CED™

Communications Engineering & Design/The Magazine of Broadband Technology

July 1984

NCTA wrap-up

CABLE
THE CONSUMERS' CHOICE

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HASTAD ENGINEERING CO
BOX 5221 STATE UNIV STA
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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.

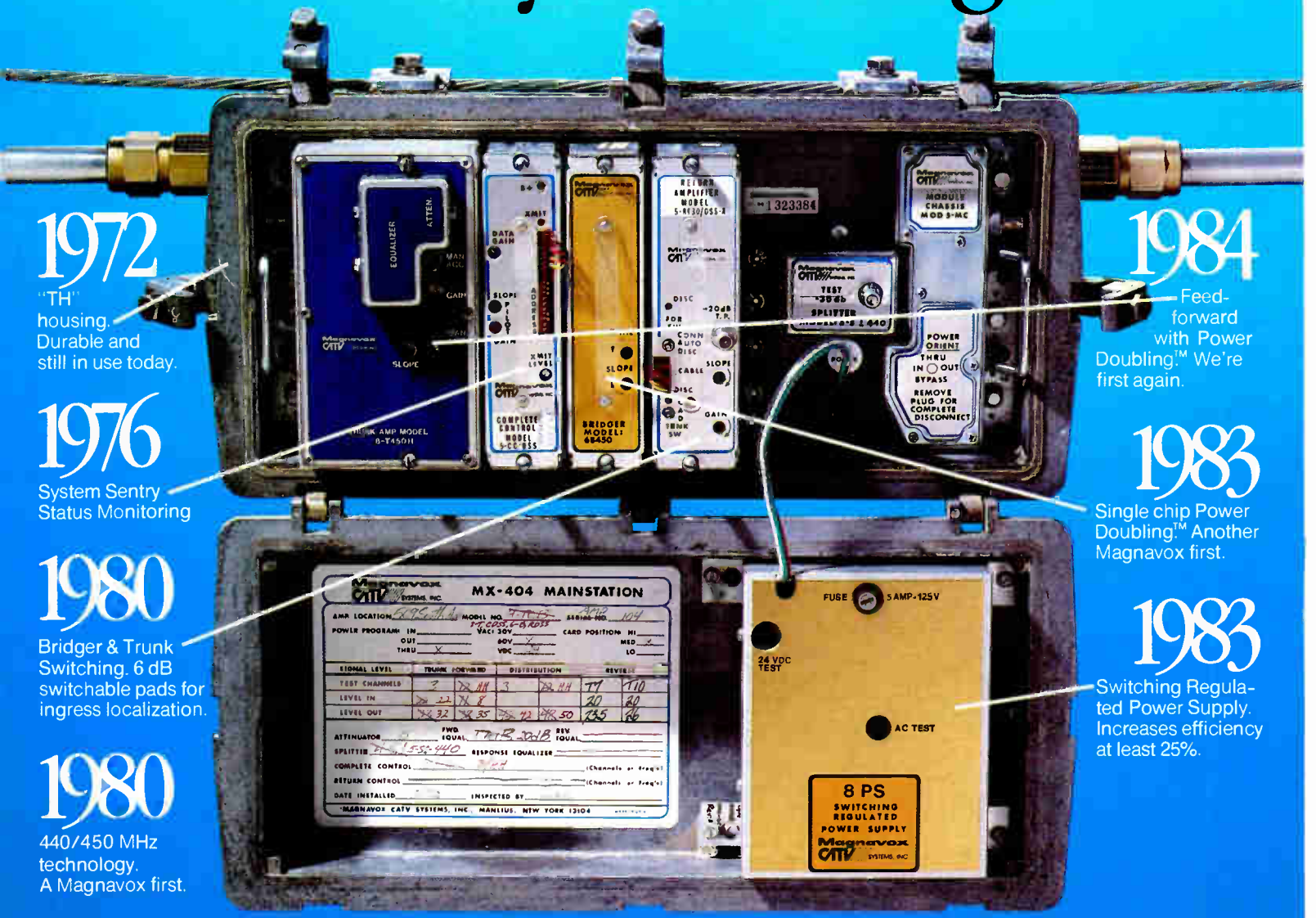
The point being, it's never too late to begin with, or rebuild with, Magnavox.

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%.

CED™

July 1984

COMMUNICATION NEWS 16
New products launched at NCTA convention
A summary of new hardware released during the show highlights this month's news section.

SPECIAL SECTION 27
NCTA technical coverage
Reports from all NCTA technical sessions are featured in this comprehensive wrap-up running more than nine pages long.

INTERFACE 38
Non-entertainment video services
This month, CED takes a look at new developments in teleconferencing.

Ku-band antennas atop Satellite Business System's Denver office already are used for freeze-frame videoconferencing. Full-motion capability will be added later.

FEATURE 43
Cable and data communications
As the cable industry concentrates on improving basic penetration, enhanced services like data communications have taken a back seat. CED takes a look at current industry efforts.

TECH II 49
Keeping plant tight
Michael Enault, engineering projects manager, Gill Cable, talks about system audits, while Robert Mills of G.E. Silicones discusses corrosion in distribution plant.

PRODUCT PROFILE 50
Broadband modems
This month, CED examines RF modems.

HARDWARE HOTLINE 52
The latest in cable technology
Details on hardware introduced at the NCTA convention highlight our regular new product coverage.

About the cover
A kaleidoscopic laser light show dazzled conventioneers at the NCTA's opening session, visually reinforcing the show's theme—"Cable: the Consumer's Choice." Photographer Rhoda Pollock captures the action.

Synchronous and asynchronous; simplex, half- and full-duplex data modems with speeds from 300 baud to 1.544 megabits per second are profiled this month.

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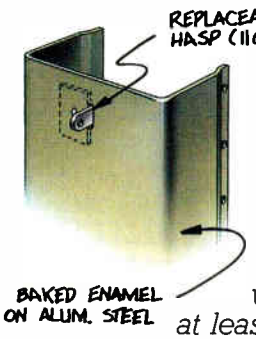
BPA

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.



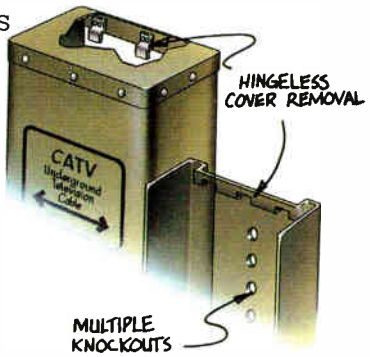
For example, CWY pedestals feature 16- and 18-gauge T2 aluminized steel construction, which tests show outlasts unpainted galvanized steel *at least five-to-one*. Plus, the rectangular design assures ease of installation and maximum use of interior space.

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

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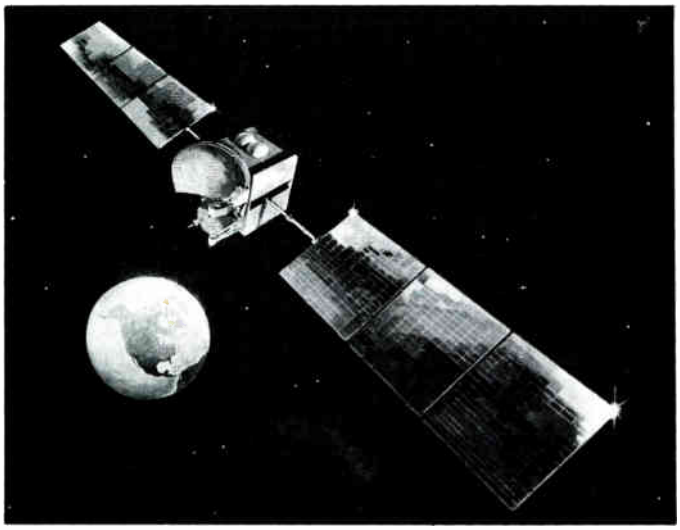

GTE Spacenet I launched

GTE Spacenet I launched

GTE Spacenet 1, the first of three satellites to form a $300 million C- and Ku-band system, was launched May 22. It carries 18 C-band and six Ku-band transponders and is scheduled to begin service by July 1. Major users will be GTE Sprint, CTE Corp., Bonneville Telecommunications, Southern Baptists' American Christian TV System Satellite Network, Sunday School Board of Southern Baptists and EFC Satellite Services.

Sign of the times

"A television antenna on your roof used to be a status symbol. Now it means you can't afford cable," says the May 12, 1984 edition of the *Virginia Pilot*, published in Norfolk, Va.

Sweeter cable balance sheets ahead

Cable industry profits are just around the corner, says the June 2 issue of *TV Guide*. Although the industry shakeout isn't completely over, the magazine predicts brighter days ahead. "Nearly 400,000 new households sign up for cable service each month. Cable watching is also increasing at the expense of the networks, especially in prime time," the magazine reports.

Pay TV subs up by 21 percent in 1983

The pay TV industry netted 5.6 million new subscribers in 1983, bringing the industry total to 28.1 million pay units by the end of 1983, says the latest *Kagan Census of Cable and Pay TV*. At that time, 5,546 cable systems were offering pay TV, an increase of 15 percent over the previous year.

Leap in addressable homes reported

The cable industry's top 50 MSOs had an estimated 3.4 million addressable subscribers at the end of March, a 57 percent increase over last August's total, reports *Cable TV Technology*, an industry newsletter published by Paul Kagan Associates Inc. The nation's total addressable population stood at an estimated 4.2 million cable homes, or 13 percent of all cable TV homes, in March. CTT projects that by the end of 1985, 22 percent of all cable homes could be addressable. The report also suggested that the top 50 MSOs account for 80 percent of all addressable activity.

HBO, Disney Channel ponder DBS

"You'll see us in the direct broadcast business, hopefully before the end of this year but certainly in 1985," says HBO Chairman and CEO Frank Biondi. Meanwhile, Disney Channel Director of Business Development Tom Coughlin estimates the long-term market for DBS at about 15 million homes, although the company hasn't made definite plans to sell to that market.

VCRs growing at breakneck pace

Sales of videocassette recorders are running 90.5 percent ahead of the same four-month period last year, reports the June issue of *The Home Video & Cable Report*. The report sets total VCR ownership at 11 million, and says that number could grow to over 16 million by the end of the year. HVCR also says basic cable growth remains steady at 15 percent a year.

Colin O'Brien has been named president and chief executive officer as well as director of Times Fiber Communications. He replaces Lawrence DeGeorge as CEO.

Cable to remain dominant pay TV medium

A study of the effects of MMDS and DBS competition on cable indicates that where it is available, cable will remain the dominant delivery system for pay TV. The study by Opinion Research Corp. estimates that, at best, DBS and MMDS services might expect an 8 percent market share compared with a 64 percent share for a 12-channel cable system. When DBS and MMDs services compete against a 36-channel cable system, their market share will be 2 to 4 percent, with cable getting 70 percent. Where MMDS and DBS will have a greater impact is in areas where they can offer several premium channels and cable can offer two or fewer, the report says.

Compact disc a Trojan horse

FM radio broadcasters may be shooting themselves in the foot by embracing the compact disc and digital audio, says a new report by Waters & Co. FM stations can't transmit in full digital quality, but cable and DBS can, the report says.

Cable customers satisfied, report says

Five out of every six current cable subscribers are very or somewhat satisfied with their service, while nearly two-thirds of former subscribers feel the same way, says a new report issued by International Communications Research. The study, commissioned by the NCTA, polled 1,501 people randomly selected from a nationwide universe. Although unhappiness with programming is often cited as the reason for a disconnect, the ICR study found that the most common reasons for terminating service were a move or price. When cable and telco repair and customer service representatives were ranked on various measures of service, the cable force scored as well or better than the telco force in 11 of the 13 categories. Cable ranked lower in the areas of telephone response and timely resolution of billing problems.

Mile Hi wins Denver vote

Mile Hi Cablevision is still in business, having won the support of 82 percent of the voters in a special franchise election held June 5 in Denver. The company spent $220,590 to have the election held, and at least $200,000 campaigning for the "yes" vote.

Antenna give-away

Within the next three months, Hughes Communications will give away 2,000 M/A-COM Prodelin or Scientific-Atlanta 3.2- or 3.8-meter antennas to operators receiving programming from Galaxy 1. Recipients, identified by Galaxy programmers, will also receive low noise amplifiers from California Amplifier. For those systems wishing to receive programming from two satellites, retrofit dual-beam modification kits will be offered. Letters explaining the give-away program will be sent to eligible operators in the first week of July. If Hughes does not hear from an operator within two weeks of the mailing date, it will phone the system to see if it is interested in the program.

Arizona pirates better watch out

The state of Arizona has signed into law a bill that will make the sale of illegal cable TV reception devices a felony and punishable by a prison sentence of 1½ years.

Programming catches Microdyne eye

Microdyne Corp. has entered the programming arena by forming a partnership with Domesticom Corp. to launch the adult HiLife Channel pay-TV service the beginning of this month. Microdyne has a half interest in the venture, called Domestidyne. The HiLife Channel will offer adult-oriented, but no X-rated, programming in pay-per-night, pay-per-view and monthly subscription formats to MSOs, independent cable operators, major hotel chains and apartment complexes.

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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.

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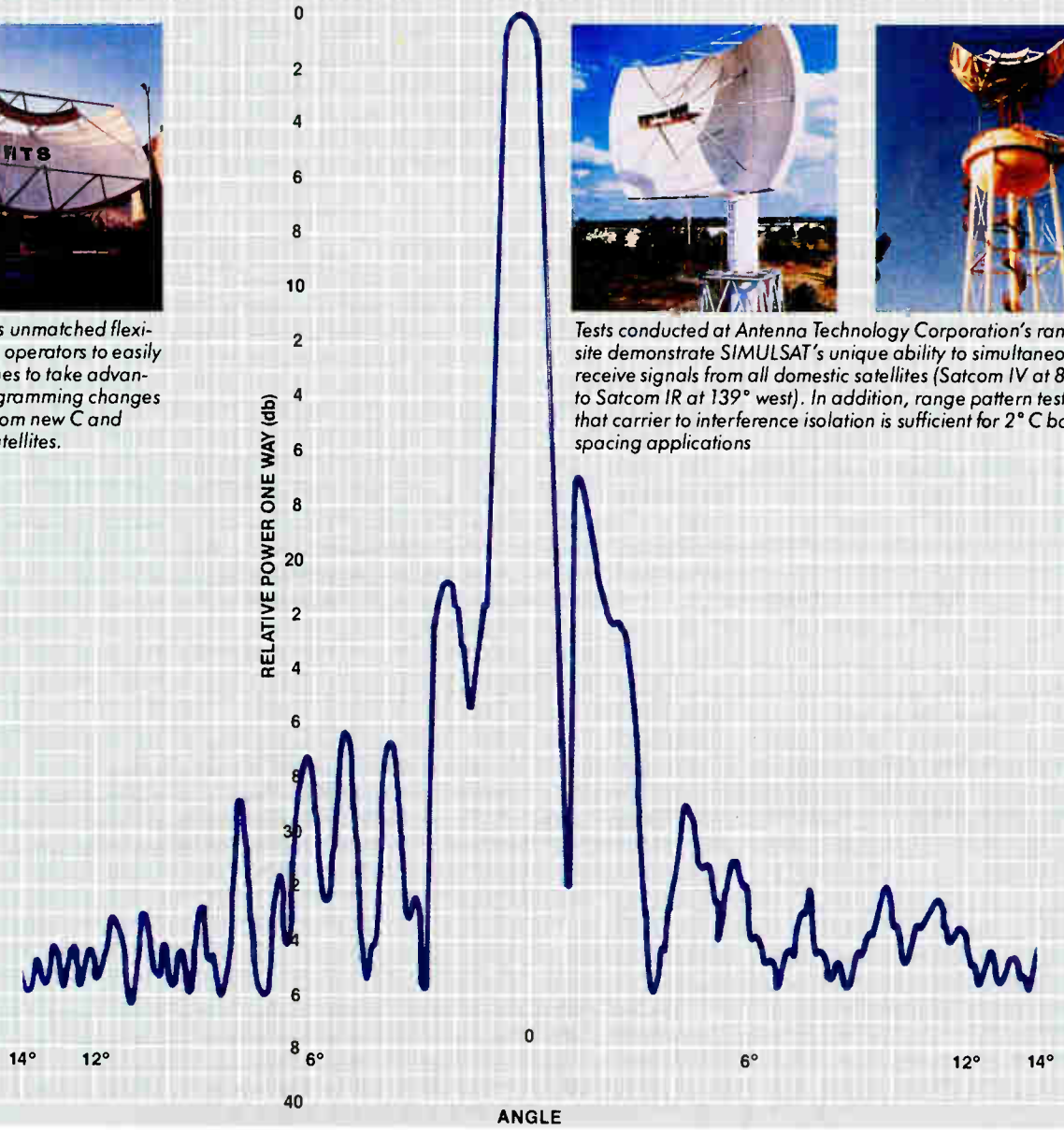
Mycro-Vision™ Max
Another Magnificent Machine from Mycro-Tek.

Reader Service Number 4

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 _____

Reader Service Number 5

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

Seminars

July

9-11: Business Communications Review offers a data communications: basic concepts seminar in Chicago. Contact Marcia Kaplan, (800) 227-1234.
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: Montana 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.
3-5: SMATV/Private Cable Workshop, Kansas City. Contact Burrull Communications Group, (608) 873-4903.
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.
21-23: C-COR Electronics CATV Technical Seminar, Ontario. Contact Debra Cree, (814) 238-2461.
22: Delaware Valley Chapter of SCTE meets, George Washington Motor Lodge, Will Grove, Pa. Contact Bruce Furman, (215) 657-4690.
22-24:Rocky Mountain Cable Television convention, Yarrow Holiday Inn, Park City, Utah. Contact Mark Carter, (801) 486-3036.
23-25: Colorado Cable Television Association convention, Keystone Lodge, Keystone, Colo. Contact Steve Durham, (303) 753-1066.
23-25: Hawaii Cable Television Association convention, Intercontinental Hotel, Maui, Hawaii. Contact: (808) 836-2888.
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.
29-31: Missouri Cable Television Association, Lodge of the Four Seasons, Lake of the Ozarks, Mo. Contact Charles Broomfield, (816) 453-3392.

September

3-5: Satellite Electronics Show, Opryland Hotel, Nashville. Contact **Satellite Television Technology International**, (405) 396-2574.
5-7: Magnavox Mobile Training Seminar, Buffalo, N.Y. Contact Laurie Mancini, (800) 448-5171.
6-7: The **2nd Swiss Videotex Congress** will be held at the European World Trade and Congress Centre in Basle, Switzerland. Contact, 061/26 20 20.
6-8: Eastern Cable Show, Georgia World Congress Center. Contact (404) 252-2454.
10-11: DBS IV, Washington, D.C. Contact **Phillips Publishing**, (301) 986-0666.
15-19: National Satellite Communications Association convention, Hyatt Regency Hotel, Orlando. Contact Mickey

Looking ahead

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.
Sept. 23-25: Great Lakes Exposition, Indianapolis Convention Center, Indianapolis.
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.

This year's Eastern Show will be held at the Georgia World Congress Center in Atlanta, Sept. 6-8

Gorman, (202) 659-2928.

17-21: FOC/LAN 84, an international exposition for fiber-optic communications and local area networks will be held at the MGM Grand Hotel in Las Vegas, Nev. Contact: Michael O'Bryant, (617) 787-1776.

18-20: Jerrold will hold a technical seminar in Atlanta, Ga. Contact Kathy Stangl, (215) 674-4800.

19-21: Magnavox Mobile Training Seminar, Ogdensburg, N.Y. Contact Laurie Mancini, (800) 448-5171.

21-23: SMATV/Private Cable Workshop, Washington, D.C. Contact Burrull Communications Group, (608) 873-4903.

22-24: New building designs and technology will be the focus of a conference held by **Cross Information Co.** in Boulder, Colo. Contact Tom Cross, (303) 499-8888.

23-25: The **Illinois, Indiana, and Michigan Cable Association** will sponsor the Great Lakes Conference and Expo at the Indianapolis Convention Center. Contact Shirley Watson, (618) 249-6263.

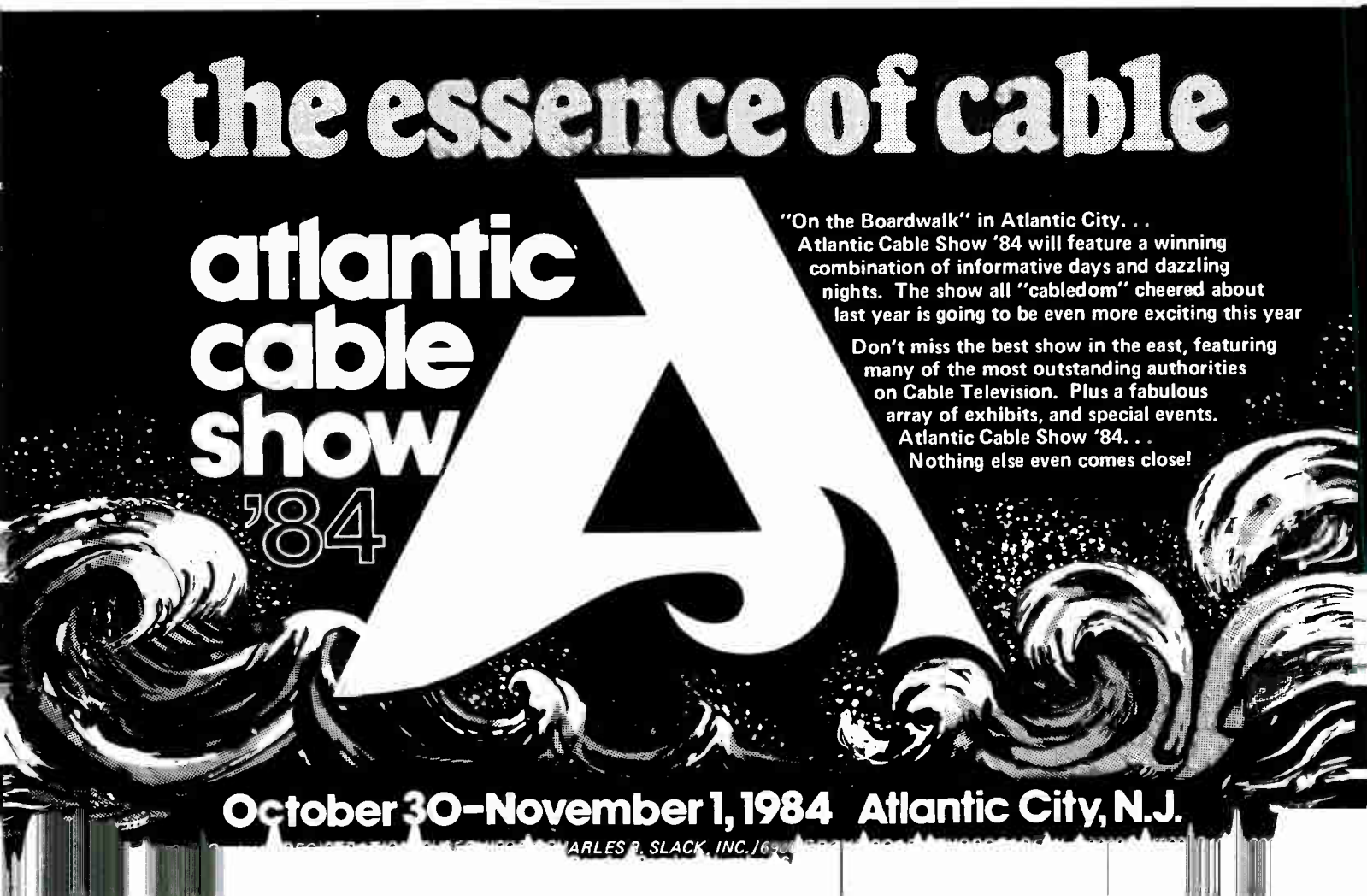
23-25: Great Lakes Exposition, Indianapolis Convention Center, Indianapolis. Contact (618) 249-6263.

23-25: Pacific Northwest Show, Red Lion Riverside, Boise, Idaho. Contact (406) 259-3026.

24-26: Wisconsin Cable Communication convention, Olympia Spa & Resort, Oconomowoc, Wis. Contact (608) 256-1683.

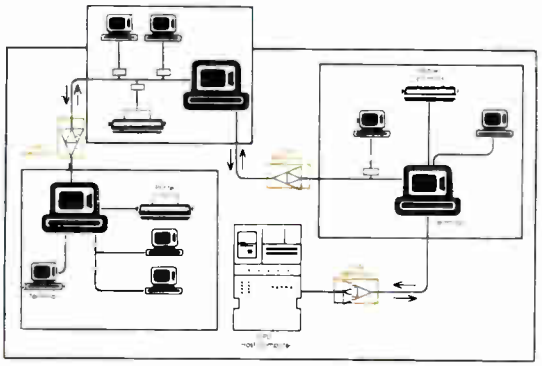
24-26: Third Annual NCTA Minority Business Symposium, Washington, D.C. Contact Ed Dooley, (202) 755-3629.

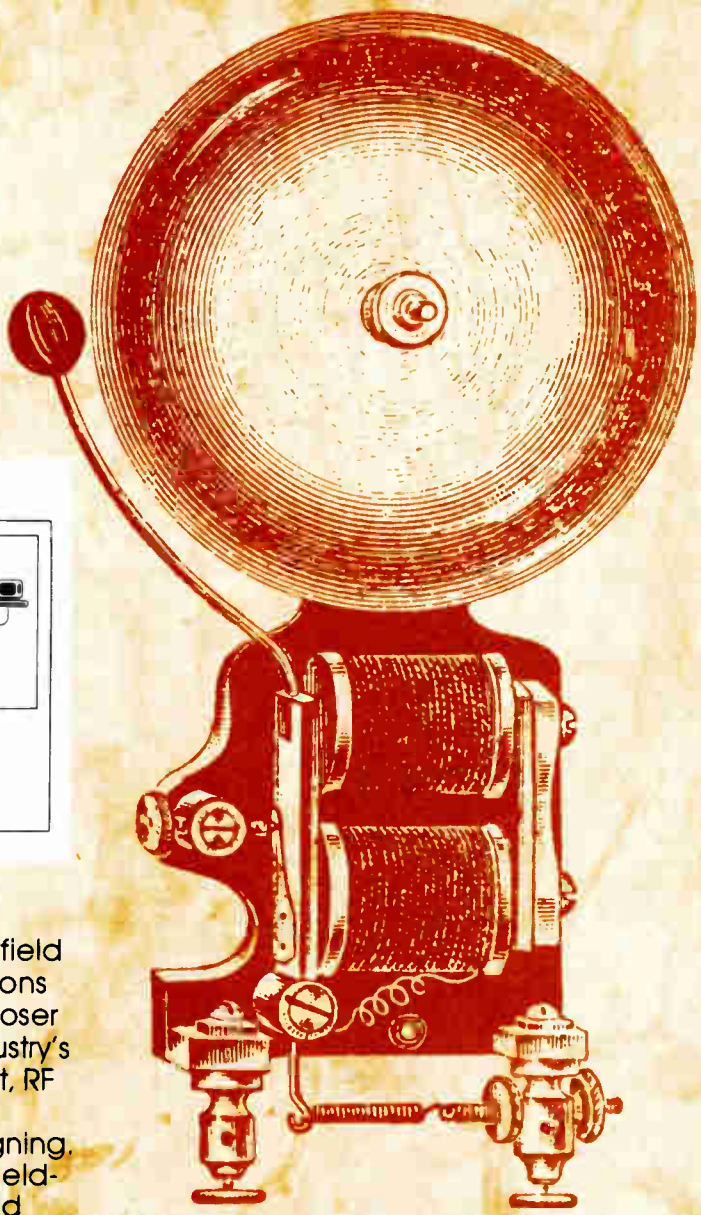
30-Oct. 2: The **Midwest National Federation of Local Cable Programmers'** regional conference will be held in Dubuque, Iowa. Contact Susan Korn, (202) 544-7272.



There was a time when communications were simple . . .

C-COR keeps it simple.





If your business has to do with data transmission, cable TV, or any other field requiring broadband communications systems, you'll be glad you took a closer look at C-COR, where you find the industry's most reliable distribution equipment, RF modems and power supplies. You'll benefit from C-COR's 30 years of designing. And you'll have access to C-COR's field-support personnel for installation and maintenance, too. The newest C-COR systems allow you to reduce the number of amplifiers while actually extending the range of signals.

If you're in cable TV or data transmission, C-COR can help you do it better. We enjoy technical talk . . . please call or write today.

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NCTA: taking stock, looking ahead

By now, most observers have had a chance to comment on the relatively sedate character of the NCTA convention. It's true — the sizzle, glitter and hype was more easily found in the casinos than on the convention floor.

But we may all miss the point by focusing on the attendance figures, number of booths, convention floor space or lack of razzle dazzle parties.

Industries, like individuals, mature, and perhaps the latest show was more evidence that cable is reaching adulthood. So, like maturing adults, each of us will ponder in our own ways what the show means.

In addition to taking stock of where we are, however, many, and hopefully most of us, also will be looking to the future.

In that vein, I'm reminded of comments once made by Alan Kay, now a key researcher at Apple Corp., and formerly chief scientist at Atari and a fellow at Xerox's prestigious Palo Alto Research Center.

There are several ways to predict the future, he said. The best way is to invent it, and recognize that the new ideas are in somebody's lab right now. The hardware may not be in production yet, but this industry's engineers haven't given up the quest for exciting new technology and products.

Another way to predict the future, Kay said, is to look at the products of the past and see what made them hits.

"We have to communicate with others or we're not humans," he said. "So every time someone has come up with a communications amplifier, it has superseded the previous technology."

I don't want to downplay our industry's need to stay on top of the current marketplace, whether that means increasing basic penetration, refining our marketing techniques or coming up with exciting made-for-pay programming.

But as we're working to keep our cascades from roaring like Niagara Falls, let's not forget that we're in a market-driven business. Kay's right: our technology has to amplify communication.

So let's not turn our backs on data services, multichannel sound, home security, videotex or teleconferencing.

True, the forecasts have been wildly optimistic at times. Sometimes our technology hasn't worked, and often when it has, the marketplace hasn't been ready for it.

There have been times when you'd think we were in the poultry business — with so much talk about "chicken and egg" situations. Franchise authorities have seen us as a golden goose and on occasion we've either laid an egg or had it on our collective faces.

Still, our recent national gathering may make more sense if we can grasp another of Kay's gems.

He says any technology has four phases. "Every media business goes through four phases: hardware, software, service and way of life."

Although Kay was referring to the computer industry when he made those comments, I think the analogy fits us well.

"The phase we're in right now is the service phase," he said. "The companies that realize this are going to make a lot of money."

The theme of this year's show was "Cable: The Consumer's Choice." During the show, the NCTA released the results of a consumer satisfaction survey that gave the industry pretty good marks. And although most of the technically inclined attendees probably spent time in the technical sessions, it was hard to ignore the marketing-oriented workshops.

We still haven't worked out all the bugs in our hardware or software, but it seems clear we are moving into a more mature, service-oriented phase.

We're not a way of life yet, but maybe this year's NCTA convention is an indication we're getting closer.

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Las Vegas product launches

LAS VEGAS, Nev. — New addressable converters, modulators, character generators, modems and receivers were among the new products introduced at the NCTA convention here June 3-6. But several prototype digital transmission systems incorporating stereo sound also drew much attention.

Sony, Panasonic, Toshiba and General Instrument all demonstrated products capable of delivering high quality audio signals over cable lines. All are in the experimental stage.

Several of the converter products also are in varying stages of development and testing. Toshiba's Distributed Subscriber Terminal, an off-premise addressable converter, now is in production and will be tested in American Television & Communications Corp.'s Independence, Kan., system.

The new Regency Cable Products baseband converter being shown also was a prototype. The device is not yet available for field testing.

Hamlin introduced two new converter products, an RF addressable model as well as a 66-channel cordless remote converter.

Oak Communications also previewed a remote control converter. The baseband unit features a remote volume control.

Jerrold demonstrated a 550 MHz agile phaselock output terminal, while C-COR Electronics unveiled a new series of block converters designed for low-cost 6 MHz block conversion on two-way systems.

Blonder-Tongue showed its Guardsman off-premise pay TV system, which can be configured in addressable, hybrid or non-addressable modes.

Pioneer Communications exhibited two off-premise systems, including a multiple dwelling unit and an interdiction version.

Zenith introduced a Dual Decode Z-Tac addressable unit. The decoder is aimed at operators who want to upgrade existing RF equipment to take advantage of baseband security and features.

The company exhibited a remote Z-Tac timer that controls both the decoder and a VCR. A Base-Tac addressable decoder using the tuning, power supply and remote control features of a Zenith cable-ready TV set also was shown.

A TV stereo adaptor rounded out the company's new line of products.

Panasonic announced its plans to market a digital basic converter.

Magnavox CATV Systems introduced a new 600 MHz eight-way tap, while Anixter Communications unveiled two new products in its line: the Reliable Electric/Utility Products Super-Safe apartment closure and a new Superlash wire.

Raychem showed its new Thermoshield wrap-around cable repair product, as well as the Hot Wrap companion product, used for housing-to-housing applications and 90-degree cable bends. Both are heat-shrinkable.

Channel Master released its new commercial quality satellite receiver, two commercial quality modulators and a 4.3-meter antenna.

Standard Communications Corp. exhibited a new C-band DBS system aimed at cable operators looking for a way to serve rural and non-cabled customers. The company also introduced two commercial quality satellite receivers aimed at the smaller CATV as well as private cable operator.

Jerrold showed its new Ku-band satellite receiver.

Phasecom Corp. also released several new products at the show. A frequency agile standby modulator and a series of HRC, IRC and standard modulators were rolled out. Frequencies up to 553.25 MHz can be accommodated by units in the line.

A character generator, FM modem and voice modem also were shown at the show.

Microdyne Corp. introduced a new motorized polar mount and controller for its five- and seven-meter antennas. An offset feed antenna also was exhibited.

Wavetek unveiled its 1 GHz CATV system analyzer, remote control for sweep transmitters and remote terminal for signal analysis meters.

Texscan introduced a slew of products ranging from graphics and character generators to commercial insertion equipment. A baseband converter, descrambler, line extender, 600 MHz tap and RF sweep generator also were released at the show.

Two new test probes, a sweep receiver, signal leakage receiver and signal level meter were among the new products rolled out by the company.

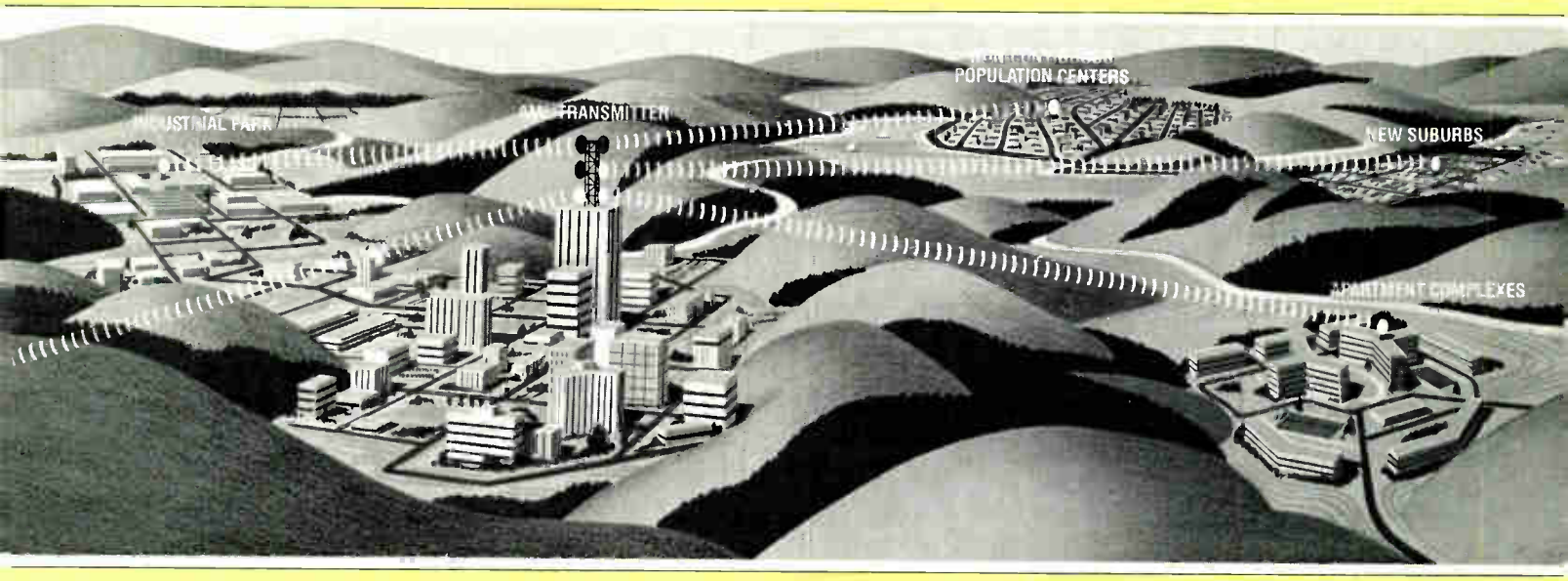
Zeta Laboratories Inc. showed its broadband RF modem as well as high-speed data modem.

CableBus Systems Corp. released a home terminal modem for cable-based security services.

Toshiba demonstrated prototype security and digital audio terminals.

— Gary Kim

The first and still the best way to deliver cable TV to hubs.



The Hughes AML® microwave system is as functional as a length of coax, but out-performs it! It delivers better signal quality over longer distances. Even a 30-mile AML link has less distortion than a cascade of just four amplifiers. And the AML system is more reliable, yet can cost less than either supertrunk or fiber. You can install it and start making money within months, by serving most profitable areas first.

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The AML system has been a basic building block of cable TV industry for a decade. But it's also as new as tomorrow's technology. For instance, AML systems are now available for CARS and common carrier applications at 11 GHz and 18 GHz. If you're not familiar with the details of our latest Hughes AML systems, write or call for more information today. **Hughes Microwave Communications Products,** P.O. Box 2999, Torrance, CA 90509. (213) 517-6233.

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Texscan rolls out new products

LAS VEGAS, Nev. — Character generators and services, a baseband converter, a descrambler, distribution and test equipment were among the new products and services Texscan Corp. rolled out at the NCTA convention.

A new line of graphics generator products based on the North American Presentation Level Protocol videotex standard topped the list of new releases. Called Spectraflex, the new product line combines full screen bit-mapped graphics with text. The ST-1 uses a low-cost frame creation system to develop graphic displays.

The company also introduced a high resolution character generator for use in studio, single and multichannel applications. The Spectragen 4 family of products features a 32 by 64 pixel dot matrix, rather than the 16 by 20 matrix that is common in the industry. Spectragen 4 comes in tabletop and rack-mounted versions.

Texscan also introduced a new Compuvid generator. The CDD-45 is the first major new product produced by the new MSI Compuvid division. It features a totally redesigned keyboard and higher screen resolution than earlier CDD models. It connects to an external standby power supply and disk memory device. The company also is working on a bubble memory system for the machine.

A new creative services department, assigned to the company's Salt Lake City division will produce and develop programming aids for customers using the firm's character generator systems. The department initially will develop a basic file of classified pages artwork, patterned after newspaper-format ads.

Texscan also announced that it has gotten Underwriters Laboratories listing for its Spectragen 3 series products.

A random access videocassette commercial insertion controller also was released. The CSR-92 can pre-cue commercials from any location on either of two videocassette players.

The Model 6060 baseband converter is a one-way addressable, set-top unit designed for 60-channel systems.

A new stand-alone descrambler, the Model 4025, also was unveiled. It is the first in a new line of products using dynamic sync suppression techniques. The company said it will work with most existing converters.

Distribution products introduced include a new line extender featuring three forward gain versions and five reverse gain versions, with reverse bandwidth splits up to 180 MHz. A new line of 600 MHz directional taps and passive devices also was shown.

New test equipment includes the Model VS-60C RF sweep generator and two new test probes. The Model T9TP-20 is designed for trunk applications and the TOLP-20 for line extender jobs.

A new high level system sweep receiver, the Model 9552, also has been released.

A lightweight, hand-held signal leakage receiver, called the Beephound, and the Installer 600 signal level meter, rounded out the new line of test equipment.

Texscan also announced the availability of a new cable data reference handbook for system operators.

— *Gary Kim*

Emerson SCTE pres.

LAS VEGAS, Nev. — James Emerson of AM Cable TV Industries Inc. was elected president of the Society of Cable Television Engineers at the group's June board meeting. Outgoing President Tom Polis was elected secretary/treasurer of SCTE at the same meeting.

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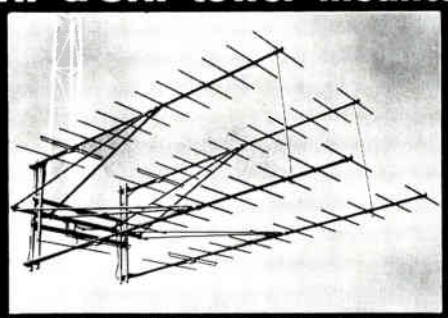

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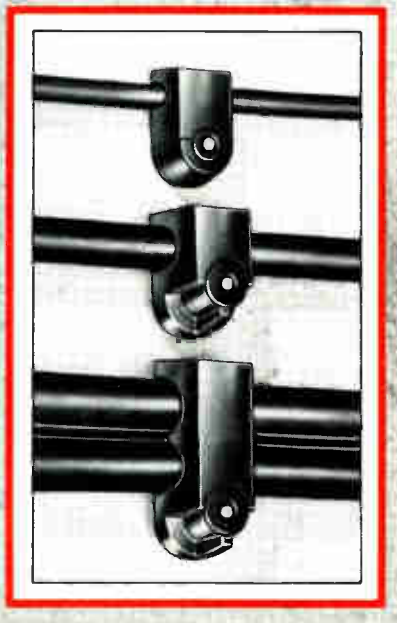

ONETAP™ CLIP is the 10¢ solution.
No holes to drill—no need for special tools. One tempered steel pin easily penetrates poured concrete, cinder blocks, mortar, bricks, hardwood floors. 3 sizes fit all coax cable installs.
Patent Pending.

Shown actual size.

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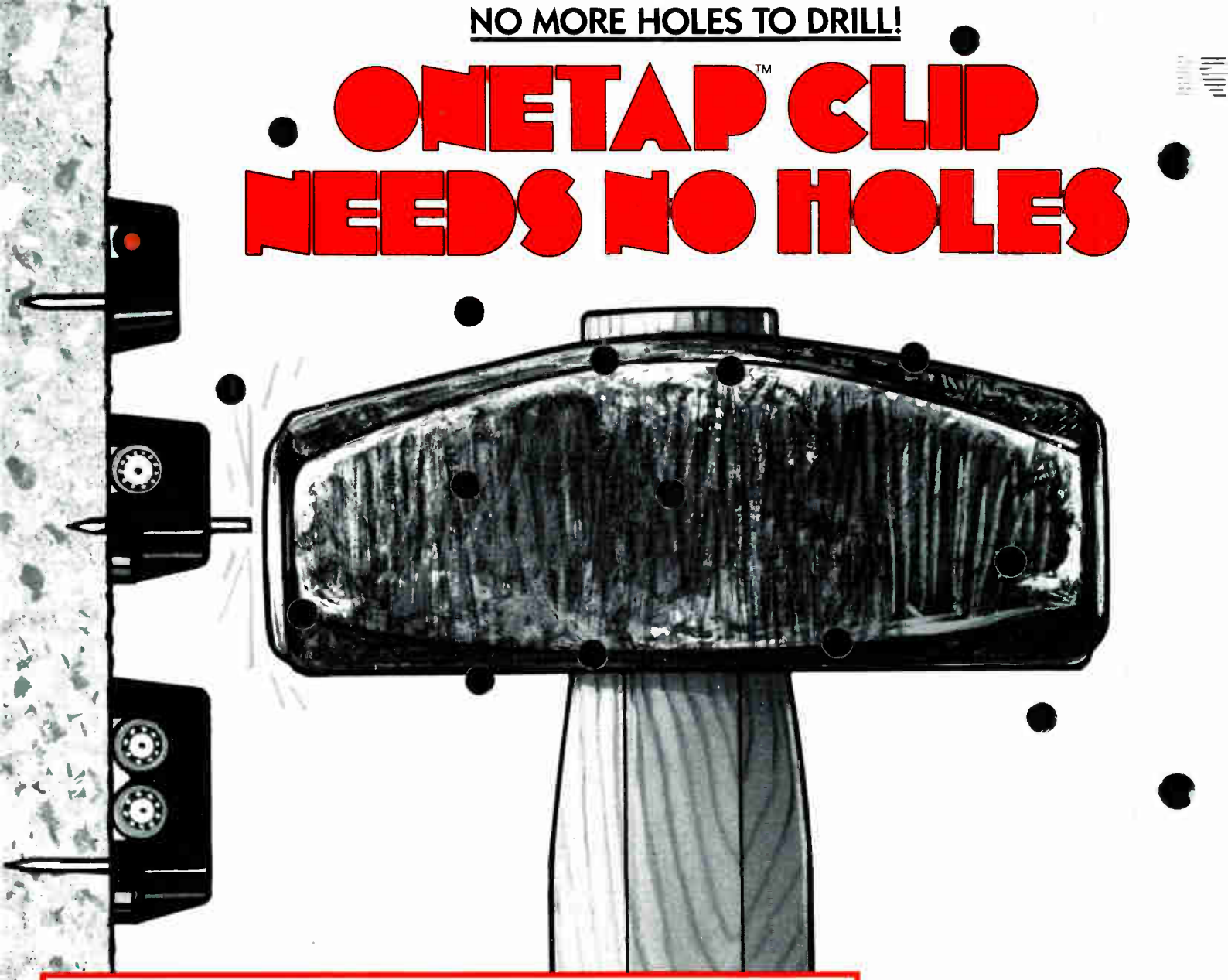
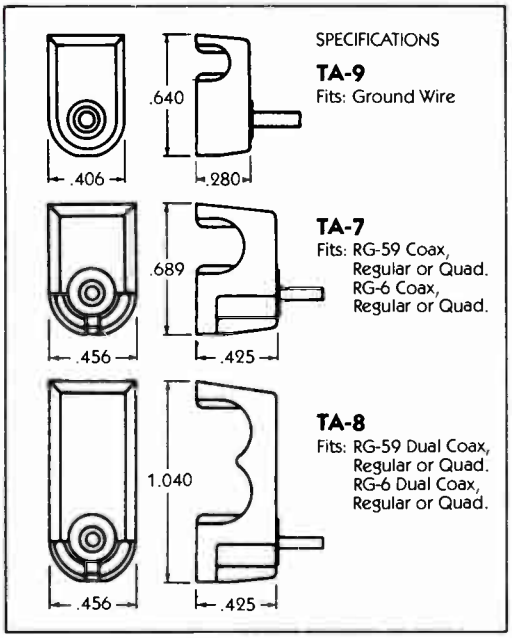


CLIPS SHOWN ACTUAL SIZE



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

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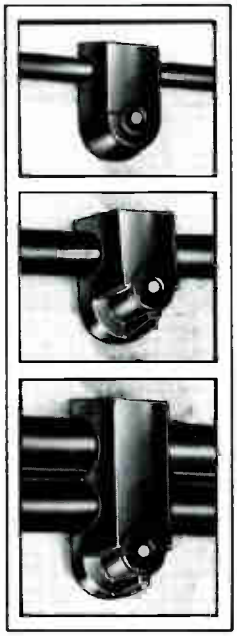

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Patent Pending.

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ATC, Toshiba team on terminals

DENVER — Toshiba Corp. and American Television and Communications Corp. have teamed in a new venture that will sell and distribute Toshiba products to the cable industry.

The new company will be based in Denver, and will be headed by John Rigsby, currently ATC vice president for video product development. In addition, Rigsby will keep his ATC post.

Joining Rigsby as Executive Vice President will be Katsuhiko Miyoshi, now head of Toshiba's North American CATV Project.

The new company is a 50/50 partnership, and reportedly will employ about 50 people initially. Sales of $40 million a year in a few years are expected.

The joint venture's first major product is an off-premises, addressable converter. The Distributed Subscriber Terminal is already in production and is being tested in ATC's Independence, Kan., system.

The 450 MHz system has four components, including the headend control computer, the off-premise External Control Unit, the set-top Subscriber Processing Unit and a remote control.

The key component is the ECU, which replaces the conventional tap. Housed inside it are communications and control modules as well as the subscriber converter modules. As many as four SPUs can be supported in each subscriber's house.

The DST is software, rather than hardware controlled, and supports standard, HRC and IRC channelization.

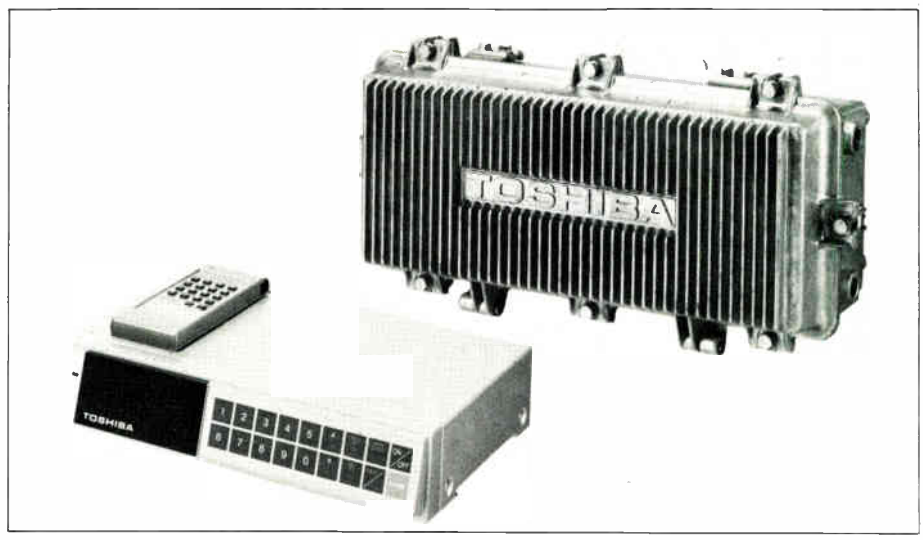
The two-way system doesn't use scrambling, offers dynamic channel allocation and comes with the features many operators are looking for: favorite channel selection, parental control, impulse PPV, subscriber polling and data entry.

On the drop, SPU to ECU communication is at 500 KHz. Spurious signals in the 5-30 MHz range are blocked at the ECU before they reach the headend.

The downstream frequency range is 50-450 MHz, while the upstream range is 5-30 MHz. The ECU drop output level is 8 dBmV and the converter noise figure is typically 12 dB.

The insertion loss is rated at 1.0 dB, while tap values range from 0 dB to 29 dB in 10 steps.

The single forward data channel has a carrier frequency of 104 MHz and a data rate of 200 kilobits per second. As many as four reverse data channels are available, with carrier frequencies of 19 MHz and a data rate of 50 kilobits per second per channel.



Toshiba DST off-premise addressable system

Converter output is selectable for channels 2, 3, 5 or 6, and two converter outputs can be multiplexed onto a single drop cable.

In the event of a power failure, system memory is backed up for 24 hours.

The new company also is working on a digital audio system and terminal. The addressable system allows for transmission of encrypted signals, and is compatible with existing cable systems.

Currently being tested on breadboarded units, the system digitizes an audio signal at the headend. Error detection codes are added before the signal is encrypted.

The information is quadraphase shift key modulated to provide a baseband signal, which is broadcast over the network. At the D-CAT terminal, the signal is demodulated, decoded and descrambled. Finally, the information is passed through an error correction circuit and a digital-to-analog converter to reproduce the audio signal.

As many as five digital channels can be packed into an arbitrary 6 MHz video channel. Each digital channel can carry one ultra-high-fidelity stereo signal or two super-high-fidelity signals. Sampling frequency is 48 kHz in the ultra-high mode and 32 kHz in the super-high mode.

A home security product also is being developed by the new firm. The wireless, supervised system should be available during the second quarter of next year in both a telephone-based and a DST-compatible version.

— Gary Kim

M/A-COM buys Cox converter

BURLINGTON, Mass. — Like the characters in Mark Twain's novel *The Prince and the Pauper,* M/A-COM and Cox Cable have switched places. M/A-COM the manufacturer is buying baseband addressable converter and remote control technology developed by MSO Cox.

The somewhat unusual deal complements M/A-COM's present El Paso, Texas development work, says Larry Bowman, vice president of business development with the Cable Home Division of M/A-COM.

Having developed an RF addressable converter, the company was set to produce a baseband model, and the Cox technology was a perfect fit, Bowman says.

Cox has placed a $19 million order for the converters.

The baseband converter and remote control are software controlled and can be configured at the headend, eliminating the problem of unauthorized remotes.

Parental control, direct channel entry, channel up/down, remote audio, on/off, favorite and last channel features are available. The converter also is compatible with sine wave, sync suppression scrambling.

Oklahoma cable ad ban overtuned

WASHINGTON — Local authorities will have less voice in deciding which programs cable TV may show after a Supreme Court decision June 18. Endorsing the Federal Communications Commission's control of cable TV content, the court struck an Oklahoma law restricting cable television wine commercials.

Although the decision does not alter local governments' authority to regulate rates or grant cable franchieses, communications lawyers said the court's move most likely will block making programming restrictions a requisite for obtaining a franchise, according to a report in *The Denver Post*.

The 1980 case, Capital Cities Cable Inc. et al vs. Crisp, began when Oklahoma officials attempted to enforce bans on TV liquor commercials. On June 18, the high court reversed the 10th U.S. Circuit Court of Appeals ruling that validated the Oklahoma law.

Brennan explained the federal government's need to regulate cable TV overshadows Oklahoma's concern for discouraging alcohol abuse. He said the Oklahoma ban clashes with federal copyright protections for cable systems and operators.

The court's decision means "a cable operator is free to put on anything he wants" without state and local government intervention, according to David Fleming, one of the lawyers representing cable operators, quoted in the Post.

NCTA President-elect James Mooney, was very pleased with the outcome of the case. "It is a very, very important case with the implications reaching across the whole spectrum of cable. We are absolutely delighted." — *Teresa Jemming*

NewsSweep

■ Studioline Corp. and Western Communications Inc. have formed a joint venture to offer Studioline's nine-channel pay audio service. The new service will launch this fall, company officials said.

Signals will be carried by cable systems in the guard band frequencies between channels four and five. Satcom III-R transponders 19 and four will deliver programming to cable headends.

Digital quality sound, hard security and total addressability will be provided by the company's STEREO-LINK decoder, included in Studioline's monthly wholesale fee. The decoder also secures an additional 60 channels of stereo in the A-1, A-2 and Channel A frequencies.

■ Profitrack, a new program working with First Data Resources Inc.'s subscriber billing system, will be available later this fall, FDR has announced.

■ Mid Connecticut CATV has purchased Magnavox CATV Systems Inc. feedforward trunk amplifiers for 200 miles of new construction. The new system will use the company's Digital System Sentry, with deliveries and construction to begin immediately.

■ A new theft of service campaign by Showtime/The Movie Channel was announced at an NCTA panel. The company's new Theft of Service Combat Kit will provide affiliates with the information needed to organize their own campaigns.

Contained in the kit are techniques for measuring system theft, educating public officials, running an effective amnesty campaign, running audit/upgrade drives and prosecuting offenders.

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Signal Level Meter has every function you need, it's Lightweight (6 lbs), Easy-to-Operate, Designed to cover Channels 2-13 plus Midband

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Quantum Reach flexible solid-sheath coax.

Now you don't have to sacrifice handling performance for lower signal attenuation!

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Minimum bend radius of seven inches for the QR 860, five inches for the QR 500. You can install Quantum Reach in tight places with sharp bends quickly and easily.

Lower attenuation and greater flexibility are just two of the reasons why Quantum Reach is a quantum leap ahead in coaxial cable technology.

Take the problem of core pull-out or shrink-back due to thermal cycling over time, for instance. QR's bonded dielectric makes it highly resistant to conductor pull-out.

Take durability. QR has an advanced performance, medium-density polyethylene jacket that lasts longer, resisting environmental stress cracks and abrasion. And the lower coefficient of friction means less drag and tension when the cable is being plowed or pulled through multiple bends.

Now there's no reason to compromise between signal quality and handling quality. With QR, there's no compromise. It's simply the finest coaxial cable available today.

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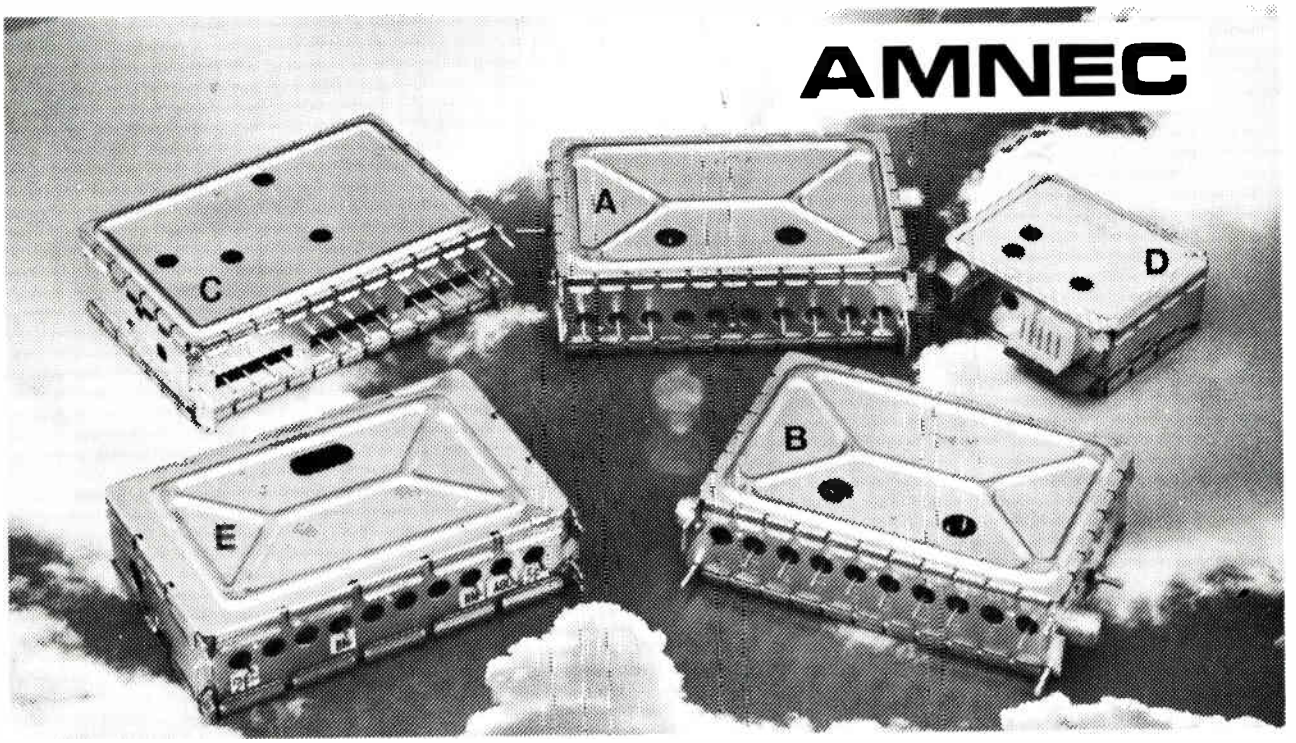

A EPU-202 UHF Tuner Ch. 14-83 75 ohm Input
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C PIF-45MO1 Picture IF. (45.75 MHz)
D RF-3400 RF Modulator Video 1VPP Audio .5
E EPU-253 UHF Tuner Ch. 3 Output

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Reader Service Number 55

New cable-telco interactive system gets Omni Cable test

Cable, telco interactive system debuts

ATLANTA — Columbus, Ohio, had Group W and Qube. Later this year, Roswell, Ga., and Omni Cable will play host to an equally experimental in-home communications system called TranstexT.

Cable lines will deliver video signals downstream, while the upstream links are by telephone line. Within the home, TranstexT will use existing electrical house wiring to send commands and transmit information from one appliance to another.

TranstexT will combine energy management services with information services such as banking, electronic shopping, security, news and education.

BellSouth's recently announced Pulselink data network ties the system together. A touchtone telephone serves as the subscriber terminal, although other peripherals such as personal computers and printers can be added.

Integrated Communication Systems, a privately held research and development firm based in Atlanta, has put together an impressive TranstexT consortium. Participating are The Southern Company, a power utility; United Telecom; GTE; Westinghouse Electric; Dow Jones; Control Data; Pacific Power & Light; American District Telegraph Co., a security firm; and a number of Georgia and Florida power companies.

Also developing TranstexT applications are National Data Corp., First Atlanta, C&S National Bank, Fulton Savings & Loan, Reistad Corp. and NCNB National Bank.

The Atlanta Journal Constitution, Group W Cable, General Telephone of Florida, United Telephone Systems and Comdial also are involved.

ICS is positioning the service as a premium value-added network with a low cost for entry but unlimited potential for upgrading.

The company hasn't revealed any details about its initial testing, nor will it comment about project costs or a timetable for commercial deployment.

— *Gary Kim*

RT/Katek, CCG merge

LAS VEGAS, Nev. — RT/KATEK Inc. and Communications Construction Group have merged to form RT/KATEK Communications Group. The new firm will offer complete construction, installation, subscriber maintenance and converter repair services.

The new company expects fiscal year 1985 sales of $26-$30 million, Roy Tartaglia, RTK vice chairman, said. Each of the company's divisions will continue to operate as autonomous units, and there are no current plans to consolidate staff or operations.

Merger talks had begun at the Western Cable Show in Anaheim, Calif., in December 1983 and "the concept just clicked," Tartaglia said. An exchange of stock sealed the deal.

CCG President George Tamasi and Executive Vice President Tom Polis were elected to the RTK board of directors as part of the agreement.

The merger culminates RTK's drive to position itself as a total services group for the cable industry.

"But we aren't putting all our eggs into one basket," Tartaglia said. "We want to be a $100 million company sometime during the next four to five years, and we don't think we can do that if we focus exclusively on cable."

RTK already had moved into overnight repair service for IBM personal computers, and recently expanded to on-site service as well.

But the company has other plans. Bob Bilodeau, RTK chairman, said the company was "very close" to a final agreement that would take the firm into the long distance telephone business.

"Companies like MCI are more concerned with the interstate traffic, but we feel there's a lot of money to be made in the intrastate business," Tartaglia said. "We know New Jersey very well, and think we can be a jump ahead of everyone else."

Bob Bilodeau, RT/KATEK chairman

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Reader Service Number 15

Power doubling by Magnavox

Feedforward tips offered

LAS VEGAS, Nev. — Feedforward only works when cancelling works, so system engineers need to know the limits of cancelling effects, said Joseph Preschutti, vice president of engineering at C-COR Electronics Inc., at an NCTA session on rebuilds.

Because third order distortion performance isn't uniform, and changes with frequency, temperature and time, Preschutti recommended that design engineers keep a few pointers in mind when feedforward is used in a rebuild.

"450 MHz, 60-channel composite triple beat for a feedforward gain block should be specified at no better than an 18 dB improvement over existing hybrid integrated circuit technology distortion performance," he said.

He also argued against using feedforward circuits for trunk station preamplifiers. "Feedforward circuits have higher noise figures and decreased dynamic range," Preschutti said.

System designers also should expect cascade flatness at temperature extremes to be measurably less than with other systems.

AML interconnects for local area networks

LAS VEGAS, Nev. — Microwave transmission systems have a role to play in local area networking, according to Jamal Sarraf, senior staff engineer for Hughes Microwave Communications Products, Hughes Aircraft Co.

The idea behind local area network development is to share a common transmission medium among many users. Interconnection of several LANs into a single, but larger, LAN extends this principle further.

This is where AML systems come in.

In many cases, extension of a broadband LAN's coaxial branches is impractical or impossible. CARS microwave radio links can be used to make the connections.

But, Sarraf warned, there are some factors that must be considered: carrier bandwidth, number of carriers and the effect of carrier-to-noise and intermodulation products on the carriers as they pass through the microwave system.

The transmission delay introduced by the microwave link, however, is probably the most important consideration, since it effects the throughput of the LAN. But, these delays are only about one-tenth of those associated with coaxial cable of comparable lengths.

Use of the carrier sense multiple access with collision detection access mechanism provides a very high throughput of 96 percent of available capacity, he added. Many broadband and baseband systems are using this access mechanism.

But, broadband LANs are lagging behind baseband systems in terms of setting standards.

In the baseband-type Ethernet system, data communications suppliers have standardized on about 30 percent of the total protocols.

"In broadband systems, there is no consensus among suppliers. Every vendor has its own scheme and system architecture," he said.

— Constance Warren

Data bus access methods weighed

LAS VEGAS, Nev. — The token passing bus access method has clear advantages for data communication on cable systems, Ernest Tunmann, president of Tele-Engineering, said at an NCTA workshop on data communications.

Tunmann gave that opinion after reviewing the three popular access protocols for broadband data systems.

The polling system requires a centralized, headend controller that can address each terminal modem, verify its readiness to transmit, initiate a handshake and then monitor the transmission from the terminal, he said.

There are a few problems with this type of system, he argued. Terminal modems sending lots of data may occupy the system for long periods of time while many shorter messages are delayed.

Another problem is the centralized controller, which has to be backed up for failure, raising the cost of the front end portion of the system, he said.

The carrier sense multiple access/collision detection method is used by many high-speed data and local area networks. CSMA/CD uses the principle of "listen before transmitting/listen while transmitting."

All terminals monitor the network and remain silent if it's being used. When the network is free, all stations may contend for control of the system. If two or more terminals initiate transmissions at once, a data collision occurs and the contending terminals are instructed to retransmit at random times.

Under high traffic conditions, there will be many collisions, restricting throughput, Tunmann said.

Cable systems with long cascades will experience further delays, he said.

Signal levels also can be a problem. "With tap settings of 3 dB, the industry standard, a LAN designer has to know the precise distances between taps, and also make sure the drop wire lengths are identical," Tunmann said.

Token passing is a distributed method of polling. A terminal needs a token, a transmit authorization message, to talk on the network. The token is passed around the network in a logical ring, and no terminal is allowed to transmit without possession of the token.

The advantage is a decrease in data collisions and an increase in throughput.

As loading on the system increases, low-priority traffic can be held, he said.

— Gary Kim

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NCTA coverage

NABU betting adapter pays off

LAS VEGAS, Nev. — The NABU Home Computer Network is gambling that a new strategy of using popular personal computers, rather than its own home terminal, will pay off when the service is launched in the United States on a national basis in early 1985.

The company announced it has developed an adapter that allows NABU to load data into such computers as the Commodore 64, IBM PC, Apple and MSX-standard machines now being supported by 19 Japanese and Korean manufacturers.

Company Chairman John Kelly said the company would not place any further orders for its own 64K terminal after the initial run of 10,000 machines. At present, only the NABU PC is compatible with the system, which offers about 100 software programs to customers in Ottawa, Canada and Alexandria, Va.

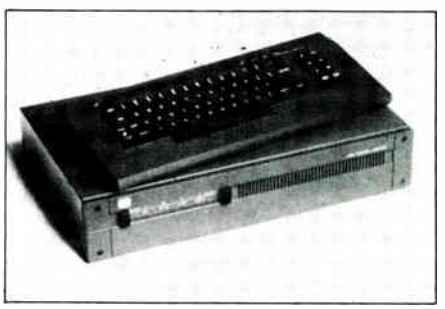
NABU's U.S. launch came on May 23, and the company has signed about 104 customers, Kelly said. He used the analogy of music distribution to explain the company's business concept.

"Basically, there are three ways to distribute music — physical media, jukeboxes and radio broadcast," he said. "Buyers of computer software have, up to this point, also had a physical media — disc and cartridge. Arcades are like jukeboxes, offering pay-per-view, but there hasn't been a broadcast-type delivery system."

But NABU's system is superior to radio in several ways, Kelly said. "Radio isn't addressable, and it's limited to the delivery of one piece of software — a song — at a time."

NABU can deliver any of its 100 programs to any subscriber with a 10- to 15-second response time. The company expects no problems with these access rates even as it adds 10 new programs per month, Kelly said.

A subscriber paying for all three tiers of programming now spends $17.95 a month. — *Gary Kim*



Nabu terminal

Wavetek CR-6

Wavetek unveils test products

LAS VEGAS, Nev. — Wavetek unveiled four new CATV testing products at the NCTA convention. Its new 1981 System Analyzer, modeled on the Model 1880, has a frequency range of 1 GHz. It is priced at $8,500 and can be delivered in 10 weeks, said company spokesman John Shaw.

Wavetek also showed a new Model CR-6 signal leakage monitor designed for belt carriage. An audible tone, whose frequency is proportional to the level of signal encountered, is automatically triggered when a leak is detected. The unit sells for $345.

The new RC-1 remote control receiver works with the Model 1855B sweep transmitter and allows access to the headend test data by telephone. The controller sells for $495 and microphones sell for $150.

The RT-1 remote controller permits activation and operation of the SAM III D and Sam IV signal level meters. The battery-powered unit is completely portable and accesses the meters by phone line.

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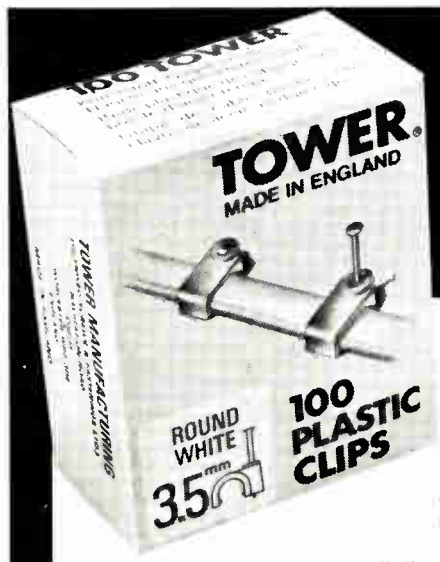

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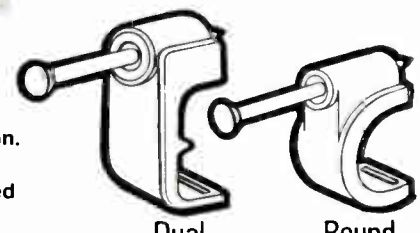

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Reader Service Number 18

Sat spacing and signal scrambling

LAS VEGAS, Nev. — Two degree spacing and satellite signal scrambling were the topics of discussion at an NCTA session on advances in signal relay via satellite and microwave.

Even with the FCC 29-25 log pheta discrimination specification for antennas, two-degree spacing in today's satellite environment will raise earth station interference to the point where small aperture antennas can not be used as distribution mediums, Dom Stasi, vice president and general manager, network operations and design engineering for Warner Amex Satellite Entertainment Co., argued.

High-powered antennas, with 8.5-9 watt transponders, will create even more interference, he said.

Under ideal conditions, carrier-to-interference and carrier-to-noise levels for small aperture antennas in a two-degree spacing environment will be 6.6 dB and 4.35 db, respectively.

Stasi called these ratios "unacceptable," and said they make "absolutely no sense in the initial cut."

But there are some measures that can be taken to reduce the hostility of the downlink so that discernable pictures can be pulled out of a 4.35 carrier-to-noise environment.

Scrambling methods that eliminate sync and the need for subcarriers can increase the modulation index and decrease deviations and the threshold number.

These methods, combined with other tricks, result in "eminently useable numbers," Stasi said.

Despite these improvements, Stasi cautioned against using an antenna smaller than four meters for distribution.

While satellite scrambling methods may play an important role in making two-degree satellite transmissions possible, that is not their primary purpose.

M/A-COM's VideoCypher II, which is in its later stages of development, will secure TV transmissions received by cable TV headends and homes.

The VideoCypher II uses a data encryption standard algorithm to protect addressing information and two channels of digitally transmitted audio, Jerrold Heller, group president, video products, M/A-COM System Division, told session attendees.

There is no degradation due to power stealing or intermodulation problems associated with subcarriers, unless more than two channels of audio are transmitted.

Encrypted information is received by a descrambler, which has a descrambling key for each program. A data encryption standard key generator generates bits that are integrated on a one-per-one basis with the audio bits being received. This process transforms the unintelligible digital stream into two channels of intelligible audio, Heller explained.

Transmitted messages also are decoded in this manner.

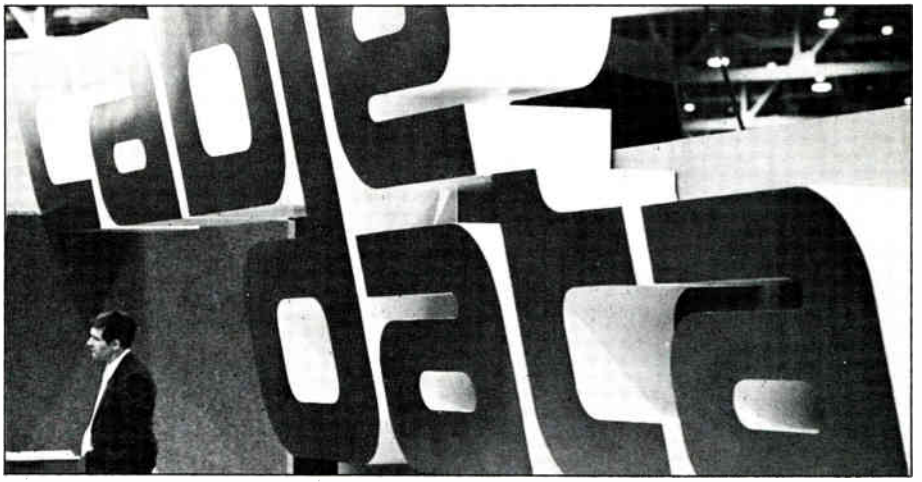
A sync elimination, video inversion scheme masks the video. Horizontal and video sync information is removed from the signal and replaced with a digital synchronization scheme. The signal also is inverted.

The system provides two types of service: tiers and impulse pay-per-view. The tiered service can be arranged on an individual channel, individual program or sets of programs on various channels basis. Fifty-six tiers can be offered.

In an impulse pay-per-view mode, the system's descrambler tracks subscriber credit availability. When the subscriber wishes to view an impulse pay-per-view event, his descrambler records the purchase and enters it into the register. When the subscriber's register reaches zero, he can not watch any more pay-per-view events unless the programmer extends his credit.

Heller said that the DBS version of the VideoCypher II will be available before the cable model. "The system will have to be redesigned to some extent for cable," he added.

— *Constance Warren*



Cable data tests continue

LAS VEGAS, Nev. — People at the system level tend to shrug their shoulders about data services, but it will be a significant future business, and operators should get a part of it, says Edward Allen, president of Western Communications Inc.

Meanwhile, data experiments continue around the country. Cox Cable has an active, four-mile data loop serving the City of Tucson, Ariz. It ties together federal, state, county and city buildings in the downtown area, and also serves one commercial customer at the moment.

A 10-mile run is scheduled for later hookup, and the city estimates it may save $15,000 a year in telephone charges by using the cable network, says Tucson Cable Administrator Clayton Hamilton.

"The I-net is 85 percent complete and contains over 1,300 miles of plant, not all of which is activated," Hamilton says.

Viacom Cablevision has activated about 10 miles of its packet-switched data service in Mountain View, Calif. Currently serving municipal clients, Viacom has about 15 active Sytek modems operating on the network, says Andy Pfaff, director of new business development for Viacom.

The city police department already is on-line, with the fire, maintenance and recreation departments to follow, says Harriet Moss, city cable TV coordinator.

In Stockton, Calif., Big Valley Cablevision, a Continental system, is carrying school attendance data between seven campuses and a district computer. The system uses Catel modems and up-converters and Prentica multiplexers.

— *Gary Kim*

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Reader Service Number 19

Better converters needed

LAS VEGAS, Nev. — Addressable terminal reliability was the major issue raised at an NCTA workshop on converters.

In the past two years, Viacom has experienced a 10-12 percent annual failure rate with addressable converters in the field. This compares to a 7-9 percent failure rate with non-addressable systems, said Del Heller, Viacom director of engineering.

"With addressable HTUs, we experience something we call 'hidden service calls,' " Heller explained. "These are events such as HTU shutdowns or deauthorizations, where, the box, for some mysterious reason, shuts off."

"We have experienced some customer abuse of the product, when the unit repeatedly fails," he added.

The issue of baseband reliability compared to RF was tackled by Clyde Robbins, senior project engineer with Jerrold.

"With reasonable care and design, a baseband signal can be transparent to the CATV subscriber," he said. "In some cases, the baseband converter can actually improve signal quality, when compared to an RF converter."

"A quality baseband terminal will add no additional multiple signal interference compared to an RF converter. Thermal noise interference can be reduced in comparison with an RF converter. Signal-to-signal interference will occur, but can be controlled below the level of subscriber perception," he said.

James Farmer, division technical manager, distribution, data and subscriber products division, Scientific-Atlanta, discussed backtalk and memory problems intrinsic to addressable converters.

"A phenomenon called 'backtalk', occurs with set-top terminals having bandwidths greater than 300 or 330 MHz," he said.

In homes with more than one TV set, some of the energy from non-desired channels isn't propagated back to the drop. Instead, it enters the coax going to the other TV set and produces a beat that appears on the second set.

This beat, or 'backtalk,' needs to be controlled to produce good pictures, he said.

Non-volatile memory also is essential to assure converter memory isn't lost during power outages.

At the same workshop, Mircho Davidov, director of corporate research and development for Oak Communications, said the scrambled picture must not be offensive to non-subscribing viewers.

Calling digital scrambling the "ultimate" in video quality, depth and security, he said that its use isn't feasible today because it is expensive and wastes bandwidth.

Heller also recommended that addressable converter manufacturers include these features in their products:

- parental control and dual cable switching
- vendor alert of security breaches
- compatibility with on-line billing systems and future services, such as stereo audio, videotex, pay-on-demand and cable ready TV sets
- automated inventory control.

— *Constance Warren*

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RF and baseband scrambling explained

LAS VEGAS, Nev. — The selection of a scrambling method depends on whether extremely high levels of security or moderate levels of protection at lower cost are desired, Mircho Davidov, director of research and development at Oak Industries said at an NCTA technical session.

Six attributes need to be considered when any scrambling technique is considered, Davidov said. Depth of scrambling, which refers to the degree of blurring of detail, is fundamental.

The degree of security offered and its resistance to breaking also is key. Furthermore, the scrambling method shouldn't have residual effects on the descrambled picture, he added.

Low cost hardware should be all the system needs, while the method also should permit overlay of a harder encryption technique on top of a simpler one.

Finally, the scrambled signal should be confined to a 6 MHz bandwidth.

Both RF and baseband techniques are available for use, Davidov said. Conventional RF scrambling is accomplished by tone jamming, inverting the video signal or suppressing sync information.

A tone jammer puts an interfering carrier near a video carrier, masking the video signal.

Video inversion subtracts a constant RF carrier at the same frequency and phase as the actual carrier, causing the active video signal to be treated as a sync signal in the receiver, he added.

Sync suppression works in one of two ways, Davidov said. The video signal can be exponentially modulated by a low-frequency sinewave, or attenuated by at least 6 dB, which causes the sync and color-burst to drop below active video.

Oak has tested two additional methods known as frequency inversion and non-linear filtering, he added.

Baseband scrambling also can be done in many ways, Davidov explained. Using a video inversion and sync suppression method, video is inverted randomly, digital audio is inserted in the sync interval and sync is suppressed.

Video jitter, another technique, randomly jitters the start time of each scan line.

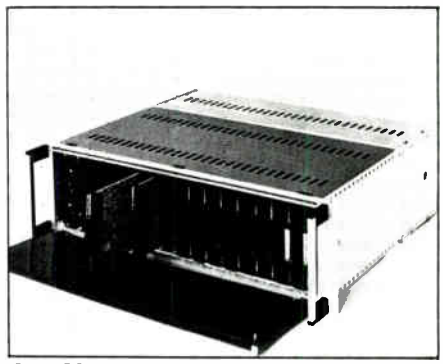
Time reversal transmits each active video line in a time-reversed fashion, leaving the sync and color burst information untouched.

Permutation of video lines also will work, he said. What is done is that a set of video lines are randomly changed and transmitted.

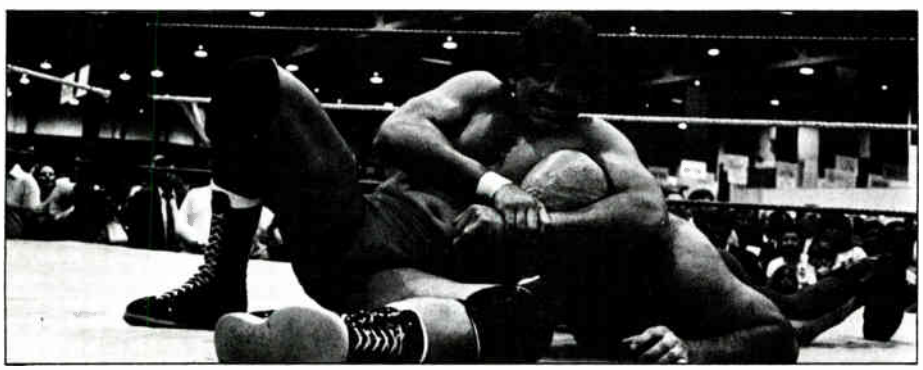
A line dicing technique splits each video line into two fragments that are interchanged before transmission.

Industry attention also has been focused on multiplexed analog component formats, Davidov said.

Davidov closed by offering his opinion that a baseband and digital method is preferable, since it could be used in satellite as well as cable environments without the need for intermediate decoding. — *Gary Kim*



Oak Sigma system digitizes and encrypts audio signals and uses dynamic baseband scrambling for video signals



Like wrestlers at NCTA booth, ATC grapples with business challenges ahead

Get lean, get mean, Myhren says

LAS VEGAS, Nev. — Cable operators must be more responsive to consumers and more competitive with alternative delivery technologies over the next three to five years, Trygve Myhren, chairman and CEO of ATC says.

Flexibility in operations is another imperative, he argues. "We're clustering our operations, reconfiguring our inventory and decentralizing our management. We're also paying more attention to employee training."

ATC also is accelerating introduction of addressability. "We need to reduce theft and service costs for multipay, as well as create capacity for exciting new programming like pay-per-view," Myhren says.

Cooperation between the cable and consumer electronics industries also is necessary, he argues. "The cable-ready issue came upon us before we were ready to deal with it. The challenge of multichannel stereo and high-definition TV is growing, and we need to take positive action by working with consumer electronics manufacturers before problems develop."

Cable shares data business

LAS VEGAS, Nev. — By 1988, cable's share of the local business communication business is projected to be $177 million a year, said Leo Shane of Jerrold at a NCTA session on data communications.

Shane reported on three current examples of cable systems offering videoconferencing and data services. Media General of Fairfax County, Va., is now serving as the terrestrial link between Satellite Business Systems' videoconferencing facility and its earth station.

Video and audio signals are converted to a digital bit stream at 1.544 megabits per second and transmitted over the cable network using T-1 broadband modems.

Shane also reported on the 72-mile institutional network being operated by ATC's Kansas City, Mo., system. Among other applications, 14 area health facilities use the system for teleconferencing.

Jerrold also has supplied equipment for a commercial data network linking 24 buildings owned by a single firm.

No pain, no gain

LAS VEGAS, Nev. — "There's going to be more pain before there's gain in commercial insertion," Scott Tipton, director of R&F systems for Home Box Office, warned cable operators at an NCTA session on the topic.

Commercial insertion is becoming an increasingly important revenue source, according to Paul Olivier, manager of production services for American Television and Communications Corp.

But, he added, its future success depends on the combined efforts of programmers, hardware manufacturers and cable operators.

Problematic satellite signaling methods are hampering the growth of the nascent industry, he said. Two examples he cited are unscheduled tones that switch off network programming at the wrong times and the failure of the cable networks to send those tones.

Ned Mountain, director of marketing for Wegener Communications, recommended the use of separate data subcarriers as the best method for sending down the tones. But, they will not become cost-effective until the next generation of commercial insertion equipment, he said.

Vern Bertrand, sales manager for Channelmatic Inc., said commercial insertion equipment needs vary with each system.

In small markets, where the local advertising medium is either print or radio, the operator doesn't need the most sophisticated hardware, Olivier said.

But, in larger markets, where the operator is competing with the local TV station, equipment selection becomes very important.

In those markets, "you have to present commercials in the same way broadcasters do," he stressed.

To achieve this goal, operators must know which channels will include local avails and how they will operate their advertising systems. Operators also must maintain large advertising staffs and pay close attention to editing, audio levels, encoding and the timing of tapes.

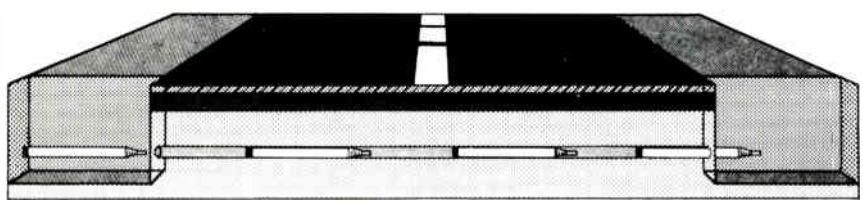
Roger Strawbridge, director of marketing and advertising for Adams-Russell Telecommunications, said operators must change their way of thinking, if they want to compete with broadcasters. "Otherwise," he warned, "the advertiser will go to the UHF station down the road."

Manufacturers also must change, Olivier said.

There are some commercial insertion manufacturers who have never seen a headend, he said.

The manufacturer needs to understand how commercial insertion works, and he must design flexible hardware that can handle a volume of spots. Service support is also essential, he said.

— *Constance Warren*



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Reader Service Number 22

CSB, not CTB the SOB, Cablesys. Eng. study finds

LAS VEGAS, Nev. — Second order distortion can be the limiting distortion in a system carrying more than 50 channels, based on test results presented by Norman Slater of Cablesystems Engineering during an NCTA technical session.

The tests also suggested that parallel or feedforward post amplifiers provide a "disappointing" improvement in second order distortion performance.

Slater ran tests on amplifier cascades of 16 feedforward, 16 conventional and a combination of both types of amplifiers in cascade. He tested the cascades using the IRC operating system and sync suppression and active video inversion scrambling. The HRC system wasn't tested.

The conventional, feedforward and combined cascades were tested with four combinations of IRC on and off and SSAVI scrambling on and off.

The results were that for any signal format, significantly less feedforward improvement is obtained for composite second order beat than for composite triple beat.

"An improvement in post-amp technology can achieve excellent improvement in CTB levels because the post-amp in a conventional amplifier is the major contributor to CTB," he said. "However, when considering CSB, the pre-amp can be a major contributor, especially when low distortion amps are used."

Slater suggested three ways to reduce CSB. Hybrid amplifiers with better CSB performance could be used as pre-amps, or pre-amp hybrids could be arranged in a parallel-hybrid or feedforward configuration.

Hybrids also could be tested for critical parameters such as noise figure, CSB and CTB levels and selected for various uses, depending on their strengths and weaknesses.

— *Gary Kim*

C-COR Electronics introduces data modem

LAS VEGAS, Nev. — C-COR Electronics is currently field testing a low cost coaxial modem called C-LAN. The modem is compatible with any personal computer or dumb terminal with an RS-232 port, and is designed for two-way cable systems, although it can be configured for service on one-way networks.

When volume production begins in August, C-LAN units will sell for about $300 each, although the company expects per-unit costs to drop to the $150 range within 12 months.

The new product is designed to minimize the operator's investment in computer hardware and software. In essence, the C-LAN system connects a subscriber to an outside data base by way of the cable plant and headend.

■ Satcom I has been deactivated by its owner, RCA American Communications Inc. The nation's first 24-transponder satellite had been in service eight and a half years.

■ Dow-Sat of Minnesota, a subsidiary of Dowden Communications Inc., has begun construction of a 300-mile cable system serving Lake Minnetonka, Minn. The system will pass about 18,000 homes.

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AGC in microwave

LAS VEGAS, Nev. — Low noise amplifiers can improve fade margin, increase path length and serve as a tradeoff for antenna size in multichannel microwave systems. But, operators must be careful how they configure LNAs into their systems, Thomas Straus, chief scientist for Hughes Microwave Communications Products, Hughes Aircraft Co., warned a group of NCTA technical session attendees.

An LNA will increase the total amount of noise in a system, but it also will boost the signal. Since the LNA raises the signal level more than the noise figure, the system's actual signal-to-noise ratio is improved.

An image reject filter placed after the LNA can filter out the noise generated by the LNA. This allows the operator to reap the full benefit of the LNA.

The LNA can be packaged inside or outside the receiver in such a way as to produce low third order distortion figures, Straus said.

Putting the LNA inside the AGC loop will reduce the signal level at the input, resulting in a lower signal level. The signal-to-noise ratio within the AGC range will not be altered.

As far as improving path reliability, the LNA can extend the breakpoint into the receiver by 3.5 dB.

Signal-to-signal ratios at low signal levels will be improved, but not at high signal levels, Straus added.

Microwave LNAs

The LNA also reduces composite triple beat, because the mixer is being hit 4 dB higher. This results in a 8 dB degradation of composite triple beat.

"If you put the LNA outside the receiver, the fade margin improvement is a lot larger," Strauss said. This improvement is achieved by placing the LNA in front of the waveguide. The waveguide loss then is able to reduce the path loss.

However, Straus warned, placement of the LNA up on the tower results in unacceptable composite triple beats. One way to circumvent this problem is to add an AGC in front of the LNA.

— *Constance Warren*

Simple tests for modems

LAS VEGAS, Nev. — A few simple tests can help operators identify poor RF modem performance before a major purchase, Kenneth Crandall, program manager for RF modems with Zeta Laboratories Inc., said at an NCTA workshop on testing and measurement.

Voice modem interface specs usually omit voice quality and overmodulation characteristics, while digital RF modem specs sometimes omit transmit clock frequency accuracy for synchronous modems.

Operators also should look for spurious signals around the carrier frequency as well as at harmonic multiples, he said.

If the modem is frequency agile, different frequencies should be tested. Carrier disable leakage and carrier frequency spacing are other areas to watch.

"Avoid spacing carriers any closer than 20 KHz," Crandall said.

Demodulator performance can also be checked in a variety of ways. Two tone tests will certify the receiver front end for intermodulation, while image rejection should be 50 dB in a good receiver design.

Receiver dynamic range also is important. Data modems ought to operate error free, and voice modems distortion free, over the full range of rated signal strengths.

RF modems should tolerate at least 2 kHz of translator drift with more margin if possible, he said.

"Bit error rates under poor signal-to-noise conditions also can be tested," he said.

Most RF modems are tested for a rather tame commercial temperature range, and Crandall recommended testing modems for cold start.

"FM frequency discriminators sometimes get nonlinear under temperature extremes, causing distortion or bit errors," he added.

Modems also should be tested for mechanical shock. — *Gary Kim*

Average Leakage Index ranks leaks

LAS VEGAS, Nev. — The Average Leakage Index can be used to rank system leakage in a particular system as compared to others in the same universe, Ted Hartson of Capital Cities Cable said at a NCTA workshop on radiation measurement and prevention.

The ALI user conducts two random measurements for each mile of plant and classifies each test site as either within FCC limits, possibly exceeding FCC rules, or likely to exceed the limits.

The total number of samples in each category is totaled and expressed as a percentage of the total plant, Hartson said.

Actual ALI figues are determined by adding all the scores and dividing by the number of samples taken.

The number of test sites should be twice the number of plant miles, Hartson said. "Tests should be made about every half mile, and on average, about 25 to 30 tests can be made each working hour."

Capital Cities uses Comsonics sniffers operating in the 108 MHz range, and calibrated to the internal standard so 20 microvolts per meter at 10 feet equals mid-scale, he said.

"Newer and well-maintained systems should get ALI scores of close to 1.0," Hartson said. "A value of 1.2 wouldn't be unusual for a five-year-old system using aluminum cable and having had only casual maintenance."

But he reported that ALI scores of 2.05 have been recorded in 15-year-old systems using foil-type trunk and distribution cables.

"As a practical matter, it will be difficult to isolate individual leaks in a system with really bad leakage."

NewsSweep

■ Star Ship Stereo, a pay audio package featuring the ten most saleable musical formats, is now available for distribution to cable systems.

Maximum cost of the entire music package, including converters, is $4 a month per pay subscriber.

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Your alternative to Standard's loop-through design is a power divider system which results in a reduced signal level when it's divided amongst each receiver. Or, you may be forced into a much more expensive 4 GHz amplifier/divider to make up for the signal loss to each receiver.

The Agile 24 eliminates both of these unsatisfactory alternatives.

System Design

The Agile 24M is a complete 24-channel dual conversion, 4 GHz input receiver that block-down converts to 760-1260 MHz. Then, through the active loop-through design, this IF is supplied to the Agile 24S.

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An inexpensive plug-in simultaneous second audio board is also available.

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The Agile 24 M/S series features a low-profile 1¾" chassis designed to occupy a single standard rack space. The front panel includes three-function meter displaying signal strength, C/N and center tune, convenient front test connections and all normal performance adjustments, as well.

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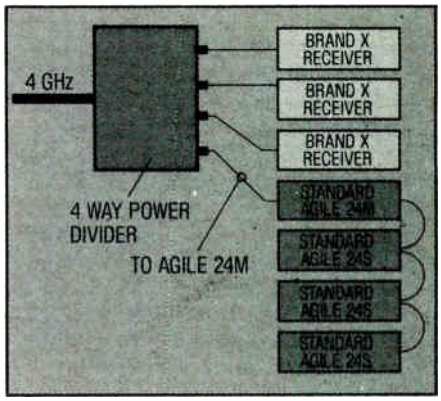

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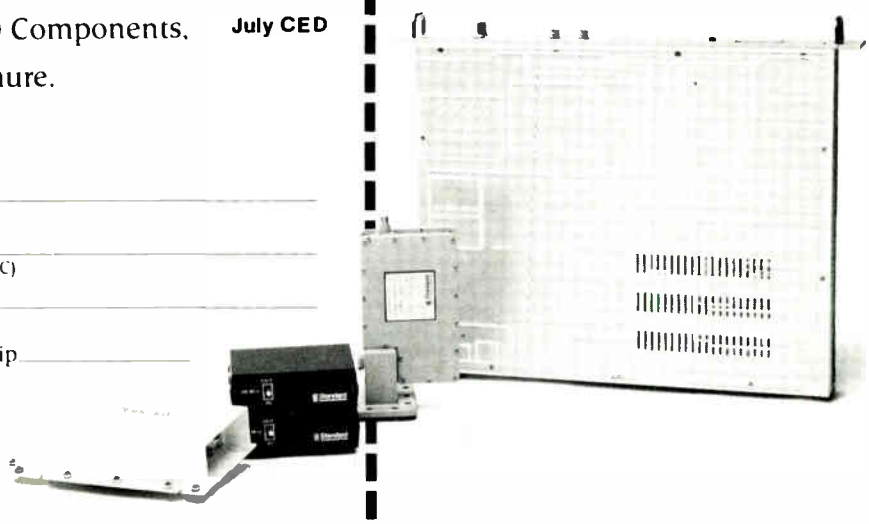

Teleconferencing batters step to plate

Big hits expected

Teleconferencing may not be a very big business right now, but the way some players are lining up at the plate, it's clear big hits are expected. Private Satellite Network Inc., the nation's first commercial Ku-band DBS service, has just signed its first two customers, and is betting that private television will become a whole new industry.

"What we're doing is developing a variety of professional television networks, engineered for pay-per-view and going straight into offices," says Marc Porat, PSN president.

Starcom Inc., a Denver-based private cable operator, is so enthusiastic about the future of commercial markets for video services that it recently changed its business direction, and now concentrates exclusively on the hotel and teleconferencing business.

"Six months from now, a hotel without a dish will be like a hotel without a pool," says Starcom's Bob Elliott, vice president for sales and marketing.

Satellite Business Systems hasn't formally entered the videoconferencing market but plans to do so, says Bob Bengston, national account representative for the company.

The firm already is using a freeze-frame teleconferencing system internally for training, transmitting in a T-1 format at 1.544 megabits per second in 15 millisecond bursts, says Terrance Egan, SBS branch manager for national network marketing.

Of the company's 20 present network sites, 10 have videoconferencing facilities in place and can handle full-color, freeze-frame transmissions. Full-motion capability will be added later, however.

"We know there's a market out there," he says.

And while few players have yet chosen to make teleconferencing their sole business, many are looking to it as a healthy source of supplemental revenues.

For example, Argo Communications Corp., a long-distance telecommunications common carrier, offers videoconferencing as well as the more traditional voice and data services to its business customers.

And although Netcom International's first customer was a textile manufacturer who wanted a teleconference set up between Hong Kong and the United States, the company now finds that 80 percent of its business is related to video program uplinking.

SBS Denver earth station

Isacomm Inc., a subsidiary of United Telecom, has set up a videoconferencing service called "The Meeting Channel," and has already installed six of a planned 1984 total of 22 video conference rooms.

Perhaps of more interest is the increasing involvement of end users and non-communications companies in teleconferencing. The Holiday Inns, for example, first set up a satellite network in 1979 to bring Home Box Office programming into its guest rooms. A year and a half later the Hi-Net system was used to broadcast the first national videoconference in the hotel industry. Today, the Hi-Net system has 340 earth stations in operation across the country.

Lee Memorial Hospital in Fort Myers, Fla., got started with satellite services when it installed a TVRO antenna aimed at Satcom III. The hospital provides free TV to its patients and figured it would come out ahead financially if it put in a private cable system.

The hospital also has a media services unit that produces regular TV programming on health issues, and found the costs of distributing its material nationwide justified an uplink.

A teleconferencing facility is now under construction that will be used for medical meetings.

Other hospital and hotel teleconferencing sites are popping up around the country, and last January, about 45 representatives of investors, developers, manufacturers and operators of teleports met to form a trade association representing the industry.

A recent survey by TeleStrategies found operational teleports in eight cities, all offering telecommunication services, primarily video.

"The grand scheme of things is for the association to represent full service communication centers offering voice, data and video services," according to Pam Janice of TeleStrategies. "Our current research indicates there is a teleport project at some stage of development in each of the top 30 U.S. cities."

"We also have identified 60 additional telecommunications enhanced buildings," she said.

One of the group's goals is the ability to interconnect systems, both nationally and internationally.

And, as Starcom found out, teleconferencing and the hotel business stand in "night-and-day" contrast to the residential cable TV business. "Basically what you're offering in the hotel market is guest services, whether it's a pay-per-day movie service or arranging a teleconference," Elliott says.

Starcom's conferences use two-way audio and one-way video, and a primary use for the meetings is sales management. AT&T, for example, uses teleconferencing for explaining new product introductions to its sales force, as does PSN customer Merrill Lynch.

All of Starcom's sites offer teleconferencing services in addition to video entertainment, and Elliott thinks the next big use for videoconferencing will be "blue collar, rather than white collar" applications.

"I can easily see the Amways and Mary Kays of the country putting on national sales conferences," Elliott says.

Manhattan Cable TV also has gone after the hotel market and currently has signed up 72 hotel clients for traditional television programming. But MCTV also is moving to set up one-way videoconferencing services and has already set up at least one ad hoc teleconference.

In Denver, both SatServ and United Cable Television Corp. have uplinking facilities, although SatServ has been

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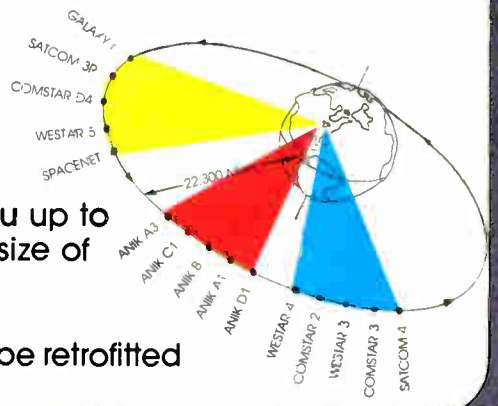

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much more actively involved in teleconferencing ventures.

The company recently launched its Campus Conference Network, which will ultimately link as many as 60 affiliates in the top communications markets around the United States, as well as others scattered throughout the country.

As planned, each receive site will accommodate at least 100 people, four monitors, a phone link, earth station and parking facilities. — *Gary Kim*

Ku-band business net activates

NEW YORK — Private Satellite Network Inc., the nation's first Ku-band DBS network aimed at business users, has signed its first two customers, and anticipates signing others soon.

Merrill Lynch, Pierce, Fenner & Smith plans to broadcast product and sales training information to its branches nationwide, while the National Education Association plans to keep its members abreast of legislative developments.

Aimed primarily at Fortune 500-type clients, PSN offers two-way audio and one-way video signals that are both scrambled and addressable.

"All of our customers tend to be large, sales-driven firms that need to keep their people informed on a constant basis," Marc Porat, PSN president, said.

Porat argues that the company's services are cost-competitive with telephone-delivered information. "The break-even point for a large firm doing teleconferencing on an ad hoc basis is 2.4 events a year. Some of our customers have spent in one day an amount of money that would buy our service for a year," he said.

"A 100-site company broadcasting one hour a day would spend $33 an hour per site," Porat said. "A company like Merrill Lynch, with some 500 sites, would be spending about $21 an hour per site. A telephone connection would run about $22 an hour per site."

The network is engineered for multichannel sound as well as two-way video, and is leasing transponder time on an as-needed basis.

PSN sees itself riding the crest of a new wave of private television and professional TV networks catering to closed audiences.

Sony shows audio systems

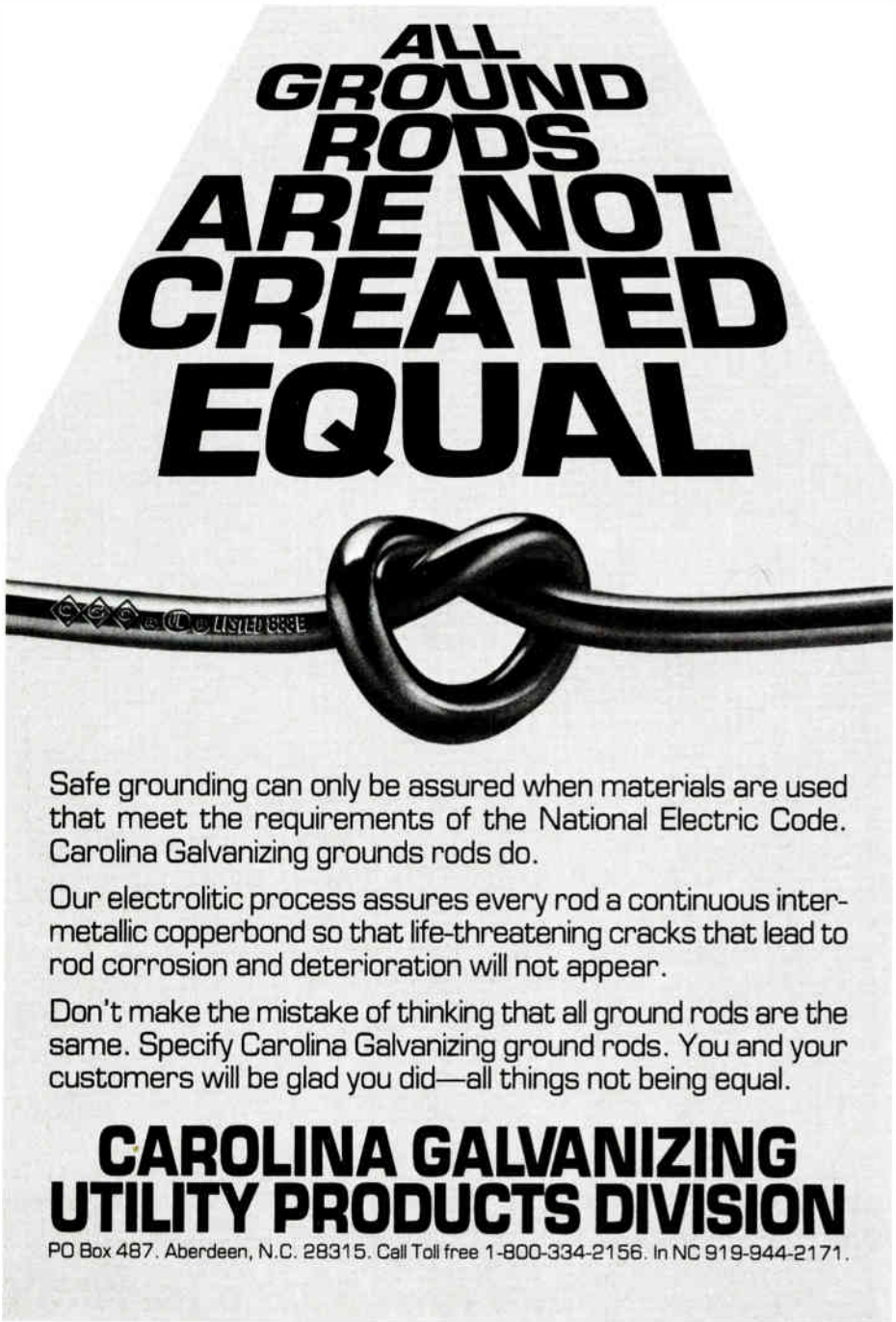
LAS VEGAS, Nev. — Sony Corp. demonstrated its recently developed Cable Digital/Audio/Data Transmission System at the NCTA convention. The CADA system shown to operators at the show isn't a final product, company officials emphasized.

"We want the comments of the cable industry before we introduce CADA to the U.S. market," said Chris Davis, manager of cable systems business development with Sony.

Three audio levels can be configured on the system, which handles audio, computer and other data services. In an 8-bit, 44.1 kHz configuration, eight stereo programs of high-, rather than ultra-high, fidelity can be carried.

In an 8-bit, 22.05 kHz mode, 32 monaural signals can be accommodated, Davis said.

CADA transmits data at 7.4 Megabits per second using 6 MHz of bandwidth.



Reader Service Number 12

The prototype exhibited at NCTA used two receivers and a headend including a public address sytem, two compact disc players, a high-fidelity amplifier, a cassette deck and Beta tape deck.

The system is totally addressable from the headend, and includes a global addressing feature allowing CADA's use for emergency services. Any individual terminal also can be addressed with a voice signal.

The company also is considering adding an option for an alphanumeric keyboard for messaging services.

Sony also showed a prototype cable transmission system using a data transmitter similar to CADA's. Eight 8-bit stereo channels can be piped down an equivalent of one audio channel, Davis said.

The interim scrambling technique demonstrated was a random variation of all baseband scrambling plus a Sony proprietary method.

"The final version will be hard encrypted and will use a phone autodialer system to provide impulse pay-per-view," Davis said. "Blocking of signals from the headend can be done on a dedicated channel or individual program basis."

The new system will deliver 74 video channels in a baseband format, and twice that number on a dual cable system, he said. — *Gary Kim*

Download

■ **Infomart, the new Dallas computer** products center, will have a public access videotex system online when the building opens in 1985.

■ **Public access videotex systems also** will be going online in Phoenix, Ariz., and Sacramento, Calif., this fall. Both services will use Telidon software. The Phoenix system, operated by R/G Cable, will use Microtel terminals, and information providers will pay $200 a page per year to advertise on the service, called "Teleguide Metro Phoenix."

■ **Storer Metro Communications Inc.** will be offering Keyfax teletext services to its subscribers in Washington County, Ore. Storer Metro is the second operator to add the satellite-delivered teletext service.

■ **Group W Satellite Communications** has formed a new business unit to provide technical and engineering services to the cable and broadcasting industries. Production, post-production and transmission services are available.

■ **M/A-COM Linkabit is building a Ku-band** satellite network for Schlumberger Technology Corp. The $20 million system will provide encrypted voice and high-speed data services.

■ **Direct Satellite Television Inc. is building** a private cable system offering over a dozen satellite channels to residents of the 1,100-unit Woodner apartment complex in Washington, D.C.

■ **The Institute of Electrical and Electronics** Engineers is now distributing continuing education courses by satellite to 110 colleges and universities that are members of the National University Teleconference Network.

■ **For the first time, major companies recruiting** engineers and other technical employees will do so by teleconference. On Oct. 9 and 10, 1984, Business People Inc. will match 20 employers with graduating students at 21 sites.

■ **Anixter Bros. Inc. is the prime supplier** of cable and distribution electronics for the local area network being installed by the Cleveland Clinic. The LAN will provide data, video, security and patient monitoring services.

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TECHNICAL SPECIFICATIONS ON REVERSE SIDE

Reader Service Number 28

Cable data: slow start, but in the race

By Constance Warren

Cable's relationship with data services often has been a case of the wedding bell blues. After the initial excitement of courtship has worn off, few operators have made it to the church to tie the knot.

Others, who can't make up their minds, keep postponing the wedding date.

Some get jilted at the altar, while others make it through the ceremony only to find their partners aren't exactly the way they once appeared.

Still, most operators believe there is a market for broadband data services. Perhaps not immediately, however.

Operators are reluctant to start offering data transmission services beause it isn't their traditional business, according to Lee Perron, general manager for Norman Cable TV, a Multimedia Cablevision system located in Norman, Okla.

Some wonder whether it's a business at all.

"I don't know if anybody has done enough market research to say that an X number of customers at an X number of dollars exists for cable data services," said David Pangrac, vice president of engineering for ATC.

Another concern is the cost of building, maintaining and operating a broadband data network.

"The cost of two-way technology is too high," argued Scott Kurnit, vice president of programming and advertising for one of cable's data pioneers, Warner Amex Cable Communications.

But John Rivenburgh, corporate product manager for Rogers Cablesystems, disagrees.

"I don't know if anybody has done enough market research to say that an X number of customers at an X number of dollars exists for cable data services."

David Pangrac, American Television and Communications

"Today, I don't think data services are a significant revenue contributor, but the converse of that is that the amount of people required to operate an I-Net is minimal because of the high reliability of the network and the equipment you put out there. It makes enough money to cover operating and capital costs fairly quickly," he said.

Perron believes the spread of suburban sprawl will create demand for cable data services, because central offices will need to reach suburban locations.

James Cooper, executive vice president of Selkirk Communications, Ft. Lauderdale, Fla., thinks differently.

"Franchising confines the operator," he explained. "In urban areas, there are multiple franchises, which requires a business with branches located around the city to deal with more than one operator."

There's also the problem of technical standards and competition from other telecommunications players, he noted.

Another unresolved issue is demand.

"All the blue skies for data — shop-at-home, electronic banking and security — just didn't develop into a viable business," Pangrac asserted.

Kenneth Krushel, director of new services for American Cablesystems Corp., also has doubts. "At $800 to $1,500 an install, is security a business or a nuisance?"

Still, Warner Amex, which has cut its Qube services 90 percent since their introduction, believes there is demand for cable data services, according to Kurnit.

"We believe the market growth we originally projected will be met, but at a slower rate," he said.

Cooper doesn't anticipate a great amount of revenue to come from Selkirk's Special Service Network.

But, "in the next five years or so, it may become a significant contributor," he added.

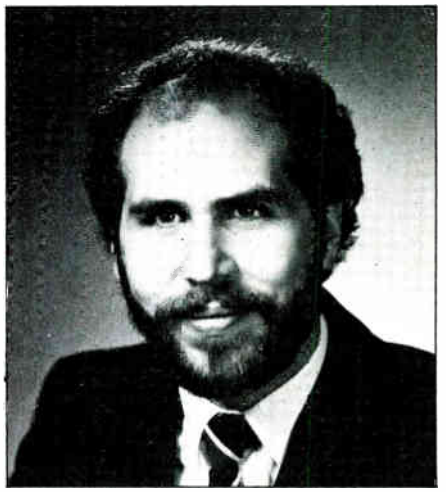
And while Rogers' Portland institutional network hasn't garnered any new clients in the last year, its existing ones have increased their usage by some 30 to 40 percent, Rivenburgh said.

He sees cable's data future lying in the provision of high-speed T-1 services and in the microcomputer market.

But these services are limited by hardware availability and cost, he added.

"I have yet to receive a cost-effective, operational packet switch," he said. And "another big issue is cost-effective modems to provide services to the blossoming microcomputer market."

Similarly, Kurnit cited 'the cost of technology and the fact that the



"We believe the market growth we originally projected will be met, but at a slower rate."

Scott Kurnit, Warner Amex Cable Communications

manufacturers are not producing enough products" as major barriers to the development of cable's data market.

Yet, "the cost of terminals is coming down," he conceded. "Terminals now cost one-half of what we originally paid seven years ago," he said.

Krushel would like to see a "multifaceted modem" that is not tied or dedicated to a single application. "Today, one modem works with this service and another works with that service," he explained. "If you want to receive three or four different services, you have to have a pizza pie of modems on top of your TV set."

But even if hardware manufacturers are able to meet operators' demands, regulatory clouds stifling cable's data service development may remain.

Calling the current regulatory environment "debilitating," Rivenburgh said that cable companies offering data services have maintained a low profile because of the uncertain regulatory issues involved.

"There is demand for certain services, like a T-1 service, that we can't necessarily provide to people because we are unsure of the regulatory issues.

"It's going to take the clearing up of these regulatory issues before we begin to make larger capital investments pursuing new business opportunities," he added.

Continued on next page

Stereo standards discussed

LAS VEGAS, Nev. — Selection of a standard for carriage of cable audio services will require several trade-offs, said Dennis Waters of Waters & Co. at an NCTA session on cable audio.

The first choice to be made is whether the signals are carried analog or digital. Digital has the advantages of encryption, ultra-high quality and flexibility — other data services also can be carried.

But digital is expensive and bandwidth-intensive, Waters said.

Analog, on the other hand, is less expensive, more spectrum-efficient and can even approach digital audio quality.

There is also the issue of in-band or out-of-band transmission. Some systems send audio signals along with the video, while others put it elsewhere in the spectrum.

In-band transmission allows tuning of both signals at the same time, and also means one subscriber terminal. However, it allows no room for stand-alone pay audio services. It also imposes an upper limit on quality, because 16-bit linear pulse code modulation won't fit in-band, Waters said.

Mentioning that the consumer electronics industry is quite excited about the potential of compact disc digital audio, Waters emphasized that broadcast FM radio doesn't have the bandwidth to transmit full fidelity sound. "About 1.5 MHz is needed for every CD stereo pair, and FM radio has only 200 kHz," Waters said.

He also described the current cable audio transmission formats, beginning with the FM multiplex system, which places carriers in the 88-108 MHz FM band. A block converter alters the signals at the subscriber terminal.

Sound also can be transmitted in analog form within the video bandwidth, usually by means of a proprietary and non-NTSC compatible method.

Some systems use NTSC standards in-band, but decode by means of an "afterburner" inserted in the line between the converter and the TV set.

Audio also can be sent in-band in digital form, or out-of-band in analog proprietary formats or digital PCM.

— Gary Kim

Slow start, but in the race

Cable's data future also depends on the operators, who must create a market for their data services by educating potential users.

"Sometimes people don't know their communications needs and what's available," Krushel suggested.

But there are some signs of change.

Rivenburgh said acceptance and education among eventual users has increased greatly in the last year or so.

"Before, you had to explain what a broadband network was, what it could do and what services it could offer," he explained. Larger corporations now are very educated on those topics, he added.

But cable operators also have a few things to learn.

The marketing of data services requires "an entirely different sensibility" than the selling of entertainment, Cooper argues.

Rivenburgh concurs. "The cable operator needs to understand the way his clients work," he said.

According to Rivenburgh, businesses usually approach internal communications very systematically. They devise a list of agenda items, with computers on the top, a phone system next and the communications link among those networks third.

"A lot of businesses look at these as separate items. And, until you're on the agenda, you don't get in the door," he maintained.

"An average client sale may take five to eight months," he added.

ATC's Kansas City Division is now running three experimental data projects. One is a T-1, dedicated line between two Blue Cross/Blue Shield facilities. The second involves high-speed, T-1, data transmission between a teleconferencing center and an Isacomm uplink/downlink site 4½ miles away. And the third is a data link that connects the operator's CableData billing system with the headend and a remote sales site. The subscriber network is used to send the billing data from the main office to the remote site and vice versa.

While, "in essence, all three projects involve data transmission, each one is slightly different," he said.

Together, the three experiments are intended to help "the operator lay the groundwork, evaluate what he's doing, identify the markets and decide what kind of problems each user within a market can stand, before he (the operator) goes out and signs the world as it were," Pangrac explained.

More specifically, the operator can use the projects to determine how many problems he can have in the teleconferencing path and in the data/interphone system and what's reasonable for a data system tieing computers together.

So far, results have been favorable. Pangrac said he has not received any complaints from Blue Cross/Blue Shield or from Isacomm.

The computer link on the subscriber path also has performed well. Pangrac cited an example: a spring ice storm that left some 200,000 homes without electricity in the Kansas, Missouri area did not affect the subscriber/data link.

Calling the 17-amp deep link "a difficult path to maintain," Pangrac added that the network's performance during the storm was "encouraging in terms of testing, ingress and problems you could have run into with this kind of thing."

The subscriber data link also is being used to compare telephone and cable transmission rates and performance.

TZ-PC 100 converter

Panasonic audio prototype premieres

LAS VEGAS, Nev. — A prototype digital audio system designed for cable applications has been developed by Panasonic Industrial Co. The system allows studio-quality sound reproduction, and features error detection and correction, phase locked digital tuning, infrared remote control and two levels of sound quality. The system also offers a high fidelity and ultra high fidelity mode, and can accommodate as many as 12 stereo channels within a single 6 MHz channel.

The unit is addressable and handles encryption. It also comes equipped with a dedicated data channel.

The company has announced plans to market a digital basic converter as well. The device will be offered in two models, the TZ-PC100 and the TZ-PC110. The latter features remote control, and both employ phase-locked synthesized tuning, field selectable standard, HRC or IRC channel conversion in 400 MHz systems.

The RF system uses 15 kHz of AF bandwidth in both ultra-high and high-fidelity modes, and has a sampling frequency of 32 kHz, at least as currently projected.

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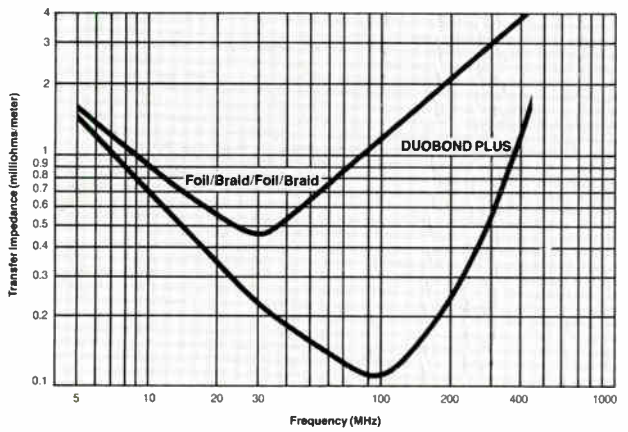
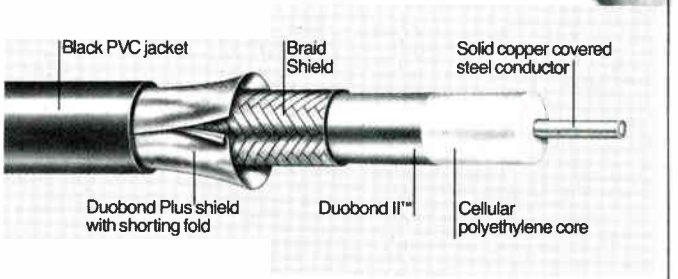


Belden's unique shield protection.



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.

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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.

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Communications Engineering & Design

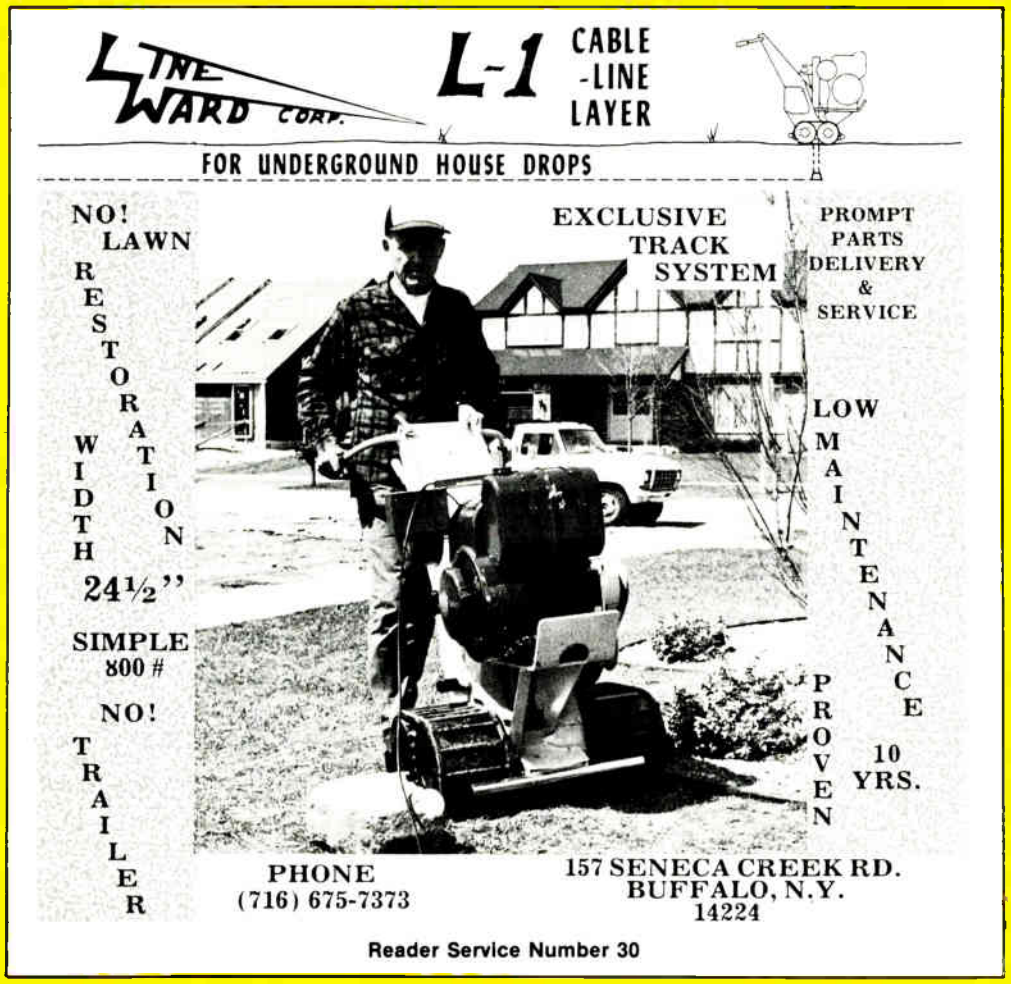
TECH II

CED's feature supplement and Product Profile

July 1984

- **System audits save subs**
- **Silicone stops corrosion**
- **Product profile: data modems**

Ungermann-Bass 5 Mbps CATV modem



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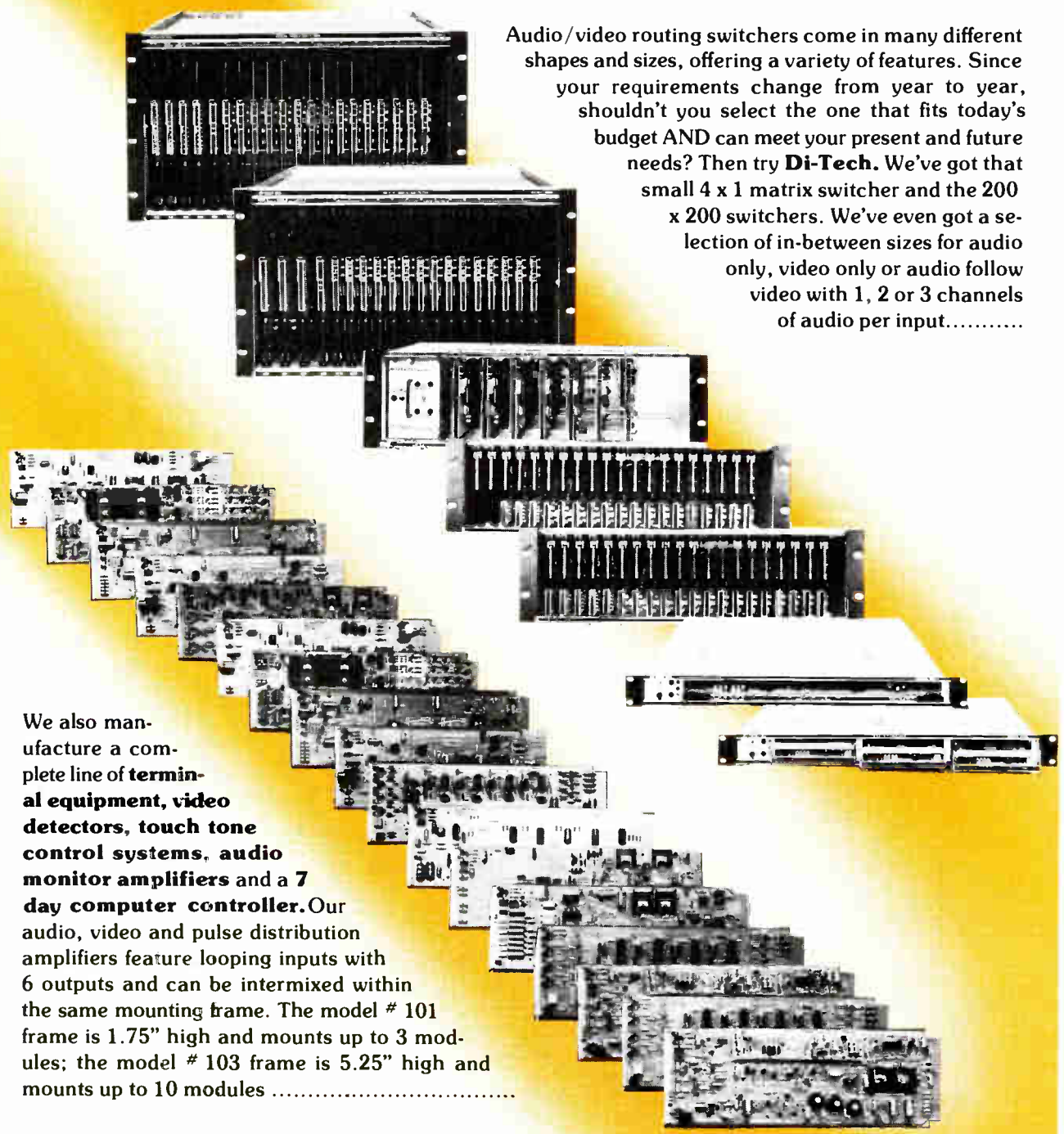

Audio/video routing switchers come in many different shapes and sizes, offering a variety of features. Since your requirements change from year to year, shouldn't you select the one that fits today's budget AND can meet your present and future needs? Then try **Di-Tech.** We've got that small 4 x 1 matrix 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.....

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Reader Service Number 31

System audits save subs

The trick is to tap your computer

By Michael Enault
engineering projects manager,
Gill Cable

The objective of a system-wide audit should be to convert illegals into good, paying subs, not just to identify illegals. So personnel should be chosen carefully and not just pulled from the ranks of the unwanted. Using five good people, a system can be audited to the tune of 5,000 units per week.

The need for an ongoing audit can be diminished or eliminated entirely if all tap positions are numbered as the audit is done. Enter into the computer system which addresses go with each numbered tap position.

After the initial audit is completed and the information entered into the system, program all installation and maintenance work orders to show which tap position is involved and other addresses that should also be hot at that tap. Now each work order to the field gives field personnel audit information and, therefore, each field person is also an auditor.

At least every other day, each worker must be given a current printout showing each address and its status. The printout should be alphanumeric by street and area. I recommend 400 addresses per day per worker so no one "runs out."

On an average, each worker should be able to audit, identify tap positions, sell illegals and complete daily paperwork for 200-250 addresses per day. Each worker should be responsible for a daily report showing ons, offs and illegals for multiple and single family residences.

The reason for the breakdown of multiple and single family residences is that by keeping good reports, the company can identify trouble areas or meet new marketing needs, etc.

Set reasonable goals and stick to them. And let the city know an audit is being done. The best way is to have an audit department logo on the audit vehicles. Once seen, word spreads quickly.

An added benefit of an audit is that new addresses (potential subs) can be identifed and entered into the system.

Thirty days after each audit is completed, retrieve a printout of illegal addresses. This printout also should show current status for all that were originally entered as illegal.

It can be assumed that those now on service are a result of your audit. Use your fifth worker to re-audit or recycle illegals that remain.

Those that have reconnected illegally should be contacted and warned.

Again, try to sell them. Thirty days after the recycle, again call for a printout of all those entered as illegal and count new subs. This will give you your final count of new subs as a result of the audit.

In underground areas, illegal hookups often result in damaged pedestals or lock boxes. I recommend a fish-hook style pedestal stake and/or tap attachment, depending on system isolation requirements to the pedestal. This will help reduce "pulling up the pedestal." Also, I recommend a "breakable lock." Sounds funny, but why put a $6 to $7 lock on a 3 cent hasp?

If the illegal wants to steal service, he will. You should see that if he does, he does it with the least possible damage to an expensive pedestal or lock box. I realize there are other ways to lock a pedestal or lock box, but breakable locks are the least expensive. If you use breakable locks your field personnel can assume: "No lock, must be an illegal," and can write a separate audit order for your fifth man to audit.

The best time to sell an illegal is when the audit people discover it. Instruct them to sell basic only and get the illegal on service. Let your sales department sell the premiums. Salesman have the expertise to sell premium.

Plus, the audit people won't have the converters or descramblers or the time to spend calling them. Make a list of all illegals found for the marketing department to act on — this is your sales lead list.

Most of the above has been tried and proven. A company can gain revenue by a good, thorough audit — but don't make the mistake of giving the audit a low priority — give it prestige.

"Talk it up." Let the city know you are out to protect your investment. Your paying subs will appreciate not seeing their neighbors get for free what they have to pay for. Check other companies that have audited their system; 14 to 29 percent illegals are not uncommon and that's revenue down the tubes.

Silicone stops corrosion

By Robert A. Mills,
G.E. Silicone Division

CATV operators nationwide expect to reconstruct some 91,000 miles of cable by 1987, including 31,000 miles to be rebuilt this year alone. While much of this rebuilding stems from technical obsolescence, some lines have been eroded by exposure and must be torn down and replaced.

Often, the best solutions to old reliability problems are time-tested products like RTV-108 and G-635. These products protect capital plant, minimize down-time and cut service costs.

What qualities make GE's RTV-108 adhesive sealant and G-635 dielectric compound so attractive to the cable industry?

RTV-108's varied applications help CATV systems cope with contaminants and temperature extremes cope with contaminants and temperature extremes that can damage connections, adversely affecting signal transmission. It protects splices, connectors and adaptors, feedthroughs and house-hooks and is commonly used to encapsulate components that must endure harsh conditions.

RTV-108 is very tough. When fully cured at room temperature, RTV-108 forms a solid mass of silicone rubber that is impervious to oxidation and corrosion caused by ozone, chemicals, moisture and radiation. And shrinkage due to weathering is negligible.

When applied to electrical connections, silicone rubber becomes an instant dielectric, and maintains its insulating strength over a wide temperature range.

The other member of the GE Silicones cable family is G-635 dielectric compound. Originally designed for a wide range of high-voltage industrial applications, G-635 is a good candidate for almost any outdoor CATV fitting. The silicone grease effectively waterproofs F-fittings, taps, HBO traps, and other connectors or adaptors, ground blocks, feeder/connector gaps and house splitters.

Wiped onto aluminum connector threads, G-635 prevents seize-up due to oxidation or the bonding of dissimilar metals.

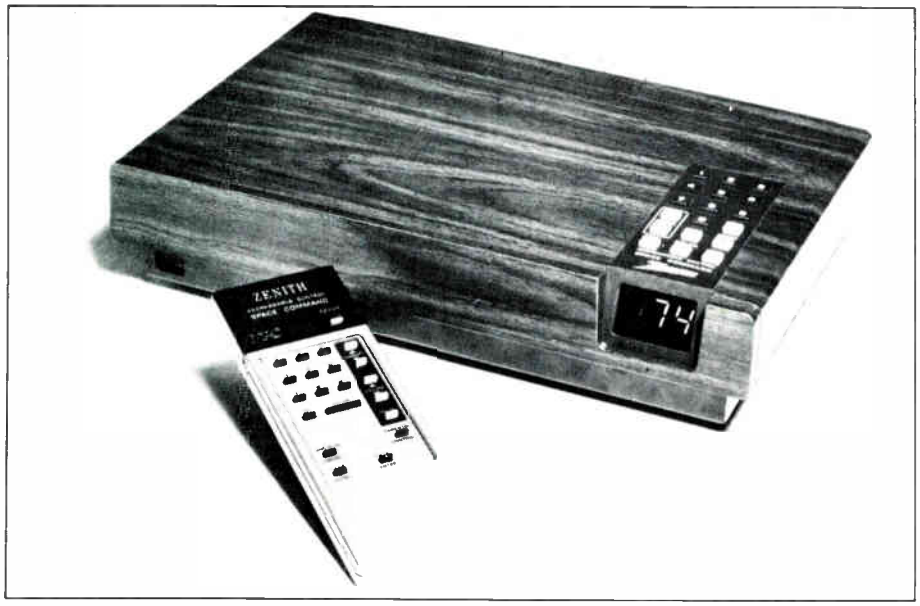
G-635 dielectric compound is finding wide usage in the critical area of radio frequency (RFI) integrity.

Data modems

Model	Operating mode	Operating channels	Data format	Data rate	Bit error rate	Spacing
C-COR 7130	full- and half-duplex, simplex, multi-drop	transmit: T-7—5-12, receive: T-11—TV-13	asynchronous	300—9600 baud; 19.2 Kbaud, optional	1 part 10^{-6} @ 16dB C/N	25 kHz, 300—9600 baud; 50 kHz, 19.2 Kbaud
C-COR 7140	full-duplex, simplex, multi-drop	transmit: T-7—T-13; receive: T-11—channel 13	synchronous	300—9600 baud; 19.2 Kbaud, optional	1 part 10^{-8} @ 20 dB C/N	25 kHz, 300—9600 baud; 50 kHz, 19.2 Kbaud
Comtech M505	full duplex	100 kHz—400 MHz	synchronous	56 Kbps—10 Mbps	1×10^{-9} @ 30 dB C/N	50 kHz
Concord Data Token Net (TIM)	N/A	transmit: 3—6, FM, P—U	synchronous, asynchronous	5 Mbps	$>1 \times 10^{-8}$ @ 30dB S/N	N/A
E-COM TRM-159	N/A	transmit: 5.75—17.75 MHz; receive: channels H or O	synchronous	9.6 Kbps—1.5 Mbps	N/A	N/A
E-COM TRM-202	N/A	0—250 MHz	synchronous, asynchronous	50—9600 bps	$<10^{-7}$	200 khz
Jerrold Metronet 1000	full- and half-duplex	input: T-7—T-13, 1A, 2A, 60, 61, 14—16	synchronous, asynchronous	100 bps—19.2 Kbps	10E-10, @26dB S/N	50 kHz
Jerrold Metronet 1600	full-duplex	input: T-7—T-13, 1A, 2A, 60, 61 14-16	synchronous	1.544 Mbps	10^{-9} @ 20 dB S/N	3 MHz per carrier
Scientific-Atlanta 6402	full-duplex	transmit 5—120 MHz; receive: 162—440 MHz	synchronous	1.544 Mbps	$<10^{-9}$ @ 33 dB C/N	750 kHz
3M 960	full- and half-duplex	transmit: J—N; receive: T-10—T-14	synchronous	1.2—76.8 Kbps	1×10^{-9} @ C/N of 30 dB in 200 kHz	800 kHz
3M 925	full- and half-duplex	transmit: 7, J and K; receive: T-9—T-11	asynchronous	50 bps—9.6 Kbps	1×10^{-9} @ C/N of 30 dB in 26 kHz	80 kHz
Ungermann-Bass 5405A	N/A	transmit: channel 5; receive: channel S	N/A	5 Mbps ±.01%	10^{-9} @ 26 dB S/N	6 MHz
Ungermann Bass NM-670	simplex, full- or half-duplex	T—7/H; T—8/I; T—9/7	synchronous	56 Kbps	1×10^{-8} @ 36 dB C/N	192 kHz
Zeta Labs Z9	N/A	T-700—QQ; modulator: T-7—2 standard; demodulator: H—O standard	synchronous, asynchronous	0—9600 bps	10^{-9} @ 25 dB S/N	50 kHz
Zeta Labs ZT1	N/A	T-7—QQ; modulator: T-7—2 standard; demodulator: H—O standard	AMI	1.544 Mbps	10^{-9} @ 25 dB S/N	1 MHz

Spurious level	Carrier detect level	Transmit level	Receive level
60 dB below carrier output	-20—+20 dBmV	+15—+45 dBmV	-20—+20 dBmV
60 db below carrier output	+20—+15 dBmV	+15—+45 dBmV	-20—+15 dBmV
(output) -80 dBc/Hz modulated, -50 dBc unmodulated @ +50 dBmV output	N/A	+30—+50 dBmV	-12—+5 dBmV
(out of band energy: -50 dB)	N/A	+30—+50 dBmV, adjustable in 1.5 dB steps	-10—+10 dBmV
N/A	N/A	+50 dBmV	-68 dBmV +10 log (bit rate): +20, -6 dB
N/A	N/A	+20—+40 dBmV	-20—+10 dBmV
N/A	-30 dBmV, factory set; 0—30 dBmV, adjustable	+30 dBmV, factory set; +15 dBmV—+ 35 dBmV, adjustable	-16 dBmV ± 10 dB
N/A	-20 dBmV, factory set	+45 dBmV, factory set; +25—+45 dBmV adjustable	0 dBmV ± 10 dB
N/A	N/A	+20—+50 dBmV	-10—+10 dBmV
50 dB below carrier	N/A	+30—+45 dBmV, adjustable	-15—+10 dBmV, adjustable
50 dB below carrier	N/A	+30—+45 dBmV, adjustable	-15—+10 dBmV, adjustable
55 dB below carrier	N/A	+30—+50 dBmV, adjustable	0±5 dBmV
N/A	-25 dBmV -10, +15 dB, adjustable	+35 dBmV +0, -15 dB, adjustable	-7 dBmV ±10 dB
(output) 50 dB below carrier	-20 dBmV (adjustable to -10 dBmV)	+40 dBmV; adjustable ±10 dBmV	-20—+10 dBmV
(output) 50 dB below carrier	-20 dBmV (adjustable to -10 dBmV)	+40 dBmV	-20—+10 dBmV

Subscriber



Zenith Base-tac decoder

Zenith debuts new products

Zenith announced five new products at the NCTA show in June, including the "dual decode" Z-Tac addressable decoder. This unit allows operators to decode RF and baseband scrambling simultaneously, permitting upgrades to baseband without interruption of service. The dual decode system features the tiering and addressable capabilities of other Z-Tac products.

Zenith's new cable TV stereo adapter and Z-Tac baseband decoder decode programming transmitted in stereo or second languages. The adapter can be attached directly to the back of a TV set, through a "redi-plug" feature, or to the wall behind the set.

The Zenith "Base-tac" addressable decoder is for cable-compatible color TV sets. The unit can connect directly to any Zenith cable-compatible set. The Base-tac has the same capabilities as the Z-Tac decoder, but also offers tuning, power supply and remote control. The unit allows the audio volume control, on-screen time and channel display of the TV set to remain operational.

The VCR interface timer enables subscribers to watch a different program than the ones they are recording. A remote control transmitter with a built-in programmable channel selector allows the subscriber to preset the Z-Tac decoder and a VCR for program recording at a later time.

For more information, contact Zenith Electronics Corp., 1000 Milwaukee Ave., Glenview, Ill. 60025, (312) 391-8181.

New baseband converter, RF descrambler

Texscan Corp. has introduced a new baseband converter and descrambler.

The converter, model 6060, is a one-way addressable baseband descrambling system for use in 60-channel cable systems. Random video line and field inversion techniques, combined with separate audio subcarriers, protect signals from theft. A fixed frequency out-of-band FSK signal is used for addressability. Other features include an IR remote control unit, a PLL-synthesized tuning system and a SAW modulator.

The Texscan 4025 descrambler uses an advanced dynamic RF sync suppression system, featuring a highly secure, non-periodic in-band tagging technique, to protect against signal piracy. The descrambler purportedly can operate with most existing converters. It incorporates a keylock switching circuit, which provides pay enable, parental guidance and on/off functions.

For more information, contact Texscan Corp., 3102 North 29th Ave., Phoenix, Ariz. 85017, (602) 252-5021.

Security modem intros

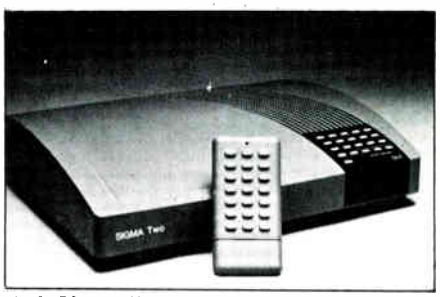
CableBus Systems Corp. introduced a home terminal modem for security monitoring at the NCTA show this June. The modem, the CDT-6/4, can sense six active high or active low inputs and can be "hardwired" directly to most alarm panels, without requiring an interface. With the addition of a firmware upgrade, the CDT-6/4 can be used in systems with CableBus MICRO-2 equipment.

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

Oak Sigma II

Oak Communications Inc. has released a new version of its Sigma addressable baseband converter, the Sigma Two. The converter uses baseband video srambling to eliminate the horizontal and vertical synchronization pulses from the video signal. A random video inversion on scene change also is used. System features include remote volume control, favorite channel memory and parental control. The system costs $122.50, in quantities of 25,000; the remote control unit sells for $9, also in quantities of 25,000.

For more information, contact Oak Communications Inc., 16935 W. Bernardo Drive, Rancho Bernardo, Calif. 92127, (619) 485-9880.



Oak Sigma II

Digital converter

A digital basic converter for CATV applications was released by Panasonic Industrial Co. This converter, which is available in a TZ-PC100 or TZ-PC110 model with remote control, features phase-locked synthesized tuning, field selectable standard, HRC or IRC channel frequency allocation; LED channel display; and 58 channel conversion in 400 MHz bandwidth. Both units can use channels 2,3 or 4 as an output channel.

For more information, contact Panasonic Industrial Co., One Panasonic Way, Secaucus, N.J. 07094, (201) 348-7183.

United Satellite SSP-1 stereo processor

USS stereo processor released

United Satellite Systems has released a stereo processor, the SSP-1, which is designed for use with existing amplifier and speaker systems. The SSP-1 features continual adjustment deviation control, LED tuning lights, automatic fine-tuning control and a noise reduction circuit. The continual adjustment deviation control accommodates narrow to wide subcarrier signals.

For more information, contact United Satellite Systems, (218) 681-5616.

Earth station

Microdyne OS-4 offset fed antenna

Microdyne antenna for C- or Ku-band

A new offset fed antenna, called the OS-4, has been released by Microdyne. This antenna is designed for either C or Ku-band operation. The antenna meets the radiation pattern envelope required by the FCC.

For more information, contact Microdyne Corp., P.O. Box 7213, Ocala, Fla. 32672, (904) 687-4633.

Standard rolls out new products

Standard Communications has released four new products.

The agile 24M/S satellite receiver series consists of a 24-channel, 3.7-4.2 GHz stand-alone master receiver and a complete 24-channel receiver, excluding the first block downconverter.

The LNBC 24/LNBC 24A low noise amplifier/block downconverter system converts satellite transmissions in the 3.7-4.2 GHz range to 760-1260 and 950-1450 MHz. The system can be mounted at the earth station antenna.

The model ODC24 downconverter is for use with the company's agile 24S slave TVRO receiver. It downconverts microwave signals in the 3.7-4.2 GHz range to 760-1260 MHz.

The 3.7-meter earth station antenna is a parabolic dish designed from unit-molding vacuum bagging and high tolerance precision tooling techniques.

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

Channel Master Sys.

Channel Master Satellite Systems has unveiled four new products.

A new dual feed commercial antenna system, model 6107, is an eight-section, fourteen-foot parabolic dish designed for TVRO use. Ortho-mode coupling of LNAs provides dual polarization.

The 6132 and 6133 modulators, also for TVRO use, feature 60 dBmVor 72 dBmV output, respectively. The systems' loop-through design allows them to combine on one common output for multiple channel applications.

The 6121 dual block downconversion satellite receiver is for CATV/SMATV hotel/motel and apartment/condo pay-TV systems. The receiver uses microprocessor technology and offers 5-8 MHz synthesized audio tuning, 24-channel agility and IF and block conversion loop-through for interference filtering and power divider elimination.

For more information, contact Channel Master Satellite Systems, Subsidiary of Avnet Inc., Industry Drive, Oxford, N.C. 27565, (919) 693-3141.

New C-COR block converters

A new series of block converters have been introduced by C-COR Electronics. Called the 5100 series, these block converters are for use in systems requiring 6 MHz block conversion. The 5100 units can support sub-channel densities of up to 200 data channels per 6 MHz and can convert as many as 36 MHz blocks in 6 MHz increments. The units are available in 20 standard channel allocation conversions and are frequency tunable to within 50 Hz.

For more information, contact C-COR Electronics, 60 Decibel Rd., State College, Pa. 16801, (814) 238-2461.

C-COR block converter

Microdyne receiver

Microdyne Corp. has released a new video receiving system and a motorized polar mount.

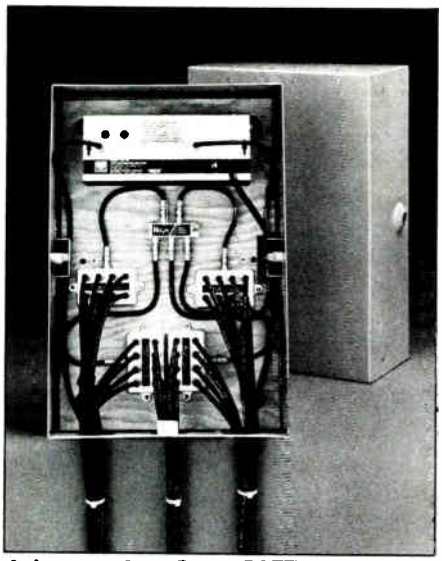
The video receiving system, which was designed for Canadian cable TV use, consists of a 1100 BDC-12 block downconverter, a 1100 DCR-12C Canadian satellite receiver and either a 3- or 3.66-meter Ku-band antenna. The 1100 DCR-12C can be used with either a C- or Ku-band receiver to receive either C- or Ku-band programming.

Microdyne's new polar mount allows operaters to switch the position of their antennas to receive programming from different satellites. It comes with a programmable controller that facilitates satellite switching. The controller is easy to operate and can store as many as 16 satellite positions. The mount is an option for the company's 5- and 7-meter parabolic antennas.

For more information, contact Microdyne Corp., P.O. Box 7213, Ocala, Fla. 32672, (904) 687-4633.

Microdyne motorized mount

Distribution



Anixter markets Super-SAFE

New closure and lashing wire

Anixter Communications displayed two new products at its NCTA booth and announced a distribution agreement with Telecrafter Products Corp.

The two new products include the "superlash" lashing wire manufactured by Maryland Specialty Wire and the "super-safe" from Reliable Electric/Utility Products.

The superlash features greater ductility for easier handling and corrosion resistance to hostile weather conditions. Its standard coil size fits all lashers.

Reliable Electric/Utility's "super-safe" is an apartment closure for use in cable theft prevention. It features an interlocking cap and is available in ten sizes, ranging from 8 x 8 x 6 inches to 18 x 24 x 8 inches.

The distribution agreement with Telecrafter Products enables Anixter to market Telecrafter address, service, system and subscriber cable markers.

For more information, contact Anixter Communications, 4711 Golf Rd., One Concourse Plaza, Skokie, Ill. 60076, (312) 677-2600.

Texscan passives, line extenders

A new line of 600 MHz, directional taps and other passives and a new line extender series were unveiled by Texscan Corp. at the NCTA convention.

The Texscan 600 MHz passive devices include two-, four and eight-way directional taps; directional couplers in 2 dB steps from 8-16 dB; two- and three-way line splitters; and an expanded power combiner. All modular devices are contained in 360 aluminum casting.

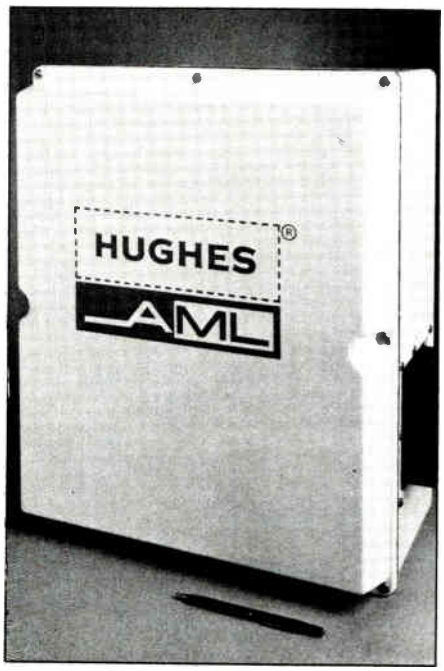
The new line extender permits colocation of institutional and entertainment system configurations. The unit is available in 26, 30 or 34 dB forward gain, and five reverse gain (16, 21, 26, 30 or 34 dB) versions. It features reverse bandwidth splits up to 180 MHz, a switching power supply, internal thermal level compensation and AGC capabilities.

For more information, contact Texscan Corp., 3102 North 29th Ave., Phoenix, Ariz. 85017, (602) 252-5021.

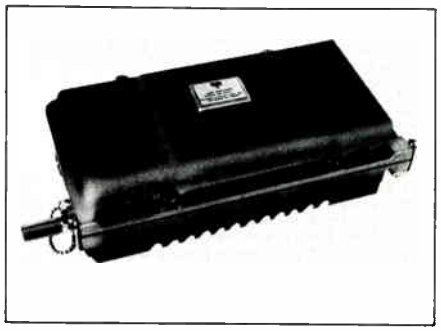
Hughes develops line extender

Hughes Aircraft Co.'s microwave products division has developed a new microwave line extender. It is a broadband multichannel transmitter that uses block upconversion techniques to distribute as many as 60 channels to small or removed subscriber "pockets." The units accept VHF inputs in the 54-440 MHz range and provide microwave output for cable hub site distribution. Applications include special local distribution service, natural barrier crossings, short hop repeatering and temporary multichannel service during service interruptions. The line extender is available in indoor and outdoor versions.

For more information, contact Hughes Microwave Communications Products, P.O. Box 2999, Torrance, Calif. 90509.



Hughes microwave line extenders



Blonder-Tongue Redicom 450

New amp, off-premise system

A 450 MHz outdoor line amplifier and an off-premise pay-TV system have been released by Blonder-Tongue.

The line amplifier, called the Redicom 450, consists of a removable printed circuit board containing a sub-return filter and other components, a power transformer for efficient 22-66 VAC operation and an external thermistor probe for tracking of gain and slope with cable temperature changes. The unit is stored in an aluminum housing for aerial or pedestal mounting.

The off-premise system, named the Guardsman, uses off-premise scramblers to secure premium services. It can be configured as an addressable, non-addressable or hybrid addressable/non-addressable system. An address encoder that interfaces with a central billing station is located at the headend. This encoder provides channel and/or tier authorization to individual scramblers. As many as five video channels and one video-plus-audio channel can be scrambled. Units can be inserted into individual drops, requiring no plant modifications. Because the address information is sent in-band, two-way capability is not needed.

For more information, contact Blonder-Tongue, One Jake Brown Rd., Old Bridge, N.J. 08857, (201) 679-4000.

Jerrold extends line

Jerrold has introduced three new products: the feedforward Starline X-3000 amplifier, a new packaging design for its Indoor IntraNet off-premise unit and an outdoor version of the IntraNet.

The X-3000 feedforward amplifier features low distortion, high gain and complete diagnostic capabilities. A station bypass is optional.

The IntraNet's new design facilitates installation in small areas such as stairwells in apartment houses and multidwelling units. The indoor unit is available in a squareback and compact version. Both models remove converter circuitry from

the subscriber's home.

The outdoor IntraNet is for densely populated areas. This outdoor system offers impulse-pay-per-view and is available for strand, pole or base mounting.

It is capable of providing data and interactive services as well as digital telephony on a high-speed digital bit stream.

Both indoor and outdoor IntraNet systems are compatible with Jerrold's existing line of RF and baseband converters.

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

Headend

Zeta Labs Z9

Zeta modem

Two broadband modems are now available from Zeta Laboratories. The model Z56 operates at 56 kilobits per second (Kbps); 65 Kbps data rates are an option. The modem costs $1,850 for quantities of ten.

The model Z9 provides either asynchronous or synchronous data transmission formats at rates up to 9600 bps. The modem costs $525 and can be ordered in quantities of 10.

For more information, contact Zeta Laboratories Inc., 3265 Scott Blvd., Santa Clara, Calif. 95051, (408) 727-6001.

Portac commercial insertion system

A new method to insert local advertising messages has been developed by Portac Inc. This method uses a 24-page programmable message generator and interface package that operates with the Tomco TT-500 satelite tone switched decoder to insert locally originated ad messages into cue-tone coded programming. The generator, the KBD-220, and interface package cost $5,000.

For more information, contact Portac Inc., 108 Aero Camino, Goleta, Calif. 93017, (805) 968-2120.

Phasecom NCTA booth

Phasecom modulators, character generator

Phasecom Corp. has introduced two new modulators, a modulator/demodulator system and a character generator.

The two new modulators are the 3140 frequency agile standby modulator and the Summaband.

The 3140 microprocessor-controlled unit can be tuned digitally to any one out of 59 channels. It is compatible with existing IF and baseband scrambling systems and features alphanumeric LED display, computer control of dual independent audio and video inputs, and input video AGC and audio limiting functions.

The Summaband modulator series are available with visual carrier frequencies to 553.24 MHz. Computer-designed strip line output circuitry provides 60 dBmV output. Spurious signals are 60 dB below output. Modulators can be ordered from the factory to operate with any of the popular scrambling schemes. Summaband units are available in standard, HRC or IRC models.

The 4800 multichannel fixed message character generator provides fixed messages for as many as eight channels. Up to four different messages can be called up automatically. The unit has a message capacity of 16 characters by 10 lines.

The FM 8100 modulator/8200 demodulator system is for supertrunk applications. The system has a bandwidth versatility of 12-18 MHz and incorporates microstrip line technology for long-term stability.

For more information, contact Phasecom Corp., 6365 Arizona Circle, Los Angeles, Calif. 90045, (213) 641-3501.

Texscan unveils new products

Texscan Corp. has introduced two new character generators, a graphics generator and a commercial insertion system.

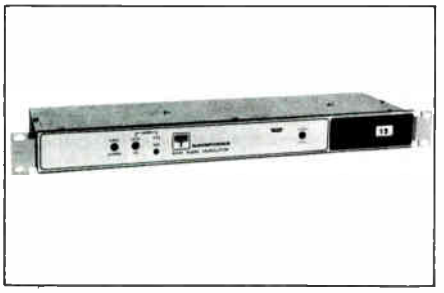
The two new character generators are the Compuvid CDD-45 and SpectraGen 4. The CDD-45 features a 16 x 32 pixel matrix, a keyboard with Hall effect touch typing keys, additional key labels for ease of graphic entry and a 64 KByte RAM memory for storage of 150 eight-line pages.

The SpectraGen 4 uses a 32 x 64 pixel dot matrix pattern to generate characters. Two fonts are standard. Four versions are available: a tabletop console enclosure with integral full-feature keyboard, a rack-mounted model and a rack-mounted unit with a tone-cue detector and video switcher for insertion of character generator pages into satellite programming.

The SpectraTex graphics generator combines "bit-mapped" graphics pictures with conventional screen text to improve local origination and advertising capabilities. The system consists of computer and display hardware and Texscan software.

Texscan's new random access commercial insertion system, the ComSerter CSR-92, is a microprocessor-based videocassette programmer and switcher with built-in digital tone-cue decoding circuitry. User friendly menus on standard computer terminals allow operators to access satellite program "commercial availabilities" up to a week in advance.

For more information, contact Texscan MSI/Compuvid, 3855 South 500 West, Suite S, Salt Lake City, Utah 84115, (801) 262-8475.



Blonder-Tongue MAM audio modulator

B-T audio modulator

A new heterodyne audio modulator is being offered by Blonder-Tongue. This modulator, the MAM, provides an unmodulated visual and a modulated aural RF carrier on any single VHF, midband or superband channel. A monaural FM band version with increased audio deviation and suppressed visual carrier is also available. The MAM can be used to insert sound in any unused channel or a closed circuit MATV or SMATV system.

For more information, contact Blonder-Tongue, One Jake Rd., Old Bridge, N.J. 08857, (201) 679-4000.

Modem for security monitoring

A home terminal modem for security monitoring was released by CableBus Systems Corp. This modem, the CDT-6/4, can sense six active high or active low inputs. It can be hardwired directly to most alarm panels without a costly interface. Each input can be identified uniquely by the central computer. The system can be used in systems with the CableBus Micro-2.

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

Jerrold demonstrates 'CIS' system

A customer information system using a remote order-entry process to shorten ordering and delivery cycles was demonstrated at the Jerrold booth at the NCTA convention.

CIS participants receive a computer terminal and telecommunications modem to access the Jerrold customer information data base. A multitiered access code protects the confidentiality of customer accounts.

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

Test

H-P announces signal generators

Hewlett-Packard has released two new synthesized signal generators.

The HP 8642A covers the 100 kHz-1057.5 MHz range; the HP 8642B is for the 100 kHz-2.115 GHz range. Both signal generators take high- and low-level receiver measurements. Through the use of high-Q SAW resonator oscillators, the units are able to provide single-sideband phase noise of less than -139 dB relative to the carrier at 20 kHz offset from a 1 GHz carrier. Spurious signal levels are less than -100 dBc. The HP 8642A costs $21,000 and the HP 8642B is available for $28,000.

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

Hewlett-Packard synthesized generators

Wavetek develops new products

Wavetek Inc. has unveiled four new test instruments.

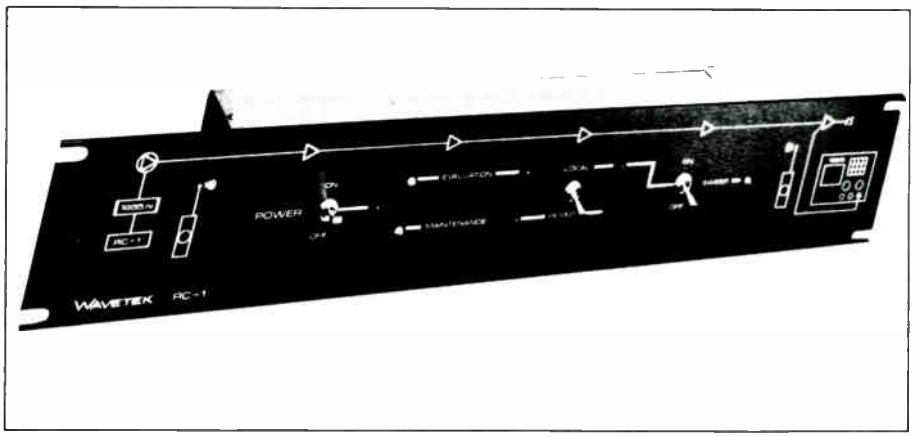
Its new 1881 system analyzer, modeled on the 1880, has a frequency range of 1 GHz. The microprocessor unit allows the operator to take carrier-to-noise measurements from the headend to the last amplifier in cascade and to measure composite triple beat and intermodulation products closer to their origination points. The system analyzer sells for $8,500.

The model CR-6 signal leakage monitor scans crystal controlled frequencies for out-of-spec received levels. An audible tone, whose frequency is proportional to the level of signal encountered, is automatically triggered when a leak is detected. The unit, designed for belt carriage, sells for $345.

The Wavetek RC-1 remote control tone receiver allows sweep technicians to call up preprogrammed sweeps and to activate the 1885B sweep transmitter remotely. Users address either an evaluation or maintenance sweep mode. The unit has frequency agile address tones, is programmed for DTMF compatibility and costs $495.

When used with the appropriate modem, the hand-held RT-1 remote controller permits remote activation and operation of the Sam IIID and Sam IV signal level meters. The unit's LED displays the commands entered and the response from the Sam unit addressed. It costs $495.

For more information, contact Wavetek Indiana, 5808 Churchman, P.O. Box 190, Beech Grove, Ind. 46107, (317) 787-3332.



Wavetek RC-1

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Reader Service Number 32

Texscan intros six test instruments

Texscan Corp. released six new test products.

The portable Installer 600 signal level meter covers the 5-600 MHz range and has an accuracy of ±0.75 dB to 450 MHz and ±1.0 dB from 450-600 MHz. Audio monitoring, front panel volume control and an internal Nicad batery with charger are standard.

The Texscan 9552 system sweep receiver incorporates all of the original features of its predecessor, the 9551, and adds a 62 dB input attenuator and log calibrated display with digital storage.

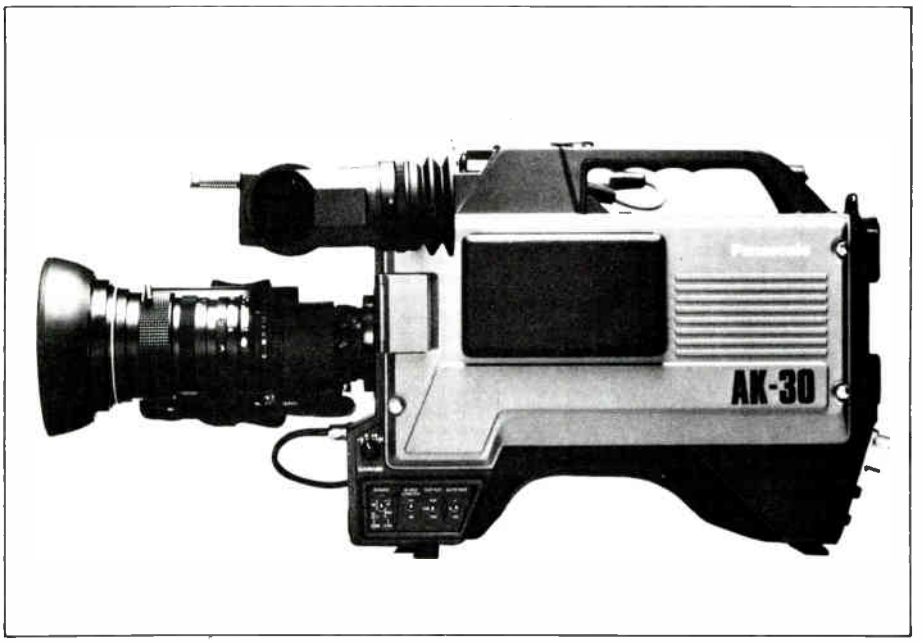
The VS-60C RF sweep generator covers the 1-1000 MHz range and is housed in a cabinet with removable covers.

The new "Beephound" hand-held leakage receiver has a single frequency, 88-128 MHz range. The receiver's "squelch" control is tone activated to eliminate false alarms. The unit has a 0.5 microvolt sensitivity and is equipped with a belt clip.

The test probe T9TP is for trunk applications and the T9LP-20 is for line extender use. Both self-seizing probes have ±0.5 dB accuracy from 5-500 MHz and flatness across bandwidth of ±0.25 dB.

For more information, contact Texscan Corp., 3102 N. 29th Ave., Phoenix, Ariz. 85017, (602) 252-5021.

Local origination



Panasonic AK-30 camera

Panasonic cameras and recorders

Panasonic Industrial Co. has introduced a new line of camera and recording equipment. The AK-30 color video camera features a standard gain of 58dB and a signal-to-noise ratio of 62dB.

The new B-100B/PL and B-100B/S Recam camera/recorders now feature Dolby noise reduction and viewfinder monitoring of both audio channels.

A new AU-220 Recam M-format recorder/player with Dolby C noise reduction is also available. The firm's new ½-inch M-format video player features two time base correctors and a computer, so it can be used as an automatic random access spot inserter, TV program sequencer and multisource editor.

Panasonic also has released the TQ-2024 disc file player, which can play back full-motion or frame-by-frame video as well as near-digital quality audio.

The company also has introduced an optical memory disc recorder that can record 24,000 video frames in still function and up to 13.3 minutes in full-motion mode.

An M-format, ½-inch editor/recorder/playback unit and time base corrector also are available.

For more information, contact Panasonic at (201) 348-7183, (201) 392-4322 or (212) 418-3093.

Lake Systems video cart

Video cart system released

A new half-inch type M and Beta-type video cartridge system that can search out, identify and activate more than 1,000 events for cueing has been announced by Lake Systems Corp. The turnkey system can be set up in a few hours, the company says.

For more information, contact Lake Systems, 55 Chapel St., Newton, Mass. 02160, (617) 244-6881.

New JVC camera

A compact three-tube BY-11OU camera using half-inch pick-up tubes has been introduced by JVC. Horizontal resolution measures 600 lines at center and the S/N ratio is 54 dB. Auto-shift registration, auto-white balance, auto-black balance, auto-beam control, auto-iris and auto-black features are standard. A color-bar generator, genlock and +6/+12 dB gain, power zoom lens with variable focal length of 7 to 70 mm also are featured.

For more information contact JVC Co. of America at 41 Slater Drive, Elmwood Park, N.J. 07407.

Sharp monitor, camera

Sharp Electronics has unveiled a new line of broadcast cameras, a base system and new color monitors. Heading up the new line is the XC-900D diode gun plumbicon camera.

The Triax System base station and XM-1300 high resolution color monitor round out the line.

For more information, contact Sharp at (201) 265-5548.

Construction

3M Co. intros graphics devices

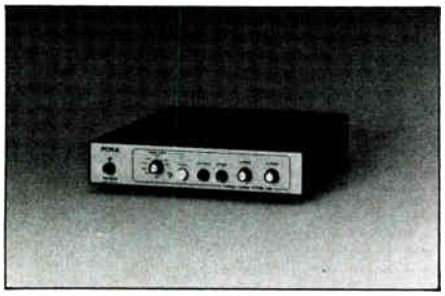
A new family of graphics equipment including a paint system and two character generators has been introduced by 3M Co. The model BFA paint system costs $32,000 and has features that previously were limited to devices costing more than $100,000, the company says. The BFA system includes 28 brush styles, and is fully controllable for hue, luminance and saturation. Rainbow spectra and continuous tones can be created. All images can be enlarged, reduced, condensed, expanded, smeared, distorted, rotated, copied or repositioned. A 16:1 zoom function also is included.

The system includes a CPU and two 5½- inch dual-density floppy disk drives storing one megabyte each. A 12-inch green monitor, detachable keyboard and digitizing pad are included.

The company also has released the D-5000 character generator, which features high-resolution graphics, multiple fonts and other features for a price of $11,000.

A model D-1000 generator offering production quality graphics sells for $4,200. It offers full color and comes with an optional disk drive.

For more information, contact 3M Co.'s Broadcasting and Related Products Division, 3M Center, Bldg. 225-3S-07, St. Paul, Minn. 55144, (612) 733-1110.

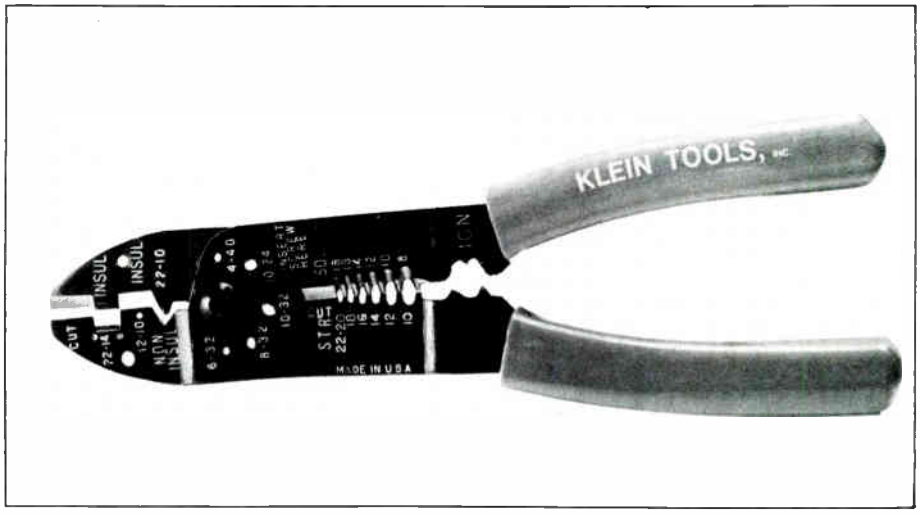


For—A-Corp. VTG-12

Video timer available

A compact, high-precision video timer replacing two earlier For-A Corp. models now is available. The VTG-12 generates a display including the month, day, year, hour, minute and second. Either 12-hour or 24-hour clocks can be configured. The character format is a 7x9 dot matrix with built-in border. Two character sets can be selected. A built-in rechargeable battery is included. The VTG-12 replaces the earlier VTG-11 and VTG-88 models, both of which have been discontinued.

For more information, contact For-A Corp., 49 Lexington St., West Newton, Mass. 02165, (617) 244-3223.



Klein electrician's tools

Klein adds kit, electrician tool

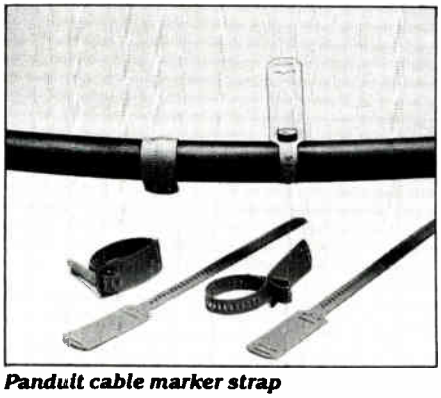
Klein Tools Inc. has added a cable splicer kit and an all-purpose electrician's tool to its product line. The splicer kit includes a splicer knife, scissors and leather pouch. The electrician's tool has two wire cutters — one at the tip and the other halfway back near the stripping holes. It can be used to crimp insulated and non-insulated terminals; lugs and splices and for cutting and stripping wire; cutting bolts; and crimping 7-8 mm terminals.

For more information, contact Klein Tools, 7200 McCormick Blvd., Chicago, Ill. 60645, (312) 677-9500.

Panduit unveils new products

Panduit Corp. has released a 28-page catalog on its insta-code identification products, a cable marker strap for identifying buried or underground cable, a winged push for securing wires in predrilled panels or cabinets and three heavy cross-section ties for larger size bundle diameters. The catalog, number E-ID-1, is free.

For more information, contact Panduit Corp., 17301 Ridgeland Ave., Tinley Park, Ill. 60477-0981.



Panduit cable marker strap

G-635 protects outdoor tap

GE sealant, compound

General Electric Silicone Products Division has introduced the RTV-108 adhesive/sealant and the G-635 dielectric compound. Both products protect CATV components from corrosion due to water, ozone, oxidation and chemicals. The RTV-108 is a paste-like sealant that cures at room temperature to a flexible silicone rubber.

For more information, contact General Electric, Silicone Products Division, Waterford, N.Y. 12188.

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MARKETING MANAGER—3 plus yrs. sales & marketing exp. required for this Midwest position. You will be coordinating marketing efforts for new build and rebuild in state. $30s plus bonus.
SALES MANAGER—Degree plus 3 yrs. exp. required to oversee marketing and sales for 64,00 sub. area. $30s.
AERIALS CONSTRUCTION SUPERVISOR—Min. 3 yrs. exp. to rebuild Southeast Florida system. Must have strong background in supervision of crews. Salary to $20K.
UNDERGROUND CONSTRUCTION SUPERVISOR—Same requirements as above position.
CHIEF TECHNICIAN—Must have FCC lic. and be able to do FCC proof-of-performance testing, sweep/balance, and design and strand mapping. Location Eastern Kentucky. Salary to $20K plus car.
TRUNK TECHS—3 needed for Southest Florida, 5 yrs. of exp. plus strong sweep background a must. Salary to $20K.
CONSTRUCTION FOREMAN—Would like strong background in all aspects of const. as well as ability to oversee crews. Salary to $20K.
SERVICE TECHNICIAN—Openings avail. for 3 service techs in Southest Florida, 2 yrs. min. exp. Company will test to see if qualified. Salary up to $7.00/hr to start.
TECHNICIANS—2 needed for separate small systems in Central Kansas. Must be able to troubleshoot sweep/balance, splice and do line repairs. Electronics background helpful. Salary up to $7.00/hr to start.
LINE TECH—Min. of 2 yrs. exp. necessary to handle service calls, line and trunk maint. as well as some installations. Location Georgia coast. Salary to $6.00/hr to start.
LEAD TECHNICIAN—Needed to help on Kentucky system. Good management and hands-on skills a must. Min. 2 yrs. exp. nec. Salary to $8.00/hr.
SYSTEM SALES MANAGER—Need college grad. familiar with telemarketing and door-to-door sales. Loc. Kentucky. Salary to $25K.
MAINTENANCE TECHNICIAN—5 yrs. min. exp. Must be able to do FCC proof-of-performance, sweep/balance and have strong electronic background. Microwave exp. a big plus. Location Tennessee. Salary $8.03/hr. to start.
ASSISTANT GENERAL MANAGER—Requires degree either in Political Science or Business. Duties for on financial analysis and refranchising exp. Must have 3-5 yrs. cable management exp. at system level or above and good track record. Location Ohio. Salary to $35K.
LEAD TECHNICIAN—Needed to be hands-on supervisor. Must have 5 yrs. exp. with a min. of 1 yr. supervisory exp. Req. troubleshoot, do FCC proofs and some construction supervision. Location Mississippi. Salary $20K.
REGIONAL TECH—Must sweep/balance, do proofs, headend maint., and some system design. Opportunity calls for a self-starter wtih 3-5 yrs. exp. that can work unsupervised. Travel in 2 state area. Location Miss. Salary low $20s.
CHIEF TECH—Needed for this 2,000 sub system. Must have good mgt. skills and background FCC license helpful. Must be currently in Tucson, AZ area. Salary $20K plus vehicle.
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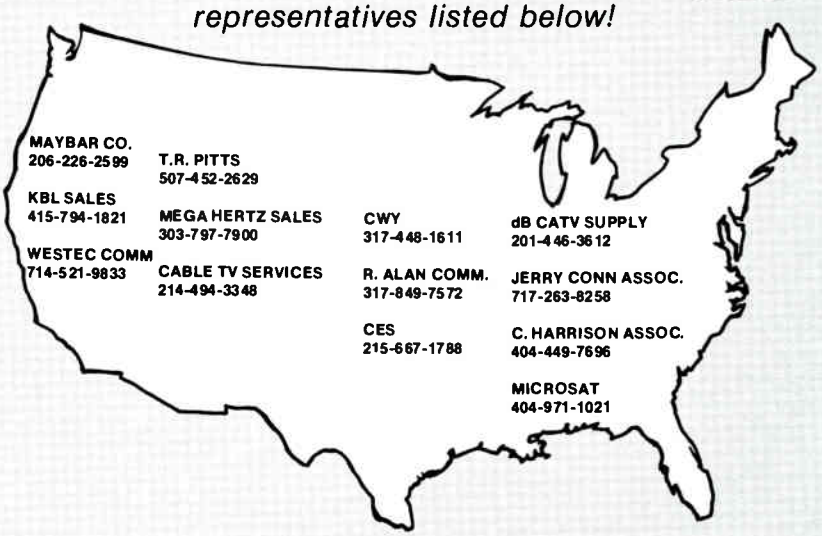

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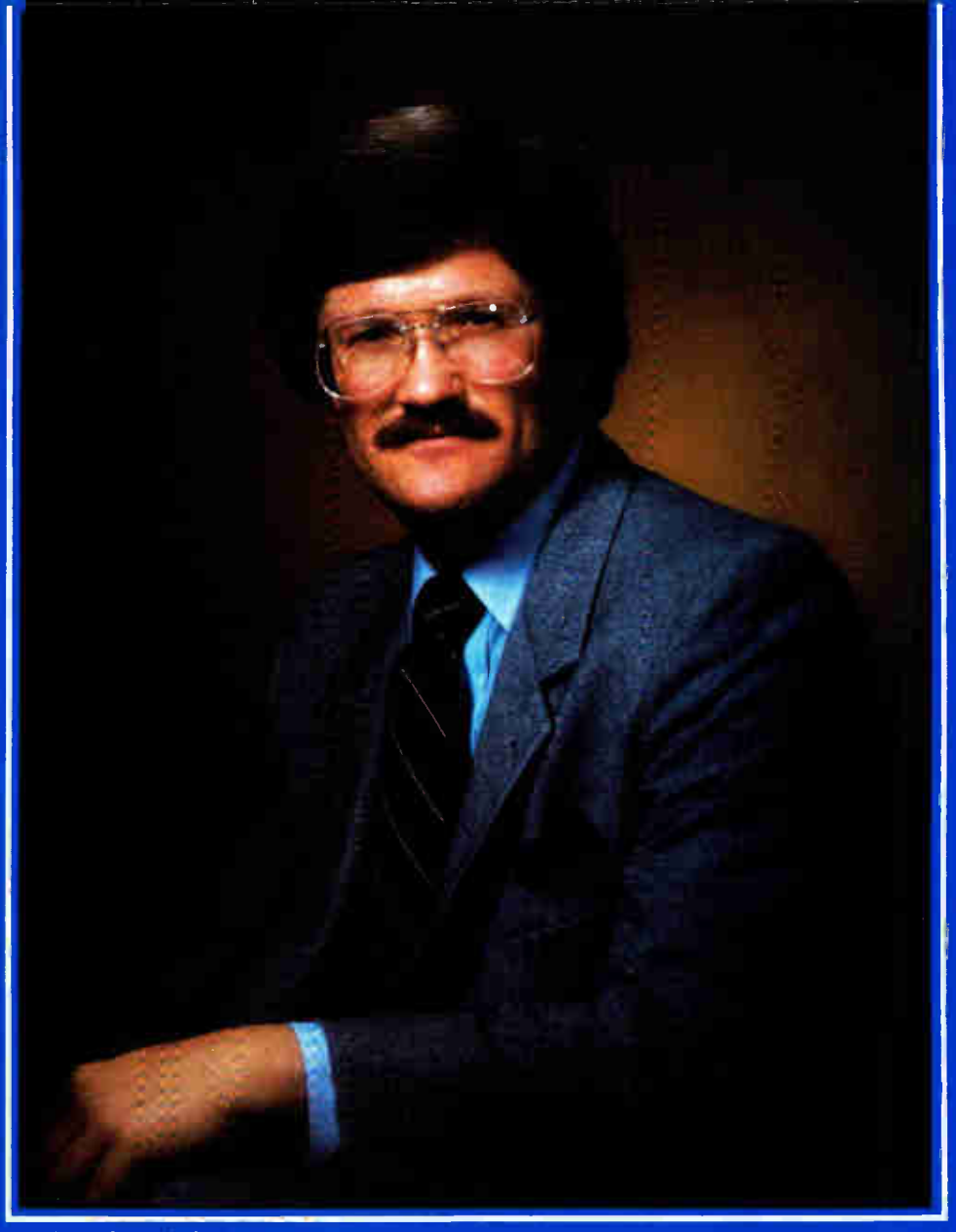

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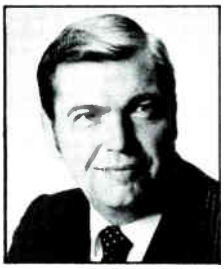
People

Jerry Pearlman, president and chief executive officer of Zenith Electronics has become chairman as well. Pearlman succeeds Walter Fisher.



Norman Lange has replaced Ken Coleman as vice president and general manager of the Jerrold Distribution Systems Division. Lange, who is a two-year veteran of GI, will be in charge of the CATV headend, distribution and turnkey construction operations of the division. He also will be responsible for the Jerrold Century III Division in Brea, Calif.

John Rigsby, ATC vice president, will head a new marketing joint venture announced by ATC and Toshiba Corp. The venture, tentatively called TCT Inc., will market the two-way addressable distributed subscriber terminal (DST) developed by both companies.

Dr. Andrew Viterbi has been named chief scientist and senior vice president of the corporation reporting to the office of the president of M/A-COM. Viterbi is a cofounder of LINKABIT Corp., which merged into M/A-COM in August 1980.

James Daves has joined the Jerrold Division of General Instrument as account executive for the southeast sales region. Daves previously was affiliate sales representative for Scientific-Atlanta.

Michael Nelson has become operations manager for Media General Cable's Fairfax County, Va., facilities.

Pacific Bell's recently formed CATV/Wideband Services group has appointed **Jeffrey Gordon** manager of new market applications and **Dennis Jones** wideband services development manager.

Toshiba America Inc.'s Information Systems Division has promoted **Yvette More** to district sales manager for the West Coast. More previously served as a marketing support representative for the western region.

Mass Communications and Management, the parent corporation of Total Communication Systems and Gateway Broadcasting Enterprises, has appointed **John Lack** exclusive consultant for all MCM entities. Lack is a former executive vice president of programming and marketing for Warner Amex Satellite Entertainment Co. and is credited with the design and development of The Movie Channel, Nickelodeon and MTV. He also was responsible for Warner Cable's QUBE Columbus, Ohio, system.

R. Robinson

Pirelli Cable Corp., Union, N.J., and Pirellia Cables Inc., Montreal, have consolidated the senior line management of their Communications Divisions in Wallingford, Conn., and Surrey, British Columbia, Canada. As a result, **Raymond Robinson** will serve as vice president and general manager for both divisions. **Robert Cohen** will be director of sales and marketing; **Ian Williams,** national sales telecommunications manager; **John Morrocco,** national sales non-telco markets manager; and **Rodney Andersen,** marketing manager.

Joseph Nugent has been appointed division controller for the RF Systems Division of General Instrument. Nugent previously served as manager of financial analysis and planning for GI's Jerrold Division.

Peggy Isaacson has been named marketing coordinator for Broadband Engineering Inc. She formerly was marketing/advertiser coordinator for Vitek Electronics Inc.

Harold Tamburro has been elected vice president of finance for AM Cable TV Industries Inc. Tamburro formerly was vice president and general manager of MAI Communications, Barrington, N.J.

Michael Soloman has been appointed general manager of RMS Electronic Inc.'s western operations in Santa Ana, Calif.

Yong Lee, the former division vice president for M/A-COM's Microwave Defense Subsystems group, is now president of M/A-COM MVS Inc.

D. Crawford

C. Davis

Pico Products has promoted **David Crawford** to national sales manager of Pico Satellite and named **Cullen Davis** district sales manager for the Southeast United States. Crawford previously was district sales manager for the Southeast U.S. Davis formerly served as technical director for West Boca Cable in Boca Raton, Fla.

Michael Green has assumed the post of general manager for the coaxial cable division of Scientific-Atlanta Inc. Green formerly served as vice president, operations, Syntex Opthalmics.

David Lenzner has been named vice president of human resources for Times Fiber Communications Inc. Previously, Lenzner was director of human resources for the Broadband Communications Group of General Instrument.

George Milne, formerly vice president, entertainment operations for Ford Aerospace Satellite Services Corp., was named president and chief operating officer of Satellite Gateway Communications Inc. Gateway develops and operates "Satellite City," an N.J. earth station complex.

Rite Cable elected the following officers: **James Riegler,** chief executive officer; **Lee Bertman,** vice president, corporate development; **Ann Muller,** vice president, engineering; **Sam Adenbaum,** vice president, finance; **Rod Warner,** vice president, marketing; and **Jerry Richter,** vice president, programming.

Ronald Groenendal has been appointed manager, adhesive products for Panduit Corp.

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Signal	Day	Start/ Stop	Alert Tone	Transponder
Satcom 3R				
Cinemax		24 hrs.	None	(E,C) 20 (M,P) 23
CNN		24 hrs.	024*/#	14
CNN Headline News		24 hrs.	635*/#	15
C-SPAN		24 hrs.	195*/#	19
Dow Jones Cable News		24 hrs.	None	6
Electronic Program Guide		24 hrs.	None	3
ESPN		24 hrs.	048*/#	7
Eternal Word Television Network	Daily	8 p.m./12 a.m.	762*/#	18
FNN	Weekdays	6 a.m./7 p.m.	975*/# 738*/#	4
Genesis Storytime		24 hrs.	None	8
HBO		24 hrs.	729*/#	(E,C) 24 (M,P) 13
HTN	Daily	4 p.m./4 a.m.	207*/#	16
The Learning Channel	Daily	6 a.m./4 p.m.	192*/#	16
Lifetime		24 hrs.	361*/#	17
Lifestyle		24 hrs.	None	3
Love Sounds		24 hrs.	None	8
Moody Bible		24 hrs.	None	3
Modern Satellite Network	Weekdays	10 a.m./1 p.m.	243*/# 421*/#	22
The Movie Channel		24 hrs.	None	(E) 5
MTV: Music Television		24 hrs.	None	11
Nice and Easy		24 hrs.	None	8
Nickelodeon	Daily	7 a.m./8 p.m.	311*/# (E, M, C) 519*/# (P)	1
PTL		24 hrs.	None	2
Reuters News View		24 hrs.	None	6
Satellite Radio Network		24 hrs.	None	2
SCAN		24 hrs.	None	6
Showtime		24 hrs.	576*/#	(E,C) 12 (M,P) 10
Sports Time Cable Network	Weekdays Weekends	7 p.m./1 a.m. 1 p.m./1 a.m.	None	4
UPI Cable News		24 hrs.	None	6
USA Cable Network		24 hrs.	601*/# 438*/#	9
USA (during blackout)		varies	295*/#	22
Video Concert Hall	Daily	4 a.m./6 a.m.	None	16
WFMT		24 hrs.	None	3
WGN		24 hrs.	None	3
WTBS		24 hrs.	024*/# 017*/#	6
The Weather Channel		24 hrs.	None	21
Satcom 4				
BizNet	Weekdays	6 a.m./1 p.m.	None	15
Bravo	Weekends Weekdays	5 p.m./6 a.m. 8 p.m./6 a.m.	513*/#	2
KKGO-FM		24 hrs.	None	17
National Christian Network	Daily	24 hrs.	073*/#	7
The Playboy Channel	Daily	8 p.m./6 a.m.	869*/#	12
Santa Fe Communications		24 hrs.	None	23

Contact programmer's technical department for more information on transponder use and alert tone.

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** (6/84)
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* (4th Q/84)
108.5		Anik C1* (10/84)
109	AnikB1***	
109		Anik D2** (11/84)
114	Anik A3**	
117.5	Anik C3*	
119	Satcom 2**	
122	Spacenet 1***	
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.

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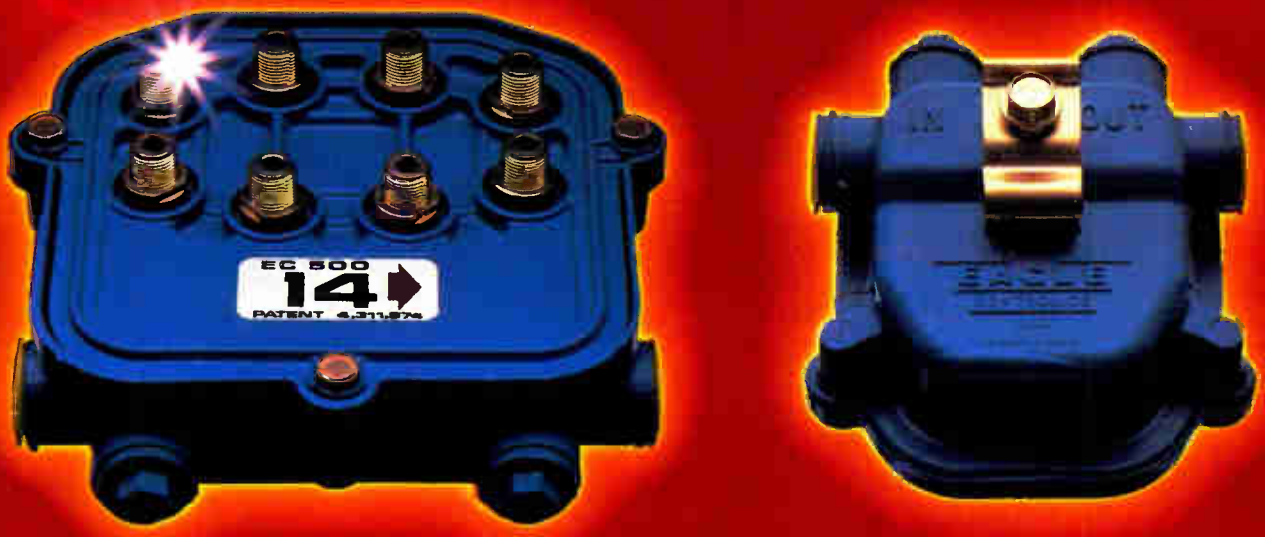

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Reader Service Number 34

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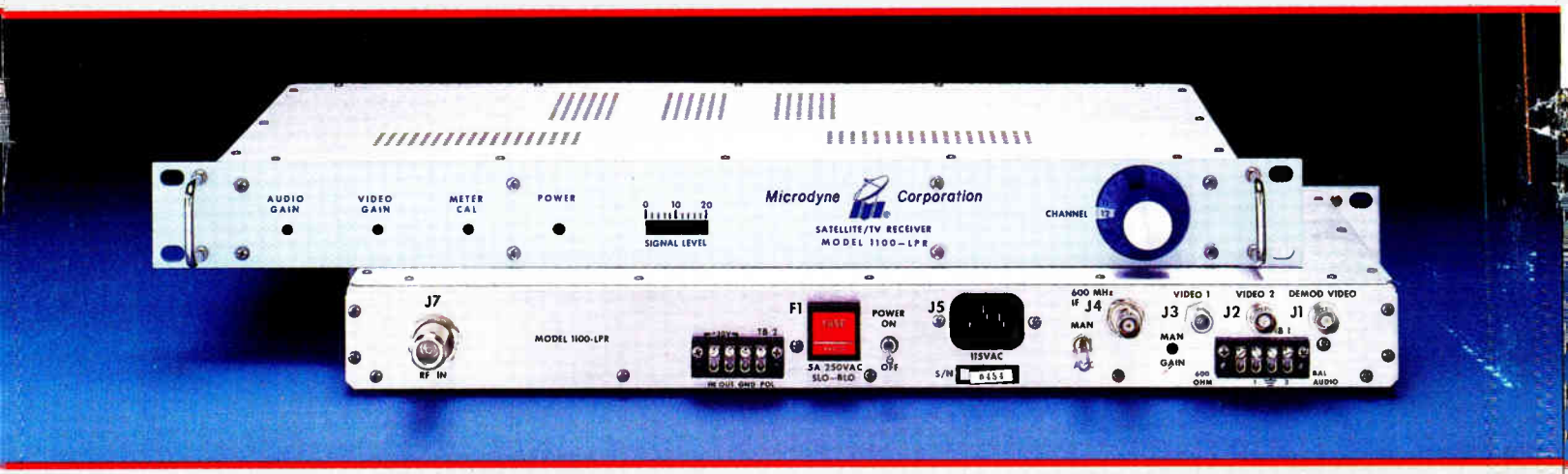

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