco has updated its civil emergency alert system IV to include the following features: 63 channel capacity and remote radio access. The system, named the CEAS IV, can be activated by either touch tone telephone or a leased telephone line. It can operate with existing headend equipment. Its trunk switching capability allows it to be located externally from headend sites.

For more information, contact Cadco Inc., 2706 National Circle, Garland, Texas 75041, (214) 271-3651.

Earth stations

Rainbow multifeed

A multifeed manufactured by Rainbow Satellite Communications has been installed in a 10-meter Scientific-Atlanta dish in Ponce, Puerto Rico for Teleponce Cable Systems. Existing F-3 signal strength was measured prior to installation and was checked after the installation was completed. No signal strength loss was reported.

For more information, contact Rainbow Satellite Communications, 734 North 3rd St., Suite 417, P.O. Box 395, Leesburg, Fla. 32748, (904) 326-8030.

Avantek receiver

Avantek Inc. has introduced the AR2000 Simulchannel satellite earth station video receiving system and an AIC-2000 interference canceller for use with the AR1000 and AR2000 Simulchannel 3.7-4.2 GHz earth station receivers.

Company officials claim that the AR2000 video receiving system is designed for studio quality reception of primary and standby channels of satellite relayed programming. The rack mounted system features triple redundancy to assure uninterrupted operation in case of failure of the horizontal or vertical LNC in the primary antenna installation; or of video signal loss from the primary antenna, receivers or from the primary satellite program channel.

Each digitally-tuned IF receiver module incorporates downconversion to a 300 MHz second IF, IF filtering, IF gain control with automatic gain control, baseband demodulation, dual audio subcarrier demodulators and audio and video signal processing.

The Avantek AIC-2000 interference canceller plugs into the mainframe of the AR1000 and AR2000 receivers. It suppresses one or two RF interfering signals by a minimum of 20 dB, resulting in no distortion to the desired carrier even with interference signal rations of 1:1. Once installed, suppression is automatic. Two separate interfering signals can by simultaneously cancelled by aiming two separate antennas at each source of interference.

For more information, contact Avantek Inc., 3175 Bowers Ave., Santa Clara, Calif. 95051, (408) 727-0700.

Ku-band TWT amplifier

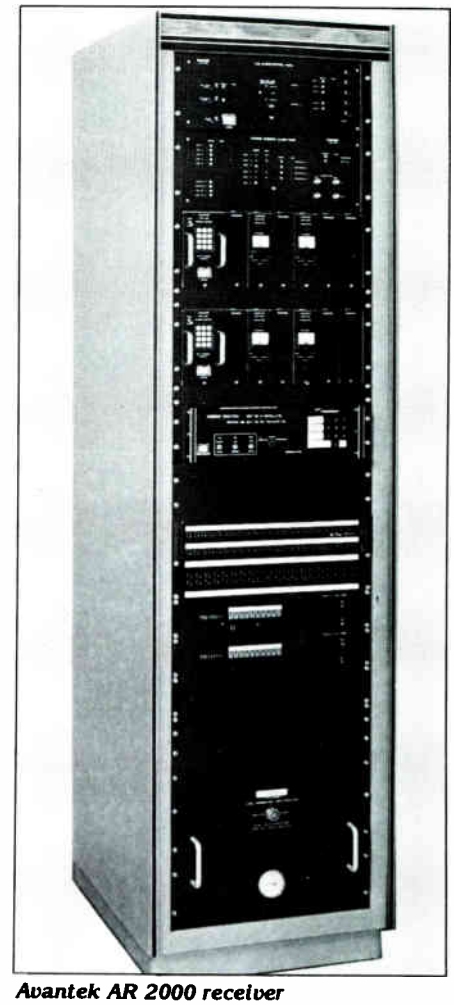
A high-power Ku-band TWT amplifier is now available from MCL Inc. The unit meets varying on-site/on-air demands for signal quality, efficiency and reliability. It also can withstand a variety of weather conditions and is computer compatible. No special tools or equipment is needed to install the amplifier. Installation assistance is available from MCL.

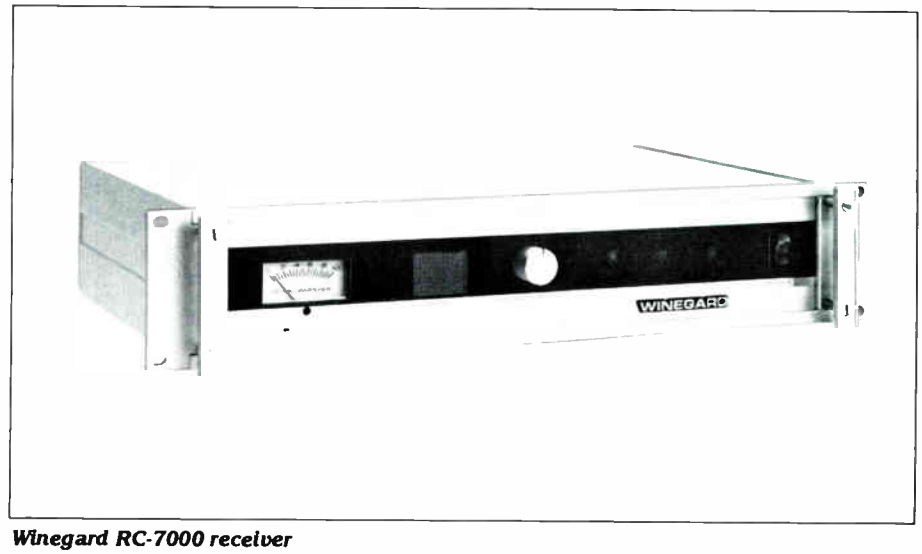
For more information, contact MCL Inc., Ten North Beach, La Grange, Ill. 60525, (312) 446-0234.

Low-cost receiver

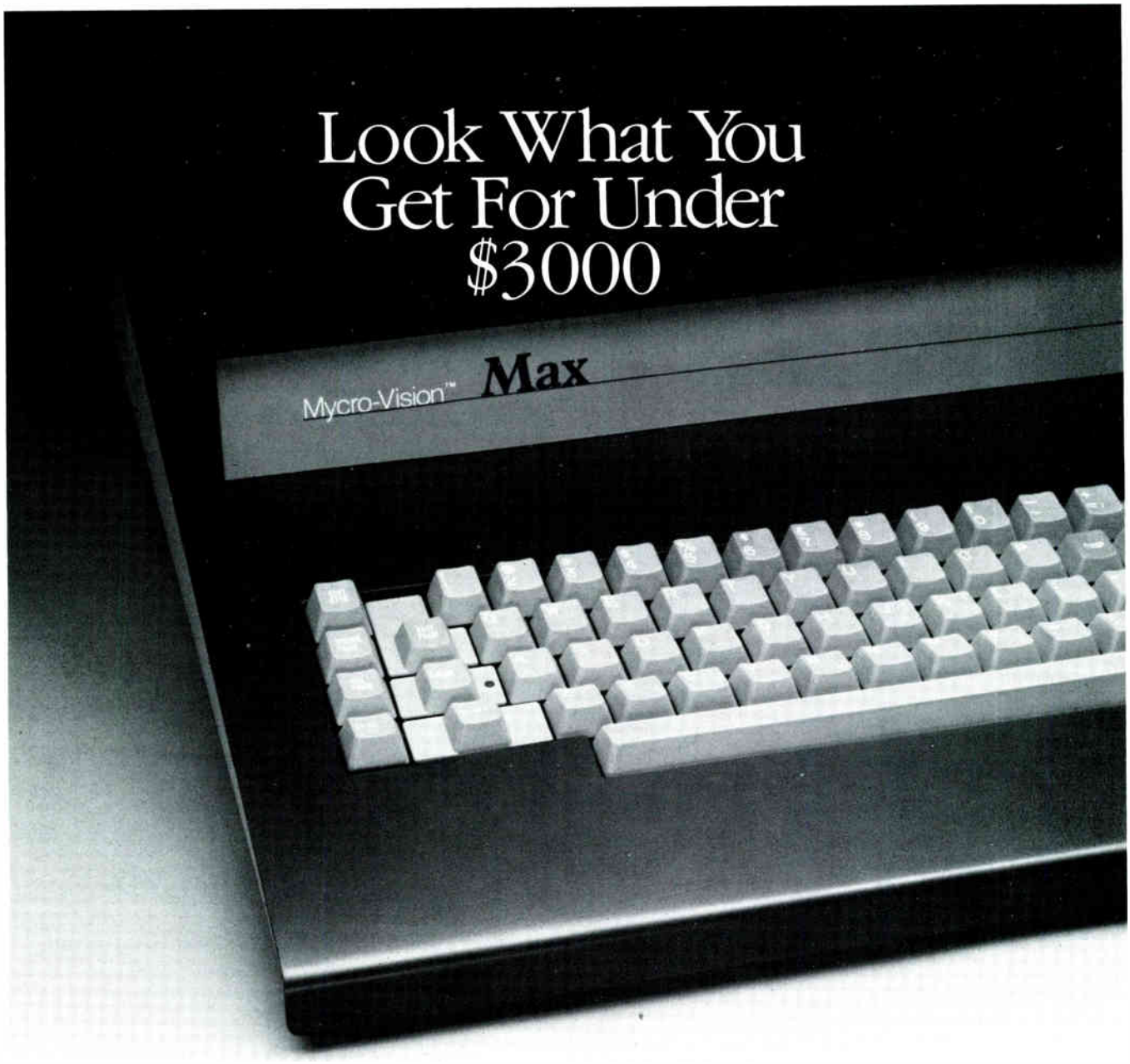
A low-cost commercial satellite TV receiver that meets most high-end receiver specifications has been released by Winegard Co. This receiver, the RC-7000, features block downconversion, from 3.7-4.2 GHz to the 1.14-1.64 GHz range; crystal-controlled, phase-locked-loop synthesized tuning; four subcarrier presets, which give users a choice of four audio subcarriers; and IF loop-through capabilities, allowing stacking of multiple receivers. The unit fits in a standard 19-inch rack, taking up 3½ inches of vertical space. Suggested retail price is $1,128.50. Quantity discounts are available.

For more information, contact


Avantek AR 2000 receiver



Winegard RC-7000 receiver



Everything you need in a character generator. PLUS non-volatile page storage... portability...and a "product life battery."

Think about that — 120 pages of memory that's almost impossible to lose. Even if the power goes off. The battery back-up is built-in...not added-on.

If you want or need portability — Mycro-Vision™ MAX gives it to you. Move it to another room, even take it to another location — you won't lose a word. And at 20 pounds it's as easy to move as it is to operate.

In the "high resolution" debate there's no question who has the last word — MAX at 70 nanoseconds. Compare that to 100 and 120 for our competitors.

MAX does it all...and then some: 8 colors...4 text style displays...graphics...4 user definable regions...weather station interface...stock and news wire posts... plus...plus...plus...and it's under $3000.

If you want the most for your money — put your money on MAX! It's one magnificent machine. See it at NAB and NCTA — or write today for more information.

Mycro-Tek

P.O. Box 47068 / Wichita, Kansas 67201
Toll Free (800) 835-2055
Reader Service Number 56

Mycro-Vision™ MAX — Another Magnificent Machine from Mycro-Tek.

Winegard Co., 3000 Kirkwood St., P.O. Box 1007, Burlington, Iowa 52601, (319) 753-0121.

Portable uplink

A portable solid state satellite uplink designed specifically for remote electronic news gathering and data collection has been unveiled by Modulation Associates. The uplink, the SU-10, can be used for either two independent SCPC uplink channels or for stereo transmission. Other features include a 10 watt, solid state, microwave amplifier; audio or data processors; frequency agile modulators; dual channel upconverters; dual HPAs and an audio monitor. The SU-10 can be housed in 4 x 2 x 2 foot roll-around carrying case.

For more information, contact Modulation Associates, 897 Independence Ave., Mountain View, Calif. 94043, (415) 962-8000.

Low noise amplifier

A low noise amplifier with 47 dB gain and a noise figure of 95°K is being offered by Regency Electronics Inc. This LNA, model number 95, is available for $499 from participating Regency Satellite ystem dealers.

For more information, contact Regency Electronics Inc., 7707 Records St., Indianapolis, Ind. 46226-9989, (317) 545-4281.

New RF Systems product line-up

The RF Systems Division of General Instrument has designed a new satellite receiver, the model C4R, for SMATV use. The unit features frequency-agile 24-channel electronically-synthesized tuning (950—1450 MHz) and a digital channel display. A bar-type meter, located on the front panel, provides a relative indication of the strength of the input signal. A phaselock loop detector helps ensure low distortion and achieves a typical 7 dB threshold. Standard features are 6.8 and 62. MHz audio subcarriers and a single RF input for either horizontal or vertical polarization. Twelve odd or 12 even channels can be tuned, depending on the polarization of the unit.

Other products recently introduced by RF Systems Division are the model C4LNB-120 low noise amplifier/block converter and model RBDC-4 separate remote block downconverter. Both units convert 3.7—4.2 GHz frequencies to the 950—1450 MHz range, and can be used with less expensive cable than other LNAs. The units also eliminate possible UHF interference encountered with lower block downconverter frequencies operating in the 270—770 MHz range.

Regency Electronics 95° K LNA

For more information, contact RF Systems Division, General Instrument Corp., 4229 S. Fremont Ave., Tucson. Ariz. 85714, (602) 294-1600.

Harris introduces Ku-band antenna line

Harris Satellite Communications Division has introduced three new antennas: the 5346 6.1-meter "Delta Gain" Ku-band antenna, the 5349 8.1-meter Ku-band model, and a 5363 11-meter Ku-band version.

The 5346 provides 54.8 dB gain at 12 GHz and 56.1 dB gain at 14 GHz, and consists of an aluminium reflector and an azimuth/elevation steel kingpost pedestal that purportedly provides the stiffness and pointing accuracy required for Ku-band operation. Precision formed panels, radials and hub assembly with matched tooling for ease of assembly without field alignment are included.

The Harris 8.1-meter Ku-band antenna provides a 57.8 dB gain at 12 GHz and 59.1 dB gain at 14 GHz. The antenna meets 2° satellite spacing requirements.

Like the 5346, the 5349 features an all-aluminum reflector, matched radials and hub assembly. The 5349 also features precision, double contoured, formed panels. Switchover between any two U.S. domestic satellites occurs in 60 seconds or less.

Both the 5346 and 5349 are desiged for full domestic orbital arc coverage.

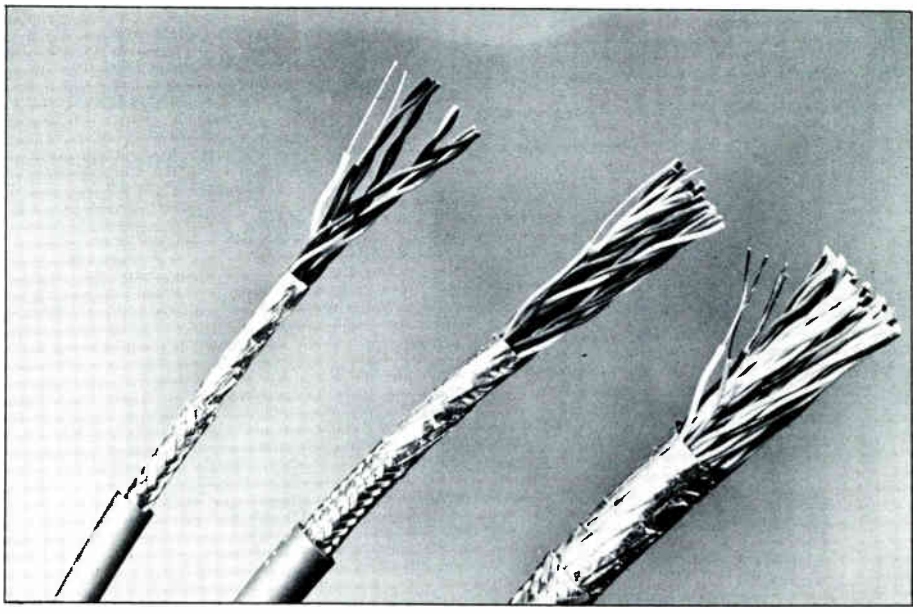
Harris's 11-meter Ku-band antenna provides 60.4 dB gain at 12 GHz and 61.7 dB gain at 14 GHz. It also meets 2° satellite spacing requirements and is designed for orbital arc coverage of 120° continuous azimuth and 85° of continuous elevation travel.

For more information, contact Harris Corp., Satellite Communications Division, P.O. Box 1700, Melbourne, Fla. 32901, (305) 724-3174.

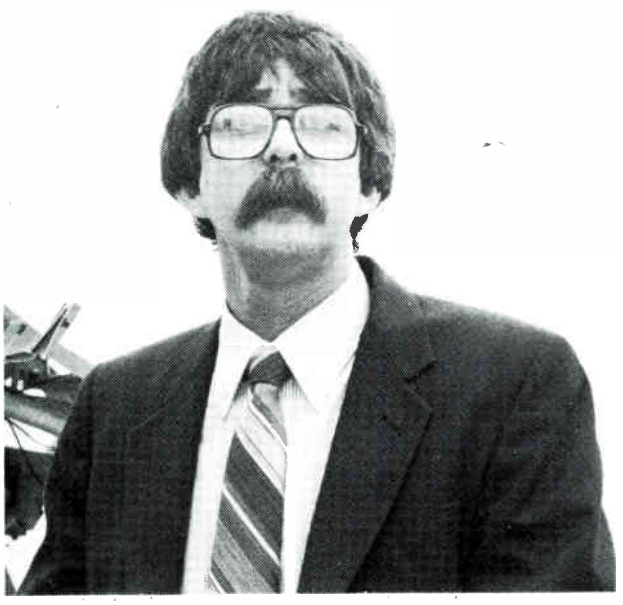
Distribution products

Belden multipair cable

Three multipair cables, the Belden 9811, 9813 and 9814, for EIA RS-232 and RS-422 extended distance interconnections have been unveiled by Belden Electronic Wire and Cable. The 9813 and


Belden multipair cable

"IF IT WASN'T FOR THE WADE COMMUNICATIONS ADDRESSABLE STAT SYSTEM, WE WOULDN'T BE IN THE PAY-PER-VIEW BUSINESS."



Jay Butler
President
Select Screening Group, Inc.

Select Screening Group, Inc. provides pay-per-view service to hotels and motels. The system they selected for their pay-per-view operations: Wade Communications STAT System.

Jay Butler, President of Select Screening Group, says "The STAT (Selective Trap, Addressable Tap) system offers the features necessary for competitive and profitable operation in pay-per-view. Wade's STAT system is economically viable, extremely reliable, and easy to install. It is technology that works today. This system has made it possible for our company to become profitably involved in the pay-per-view industry."

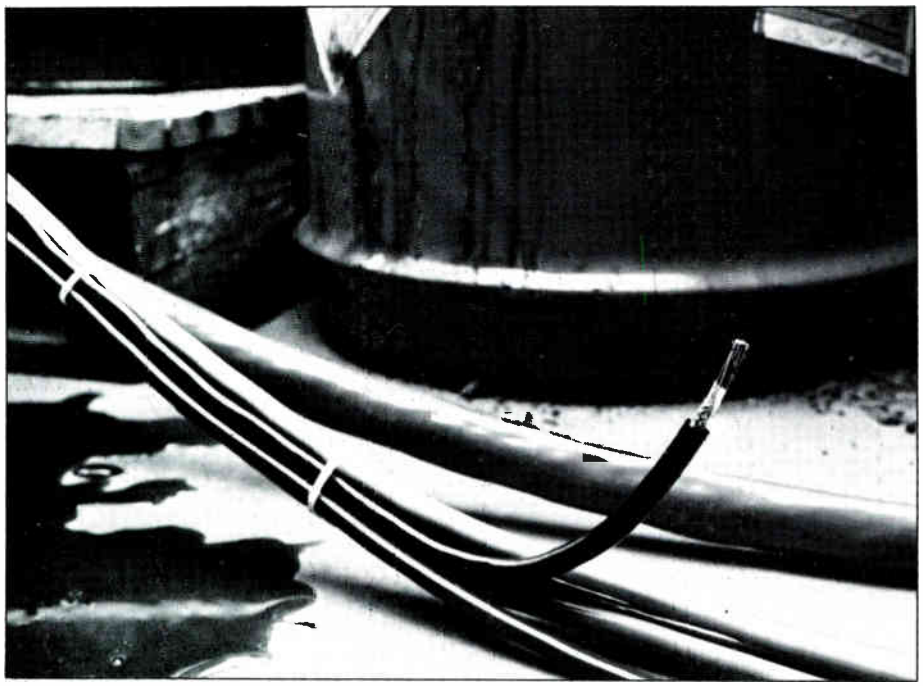
The Wade Communications STAT device is available in 4 or 8 port configurations, and will control four tiers of service — basic, plus three separate pay channels. Contact Wade Communications for more information on the STAT device, or to arrange a demonstration.

Specifications

Band Pass
10Mhz-400Mhz
Trap Notch Depth
-50dB
Functions Per Port
All channels on/off
3 Premium channels on/off
Control Method
Pulse Modulated FSK
Data Message
ASCII
Power Requirement
30 or 60 VAC,
50MA, from system

WADE COMMUNICATIONS
The leader in addressable tap technology for the cable industry
3535 Briarpark Drive,
Suite 225
Houston, Tx. 77042
713-785-3143

Reader Service Number 32



Omniguard 2

9814 cables are suited for instrumentation and minicomputer applications. Both consist of a 28 AWG stranded tinned copper conductor insulated with polypropylene and have a low capacitance value of 15.5 pF/ft. The Belden 9811 has six pairs; the 9813, three pairs; and the 9814, 31 pairs.

For more information, contact Belden Electronic Wire and Cable, 2000 South Batavia Ave., Geneva, Ill. 60134, (312) 232-8900.

Off-premises addressable system

A new addressable off-premises channel system has been designed by Ortech Electronics Inc. This system, called the Oracle addressable tap, uses a signal obliterating technique to secure premium channel signals. The system is compatible with cable-ready TV sets and all cable converters. It can be added to an existing system without necessitating major system design changes and incorporates a subscriber on/off feature for service connection or disconnection. When used in conjunction with an IBM PC, the system can control 65,535 four-subscriber taps.

For more information, contact Ortech Electronics, 297 Talmadge Rd., Edison, N.J. 08817, (201) 287-2992.

Alpha electronic cable

Alpha Wire Corp. has announced the addition of Omniguard 2, an electronic cable for hazardous outdoor use, and Omniguard 5, for all environmental conditions.

Omniguard 2 is available in unshielded, foil shielded and "suprashield" designs. It consists of copolymer-insulated cores and a thermoplastic jacket; can resist moisture, chemicals and severe mechanical abuse; and is available in quantities from 100 feet.

The Omniguard 5 features a core and fluorocarbon copolymer jacket construction; can be used in both low and high temperatures; and is ideal for missile wiring, space vehicle optical systems and other sophisticated applications.

For more information, contact Alpha Wire Corp., 711 Lidgerwood Ave., P.O. Box 711, Elizabeth, N.J. 07207, (201) 925-8000.

New S-A amplifiers

Amplifiers designed for indoor, trunk, local area network and multiple applications have been released by Scientific-Atlanta. The Model 6822 indoor distribution amplifier is designed for use in multi-dwelling units, and is compatible with S-A's line extender amplifier. It is available in bandwidths to 450 MHz, and features three forward/reverse frequency splits, power supply and optional AGC/thermal compensation.

S-A also has released a drop-in upgrade trunk amplifier module that can upgrade either 216 or 270 MHz systems to 300 MHz or 330 MHz. The module can be added to virtually any existing system, the company says.

The Model 6822 amplifier is designed for local area network applications. Available in bandwidths to 450 MHz, it features three forward/reverse frequency splits, optional AGC/thermal compensation and 115V ac switching regulated power supply.

The Model 6501 and 6502 distribution amplifiers are designed for diverse applications such as bridgerless systems, supertrunking or line extension. The Model 6501 works as a line extender, while the 6502 provides higher forward gain and optional piloted AGC.

For more information, contact Patrick Miller at Scientific-Atlanta, Box 105600, Atlanta, Ga. 30348, (404) 925-5462.

High-split amp for voice, video and data

A 5-174 MHz high-split reverse amplifier is being offered by Scientific-Atlanta. This amplifier provides expanded reverse channel capability for metropolitan area network systems. It can support a combination of data, voice and video signals; uses thermal compensation to eliminate the need for pilot carrier generators; and can maintain signal quality over a -40°C-+140°C temperature range.

For more information, contact Scientific-Atlanta, One Technology Parkway, P.O. Box 105600, Atlanta, Ga. 30348, (404) 441-4000.

Two cable lines added

Times Fiber Communications has introduced two coaxial cable lines: the Flexifoam II RG 62 and the T4 Plus cable for indoor local area network applications.

The Flexifoam II RG 62 coaxial cable is suited for the electronic data processing market and the industrial and electronic industries. These cables feature a hard dielectic, resulting from a technique in which selected polyethylene resins are processed to provide a closed-cell, high velocity precision matrix foam. The Flexicom II RG 62 line is comprised of a FM-62 version for indoors and an IP-62 type for outdoor, direct burial use.

The T4 Plus cable is completely seamless and continuously bonded from conductor to jacket. The handling characteristics permit a 4-inch minimum bend radius for 1/2-inch cable. According to the company, the cable's pull strength and sidewall pressure resistance facilitates multiple 90 degree bends. The cable is bonded, but can be stripped without leaving any residue.

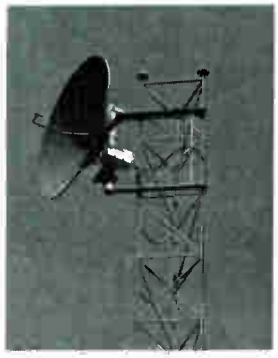
For more information, contact Times Fiber Communications Inc., 358 Hall Ave., P.O. Box 384, Wallingford, Conn. 06492, (203) 265-8500.

Test Equipment

100 MHz oscilloscope

A 100 MHz portable oscilloscope with a built-in microcomputer has been

continued on page 90



Micro-Beam™—Performance proven in over a year of trouble-free, revenue producing operation at many different sites.

If you thought microwaves were too rich for your system...look again!

Look at MICRO-BEAM™

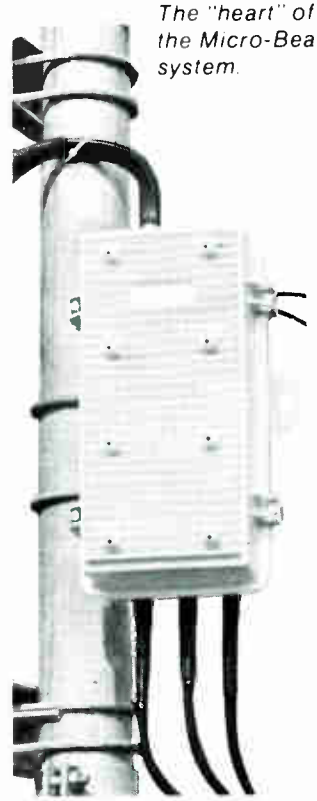
Micro-Beam™ (patent pending) is a new flexible and cost-efficient CARS Band signal delivery system ideally suited for CATV plant expansion.

Micro-Beam™ transmission allows the cable operator to skip on by long cascades. Start with a fresh signal anywhere in the system. Go beyond the limits of subscriber density, geographic, or man-made barriers—without expensive heated/air-conditioned transmitter buildings.

Using just one Micro-Beam™ transmitter (mounted behind the antenna) you can send as many as 52 channels up to 14.5 miles away! And now, with our new Micro-Beam Plus™ systems, you can transmit a full 52 channels up to 10.5 miles, in two different directions. All for less than half the cost of conventional microwave systems.

Micro-Beam™ gives you multi-channel microwave transmission of your entire service from a single outdoor unit which can be located practically anywhere in your plant.

How many new runs are you planning? Take a look at how much it's going to cost you. Then take a look at Micro-Beam™. For more details call, or write:



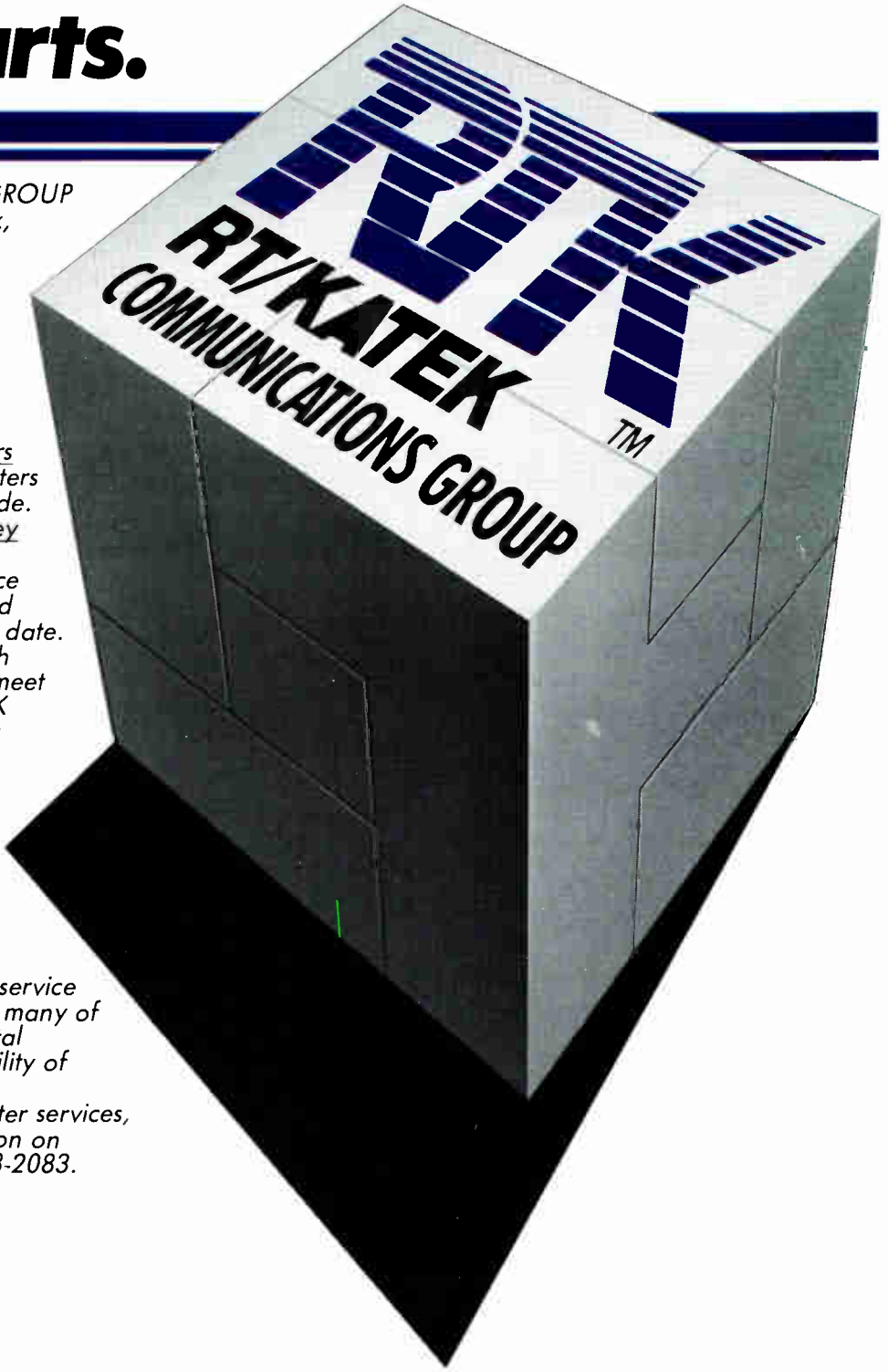
The "heart" of the Micro-Beam™ system.

channel master satellite systems

Subsidiary of Avnet, Inc.
Industry Drive, Oxford NC 27565 (919) 693-3141

Reader Service Number 33

RT/KATEK™ is a classic example of the whole being greater than the sum of the parts.



RT/KATEK COMMUNICATIONS GROUP is the result of the merger of Katek, Inc. and RT Cable Corporation — and a perfect example of two organizations combining to offer much more than twice the services they previously offered.

You know Katek for its unexcelled factory authorized repair of Jerrold, Hamlin, RCA, Pioneer and GTE/Texscan converters with full-service regional repair centers at five strategic locations nationwide.

You know RT Cable for its turnkey residential, MDU and commercial installation and system maintenance services, with an unmatched record of more than 1,400,000 installs to date.

The extensive capabilities of both companies are now combined to meet your cable needs. But the new RTK offers much more than capabilities — it offers experience! The two parts that make up the whole have been deeply involved in cable for more than a decade. Think of them as pioneers.

RT Cable pioneered turnkey drops. Katek pioneered converter upgrading, addressable converter repair and the 6-month converter service guarantee. Just four cases among many of how the new RT/KATEK has the total capability to upgrade the profitability of your operations.

For more information on converter services, call (201) 356-8940; for information on installation services, call (201) 678-2083.

RTK
RT/KATEK™
COMMUNICATIONS GROUP
Installation Services Division
Converter Services Division

See us at NCTA Booths 1370 and 1372.

Reader Service Number 34

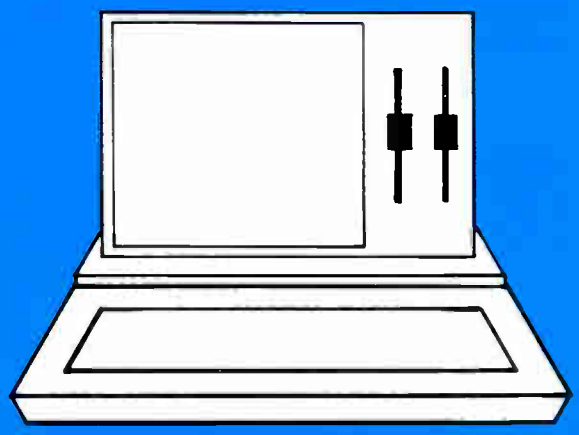
Communications Engineering & Design

TECH II

CED's feature supplement and Product Profile

June 1984

- **PC network automates office**
- **Cable billing software**



Cable billing software

Below are descriptions of various companies' computer billing systems. Charts detailing these systems' capabilities are presented on pages 68-71.

Apple Store's in-house system provides reports on the number of subscribers per service, by franchise; sales; tax; installations and service charges; accounts receivable in aging slots; and total earned income. Supporting one terminal, the system uses software that runs on IBM, Radio Shack and Apple computers. A $40 monthly maintenance plan is offered which includes training and a toll-free "hotline". Prices range from $2,000 to $2,250.

Business Systems Inc.'s Cable Television Management System prepares 15 management reports including churn analysis, penetration, and subscriber counts at any selected window picture. Other features include automated pay-per-view and balance checking on subscriber accounts. The combined in-house and distributed system utilizes Digital Equipment Corp. hardware. Customer support includes training as part of a one-time installment package; enhancement updates at no additional cost; and telephone and field support. Software ranges from $7,000 to $70,000 or 3 to 12 cents per sub.

CableData's in-house and distributed system can support an unlimited number of terminals and provides 60 main programs. The software runs on Tandem hardware. Cost of a package is approximately 25 cents per subscriber each month, including training and 24-hour customer support.

Cablefacts billing software system prepares a variety of reports in the areas of marketing, accounts receivable, installation and management. Additional features include the ability to operate independently from the telephone lines and to perform mailing functions. The in-house system utilizes IBM Series I hardware. Each CPU is able to support 23 terminals. Customer support includes training as part of the initial package, enhancement updates at no additional cost and internal customer service phone support. Software cost ranges from 22 to 30 cents per sub.

The in-house system of **Cambrian Compsuit** supports 53 terminals. The system does management reports on revenue, billing, tax, penetration, marketing, customer age journals and has an automatic debit system. Training and on-line support are included in packages that range in price from $25,000 to $300,000. The software can be updated at additional cost.

Check Free Systems' in-house system provides management reports such as daily cash summaries, returned checks reports and demographic information on customers. The system possesses a marketing strategy and payment program that automatically collects funds from checking accounts or from Visa/Mastercards and also resubmits returned checks. The software runs on the IBM 4331. Training is included in the $1,500 implementation fee. A toll-free service number and a product support team are offered. Updates are free of charge.

Computer Utilities of the Ozarks' Cable I system prepares a variety of reports: franchise summary churn, downgrade/upgrade, four-quarter activity, trouble call, financial summaries and others. Additional features include customer service inquiry modes and bank draft preauthorized checking. The in-house system utilizes IBM Series I, IBM PC and IBM PCXT hardware, with the Series I able to support 20 terminals. The PC and PCXT can maintain 1,000 and 3,000 subs, respectively. Customer support includes training as part of a one-time installation package; annual enhancement updates at 10 percent of the original software cost; and telephone and modem support. Software cost, based on a five-year plan and including hardware, averages 18 cents per sub.

Cox Cable Communications Inc.'s Cable Information System prepares a variety of reports: churn, retention, collection, demographic, revenue summary, service analysis, marketing, availability and others. The service utilizes IBM mainframes and provides personal computer and an automated lock box interface.

Ehlen Enterprises CATV 5.0 Billing/Account Receivable System prepares a variety of reports: summary of billing activities, summary of reports by franchise, sub listing debt, credit and proration reports, connect/disconnect listings and others. The user friendly system is completely menu driven. The in-house system utilizes Xenix TRS80 Model 12 and 16B multi-user systems and is able to support one and three to six terminals, respectively. Customer support includes training as part of a one-time installation package and telephone support. Upgrades are offered at additional cost. Software cost ranges from $2,800 to $3,900.

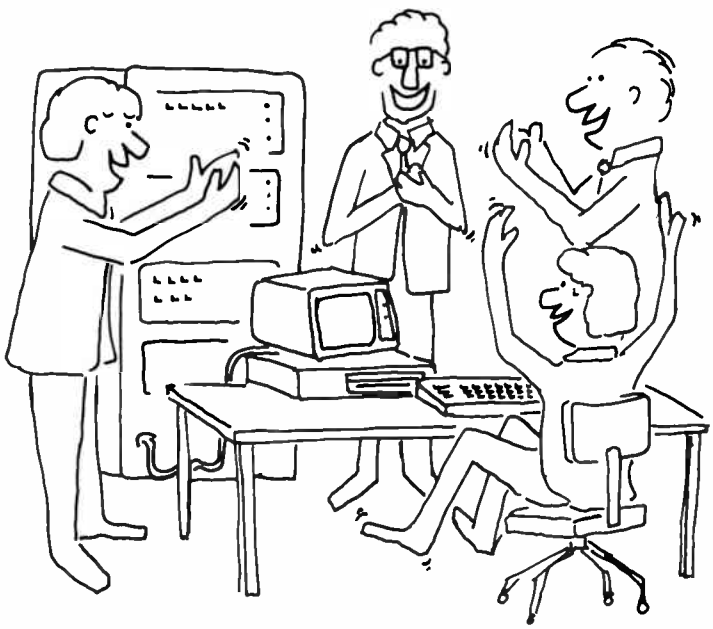
Florida Automated Resources' in-house system can do management reports such as billing summaries. With its on-line capability for post debits and credits, the system can support up to 999 terminals. The software, which runs on a Burrows Medium System, is sold along with training. Updates are offered for an annual maintenance fee.

The system offered by **First Data Resources** is capable of doing sales, marketing and financial reports. The system can generate computer letters and has an on-line collection system with cycle billing. The system supports 8,000 terminals and has software that runs on IBM. The training fee is calculated in the conversion cost. Updates, released four times a year, are offered at no additional cost. Prices range from about 35 cents to 40 cents per subscriber.

Gill Management Services Business Manager III prepares a variety of management reports including accounting, credit collection, marketing, pay-per-view, equipment inventory and others. The system features 600 unique rate combinations, 20 service levels, one-time and recurring campaign discounts, four-cycle billing sales call cards, marketing sheets and a 40 line, item billing statement. The system, which can act as either an on-line, time share or in-house system, utilizes IBM mainframe hardware. Customer support includes training as part of the initial package and customer phone support. Software cost is competitively priced. GMS's Business Manager I also prepares a variety of management reports: subscriber and management analyses, penetration analyses and others. The in-house, on-line, stand-alone system utilizes IBM PCXT hardware. Customer support includes training as part of a one-time

continued on page 100

Of Your Choices in On-Line Subscriber Management, Only Ours is Personal!



INTRODUCING BUSINESS MANAGER I, THE COMPLETE ON-LINE SUBSCRIBER MANAGEMENT AND BILLING SYSTEM FOR THE IBM* PERSONAL COMPUTER XT.

If you are currently operating in the dark on batch billing systems, you will be enlightened with GMS's total solution for all your subscriber management needs.

And BUSINESS MANAGER I can even be interfaced to our most comprehensive on-line subscriber management and billing system, BUSINESS MANAGER III.

So let's get personal!

BUSINESS MANAGER I includes:

- On-Line Order Processing
- Bill Inquiry
- Automated Scheduling
- Work Order Processing
- Cycle Billing to 30 Cycles
- Marketing/Sales Analysis
- Equipment Inventory
- Flexible Management Reporting
- Proven Hardware Performance

GMS

a subsidiary of Gill Industries

Find out more about how our personal computer system can help you run your business better. Write or call Bill Serencsa, at GMS, 2050 Bering Drive, San Jose, CA 95131 (408) 998-8078.

*IBM is a trademark of International Business Machines, Inc.

Reader Service Number 36
See us at the NCTA Booth #211

Cable billing software

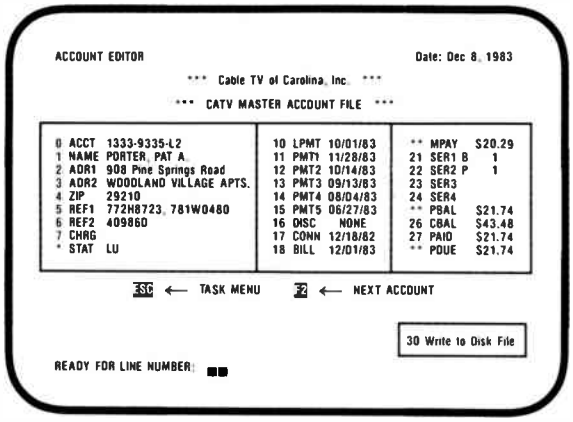
Company Name	Name of Software	Invoices	Orders	Non-pay Disconnect Orders	General Ledger	Accounts Payable/ Receivable
Apple Store	Cable/TV Billing Program	Yes	Yes	No	No	receivable only
Business Systems Inc.	Cable Television Management System	Yes	Yes	Yes	Yes	Yes
Cable-Data	Cable-Data	Yes	Yes	Yes	Yes	Yes
Cable-facts	Cable-facts	Yes	Yes	Yes	No	receivable only
Cambrian Compsuit	Cambrian Cable System	Yes	Yes	Yes	No	receivable only
Cambrian Compsuit	Grok System	Yes	Yes	Yes	No	receivable only
Check Free Systems	Check Free Systems	No	No	No	Yes	Yes
Computer Unilities of the Ozarks	Cable I	Yes	Yes	Yes	Yes	Yes
Cox Communi-cations	Cable Information System	Yes	Yes	Yes	Yes	Yes
Ehlen Enterprises	Account Receivable System	Yes	No	Yes	No	receivable only
First Data	Cable Control System	Yes	Yes	Yes	Yes	Yes
Florida Automated Resources	Cable Billing System	Yes	Yes	No	No	receivable only
Gill Management Services	Business Manager III	Yes	Yes	Yes	No	receivable only
Gill Management Services	Business Manager I	Yes	Yes	Yes	Yes	receivable only
Joyce Cable		Yes	Yes	Yes	Yes	Yes
KMP Computer Systems Inc.	Cable-star	Yes	Yes	Yes	Yes	Yes
Logical Data Management	Subscriber Management & Financial Accounting Systems	Yes	Yes	Yes	Yes	receivable only
Magnicom Systems	Marc-10	Yes	Yes	Yes	Yes	Yes
Parallex Corp.	Parallex	Yes	Yes	Yes	Yes	No
Sun Software	Sun Response	Yes	Yes	Yes	Yes	Yes
Telease Inc.	Telease Computer Package	Yes	Yes	Yes	Yes	Yes
Toner	SMART	Yes	Yes	Yes	Yes	Yes

Adjustment Tracking	Subscriber Counts	Program Guide Mailing	Daily Service Reports	Cash Reconcil-iation	Converter Inventory Reports
Yes	Yes	Yes	Yes	Yes	No
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	No	Yes
Yes	Yes	Yes	Yes	No	Yes
Yes	Yes	No	Yes	Yes	No
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	No	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	No	Yes	Yes
Yes	Yes	Yes	Yes	No	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes

Product Profile

Company Name	Name of Software	Pending Installs Records	Delinquent Disconnect Records	Bad Debt Write-offs	Other Reports	Inventory Control
Apple Store	Cable/TV Billing Program	Yes	Yes	Yes	Yes	No
Business Systems Inc.	Cable Television Management System	Yes	Yes	Yes	Yes	Yes
Cable-Data	Cable-Data	Yes	Yes	Yes	Yes	Yes
Cable-facts	Cable-facts	Yes	Yes	Yes	Yes	Yes
Cambrian Compsuit	Cambrian Cable System	Yes	Yes	Yes	Yes	Yes
Cambrian Compsuit	Grok System	Yes	Yes	Yes	Yes	Yes
Check Free Systems	Check Free Systems	Yes	No	No	Yes	No
Computer Unilities of the Ozarks	Cable I	Yes	Yes	Yes	Yes	Yes
Cox Communi-cations Inc.	Cable Information System	Yes	Yes	Yes	Yes	Yes
Ehlen Enterprises	Account Receivable System	No	Yes	Yes	Yes	Yes
First Data	Cable Control System	Yes	Yes	Yes	Yes	Yes
Florida Automated Resources	Cable Billing System	No	Yes	Yes	Yes	No
Gill Management Services	Business Manager III	Yes	Yes	Yes	Yes	Yes
Gill Management Services	Business Manager I	Yes	Yes	Yes	Yes	No
Joyce Cable		Yes	Yes	Yes	Yes	No
KMP Computer Systems Inc.	Cable-star	Yes	Yes	Yes	Yes	Yes
Logical Data Management	Subscriber Management & Financial Accounting Systems	Yes	Yes	Yes	Yes	Yes
Magnicom Systems	Marc-10	Yes	Yes	Yes	Yes	Yes
Parallex Corp.	Parallex	Yes	Yes	Yes	Yes	Yes
Sun Software	Sun Response	Yes	Yes	Yes	Yes	No
Telease Inc.	Telease Computer Package	Yes	Yes	Yes	Yes	Yes
Toner	SMART	Yes	Yes	Yes	Yes	Yes

Pay Per View Ordering	Dispatching	Installment Scheduling	Customer Service History Records	Trouble Call Tracking	Addressable Converter Activation
No	Yes	Yes	Yes	No	Yes
Yes	Yes	Yes	No	Yes	No
Yes	Yes	Yes	Yes	Yes	Yes
No	Yes	Yes	Yes	No	Yes
No	Yes	Yes	Yes	Yes	Yes
No	Yes	Yes	Yes	Yes	Yes
Yes	No	No	No	No	No
Yes	Yes	No	Yes	Yes	Yes
Yes	Yes	Yes	Yes	No	Yes
No	No	Yes	No	No	
Yes	Yes	Yes	Yes	Yes	Yes
No	No	No	Yes	No	No
Yes	Yes	Yes	Yes	Yes	Yes
No	Yes	Yes	Yes	Yes	No
No	Yes	No	Yes	Yes	Yes
Yes	No	No	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes



ANNOUNCING

CATV 5.0

BILLING/ACCOUNT RECEIVABLE SYSTEM FOR THE ECONOMICAL TRS-80 MODELS 12 & 16

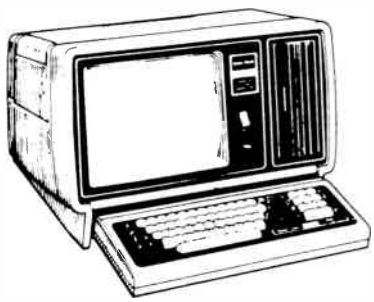
CAPABILITIES OF CATV 5.0

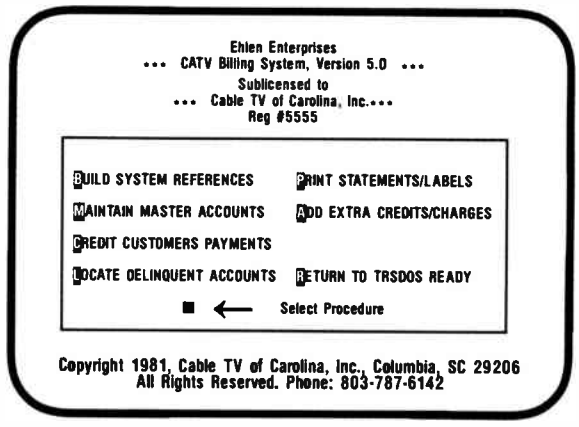
- Model 12 version can process up to 6,000 subscribers
- XENIX Multi-user version can process up to 20,000 subscribers
- Handles multiple franchises
- Handles up to 24 different pay tier/pay tiers combinations
- Handles up to 100 bulk rate accounts
- Allows additional outlet rates for each pay tier
- Allows up to 4 different pay tiers/packages per account
- Allows entry of one time charges and adjustments such as:
  - —Special debits
  - —Credits
  - —Prorates
- Handles different service and mailing addresses
- Keeps track of franchise taxes/fees
- Prints monthly billing statements
- Allows advertising messages on billing statements
- Identifies delinquent accounts
- Prints late and disconnect notices
- Prints mailing labels by Zip Code
- Generates mailing labels by pay tiers for advertising purposes
- Allows easy crediting of customer payments
- Allows selection of cut-off dates for late and delinquent searches.

CATV 5.0 MEANS SIMPLICITY

- User friendly
- Completely menu driven
- Built-in safety features — automatically checks for various keying errors
- Trial update feature insures proper crediting of customer payments
- Easy to use edit features.
- Aids in training new operators quickly.

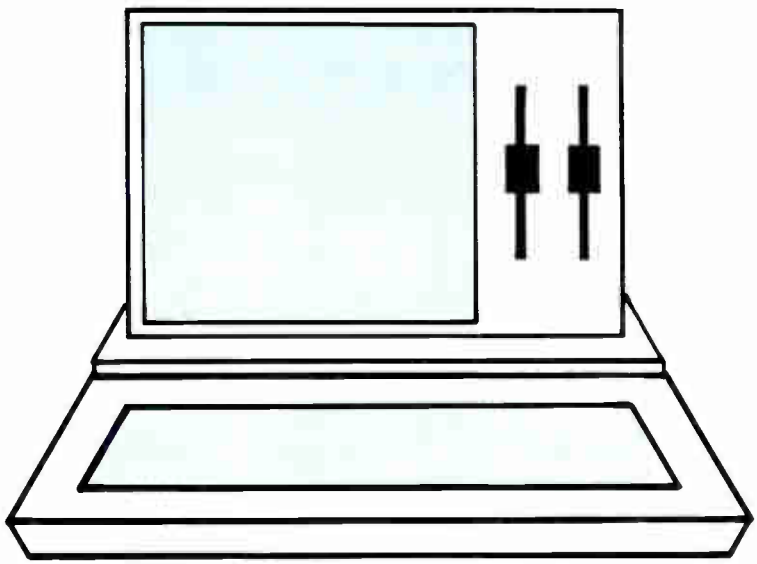
(Spanish versions available)
PRICED FROM $2,800





FOR INFORMATION WRITE OR CALL EHLEN ENTERPRISES 6319 BRIARWOOD ROAD COLUMBIA, S.C. 29206 PHONE: (803) 787-7256 TELEX: 466528

Reader Service Number 37



PC network automates office

Mini features at micro cost

By John Mayo, United Artists Cablesystems

As personal computers have moved into the office environment over the past several years, the advantages they bring by increasing the productivity and effectiveness of engineers, secretaries, and managers have become accepted by almost all. Word processing, spreadsheets, cable plant design, accounting, and data base uses are an everyday activity for more and more office workers in MSO corporate and division offices. The personal computer, once a hobby for the computer "hacker," has become as indispensable as the telephone and the typewriter.

As we have begun to rely on these stand-alone desktop machines, however, we realize that something is missing. When each computer user keeps a personal filebox of floppy disks, each with different data and files, the sharing of information requires passing disks and printouts back and forth. Access to data for broad management and engineering decisions is difficult, since the information is scattered among several users, and possibly in many different programs and formats.

The problem is twofold. First, compatibility of personal computer hardware and, more importantly, software, is essential to making maximum use of corporate data. Second, the communication of information from machine to machine and site to site needs some attention.

The solution to both problems lies in the use of Local Area Networks (LANs), which connect all personal computers in an office, allowing standardization of programs and data, and ready interchange of information among users. The existence of a ready communication path among users also enables use of such new conveniences as electronic mail, electronic calendars, and other features of the "electronic office."

This article outlines how one MSO engineering office has implemented a LAN to enhance the services it provides to its systems in the field.

Personal computers

United Artists Cablesystems started using personal computers in its engineering offices in 1979, with the purchase of a Radio Shack Model I. Organization of laboratory evaluation data was one of the first applications, followed by word processing and Basic programs for engineering analysis. Use of the spreadsheet was unknown at that time.

The engineering group grew into using Radio Shack Model IIIs over the next two years, learning about Visicalc, modems, and The Source as things progressed. Eventually, there was a Model I or III on the desk of the vice president for engineering and each of the engineers and secretaries. The capital investment was not large, since the engineering group numbers about a dozen persons in the corporate office.

The first IBM PC was acquired in 1982, launching us into the next generation of desktop computers, and also into the problems of multiple hardware and software standards. Concurrently, the management of the company engaged a consultant to evaluate our use of computers in the office, and to make a recommendation for possible installation of an "office automation system." Such a system would serve not only the engineering group, but also corporate and division offices located in several sites around the country.

This "OA" project was to require over a year's effort on the part of the author, working with several engineering staff, outside consultants, and ultimately four vendors. The consultants' recommendation was for a minicomputer to serve "dumb" terminals on each users' desk, at a capital cost of about $250,000 for 20 users. A great deal of time and energy was spent in pursuing this approach with several eager vendors, including Digital Equipment, Data General, Hewlett-Packard, and IBM.

Meanwhile, we continued to acquire

Model IIIs and IBM PCs. Our familiarity with personal computing and the flexibility we had come to enjoy with them mandated that our solution to office automation include personal computers as workstations, for at least some of the users. We were not satisfied with any of the OA systems available in 1982-1983, however, because of their lack of integration of personal computers into the minicomputer based system.

Additionally, the software available for these systems was primitive when compared to the IBM PC software with which our users were already familiar. Minicomputer based office automation would be for us a step backward.

Luckily, our conservative approach in not buying an OA system led us to explore the emerging field of personal computer networks. We realized that the market was full of users like ourselves, who understood personal computers and liked them, but did not have a data processing department to support an elaborate supermini or mainframe computer system. Personal computer networks appeared to be a soution to our needs.

Our evaluation of OA had shown us that features like electronic mail, calendars, and data bases for decision management were desirable and effective. These advanced features, along with ready access to mass storage and easy ability to move information from machine to machine were what we wanted to add to our already successful use of personal computing.

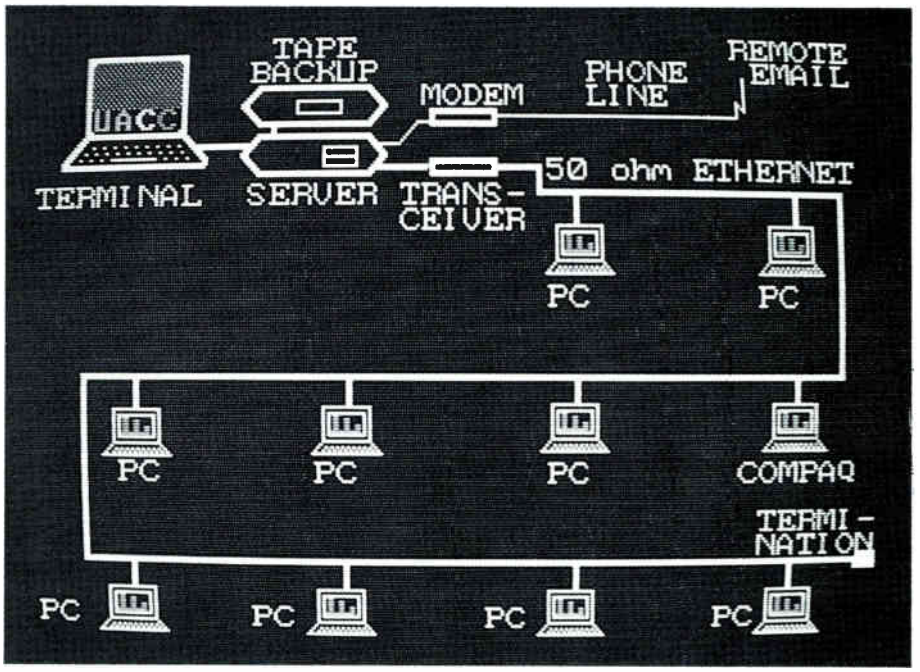
Looking at networks

By the summer of 1983 there were at least a half dozen vendors of personal computer networks. We evaluated Corvus, Orchid PC-Net, 3-COM EtherSeries, and Nestar.

Our criteria for selecting a vendor included:

- Performance of the network for 10 to 25 users
- Adherence of the network to industry standard protocols
- Expandability of the network
- Software features
- Stability of the vendor
- Availability of the product

Cost was not a significant consideration. We found that most of the networks cost approximately the same, and all were significantly below the capital cost of the minicomputer OA system we had been contemplating earlier. We initially expected to spend approximately $25,000 to equip ourselves with a network to serve a dozen users.



The cost per workstation, including PCs, would be about $7000, compared with over $12,000 per workstation for the minicomputer system.

The topic of network architectures and protocols is one which could involve many pages of discussion. There are a number of excellent books and articles covering the techniques available, and potential users of a LAN are advised to explore the architecture options carefully.

Our site has users on three floors of one building, all located within a wiring distance of about 200 feet from the center of the volume. Thus any of the current network topologies would work (star, ring, bus), and the cable distances fit within the technical limits of most network systems.

One of the most important decisions we made was to standardize the personal computer hardware the network would be expected to support. We decided that the only personal computer we would attempt to support would be the IBM PC.

Some systems, notably the Corvus Omninet, support multiple personal computer vendors, for example Apple and IBM, on the same network. Since we had experienced problems with both Radio Shacks and IBMs in the same office by this time, we planned to phase out the Model IIIs by the time the network was implemented.

We also decided to support only one standard software product in each category, usually the leading product in its class. By standardizing we have made user training easier and data interchange possible. Special applications may require specialized software, but the general user does not have to cope with these products.

The most important criteria for us was performance. We knew how an IBM XT with its integral hard disk performed, and this became our goal for speed and convenience. Each network user would expect shared hard disk access to be as fast as a dedicated disk.

Some of the networks, which use a single XT as the "file server" for a number of users, were ruled out on the basis of slow performance. We determined that a more powerful, dedicated file server computer would be required, with disk capacity in the range of 40 megabytes or more.

Another important criteria was adherence to industry network standards. Our investigation of OA systems showed that someday we might want a supermini as a file server and data base machine, and that the ability to link our personal computers to such a machine would be important.

3-COM Ether Series

The above criteria were best met by the EtherSeries Network from 3-Com Corporation in Mountain View, California. The EtherSeries uses IEEE 802 standard Ethernet as the protocol, operating at 10 megabits/second. This is the fastest data rate of any personal computer network now available.

The EtherLink transceiver card installs in one IBM PC expansion slot, and connects in a loop-through bus architecture back to a central file server. The

cable may be either standard Ethernet cable for runs up to 1000 meters, or smaller, less expensive RG-58, capable of a total bus run of 300 meters from the server. The network may have up to 100 users, and may have multiple file servers.

Each 3-Com file server may be either an IBM XT or an Altos 586 microcomputer equipped with Ethernet communications. For performance reasons, as well as disk capacity, we selected the Altos, with 512 KB of memory and a 40 megabite Winchester. We use the Altos cartridge tape unit for daily backups.

We presently have 11 IBM PCs and one Compaq Plus operating on the network, with a maximum bus run of about 700 feet. We experience virtually no wait for server access, with the exception that when the server is doing a backup to tape, requiring 1/2 hour per day, there can be a server access wait of several seconds at times. By scheduling the backup at an off-peak hour we have minimized any effect on the users.

Network software

Each PC on the 3-Com system uses a modified PC-DOS 2.0. 3-Com has added 17 commands, but otherwise, users see absolutely no difference from the IBM PC with which they are familiar. Volumes, equivalent to floppies, are created on the file server, and may be linked to four "virtual" drives on the PC as needed.

"The most important criteria for us was performance."

There is complete freedom to move data between floppy drives and the four network drives as desired. The UNIX network software for the Altos is well written, and has given us very little trouble, except for a few bugs that 3-Com fixed.

We have installed all of our applications programs on one public, read-only volume, making the same programs available to all users simultaneously. We created an OA user interface, whereby any program is available from a single menu by entering the option number.

The interface program automatically links the specified volume and performs all set-up for the user. To move from word processing to spreadsheet, for example, requires 10 seconds, and only one entry.

In addition to standard software we have created a number of custom programs to fill specific needs. We use a

group travel calendar which anyone can access and update, and a project status program to track engineering projects. The evaluation lab maintains an engineering buyers guide which lists over 700 approved products for system engineering and construction projects. The buyers guide program, written in dBase II, automatically prints updates of the manual for use by system personnel.

Each user can have a personal menu from which programs may be executed that are not accessible to other users. Examples of these are personnel records, budgets, and the purchase order tracking system.

Managers have available a personal menu option for a set of current reports. These are generated by the data base programs and are moved to spreadsheet format for analysis. These reports track budgets, purchasing, quality control reports from the QC techs in the field, and special projects.

As if this were not enough, the Ether-Mail program allows all users to send and receive electronic mail. Local users have access to the mail via the Ethernet coax, while remote IBM PC users can dial into the server via a telephone modem to send and receive mail to any network user. The central server becomes the post office for all users, who move mail to and from their individual "inbox" volumes.

Are we happy?

United Artists Cablesystems started its network implementation with an experienced group of personal computer users. By adding a powerful network as an overlay, we have enhanced our use of he PCs with virtually no penalties. The menu system actually makes it easier for a user to access programs and manipulate data.

Training consists of individual instruction for each user as he or she is added to the network. The network was activated over a two month period, with the most experienced PC users getting access to the system first and helping in the development of the menu system. By the time the balance of the users were installed, there was a good base of experienced users to train new users.

One of the most important ingredients in the success of our network has been the interest and commitment of corporate management to the project. They have embraced spreadsheets for financial analysis, data bases for various applications, and are daily users of electronic mail.

Without the support of management such a system would not have been a success. At each step of the project, the way was clear to develop the system because people at the top understood the goals and shared in the enthusiasm for the project.

The future will see a probable addition of more disk storage to the file server, addition of printers to the server for shared printer access, and additional applications software. We have plans to build a number of data bases for management information, and will probably add division level accounting to the network.

Cable systems in the field are being equipped with IBM PCs and modems for access to the remote mail facility. We will install 3-Com networks in other corporate and division offices around the country, and bridge the networks together via telephone circuits. And, since a Digital VAX supermini can replace the Altos file server on the network, the sky is the limit in network computing power.

We are well on our way to an automated office that we designed and will maintain. We have done this without a data processing department, and at less than half the cost of other OA alternatives. ■

Must-carry teletext: war begins

First shot fired in Buffalo, N.Y.

By Gary Arlen

Look for increasing controversy and skirmishes on the issue of whether cable systems must retransmit enhanced services of TV stations they carry. The first battles have been fought, and apparently won, by the cable industry. Notably, the FCC's decision that cable companies don't have to retransmit teletext of broadcast TV stations has paved the way for subsequent rulings. But broadcasters already are fuming about the stereo TV ruling, which permits cable operators to drop stereo transmissions. In the latter case, cable companies would have to buy special equipment in order to carry broadcast TV's stereo shows, so economics will play a role.

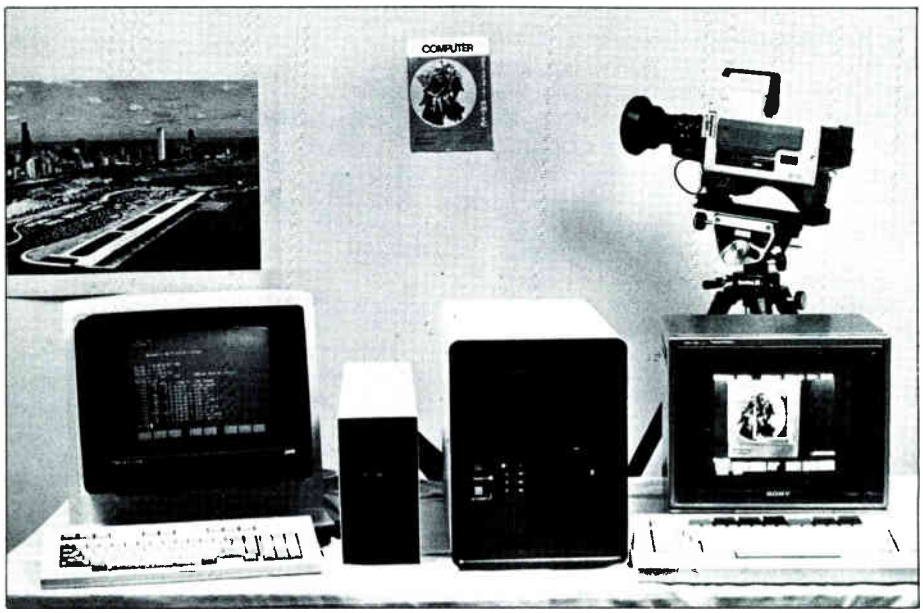
Now comes the FCC examination of alternative uses of the Vertical Blanking Interval. In addition to using the VBI for teletext and other limited broadcast related transmissions, the FCC is proposing that almost any type of data transmission be permitted on most VBI lines. Broadcasters have warmed to the concept; in its comments CBS even suggested that in overnight hours when a station is otherwise dark, it should be permitted to carry full channel data transmission, using all 525 lines, not just a few VBI signals.

This will, inevitably, lead to questions about whether a cable system should carry special services which are revenue-generators for broadcasters. Predictably, NCTA and others argue against such retransmission of data.

Sensing a problem at the national level, broadcasters seem willing to take the battle down to the local arena—aiming particularly at franchising authorities. In short, broadcasters may be ready to twist local arms in order to force cable operators to retransmit data services which are carried aboard TV channels.

The first shot has been fired in Buffalo, N.Y., where WIVB-TV is launching ExtraVision teletext service this summer, including some of its own material along with CBS network teletext data. As part of its effort to introduce teletext, WIVB is seeking approval from the local city council to modify its cable TV ordinance.

Leslie Arries Jr., station president, hopes to convince local authorities



AT&T Frame Creation System Series 700

that teletext should be a must-carry requirement. According to CBS officials, the same tactic is being used by affiliates in other markets such as Jacksonville, Fla., and Charleston, S.C., trying to establish teletext must-carry rules on a market-by-market basis even though the FCC has ruled that cable systems don't have to retransmit the signal.

Such an approach could be taken as other data services are introduced by broadcasters. Although it's uncertain how city councils will respond to such pleas—or whether they have the power to require cable systems to retransmit ancillary services such as VBI data—the threat is significant. Cable's tenuous relationship with city officials these days could make the situation even tougher, raising the prospect that franchising agencies will listen seriously to broadcasters' pleas.

Still waiting for videotex

"Do it through software."

It's a snappy, and familiar, phrase in the booming computer business—and nowhere will the concept be more welcome than in the videotex business. Suddenly there are nearly two dozen microcomputer software packages which make personal computers emulate a videotex terminal. There is software for Commodore 64s, IBM PCs, DEC Pro-350s and Apple IIs. Prices range from about $100 to $250, although some of the software packages require that an additional board be inserted into the home computer. And, although most of the new software is geared to the North American Presentation Level Protocol Syntax (NAPLPS), there is software for Prestel format and other videotex systems.

This sudden infusion of software may be the long-awaited launching pad for videotex. Moreover, it underscores the growing importance of developing products which capitalize on the fast-expanding home computer business. It appears that cable-based services will learn a lesson from the fledgling videotex business in developing facilities to encourage the convergence of technologies.

In the case of videotex, the new software boomlet is most welcome. Despite valiant efforts, hardware designers are still unable to break the price barrier for dedicated NAPLPS terminals. AT&T's pioneering Sceptre terminal is still selling in the $600 to $900 range, and it is believed that AT&T spends well over that to build each unit. At the recent Videotex '84 conference, Panasonic and Norpak promised year-end delivery of NAPLPS terminals in the $500 to $600 range. To many observers, however, these devices are still too costly. The target price still being sought is in the $200 category.

Enter the low-priced software packages. To be sure, they require that a customer already has a personal computer. Indeed, the cheapest entry system is in the $700 range after a

customer buys (at discount prices!!) a home computer, modem, disc drive, monitor, communications and videotex software.

For higher-grade configurations (such as the IBM PC), the investment quickly rises above $3,000. But for that set-up the customer has a full functioning home computer set-up, not just a dedicated, single-purpose videotex terminal. Indeed, the add-on peripherals (modem particularly) play a small incremental role. That's why the videotex experts are so encouraged about the arrival of the new software which could open large new markets for their business.

Few if any of these software packages implement the full NAPLPS Service Reference Model as endorsed late last year by the American National Standards Institute. That causes concern among videotex system operators, who fret that advertisers and other service providers will be unhappy if they design a logo or illustration, only to find out that a home computer with software does not accurately reproduce the shape or color of the intended image. Since most of the software packages are restricted to the color boards of the PCs, this could become a real problem.

But for the time being, videotex operators seem ecstatic about the new market which is opening for them. At the Videotex conference, for example, executives from Viewtron were gushing that their material was being accessed through a variety of devices, not just the AT&T Sceptre videotex terminals which have been available since October.

Significantly, most of the NAPLPS software packages have been developed by Canadian companies, reflecting that country's final push to encourage and underwrite efforts by firms there in the videotex business. Among the Canadian companies which have developed NAPLPS-type software are Avcor, Ashdune and Manitoba Telephone Co. (all three have software for the Commodore 64), Norpak, Formic and Ashdune (which offer Apple software), and Microtaure, MicroStar, Micro Pixel, FBN Software and Microtel (all for IBM PCs). Nonetheless, there is growing interest among U.S. firms in developing software, especially for the IBM models: IBM itself unveiled a $250 software package for the PC and PCjr; Wolfdata and Home Vue Hawaii also have similarly priced NAPLPS software for IBM devices.

Meanwhile, Videotex Systems in Dallas is offering a $199 "PC-Prestel" software package which enables the IBM PC and PCjr to emulate a Prestel terminal. Other programs are certainly being written.

One looming question is whether this trend will continue as videotex and interactive services expand into the cable TV business. With companies like NABU and Jerrold developing proprietary terminals, what will happen if software becomes available allowing customers to use their won PCs to reach into the cable-based services?

On the one hand, that could be a desirable situation for system operators, offering the opportunity to attract more users without having to sell or support the cost of dedicated terminals. Conversely, if the system's revenue stream is supposed to include fees from use of terminals, this drive toward compatible software could shoot holes in business plans.

Second level of suppliers

The nascent videotex industry also is seeing the emergence of a second layer of industry participants—support and specialty suppliers who are vital to the livelihood of this business. In particular, packagers of data bases and graphic material are surfacing.

For example, United Media—which syndicates everything from comic strips to TV program guides to feature stories for newspapers—has set up an electronic publishing subsidiary to offer, repackaged products to videotex system operators.

In a similar vein, companies such as Voltex have been set up to manage frame creation and advertising services for would-be videotex companies. And there are a slew of new devices aimed at making videotex data base creation easier. For example, Sony—which has been active in videotex decoder development—is now pushing to introduce headend equipment, notably a new FCX-1000 Frame Creation unit, which digitizes photographic images into NAPLPS format.

Zenith ZTX-11 videotex terminal

The Sony device, due out next year, is similar to AT&T's latest Frame Creation System, Model FCS 700, which also allows a photo to be digitized for NAPLPS display. Such systems, in addition to encouraging faster, easier videotex design and production, open the prospect for "true" video service, rather than the geometric computer graphics which have been perceived as a stumbling block in videotex development.

Other developments

■ Group W Cable is launching a June field trial of "Request Teletext," a full-channel service at its Buena Park, Calif., system, using World System Teletext format and Zenith addressable cable/teletext decoders/converters. "Request" is being packaged as a premium service, although Group W plans no extensive editorial operations of its own. Most material is being fed directly into the system by outside information and service providers.

■ Videotex and teletext services are available in more than two dozen nations worldwide, according to a survey by *International Videotex Teletext News*. By far, the most widely used system is the British-developed World System Format, although in a curious bit of techno-diplomacy, the NAPLPS format is finding its way into several European and Oceania nations. A free copy of the "Special Report on International Videotex and Teletext Developments" is available form IVTN, P.O. Box 40871, Washington DC 20016; phone: 301-656-7940.

■ "Radiographics" could be the next buzzword to surface as broadcasters figure out what to do with their newly won ancillary service opportunities. McMartin Industries is promoting a text-and-graphics delivery system using FM radio subcarriers. The developmental system, which can carry data at 4800 baud now (with expansion modules capable of 9600 baud and 19,200 baud later this year) is being promoted as a way for FM radio stations to move into the data delivery business.

Classifieds

EMPLOYMENT OPPORTUNITIES/HELP WANTED

"Leader in the Placement of Cable Television Professionals"
Call Toll Free 1-800-433-2160

CABLE TV
TECHNICAL AND EXECUTIVE SEARCH

FEES PAID

CONFIDENTIAL & PROFESSIONAL

MARKETING MANAGER—One-half of systems are new build in this Midwest region. Degree plus 3 or more years experience required. $30s.
REGIONAL SALES MANAGER—Degree plus 2 or more years experience for this Southwest state system. $25K plus bonus.
SALES MANAGER—Take complete charge of all sales operation for this Ohio valley state. $28K plus bonus.
CHIEF TECHNICIAN—Supervise 5 employees and be responsible for all proof and outside system maintenance in this 150 mile Virginia system. $25K.
MAINTENANCE SUPERVISOR—Supervise 10 employees in this Georgia system. $26K.
LEAD TECHNICIAN—Must be able to perform proof test and do turn-on for this Louisiana system. $20K.
NATIONAL SALES MANAGER—Responsible for recruiting sales representatives for 7 state system. Strong sales background and door-to-door cable sales and strong supervisory background. N.E. location. $25K.
SYSTEM SALES MANAGER—Need to oversee marketing and sales in this Southern location. 3 years experience in telemarketing, radio advertising, direct mail and writing of copy. $27K.
CHIEF TECHNICIAN—BS degree with power supply maint. exp. needs strong administrative and organizational skills and must be detail-oriented. Mid-south locale, $23K plus car.
CHIEF ENGINEER—5 plus yrs. exp. plus ability to supervise 30 plus employees in this N.E. 40,000 subscriber system. $42K.
REGIONAL MANAGER—Take charge of all technical responsibilities for a West Coast, 45,000 subscriber system. $35K.
FIELD ENGINEER—Assist Chief Tech and be in charge of proof for two great states. $25K plus.
CHIEF ENGINEER—Manage technical end of the 100,000 subscriber New England system. $37K.
TECHNICAL MANAGER—This 700 mile new-build needs your management skills for this upper Midwest system. $36K.
DIRECTOR OF ENGINEERING—This large Southern system is in need of a degreed engineer to head up all technical activation for this two-way, 2,000 miles of plant. $40s.
OPERATIONS MANAGER—Lots of construction going on in this 1,000 mile southern system. 5 plus years of experience required. $30s plus.
CHIEF ENGINEER—Degree plus 3 or more years of experience for this 50,000 subscriber, 40 MHz system. $38-44K.
FIBEROPTICS DESIGN ENGINEER—One plus years of exp. plus BSEE required for this N.E. engineering center. $38K.
ATTENTION TECHNICIANS—Call us for your location preference. We have lots of clients who need your skills.

JIM YOUNG & ASSOCIATES, INC.
ONE YOUNG PLAZA, 1235 RANGER HIGHWAY, WEATHERFORD, TX 76086
Call for information about these and our many other opportunities nationwide.
TOLL FREE #1-800-433-2160. IN TEXAS ONLY CALL (817) 599-7623

Call Suzanne Sparrow Today For information on Classified Advertising (303) 295-0900

CABLE TV SYSTEM LEAD TECHNICIAN

With 2-5 years of field experience. Dual 400 state-of-the-art plant, suburban Washington, D.C. Reply to:

Box: CED 0684-1
EEO M/F

Place a classified ad in CABLEVISION and CED. Call or write P.O. Box 5727 T. A., Denver, Colorado 80217 (303) 295-0900

ENGINEERING • MANAGEMENT TECHNICIANS • MARKETING • SALES
(MSO or Equipment)

CAREER MARKETING ASSOCIATES

ROBIN SQUIRES
Cable Television Specialist
7100 East Belleview, Suite 206
Englewood, CO 80111
(303) 779-8890

EXPERIENCED CABLE TELEVISION TECHNICIANS

New England multiple System Operator is seeking line technician with 3-5 years' experience. Complete knowledge of system sweep procedures required. Opportunities available in several east coast locations. Excellent salary and benefit plan. Promotional opportunities. Send resume to:

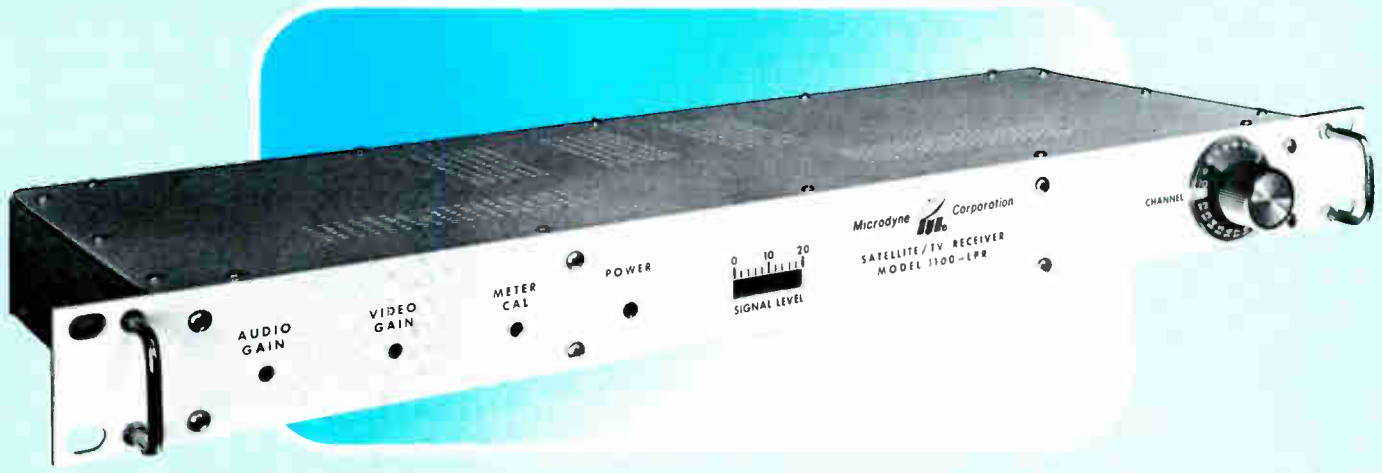
William Riley
American Cablesystems Corp.
79 Parkingway
Quincy, MA 02169
Phone: (617) 472-1231

CABLE SEARCH ASSOCIATES
Professional Search and Placement

Engineering	Sales
Management	Marketing
Technicians	Construction

Call or Write
WICK KIRBY
(312) 369-2620
Telex: 720-462
P.O. Box 2347, Naperville, IL 60565

Advertisers Index



Microdyne's New, Lower Priced TVRO Receiver — the LPR

Answer These Six Questions Before You Buy Your Next TVRO Receiver

1. How Good Is the Picture?

Make comparisons. Ask your distributor to set up a side-by-side or A-B comparison test (switching from one receiver to another). Often you can see the difference in picture quality. And if *you* can see the difference, so can your subscribers.

2. How Long Will It Last?

Most TVRO equipment has to run all day, every day, year after year. Marginal receivers that are poorly designed or cheaply made will end up costing you money, and subscribers.

Microdyne takes no short cuts in the design, manufacture or testing of its products. Our equipment is extremely reliable. Typical Mean Time Between Failure rates for our TVRO receivers are in excess of 80,000 hours.

That's over 9 years.

That doesn't mean that every receiver we make will run that long without failure, but it indicates the average expected rate of failure, and that's important.

3. Can I Get It Serviced?

No matter how much care has gone into the design and manufacture of electronic equipment, failures do occur. So, we offer a 48-hour repair policy. If your receiver is in warranty, we fix it free within 48 hours. If we can't fix it, we replace it. If the unit is out of warranty, we provide the same service, for a nominal flat rate which we quote *before* you send in the unit.

4. How About Delivery?

We have nine nation-wide factory authorized distributors who routinely stock our equipment, so it's a pretty good bet that you'll be able to get just what you want, when you want it. And our distributors are selected on the basis of their experience, knowledge and willingness to provide the support you need.

5. How Reliable Is the Company?

You have already seen several big, established companies abandon the TVRO market. But not Microdyne. We have been involved in satellite communications since it all began, and we are here to stay. TVRO isn't a sideline for us; it's our business.

6. What Else Can the Company Do For Me?

Right now you may only need a receiver. But some day you will need a lot more, and a lot more *is* what Microdyne can deliver. We make a full range of antennas, downconverters, modulators, demodulators, and related TVRO equipment.

And our Customer Support covers all the bases: site surveys, turnkey transmitting and receiving system installations, customer training, program management of network systems, on-site service, and a 24-hour toll-free phone number for emergency engineering support.

By now you may have one more question — Where is my nearest Microdyne Distributor? For the answer, call our Marketing Department at (904) 687-4633. We'll also send you our new TVRO Systems brochure, free.

See us at the NCTA Booth #1001

Reader Service Number 40

Microdyne Corporation

P.O. Box 7213 • Ocala, FL 32672 • (904) 687-4633 • TWX: 810-858-0307

COME BY OUR BOOTH AT THE NCTA CONVENTION AND:

WIN AN IBM PCjr

- Drawing will be held June 6th, 11:00 AM at the NCTA Convention.
- Pick up entry blank at Booth #830 at the NCTA Convention or send us your entry if you cannot attend.
- Need not be present to win.

NEW PRODUCTS TO BE INTRODUCED AT THE NCTA CONVENTION:

1) **TUNABLE TV DEMODULATOR** — model IFDM utilizes a product detector for envelope and synchronous detection.

2) **AUDIO SUBCARRIER DEMODULATOR** — the model SCDM-45 is a fixed 4.5 MHz audio carrier demodulator and video processor that can be used to produce superior baseband audio and video signals from a composite video signal.

   The model SCDM is a tunable subcarrier demodulator that demodulates carriers from 4.5 to 6.8 MHz.

3) **REMOTE HEADEND CONTROLLER** — the model RHC-1000 is a microprocessor based controller that can control and monitor headend switching functions. The RHC-1000 is tied to any central based computer via an RS-232 part.

4) **FM TRANSMITTER / RECEIVER** — Model FMVT-4000 and the model FMVR-4000 together form an FM video system.

5) **IF/RF SWITCH SYSTEM** — Model RFS-100 and IFS-100 are high isolation switches available in 2, 4, 6, or 8 switch configurations.

Reader Service Number 41

Synchronous COMMUNICATIONS, INC.

1701 FORTUNE DR. • SAN JOSE, CA 95131 • (408) 262-0541

People

Michael Seeger has been promoted to vice president, operations and production services for Showtime/The Movie Channel. Seeger, who previously served as director of operations and production, now will oversee the company's production services and network operations departments and will be responsible for the execution of the broadcast schedule.

Robert (Mike) Baker has been appointed account executive for the Jerrold Division of General Instrument Corp. He will be responsible for Jerrold accounts in the Pacific Northwest, including Washington, Oregon, Idaho and Alaska.

Dr. Robert Kahrmann Jr., has been elected manager of satellite and seminar continuing education at The Institute of Electrical and Electronics Engineers Inc. In this position, Kahrmann will be responsible for developing packaged courses for IEEE institutions and private companies and for IEEE video conferences, including the June 12 satellite course on "Personal Computer Software—An Aid to Improved Professional Productivity."

Gill Management Services Inc. has appointed **Bobby Morrison** manager of new products/sales. Morrison's first assignment will be to generate marketing acceptance of GMS's new micro business computer products and ensure their successful integration into the company's Business III on-line system product line.

S. Crook

J. Rocci

AM Cable TV Industries Inc. has appointed **Stephen Crook** senior project engineer and **Joseph Rocci** manager of product development for the company's E-Com Products Division. In his new position, Crook will be in charge of project planning and coordination. Rocci's first responsibility will be completion of the development of the Tier Guard product line.

K. Barber

M. Davis

Belden Cord Products has appointed **David Anderson, Keith Barber** and **Melody Davis** field sales representatives. Anderson will be based near San Francisco and will service the central and northern California regions. Barber will cover Minnesota, western Wisconsin, North Dakota and South Dakota. Davis, who will operate out of Cincinnati, will handle Kentucky, southern Ohio and West Virginia.

Dan Cornett has become vice president of marketing for Byers Communications Inc. He will head the firm's worldwide sales and marketing efforts.

Dr. Mark Greene has been named manager, marketing research information systems of Satellite Television Corp. Before joining STC, Greene was manager of QUBE Research for Warner Amex Cable Communications. At STC, Greene will develop information systems for marketing, research and programming and will coordinate information exchange between these three divisions and STC's billing systems.

William Tolley has become the director of legislative affairs for Harris Corp. Tooley, who joined Harris in 1956, will coordinate the company's legislative and political action activities.

Wendall Starr of Raychem Corp., Menlo Park, Calif., will receive the Thomas Dakin Award, the highest honor for technical achievement, from the Electrical Insulation Society of the Institute of Electrical and Electronic Engineers. The award recognizes Starr's major role in Raychem Corp.'s development of high-voltage cable accessories and his contributions to industry societies and publications.

Everett Hirsh has been appointed vice president, CATV-West for Anixter Communications. Hirsh will be based out of Anixter's Walnut Creek, Calif., offices and will direct cable sales in Arizona, California, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Washington and Utah.

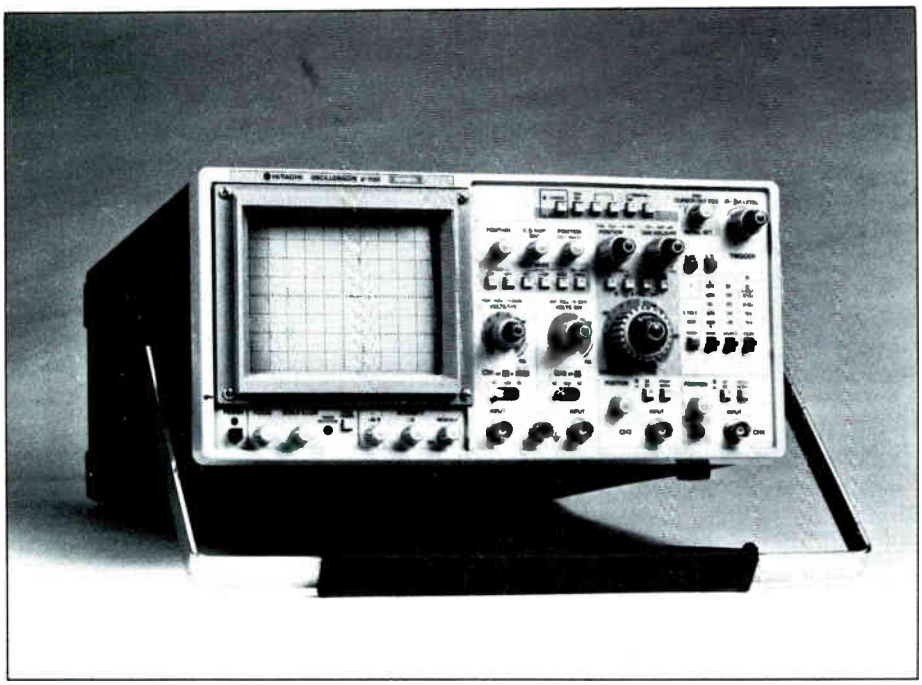
The SCTE's Member of the Year for 1983, **John Kurpinski**, has joined Cable Services Co. Inc. In his new post, Kurpinski will serve in domestic and international turnkey sales.

Matthew Miller has been elected director of science and technology for Viacom International Inc. Miller will assist the vice president of science and technology. He also will be involved in the development of new communications technologies.

William Holmes has been named chief engineer of Hi-Ranger Inc., a manufacturer of truck-mounted aerial lifts and other construction equipment. Holmes will oversee new product design and will coordinate research, development and production efforts for the company.

Lee Lindbloom has been named marketing and program production specialist for SatServ. His responsibilities will cover marketing the Denver satellite access facility and transportable earth station, overseeing transmission and distribution services for program producers and syndicators, video production consulting and managing production aspects of SatServ's videoteleconferences.

Ricardo Diaz has joined Harris Corp. as vice president, manufacturing programs. Diaz will be responsible for improving Harris' national and international operations.



Hitachi Denshi V-1100 oscilloscope

continued from page 62

released by Hitachi Denshi America Ltd. This scope, the V-1100, features a CRT readout that displays frequency counter, DVM functions and constant ground level display. Built-in microprocessor circuits permit the display of measurements of voltage value between ground level and reference cursor or two cursors and the time difference between the two points. The microprocessor circuits then determine the panel settings on the CRT screen. Other features include "quad" channel—channel 1,2,3 and 4—with independent position controls; eight trace with alternate sweep; 18 kV-6 inch rectangular CRT; minimum deflection factor of 1 mv/div.; maximum sweep time of 2 ns/div.; TV-sync, X-Y operation up to 1 MHz; variable hold-off; gate output for A and B sweep; and Channel 1 signal output to 100 MHz (-3dB).

For more information, contact Hitachi Denshi America Ltd., 175 Crossways Park West, Woodbury, N.Y. 11797, (516) 921-7200.

EMI software

An EMI measurement software program that can be used with HP 8566A/B and 8568A/B spectrum analyzers has been introduced by Hewlett-Packard. This BASIC program, which operates with the HP 9000 model 226 and 236 desktop computers, leads the user through conducted and radiated emissions tests. No prior programming knowledge and only a minimum knowledge of spectrum analyzer operation is needed. The program's standard library consists of FCC, European and military measurements.

The program, called the HP 85864A, costs $3,020 and is available on two 5¼-inch diskettes.

For more information, contact Hewlett-Packard, 3000 Hanover St., Palo Alto, Calif. 94340, (415) 857-2420.

Wiltron sweep generator, brochure

Wiltron has introduced a programmable sweep generator, the 6669A, and an automated scalar network analyzer system brochure.

The Wiltron 6669A sweep generator

The Wiltron 6669A programmable sweep

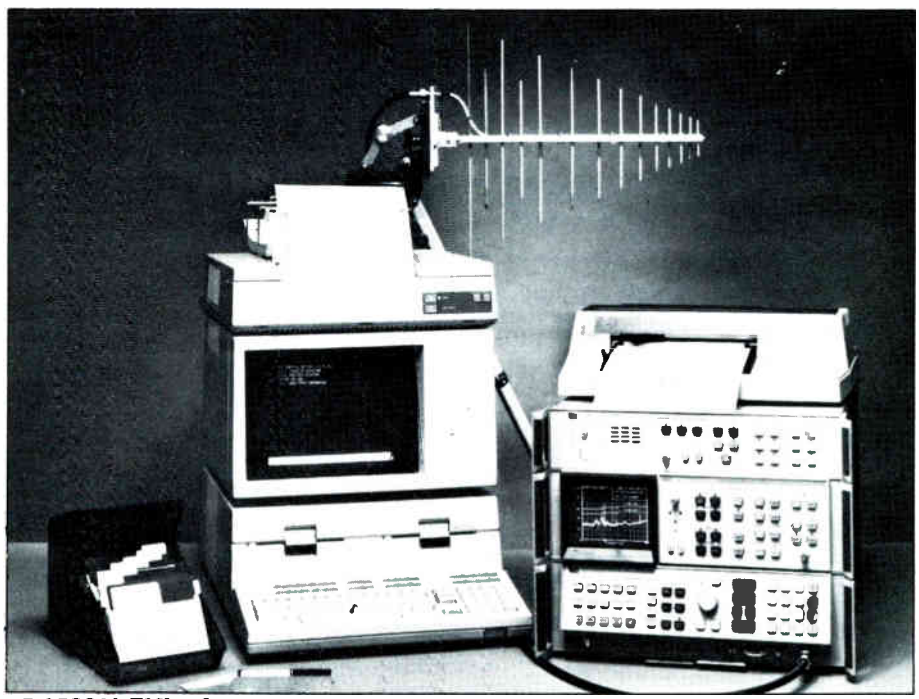
provides an internally leveled 10 MHz-40 GHz sweep from a single coaxial connector. It is fully IEEE-488 programmable, has a frequency accuracy of ±20 MHz and can attentuate spurious signals to greater than 40 dBc below 2 GHz and 60 dBc above 2 GHz. System components include a 10 MHz-40 GHz PIN switch, a 2-40 GHz leveling coupler and a 2.92 mm connector.

Wiltron's scalar network analyzer system brochure includes a description of the company's new model 5669.

For more information, contact Wiltron Co., 805 East Middlefield Rd., P.O. Box 7290, Mountain View, Calif. 94042-7290, (415) 969-6500.

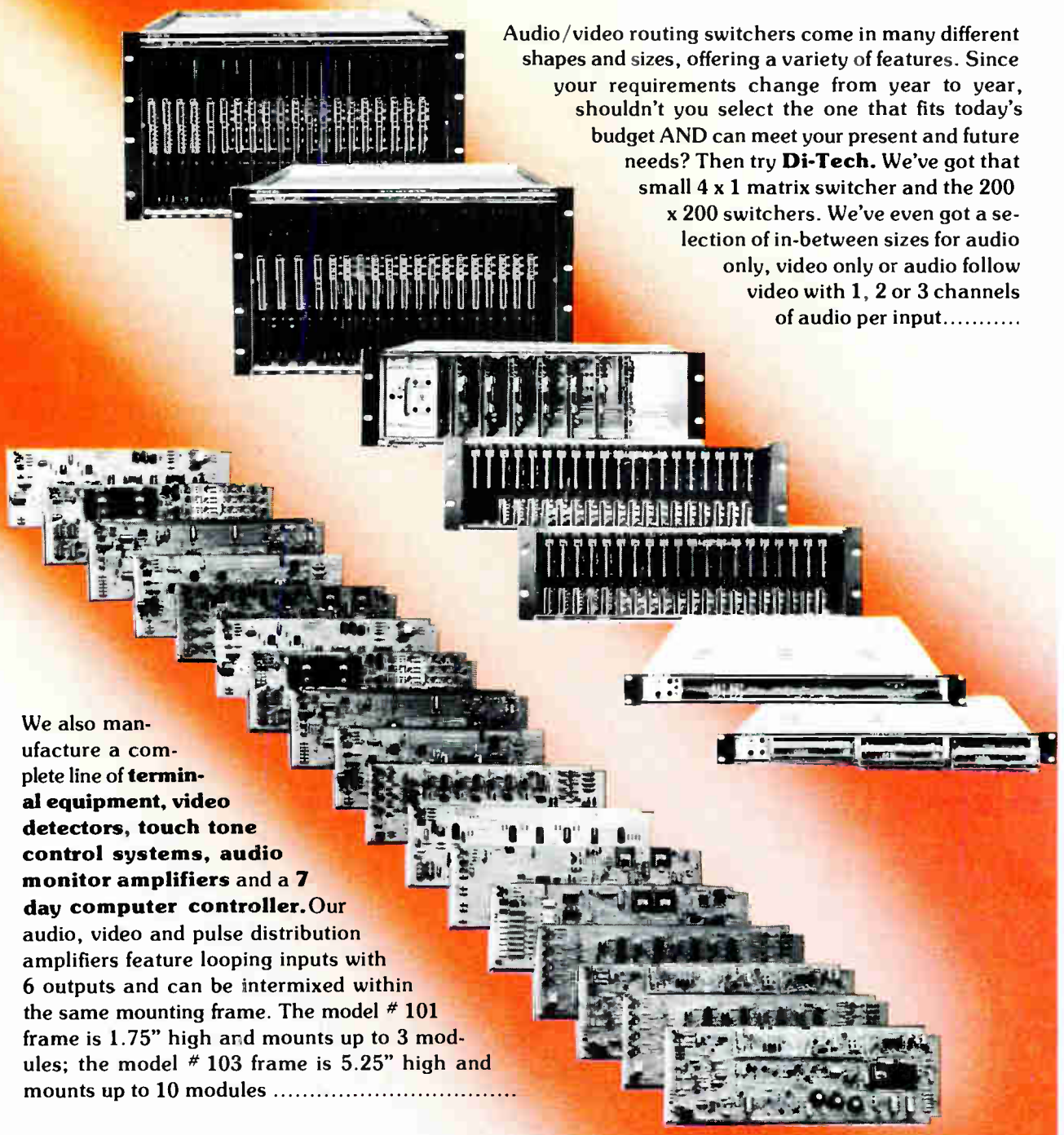
Network analyzer for testing

A network analyzer is being offered by Hewlett-Packard. This analyzer, the 3577A, can perform network analyses for bench use or automatic testing. Measurements can be made over the system's 100 dB dynamic range with 0.02 dB and 0.2 degree dynamic accuracy. In the 1 Hz resolution bandwidth, critical low-level measurements can be taken with -130 dBm sensitivity. The system



HP 85864A EMI software

Imagine The Features That Will Answer Your Present And Future Needs ... Then Call **Di-Tech**



Audio/video routing switchers come in many different shapes and sizes, offering a variety of features. Since your requirements change from year to year, shouldn't you select the one that fits today's budget AND can meet your present and future needs? Then try **Di-Tech.** We've got that small 4 x 1 matrix switcher and the 200 x 200 switchers. We've even got a selection of in-between sizes for audio only, video only or audio follow video with 1, 2 or 3 channels of audio per input.....

We also manufacture a complete line of **terminal equipment, video detectors, touch tone control systems, audio monitor amplifiers** and a **7 day computer controller.** Our audio, video and pulse distribution amplifiers feature looping inputs with 6 outputs and can be intermixed within the same mounting frame. The model # 101 frame is 1.75" high and mounts up to 3 modules; the model # 103 frame is 5.25" high and mounts up to 10 modules .....

Whatever your present or future needs are, call **Di-Tech** for the high quality, reliable, easy-to-operate answer.

di-tech

our NEW, bigger location:
48 JEFRYN BOULEVARD
DEER PARK, N.Y. 11729
TEL. # (516) 667-6300
Reader Service Number 46

An old line company... in a new line of business!

Poleline Corporation is the newest member of the RMS Electronics family. RMS Electronics, Inc. has been in operation for over 35 years.

PRODUCTS MANUFACTURED for various divisions of RMS Electronics, Inc. and available to the Cable Television Industry through **Poleline Corporation** include:

Poleline Hardware

■ Thimble eye bolts ■ Machine bolts ■ Suspension clamps ■ Support strand ■ Lashing wire ■ Tap and amplifier brackets ■ Lashing clamps ■ Crossover clamps ■ Guy-grip Dead-ends ■ False Dead-ends ■ and more.

Cable TV Products

■ Moulding Duct ■ Non-Power Passing "Raceway" Splitters and Directional Couplers ■ Apartment Amplifiers ■ Antenna/Cable TV Switches ■ Feed-thru Bushings ■ Ancillary Hardware ■ and more.

Poleline Corporation also distributes products such as:

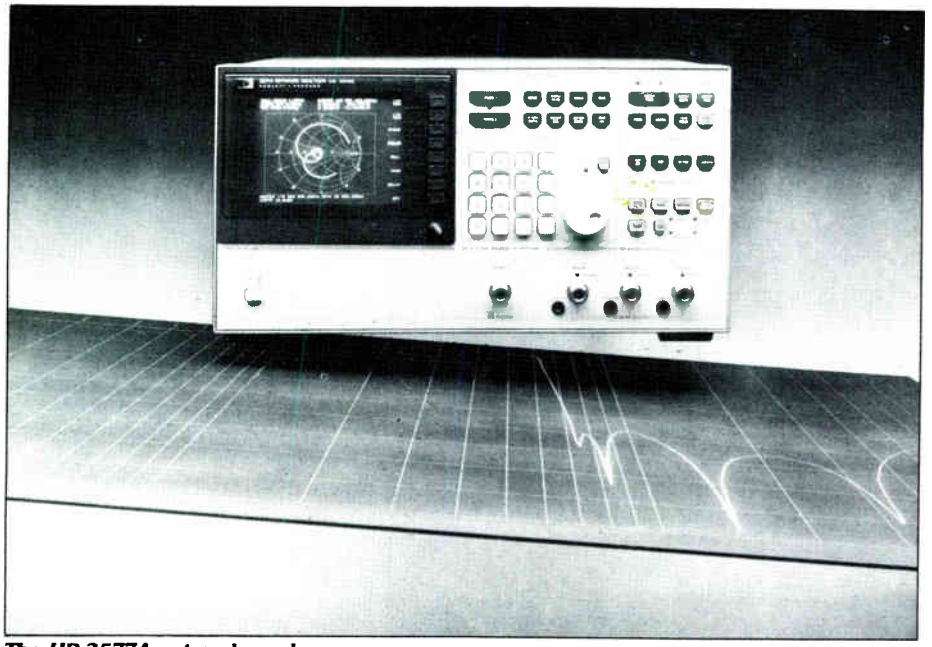
■ Heat Shrink Tubing ■ Moulding Duct ■ Prewire Apartment House Boxes ■ Cable ■ Lashing Machines ■ Pedestals ■ Test and Measuring Equipment ■ Ground Rods ■ Marker Tags ■ Tools ■ Silicone Grease ■ Ladders ■ Safety Equipment ■ Ancillary Hardware ■ and more.

Poleline Corp.

Subsidiary of RMS Electronics, Inc.

EASTERN OPERATIONS:
20 Antin Place, Bronx, N.Y. 10462
TOLL FREE (800) 221-8857
(Continental U.S.A., Puerto Rico, U.S. Virgin Is.)
Call Collect (212) 829-1070 (N.Y. State Only)

WESTERN OPERATIONS:
2901 W. Garry Ave., Santa Ana, California 92704
Telephone (714) 662-1041
TOLL FREE (800) 624-2511 (Continental U.S.A., Puerto Rico, U.S. Virgin Is., Alaska and Hawaii)
In California (800) 247-8435



The HP 3577A network analyzer

features analog design, digital-signal processing and microprocessor control with extensive internal firmware. The HP 3577A is comprised of an integrated three-input receiver, graphics display and synthesized source components, an autoscale, multiple display formats and direct digital plots to an HP graphics plotter.

For more information, contact Hewlett-Packard, 3000 Hanover St., Palo Alto, Calif. 94304, (415) 857-2420.

New system isolates faults quickly

A computer aided fault isolation system for bare printed circuit board repair has been unveiled by Augat/ES.P. The system, called 8501 CAFIS, incorporates user-friendly software and isolates faults quickly. A graphic representation of a fault is projected directly onto the system, which relieves the operator from having to refer back to a wiring diagram during fault location. The 8501 CAFIS also isolates both continuity and short failures on both sides of a two sided PC board, identifies the break in a PC trace and helps determine the location of a short between two networks.

The system can be programmed via a standard GERBER plotter tape or can be "digitized" directly by the operator himself.

For more information, contact Augat Inc. Electronic Systems & Programming Inc., 12832 Chardon Ave., Hawthorn, Calif. 90250, (213) 973-0262.

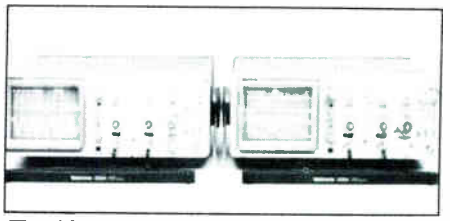
Tektronix oscilloscopes

Tektronix's 60 MHz 2213 and 2215 portable oscilloscopes have been upgraded to incorporate more than 25 feature and specification enhancements. CRT brightness on both A versions has been improved by 40 percent. Vertical accuracy is specified over a wider temperature range. Sweep accuracy (in 10X) has been increased from 5 percent to 4 percent, over a wider temperature. Trigger sensitivity has been improved in both internal and external A trigger and in the B trigger on the 2215A as well.

The 2215A standard features now are a 10 MHz bandwidth limit switch, a single sweep mode and power-on light and separate A/B dual intensity controls.

The 2215A weighs 13.5 lbs., and the 2213A, 12.8 lbs.

For more information, contact Tektronix Inc., P.O. Box 500, Beaverton, Ore. 97077, (503) 623-8461.



The 2213A Tektronix oscilloscope, The 2215A Tektronix oscilloscope

Construction

Adams Equipment swivel sheave

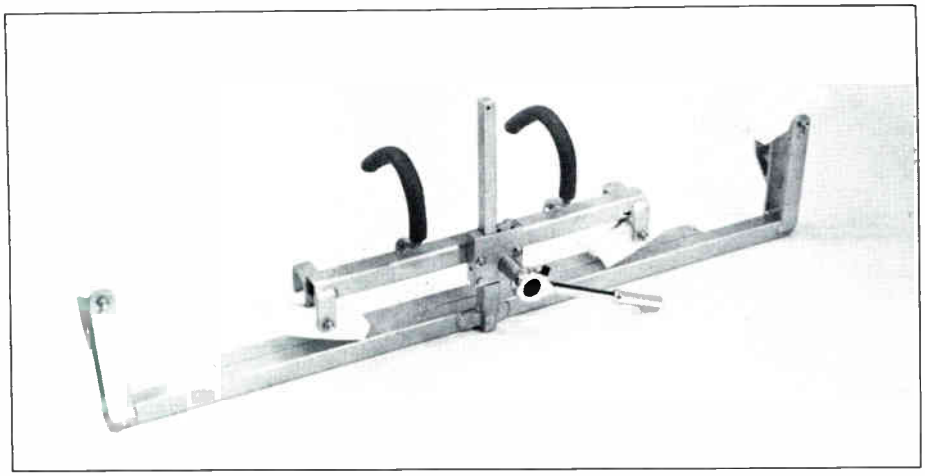
A universal swivel sheave that permits users to pull wire rope from any angle is being offered by Adams Equipment Inc. This swivel sheave, the UV-20, can be mounted on a vehicle tailshelf through the use of two handle-type bolts and can withstand line pulls to 20,000 lbs. Wire rope up to ⅝ of an inch in diameter can be accommodated.

For more information, contact Adams Equipment Inc., 325 Andrews Rd., Trevose, Pa. 19047.

Bending tool forms identical loops

A new mechanical cable bending tool for CATV construction has been developed by Jackson Tool Systems division of Jackson Enterprises. This tool, the double one-inch bender, number

Augat/ESP 8501 CAFIS system



Jackson Tool double one-inch bender

2084, forms two identical flat-bottom expansion loops as the cables are pulled over low-friction teflon surfaces. For use in aerial construction, this bender can work with coaxial cable up to and including jacketed one-inch.

For more information, contact Jackson Enterprises, P.O. Box 6, Clayton, Ohio 45315, (513) 836-2641.

Pedestals from Channel Commercial

Two new low profile above-grade pedestals from Channel Commercial Corp. resist corrosion and can withstand extreme temperatures. These pedestals, the CPH-1730 and DCPH-1730, extend 17 inches above the ground, have rounded corners and are available in light green or beige. The CPH-1730 is designed to house a trunk amplifier and the DCPH-1730, to protect a dual line extender, tap and splitter combination. Both come with ground skirts for storage, security locks and hot-dipped galvanized metal strand brackets.

For more information, contact Channel Commercial Corp., 620 W. Foothill Blvd., Glendora, Calif. 91740, (818) 963-1694.

Specification kit

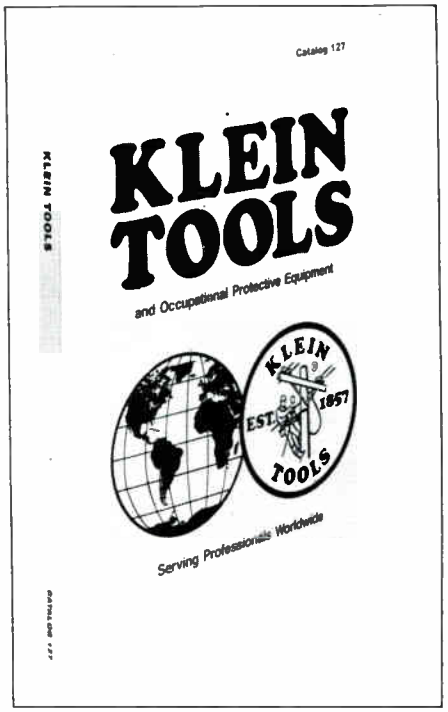
A specification kit for installation of PVC conduit and duct for CATV systems is being offered by Carlon, Electrical Sciences Inc. The kit contains standard specification C.I.S. 1182, an industry standard for underground duct installation and protection; an information bulletin and other Carlon cable TV products literature.

For more information, contact Carlon, Advertising Dept., 25701 Science Park Drive, Cleveland, Ohio 44122.

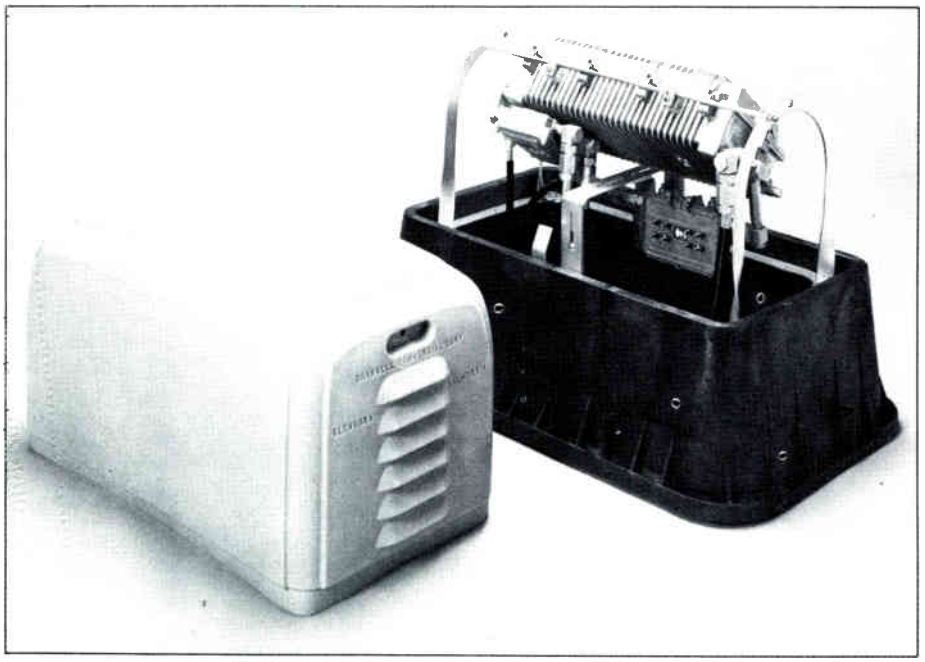
Klein expands catalog

Klein Tools has expanded its catalog of hand tools and occupational protective equipment. This 192-page catalog contains a section on general purpose items. It also covers specialized tools and protective equipment. Product descriptions, specifications, application information and catalog numbers are included.

For more information, contact Klein Tools, 7200 McCormick Blvd., Chicago, Ill. 60645, (312) 677-950.



Klein Tools' new catalog



Channel CPH-1730, DCPH-1730 pedestals

Fiberoptic capstan

A new capstan that eliminates the need for a special fiberoptic winch in fiberoptic cable placement has been unveiled by Adams Equipment Inc. The capstan, model FOC-1, limits the pulling torque of existing winches to meet fiberoptic cable placement requirements. This allows other winches than fiberoptic types to be used for fiberoptic placement. The FOC-1 features a torque limiter range of 100-800 lbs. and is factory-set and wire-locked at 600 lbs. of pull.

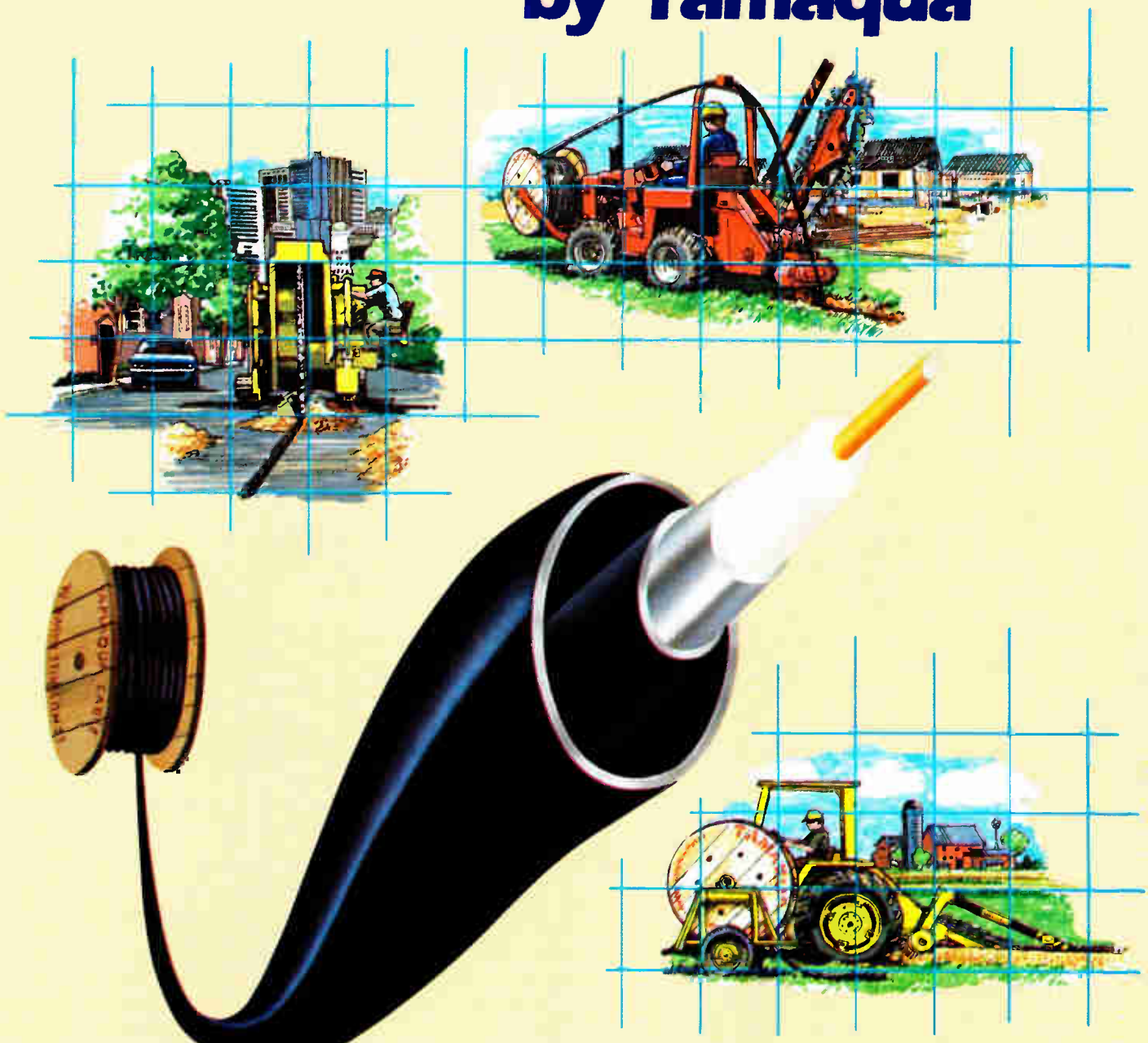
For more information, contact Adams Equipment Inc., 325 Andrews Rd., Trevose, Pa. 19047.

Cable tie kit available

A new cable tie kit for laboratory and maintenance use has been unveiled by Panduit Corp. This kit, called KP-506, contains 300 PAN-TY cable ties, 50 cable tie mounts, and an installation tool, contained in a compartmentalized polypropelene box. The kit measures 10¾ x 7⅛ x 1⅝ inches high.

For more information, contact Pan-

COMM-DUCT™
by Tamaqua



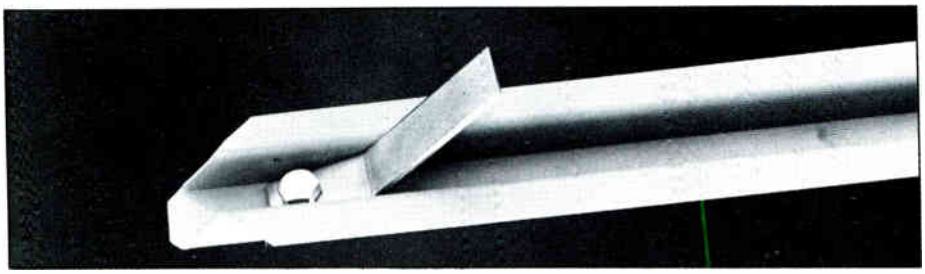
Comm-duct is an innovative installation concept. Virtually any configuration of coax, fiber-optic or telephone cable can be supplied by Tamaqua to the installation site in a flexible polyethelene duct system ranging in nominal pipe sizes from 0.5 to 4.0 inches. Tamaqua warrants the entire system, duct and component cable.

Comm-duct is superior to rigid conduit systems because it can be plowed-in avoiding trenching, select backfill, tamping and re-seeding. Where trenching or concrete cutting is required, trench or cut widths can be greatly reduced since working space for system assembly is not required.

Comm-duct used in conjunction with the appropriate installation practices has proven installed cost savings of 25% to 40% over other conduit systems without giving up the advantages of extended cable life or the ability to replace or add cables without disturbing underground plant.

Reader Service Number 48

TAMAQUA
CABLE PRODUCTS CORP.
P.O. Box 347
Schuylkill Haven, PA 17972 (717) 385-4381
Represented by:
Gary R. Zuk/Bruce W. Rawlings
ZR Concepts
P.O. Box 135
Riverton, N.J. 08077
609-786-0270/or -0053



CWY Electronics SL stake lock

duit Corp., 17301 Ridgeland Ave., Tinley Park, Ill. 60477-0981, (312) 532-1800.

Stake lock device

CWY Electronics has designed a device, the model SL stake lock, that impedes pedestal stake removal. The lock uses an arrowhead design, fits all CWY pedestal stakes and some other brands, and is plated for durability.

For more information, contact CWY Electronics, P.O. Box 4519, Lafayette, Ind. 47903, (800) 428-7596.

FEATURE

Smarter Computers

Machines can't think—at least not yet. But by 1990 they might, if computer scientists succeed in creating a "fifth-generation" computer imbued with artificial intelligence, or "AI" for short. Right now computers are powerful, extremely fast calculators. But scientists are at work on even more complex machines which simulate human thought processes.

Such a machine will see, understand spoken English, reason, make judgments, and learn from its own experience. Using data stored in its memory plus rules of logic patterned after human problem-solving skills, the AI machine will mimic human intellectual ability.

The first commercial applications for AI technology will probably emerge in three areas: computer-based consultants in specialized fields like medicine; information systems which understand ordinary spoken English and hence require no knowledge of programming; and artificial vision systems for industrial applications.

AI technology aims to create "expert systems" which sort through knowledge, apply decision-making rules based on experience, and then reach conclusions. The design of such an expert system is a laborious and time-consuming task.

AI researchers can spend months or years interviewing people with specialized knowledge, trying to determine how they solve problems. This process, known as "knowledge engineering," is more difficult than it may sound.

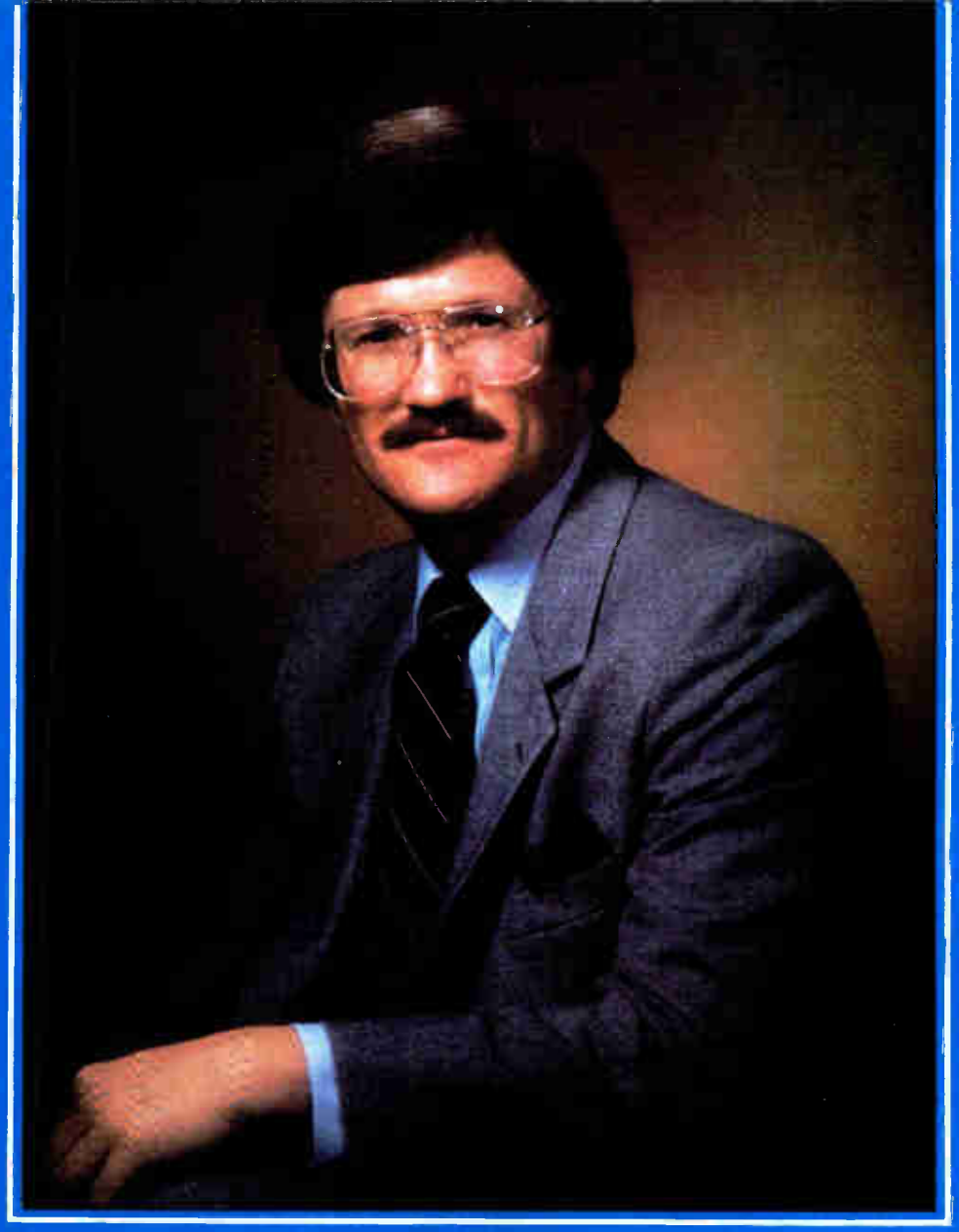
Humans are not always consistent, and computer decision-making rules must be consistent. People are rarely conscious of applying rules when they make decisions and may omit steps when explaining themselves to researchers.

But once a sufficient representation of the decision-making process has been developed, a computer programmer tries to design a set of rules representing each step the thinker follows in solving a problem.

A complex and detailed series of "if-then" rules results. For example: "If a patient has a runny nose and a fever, then the patient is likely to have a cold. If a patient has a cold, prescribe two aspirin and send her to bed."

More than 50 expert systems have been developed so far. One system, ONCASYN, helps doctors keep track of drug therapy treatments at Stanford University's cancer clinic. Another

continued on page 100



Richard N. Clevenger
Director of Engineering

Cox Cable Communications, Inc.
Atlanta, Georgia

"The telecommunications capability of our systems is clearly becoming a strategic resource—one in which technology advancements are fairly continuous and in which improvements on performance and price are unfolding both through manufacturing and application.
CED provides an important link in communicating these experiences, applications and new directions."

CED
The Right Stuff

Titsch Communications Inc.
P.O. Box 5727 T.A.
Denver, Colo 80217
303-295-0900

continued from page 96

system called MYCIN diagnoses blood diseases, while PUFF diagnoses lung problems.

At Digital Equipment Corp., XCON checks and corrects orders for computer equipment. At Machine Intelligence Corp. in Sunnyvale, Calif., an AI system helps a robot find tools scattered on a table.

AI systems work with ideas, not numbers, so the software is dramatically different from that common to traditional computer programs. Computers were originally designed to work wtih numbers. Hence the control programs were carefully structured sequences of mathematical steps carried out in a rigidly-defined sequence. An algorithm is a detailed, step-by-step recipe for how to do something.

But the types of problems encountered by AI systems cannot be squeezed into such tidy form. So expert systems manipulate their stored knowledge much as humans do—by sorting through what is known and then deciding on the proper sequence of steps to follow in solving the problem. The programmer provides the general guidelines for searching the knowledge, but no precise and predetermined set of steps.

This technique of using knowledge about a problem to suggest solutions is known as heuristic problem-solving. It's a trial-and-error method in which each success or failure is evaluated before the next step is tried.

When using a heuristic approach, the computer follows a general set of rules such as "break every problem down into smaller and easier problems;" or "use information about the problem to suggest and test possible solutions."

For example, given the symptoms of a sick patient, the AI program searches for rules which fit the known facts. This first search may produce an immediate diagnosis, but usually more information is requested. The computer evalution continues until a conclusion is reached.

Many rules and facts are part of the AI system's memory. The XCON computer equipment system, for example, uses 1500 rules and 500 product descriptions to determine possible "system configurations": combinations of compatible machines. Checking a typical order takes about two minutes, during which XCON runs through 1000 rules.

—Gary Kim

TECH II

continued from page 66

installation package; updates with the purchase of hardware, software or maintenance contracts; and telephone and field support. Software costs on a five-year plan range from 5 to 20 cents per sub unit.

Joyce Cable's in-house system can do sales reports and offers a "court package," which issues all legal documents including a court summons if the customer fails to pay. The system supports 12 terminals and has software that runs on the IBM System 34 and the Hewlett Packard 1000 CPU. Training is offered free of charge, but updates carry a fee. No other customer support services are provided.

KMP Computer Systems Inc.'s Cablestar system can compile statistical lists; provide a variety of invoice formats; maintain transaction histories; and sort the data base in any selected order. The in-house system utilizes IBM XT and Radio Shack single terminal hardware and Televideo multiterminal hardware. It is capable of supporting 16 terminals. Customer support includes training as part of a one-time installation package. A $45 per month software enhancement

DAVID WILLIS, Chief Engineer for Tele-Communications Inc.

"**CED** is the technical pulse of the industry . . . I like **CED**'s in-depth series, the technical information, new product information and charts. I use the charts, even have one here on the wall . . . We read **CED** from cover to cover!"

CED

The Right Stuff

Titsch Communications Inc.
P.O. Box 5727 T.A.
Denver, Colo 80217
303-295-0900

contract for a single system is also available. Software costs range from $2,500 to $7,500.

Logical Data Management's Subscriber Management System prepares over 100 reports including marketing, churn analysis and promotional analyses. The system also features inventory control; converter control; an on-line, real time data base; ad hoc data management inquiry; and multilevel service records. The distributive in-house systems utilize Burroughs large-system hardware. Customer support includes training as part of the installation package; monthly license fee charges included in the initial package; and telephone hotline and field support at additional cost. Software costs for larger systems range from $40,000 to $150,000.

Magnicom Systems' Marc-10 prepares approximately 200 reports, including sales, marketing, statistics, penetration, pay-to-basic, sales call card, performance analysis and detailed listings. The Marc-10 is a fully integrated, transaction based on-line, real time system, utilizing Digital Equipment Corp. hardware. Customer support includes training: enhancements at no additional cost; seminars; and toll-free telephone support. Software cost ranges from 15 to 20 cents per sub.

Parallex Corp.'s Parallex system prepares a variety of reports: subscriber life analysis, subscriber migration, pay saturation, accounting, installer/technician efficiency, penetration, management, marketing and billing. The in-house, on-line system utilizes IBM System 38 hardware. Customer support includes training as part of the initial package; free enhancement updates; and telephone and field support. Software cost ranges from 10 to 15 cents per sub.

Sun Software offers an in-house and distributed system with a very high level of security. The software, which runs on the Hewlett-Packard 3000 series can maintain any amount of history. Along with standard management reports, the system works with the "ad hoc report writer" and is capable of customized-reporting, issuing any report an operator programs. The system is subscriber- or account-based, assigning account numbers to a person rather than a customer's house. Training is provided for a monthly maintenance fee which includes any updates. Prices for the in-house system range from $25,000 to $100,000. The distributed "service bureau" costs from 25 to 50 cents per subscriber.

Telease's in-house system features an "impulse pay-per-view" for instant service requiring no pre-ordering. The system is capable of analyzing disconnect ratios and doing 150 standard reports plus others that are data base oriented. These reports are generated automatically on a certain day of the month. Training and a monthly maintenance program are included in the package price ranging from $90,000 to $150,000.

Toner's in-house system can support an unlimited number of terminals. The system has software that runs on Texas Instruments hardware. Customer service provides training as part of a package and offers free updates along with a toll-free hotline. Packages cost from $15,000 to $290,000.

—Researched and compiled by Teresa Jemming and Lisa Snyder

FOR CABLE OPERATORS WHO HAVE WAITED FOR RELIABLE, AFFORDABLE, PROVEN BASEBAND ADDRESSABILITY...

YOUR CONVERTER IS READY.

You've told us your reasons for waiting to upgrade to baseband addressability. And they've been valid reasons. You want proven technology at an affordable price. You want higher reliability and revenue-producing features.

The waiting is over. With TOCOM's new 5503 Baseband Addressable Converter, we've gone back to the basics. We've designed a full-featured baseband converter that includes everything you want in an addressable unit at an affordable price. How?

The 5503 is straightforward in concept. Fewer parts combined with a single-board VLSI design make the 5503 extremely reliable, yet affordable.

New features include 450 MHz operation with 66 channel capacity and TOCOM's enhanced Baseband Encoded Scrambling Technique, which virtually eliminates theft of service. Of course, the 5503 features TOCOM's full-function remote control unit with volume, mute and parental access control. And, TOCOM PLUS addressability allows you to enable or disable the remote unit from the headend. Obsolescence? Not with TOCOM. A modular expansion plug on the 5503 enables you to expand to two-way and add text capability as demand evolves. In addition, TOCOM PLUS compatibility allows you to intermix the 5503 with other TOCOM PLUS terminals in the same system.

Flexibility? Certainly. The 5503 can be user-configured for HRC or standard format and specific channel output. At last, there's a "no-option" converter that can be moved from system to system regardless of headend format.

You've waited for a converter that would simplify addressability. It took TOCOM technology to build it. There's no reason to wait any longer.

For more information call our Marketing Department (214) 438-7691. Or for free product literature, write to Director of Marketing, TOCOM, Inc., P.O. Box 47066, Dallas, Texas 75247.

TOCOM

The Leader in Interactive Cable Technology.

Reader Service Number 58

Signal	Day	Start/ Stop	Alert Tone	Transponder
Westar V				
Arts and Entertainment	Daily	(E) 8 a.m./4 a.m.	311°/519°	**12D**
BET	Daily	8 p.m/2 a.m.	406°/#	**12X**
The Disney Channel	Daily	6 a.m./1 a.m.	None	**(W) 5X (E) 6X**
FNN	Weekdays	(E) 6 a.m./7 p.m.	None	**11D**
Meadows Racing Network	Fri-Sat	7 p.m./11 p.m.	None	**8X**
The Nashville Network	Daily	(E) 9 a.m./3 a.m.	674°/#	**9D**
National Jewish Network	Sunday	1 p.m./4 p.m.	None	**12X**

Major Communications Satellites Serving North America

Location: Degrees West Longitude	Satellite: Present	Future
41	TDRS 1***	
67		Satcom 6**(5/86)
69		Spacenet 2***(10/84)
72	Satcom 2R**	
74	Galaxy 2**	
76		Telstar**302 (8/84)
76	Comstar D1/2**	
79	Westar 2**	
81		ASC1***(9/85)
83	Satcom 4**	
86		Telstar 303**(5/85)
87	Comstar D3**	
89		SBS 4° (8/84)
91	Westar 3**	
93.5		Galaxy 3** (3/84)
95	SBS 3°	
96	Telstar 301**	
97	SBS2°	
99	Westar 4**	
100	SBS 1°	
103		Gstar 1° (7/84)
104.5	Anik D1**	
105	Anik C2°	
105		Gstar 2° (11/84)
108.5		Anik C1° (6/84)
109	AnikB1***	
109		Anik D2** (11/84)
114	Anik A3**	
117.5	Anik C3°	
119	Satcom 2**	
120	Spacenet 1*** (5/84)	
123	Westar 5**	
127	ComstarD4**	
128		ASC2*** (9/86)
131	Satcom 3R**	
134	Galaxy I**	
136	Satcom 1**	
139	Satcom1R**	
143	Satcom 5**	
171		TDRS2*** (late/84)
TBD		Spacenet 3*** (3/85)

° Ku-Band
** C-Band
*** Dual C/Ku-Band

Orbital slots and launch dates often change without notice.

Signal	Day	Start/ Stop	Alert Tone	Transponder
Pro Am Sports System		varies	None	**7X**
Select TV		24 hrs	None	**3D**
Sportsvue		varies	None	**4X**
University Network		24 hrs.	None	**1X**
WOR-TV		24 hrs.	None	**2D**
WPIX		24 hrs.	None	**6D**
Westar IV				
SIN		24 hrs.	None	**3X**
Comstar D-4				
Country Music Television		24 hrs.	468°/#	**9H**
ESPN		24 hrs.	None	**(W) 7V**
ON TV		24 hrs.	None	**(W) 5V (E) 6V**
Silent Network	Thurs.	6 p.m./8 p.m.	None	**9H**
Galaxy 1				
BET	Daily	8 p.m./2 a.m.	406°/#	**17**
CBN		24 hrs.	None	**11**
CNN		24 hrs.	024°/# 017°/#	**7**
CNN Headline News		24 hrs.	635°/# 541°/#	**8**
C-SPAN		24 hrs.	295°/#	**13**
The Disney Channel	Daily	7 a.m./11p.m	617°/# 834°/# (E)	**(E,C) 4 (M,P) 24**
Galavision	Weekdays Weekends	4 p.m./4 a.m. 24 hrs.	None	**20**
HBO		24 hrs.	None	**(E) 23**
Home Team Sports		24 hrs.	414°/# 715°/#	**(E,M,C) 12**
The Movie Channel		24 hrs.	None	**(W) 14**
The Nashville Network	Daily	9 a.m./3 a.m.	None	**2**
SIN		24 hrs.	819°/#	**6**
WOR-TV		24 hrs.	None	**15**
Satcom 3R				
AP News Cable		24 hrs.	None	**6**
Arts & Entertainment	Daily	8 p.m./4 a.m.	311°/# (E,C,M) 519°/# (P)	**1**
Cable Jazz Network		24 hrs.	None	**8**
CBN		24 hrs.	414°/# (E,C,M) 715°/# (P)	**8**

Contact programmer's technical department for more information on transponder use and alert tone.

EAGLE

TAPS

Designed to Endure the Toughest Conditions.

Eagle 500 MHz Taps assure you of long-term quality performance—even in the toughest environments. They're specifically designed to last in harsh climatic conditions caused by salt spray, industrial pollution, fungi, or other highly corrosive elements.

Review the Best Tap Specs in the Industry.

- *Standard* Brass F Ports provide maximum corrosion resistance and virtually eliminate connector seizure.
- Polyurethane surface coating with iridite undercoat stands up to severe climates.
- Sand-beaded finish on exterior hardware further assures long product life.
- *Double* tongue & groove construction plus Mates Gasket ensures superior RFI protection.
- 500 MHz performance allows cost-effective system expansion.
- Patented circuitry.
- Small size permits easy aerial or pedestal mounting.
- Extremely low insertion loss helps protect system investment.
- Neoprene weather gaskets under bottom plate and F-Ports.
- Choice of 2-, 4-, and 8-way units enhances system compatibility.
- 100% of Eagle Taps are pressure tested prior to shipment.

Eagle . . . The Choice of Leading MSO's.

After thoroughly testing our Taps against the competition, most of the ten largest MSO's have chosen Eagle Taps. Our Taps are in wide and growing use throughout their systems. That's why we're confident they'll work for you.

A Secure Investment for System Profitability

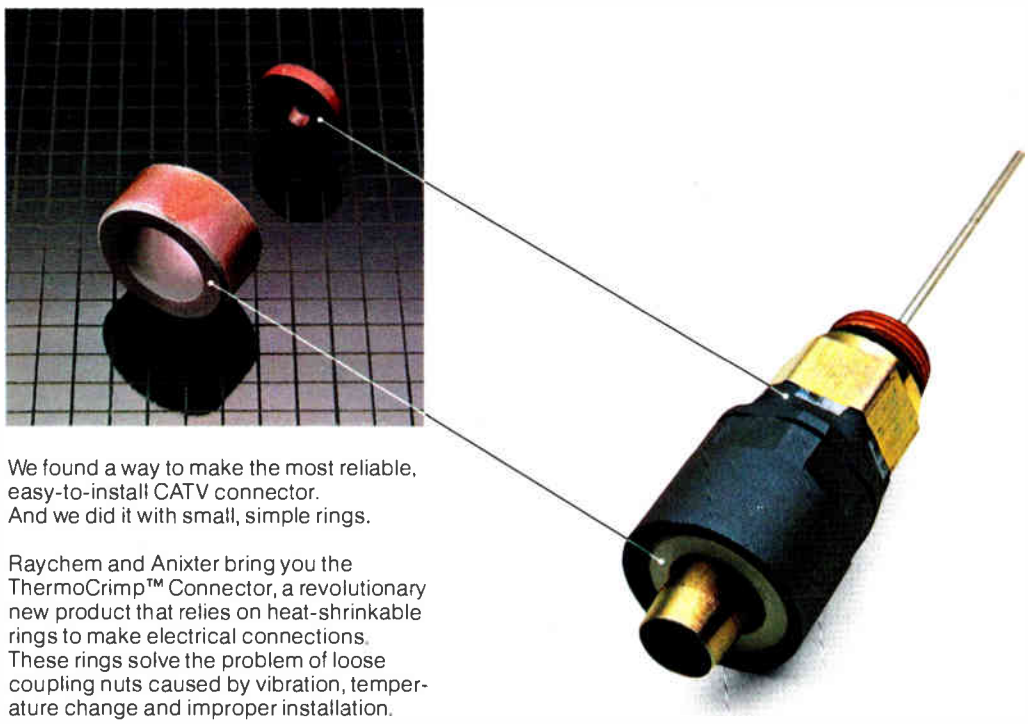
OTHER EAGLE QUALITY PRODUCTS. . .
Converters, Addressable Descramblers, Programmable Descramblers, Splitters, Taps, Decoding Filters, Video Amplitude Controllers, Band Pass Filters, Channel Dropper for Batch Descrambling

EAGLE COMTRONICS, INC.
4562 Waterhouse Road, Clay, New York 13041
TO ORDER, CALL TOLL-FREE: 800-448-7474
In New York, call 315-622-3402/In Canada, call Deskin Sales, 416-475-1412

EAGLE
COMTRONICS INC.

Reader Service Number 53

ThermoCrimp™ Connectors run rings around everything else.



We found a way to make the most reliable, easy-to-install CATV connector. And we did it with small, simple rings.

Raychem and Anixter bring you the ThermoCrimp™ Connector, a revolutionary new product that relies on heat-shrinkable rings to make electrical connections. These rings solve the problem of loose coupling nuts caused by vibration, temperature change and improper installation.

To achieve precise, reliable connections time after time, use ThermoCrimp™ Connectors. They're in stock now at Anixter. Call 1-800-323-0436.

Raychem + ANIXTER COMMUNICATIONS

Reader Service Number 54