



# THE MATRIX SYSTEM



## Finally! Traps with Addressability. Only from MIDWEST CATV.

It's here. The off-premise addressable trap system that saves the operator time and money. And provides the operator with more billing flexibility and better customer service.

The Matrix System, exclusively from Midwest CATV, takes the electronics out of the residence and places it where the operator has easy access. Fewer service trips for the operator means more cost-efficiency. Providing the subscriber with channel

upgrades means better service from the operator.

Traps for security. Addressability for control. Developed by Syrcuits International. Distributed only by Midwest CATV.

For more information, give any of our salespeople a call.

Patent Pending

Reader Service Number 1

Corporate Offices  
Charleston, WV (1 304 343-8874)  
Clarksburg, WV (1 304 624-5459)  
Outside WV (1 800 532-2288)  
Lafayette, IN (1 317 448-1611)  
Within IN (1 800 382-7526)  
Outside IN (1 800 428-7596)  
Ocala, FL (1 904 854-6511)  
Within FL (1 800 433-4720)  
Outside FL (1 800 433-3765)  
Pottstown, PA (1 215 970-0200)  
(1 800 458-4524)  
Virginia Beach, VA (1 800 468-6444)  
Within VA (1 800 421-2288)  
Outside VA (1 800 643-2288)

**MIDWEST  
CATV**

A division of Midwest Corporation

More than supplies. Solutions.

# GROWING STRONGER ALL THE TIME



**SIGNALING  
THE INDUSTRY  
STANDARD**

**MC<sup>2</sup>  
COAXIAL CABLES**

Broad acceptance and rapid growth are familiar rewards for a company that provides the American marketplace with a superior product. "Build a better mousetrap..."

The company is Trilogy, and the product is MC<sup>2</sup>.

The impact of MC<sup>2</sup> alone – with its air dielectric assuring a 93% velocity of propagation – has set a new industry standard for coaxial cables. Manufacturers of foamed cables have had to increase their diameters in order to approach the attenuation characteristics of MC<sup>2</sup>.

Overnight success stories in the telecommunications industry can be short-lived, unless accompanied by farsighted commitments to industry needs that go beyond the most advanced product available. Consistent quality, assured availability, technical services, including problem-solving capabilities, and customer cost-effectiveness have always been important concerns of the Trilogy founders.

**TRILOGY LEADS IN TECHNOLOGY**



Call or write for a free sample and brochure:

TRILOGY COMMUNICATIONS INC., 2910 Highway 80 East, Pearl, Mississippi 39208

800-874-5649  
601-932-4461

Reader Service Number 2

**Trilogy**   
COMMUNICATIONS INC.



**Blown away in Anaheim**

Attendees at the 1988 Western Show may remember the high winds that blasted the area for three days, but more likely they'll remember it for all the fiber news and equipment that was on display. The Western Show wrap-up package tells of news from the trade show floor as well as some of the conversations that went on in the technical sessions.

21

**About the Cover:**

*Because of his pioneering work in getting the CATV industry to accept fiber optics as a useful tool to deliver better pictures, we honor Jim Chiddix of ATC as the 1988 Man of the Year. Photo by Greg Packer.*

DEPARTMENTS

**In Perspective . . . . . 8**  
**Frontline . . . . . 12**  
**From the Headend . . . . . 14**  
**Capital Currents . . . . . 16**  
**Return Path . . . . . 18**  
**LANwatch . . . . . 74**  
**What's Ahead . . . . . 80**  
**Classifieds . . . . . 82**  
**In the News . . . . . 86**  
**Ad Index . . . . . 90**

**Honoring the 'father' of fiber in CATV**

In recognition for his work in fiber optics, Jim Chiddix of ATC was chosen as *CED's* Man of the Year for 1988. How the fiber 'backbone' idea came about and where this rethinking engineer thinks the industry is headed is included in our cover story.

52

**Taking fiber to the home**

David Large, director of video product planning at Raynet, examines the fiber architectures proposed for CATV so far and proposes a new architecture that lays the groundwork for fiber installation to the home.

64

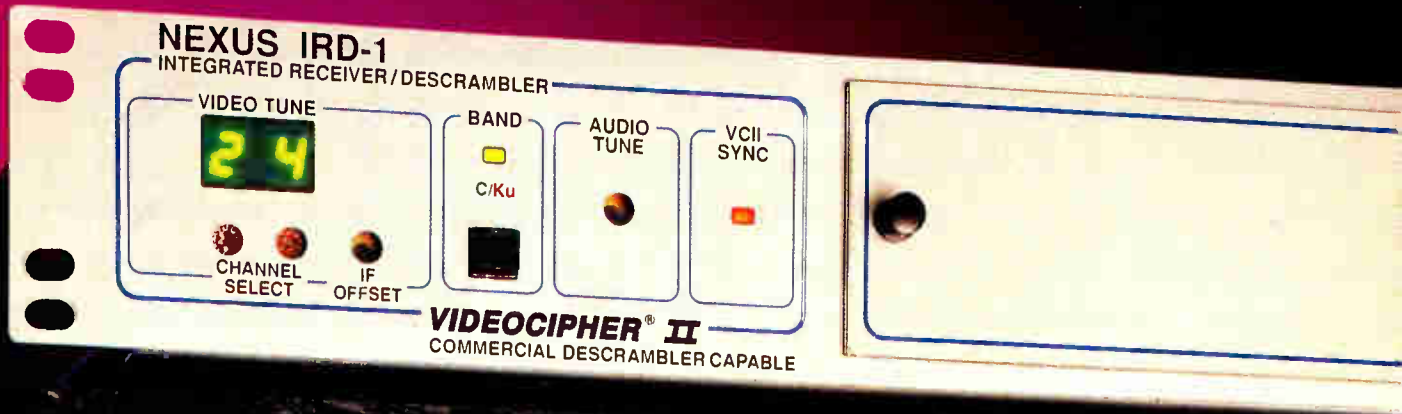
**How to rid your system of terrestrial interference**

In the final installment of his seven-part series involving the use of filters in CATV systems, Glyn Bostick of Microwave Filter Co. examines terrestrial interference and suggests methods operators can use to eliminate it.

76

©1989 by International Thomson Communications Inc. All rights reserved. CED, (USPS 300-510) (ISSN 0191-5428) is published monthly by International Thomson Communications Inc., 600 S. Cherry St., Denver, CO 80222. ©January 1989, Volume 15, Number 1. Subscriptions free to qualified industry readers. All other one-year subscriptions are \$26, prepaid in U.S. funds only. Second-class postage paid at Denver, CO, and additional mailing offices. CED is published on behalf of the cable television and broadband communications industries. POSTMASTER: Please send address changes to 600 S. Cherry St., Suite 400, Denver, CO 80222. MEMBERS OF THE BPA.





*Introducing*

## The World's

- smallest
- most cost-effective
- most reliable

## Commercial IRD

### Integrated Receiver Descrambler

*Congratulations Jim Chiddix, Man of the Year!*

### Now Available Off-The-Shelf

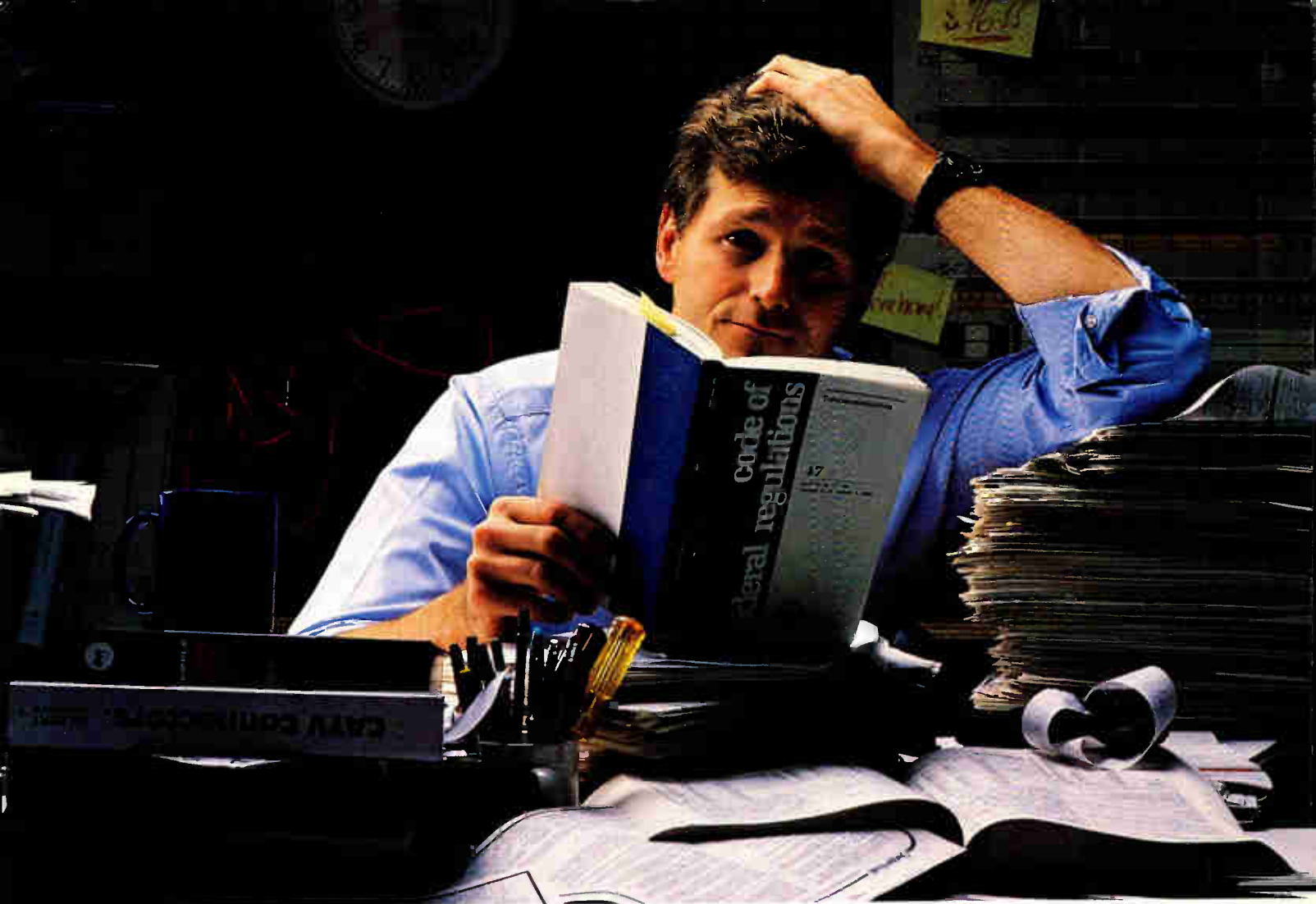
Receiver covered by the famous NEXUS 5 YEAR WARRANTY.\*  
VideoCipher® Module covered by General Instrument's Warranty.

\*Call or write for details.

TEL: (206) 644-2371 Bellevue, WA. or (604) 420-5322 Burnaby, BC. FAX: (604) 420-5941  
WRITE: Nexus Engineering Corp., 7000 Lougheed Hwy., Burnaby, BC. V5A 4K4

**NEXUS**  
ENGINEERING CORP.  
PERFORMANCE  
YOU CAN SEE

*rely on*



# Don't worry.

With the FCC's Compliance Regulations, the way you seek, find and document cable leakage will be under careful scrutiny. It's going to take more technician time. It's going to take more administrative time. So, to play by the new rules, it's going to cost you. But if you don't play by them and get caught, it will *really* cost you.

Welcome to that comfortable spot between a rock and a hard place.

But wait, compliance is simply a function of locating, documenting and repairing leaks. And locating and documenting leaks is simply a function of the right equipment.

Presenting the new *Wavetek Cable Leakage Instrument (CLI) Series*.

## The new CLM-1000: Amazing.

If you had one instrument to buy to solve your leakage problems, this would be it. It measures field

strength at any frequency from 50 to 550 MHz. At any range from 9 to 100 feet. And what it finds, it remembers, so you've got foolproof recall to simplify your documentation.

## The end of calculated risks.

With just the push of a button, the CLM-1000 takes precise measurements. The dipole antenna receives signals as far as 30 meters and as weak as 20  $\mu\text{V}/\text{m}$ . All you do is approximate and input the distance between the antenna and the leak. The system automatically converts the measurement to a 3-meter distance. No number crunching with conversion tables or formulas. No question about accuracy. All the information you need is dis-

played in an easy to read two-line LCD display, including analog level bar. Nine instrument stored setups simplify even the most complicated situations.

## As easy as rolling off a log.

The CLM-1000 contains a complete logging system. At the touch of a button you can store all the measurement data, leak location, date and time of measurement. Then you can print it out on site, or save it for downloading to your office PC.

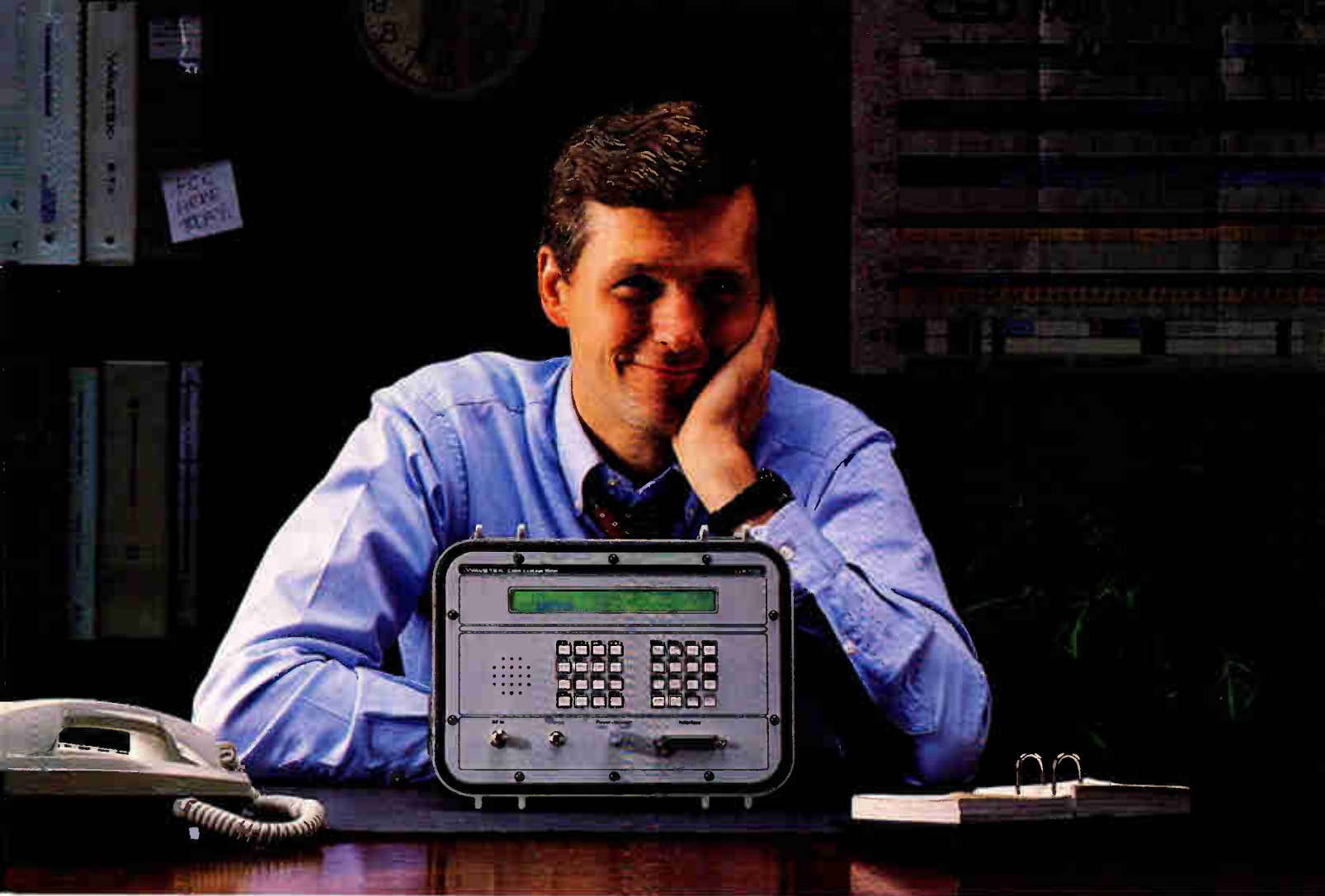


*The CLM-1000 memory bank automatically provides a detailed log — just for the record.*



*CLM-1000 digital readout takes guesswork and interpretation out of settings and readings.*





# Be happy.

It's easy. And so is retrieval, which cuts data tracking time to a minimum. So you can say goodbye to recording errors.

For the record, the CLM-1000 is the most precise, versatile field strength meter you can buy.

## When second best will do.

For instances when you don't need all the sensitivity, memory and documentation capabilities of the CLM-1000, Wavetek has two new very trustworthy hand held CLI receivers. The CLR-1 and CLR-4. Both almost operate themselves and are virtually goof-proof.

## CLR-1: One track mind.

Designed for easy, near-field use, the CLR-1 can detect and verify leaks at a subscriber installation or an amp. It tunes into one cable channel and gives you a precise reading. Locator tone pitch and

LED readout verify leakage level. No knobs, no needles. And no signal generator is required.

All at a price that makes the CLR-1 impossible to do without.

## The CLR-4: When there's more going on.

The CLR-4 covers the CATV spectrum, scanning four different channels simultaneously, or one at a time. It can tune channels 2, 3, D, and R as well as others.

An exclusive Wavetek lock-out feature prevents interference from strong competing signals. LED's and

locator tone pinpoint the leak source, quickly and precisely.

And all this technology is yours for a remarkably low price.



*CLR-1 (right) and CLR-4 give you two very affordable and goof-proof ways to locate leaks.*



*Let the CLM-1000 do the walking, since it can detect and measure leaks up to 100 feet away.*

## Compliance made easy.

Although compliance is mandated by law, in the long run, everyone will benefit from it. And it doesn't have to be difficult.

It's really just a matter of applying the right equipment. With Wavetek's new line of CLI's, you've got the right equipment.

Make it easy on yourself. Call Wavetek at 1-800-622-5515 for more information and the name of your nearest rep. In Indiana call 317-788-5965. Then, don't worry. Be happy.

Reader Service Number 4

**WAVETEK®**

## An astounding turn of events

No one could have predicted the effect Jim Chiddix has had on the industry. These days, every trade show and conference technical session schedule has a heavy emphasis on fiber optics, and manufacturer's booths are crowded with interested operators wanting to know how fiber can solve their problems.

When Chiddix and his Director of Engineering Dave Pangrac cooked up this idea of using an AM fiber scheme to reduce amplifier cascades, there were many more skeptics than converts. But it wasn't long before hardware vendors were convinced and began to make technological breakthroughs. That's the reason why Chiddix was named the 1988 Man of the Year (see p.52).

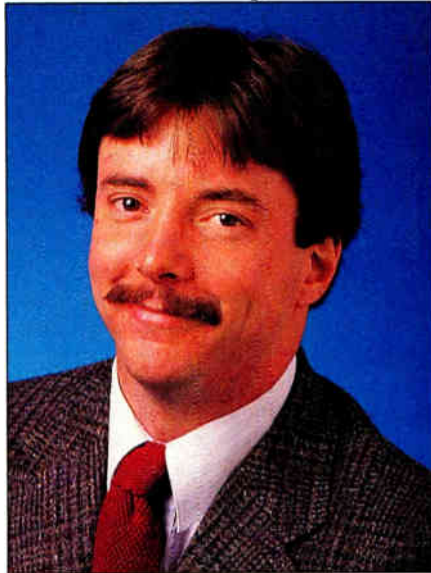
Today, we're beginning to see implementation (see In the News, p.86). Jones Intercable will rebuild a Florida system using Catel equipment and is planning to use fiber in an even bigger system, TCI will implement fiber systems with Anixter's AM Laser Link product, Continental has aggressive plans and other MSOs, I'm sure, will be making significant announcements in the near future.

When you step back and look at the big picture, there's a lot going on. It's not just ATC and it certainly isn't just Chiddix—but it took a man of his reputation and position to champion the cause. It will be interesting now to see which MSOs come out aggressively looking to fiber as yet another technological tool to beat back the competition. And it will be *really* interesting to investigate the different architectures and approaches those MSOs take.

It will be an interesting and busy 1989—the industry is still riding the crest of heavy spending as MSOs upgrade and rebuild for more channel capacity and to deliver better pictures to subscribers. On the vendor side, 1989 will likely be full of change. Serious technological developments will be made in areas like HDTV and fiber. Addressability and leakage control will continue to gain importance, too.

In all, it appears 1989 will be a healthy year for the industry as a whole. We look forward to bringing you all the technical news we can.

Roger Brown  
Editor



**William McGorry**, Group Publisher  
**Robert C. Stuehrk**, Associate Publisher

**EDITORIAL**  
**Roger Brown**  
Editor

**Greg Packer**  
Contributing Editor

**George Sell**  
Contributing Editor

### CONSULTING ENGINEERS

Chairman  
**Wendell H. Bailey**, NCTA VP, Science and Technology

### Members

**Jim Chiddix**, Senior VP, Engineering and Technology, ATC  
**John Dawson**, VP of Engineering, Mile Hi Cablevision

**Roy Ehman**, Director of Engineering, Jones Intercable

**Tom Elliot**, Director of Research and Development, Tele-Communications Inc.

**Jim Farmer**, Principal Engineer, Scientific-Atlanta

**Paul Heimbach**, VP Engineering, Home Box Office

**Dave Large**, Director, Video Product Planning, Raynet Inc.

**Robert Luff**, VP Technology, Jones Intercable

**Steve Raimondi**, VP Engineering, UA Cablesystems Corp.

**Joe Van Loan**, Consultant

### PRODUCTION

**Jeff Knight**, Production Director

**Don Ruth**, Art Director

**Elaine Callahan**, Production Assistant

**Debbie Van Dyke**, Production Assistant

**Dick Benson**, Circulation Director

### ADVERTISING

**Cathy Wilson**, National Sales Manager

**Judy J. Medley**, Account Executive

**Curt Stocker**, Classified Sales Manager

### MARKETING AND SUPPORT

**Michelle Pazar**, Author Support and Quality Assurance

**Linda Hendrick**, SCTE Chapter Support

### OFFICE

Denver 600 S. Cherry Street, Suite 400, Denver, CO 80222 (303) 393-7449. Fax (303) 393-6654.

# ITCI

INTERNATIONAL THOMSON  
COMMUNICATIONS INC.



# There's A Name For People Who Look For Trouble. And Then Repair It.



## Introducing Three Tier Service. Raising Repair Response To New Levels.

*Eastern International employs the technicians and technologies to efficiently and effectively repair your converter. We've made the investments. And now we're making promises with Eastern International's Three Tier Service.*

**I. GOLD SEAL SERVICE.** *Guaranteed 4 week turnaround (Our goal is 2 weeks) with low flat rate labor, plus charges for parts. 4 month warranty.*

**II. PLATINUM SEAL SERVICE.** *2 week turnaround guaranteed with competitive flat rate, including parts and labor. 6 month warranty. Shipped sealed for storage.*

**III. EASTERN EXPRESS SERVICE.** *Guaranteed turnaround within 5 working days (Our goal is 3 days). Eastern's Express Service is for those emergency situations. 4 month warranty.*



**EASTERN**  
INTERNATIONAL

(317) 247-1662 Fax: (317) 247-1675  
2415 Directors Row Suite N Indianapolis, IN 46241

**(800) 222-5109**

Circle 5



## Thinking your way to success in life

With all of the work we as engineers have to do, with all the issues we must keep up with, it sometimes seems as if there is not enough time in the day to get everything done. Meetings take time, but it's important to keep up with advances in equipment and technology—not to mention contact with your peers who are considering the issues you, too, must face.

The reading load in the technology business is enormous. You sometimes get the feeling that you cannot read another paper, magazine or book, but you must, lest you miss the important changes that occur in so rapid a pace.

With so much to accomplish and so little time to do it, certain techniques and tools need to be developed to cope. Everyone who faces this dilemma gets by somehow. Some let pressure and workloads build to a breaking point and then dump the unfinished business and ideas, only to start a new cycle. What a waste.

### Others just cruise along

Others do only what they can accomplish leisurely and completely, thus they do less than they are capable of and miss the opportunity to contribute greatly to company goals and their own

By Wendell Bailey, Vice President  
Science and Technology, NCTA

careers. Still others, however, seem to be very busy, very competent and thorough, and always have just enough time to get it all done.

When a crisis occurs, these same people, incredibly, expand their effort to handle the new challenge and does not take long to get back on track after the crisis has passed. These are the people we can learn something from. If we can understand what distinguishes this group of achievers from the masses, perhaps we too can get more useful work done.

One of the first things that you notice about the successful engineer I have described is that he is an absolute glutton for information. He absorbs it from every imaginable source—trade magazines, newspapers, books, TV, radio, memos, phone calls, meetings, friends, acquaintances, relatives, strangers—literally everywhere and everywhere. They use this ever-changing stream of information input as a constant to anchor their competence in any field.

### Complexity demands thought

Even seemingly irrelevant data is noticed because it is rarely irrelevant for long. The complexity of the modern

Five percent of the tasks will not be done correctly no matter what you do.

world demands an understanding of several disciplines other than technology if one is to make valid decisions on business issues.

This type of person does not just memorize or log-in information; they *think* about it. This is a devastatingly simple process, but is one of the hardest to succeed at. Henry Ford once said, "Thinking is the hardest work, that's why so few engage in it." Thinking about how everything you know can affect the specific decisions you make is hard work. It is the kind of work that pays off in successful decisions. This thinking can be done in quiet contemplative moments or while involved in a full-court press on a problem. Both kinds of mental activity seem to characterize the subject.

This person has also learned the knack of "fixing the right thing." This

is the corollary to "don't fix the wrong thing." Almost every problem, project or decision hinges on one or two key points. No matter how complex a problem it is, if you get the "key" things, the "right" things, fixed, the whole exercise becomes not only manageable, but will likely require less time to deal with it.

### Why is this important?

This is important for several reasons. The most obvious one is that it frees up time to be spent on other matters. It also frees up mental resources to bring to bear on new problems or opportunities. The not-so-obvious advantage is that it makes for better results. Problems are solved correctly, the right decision is reached, the contribution is not just increased, but is also qualitatively *better*. This is the major difference between winners and those who just participate.

In project management, this goal can be explained this way:

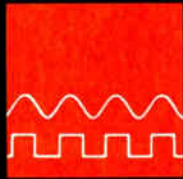
Let's say there are hundreds of things that have to be done to successfully complete a project. Experience has shown that 90 percent of all the myriad details and countless tasks will get done correctly, on time and within budget. Five percent of the tasks will not be done correctly no matter what you do. The final 5 percent can go either way; if you take the correct action at the right time these tasks will be as successful as the first 90 percent.

Conversely, if you don't make the right decisions or make it at the wrong moment, they're doomed to failure.

### The way to stay ahead

The trick is to put the appropriate effort into the 90 percent that will work out and the 5 percent that *needs* your input to succeed. The doomed 5 percent will have to be redone anyway, so why waste time on them? The difference between the successful project manager and all others is the ability to figure out what the right things are and what the others are.

The cable industry is rich with the achieving type. It is hard to tell if we are successful because we have this type of person, or if we have this type of person because this is such a dynamic industry. The best do well; the others move aside (eventually) to let others who may have learned the secrets get a shot at the fast times. ■



# POWER GUARD

# POWER SUPPLIES

## EXPERIENCE

Power Guard's founder, Jerry Schultz, has been manufacturing standby power supplies since 1974.

## EFFICIENCY

Power Guard started the move to high efficiency in 1985 when we shipped our first 90% efficient power supply.

## MODULARITY

Power Guard products are completely modular and entirely field serviceable.



## VALUE

Power Guard delivers highly efficient, top quality products at competitive prices.

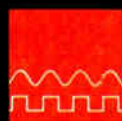
## WARRANTY

Reliability and experience are the reasons Power Guard's 5 year warranty is the industry's longest warranty.\*

## COMMITMENT

Power Guard is 100% committed to being number one in standby power supplies!

**CALL 1-800-288-1507 FOR PRICING AND INFORMATION.**



# POWER GUARD

3808 PEPPERELL PARKWAY • P.O. BOX 2796  
OPELIKA, ALABAMA 36801  
1-800-288-1507 • (205) 749-3800

\*This is a limited warranty.

Exclusive stocking distributor Midwest CATV.

Reader Service Number 6



## Recommended practices on video performance

Video performance is something we are all concerned about. In fact, much of what we do on a day-to-day basis revolves

around supplying the best video performance possible to our subscribers. The coming of HDTV can only tend to enhance our awareness of the need for good video. With that in mind, I thought it would be useful to review several of the industry's "bibles" of video performance, and to present them in a side-by-side comparison so that we can gain a

better feel for how we "measure up" against the industry recommendations.

By Chris Bowick, Engineering Dept. Manager; Scientific-Atlanta

Table 1 outlines video performance specifications as recommended in four of our better known industry standards: *EIA Standard RS-250B*, *NTC Report #7*, *The HBO Transmission Test Manual*, and the *NCTA Recommended Practices for Measurements on Cable Television Systems*. All are excellent publications containing both recommendations and step-by-step instructions for the measurement of any of the listed parameters. While it's important to understand the existence of these recommendations, it's equally important, in order to calibrate ourselves, to understand where these recommendations were developed, and for what purpose.

### An EIA standard

*RS-250B* was developed as an EIA Standard (replacing *RS-250A*) in September of 1976 as a performance standard for NTSC television relay facilities using analog microwave systems and angle modulation (FM). Such relay facilities might include a studio to transmitter link (STL), a point to point relay system, or a satellite relay system. Within *RS-250B* there are five levels of specification depending on the

end-to-end performance recommendations slightly more relaxed.

*NTC Report #7* was published in June of 1975 by the Public Broadcasting Service after being prepared by the Network Transmission Committee of the Video Transmission Engineering Advisory Committee. This was a joint committee set up between the technical representatives of the major TV networks and the Bell System to specify the performance objectives of video facilities that the networks were leasing from the Bell System. The report was intended to specify the performance of a single-channel relay system.

### Help from programmers

The *HBO Transmission Test Manual* is an excellent manual that was put together by the staff at HBO for the affiliates. It was developed as a tool for the operator, to be used in conjunction with HBO's monthly test schedule, in analyzing and diagnosing problems or trends with the satellite link, with the purpose of correcting problems before they became noticeable by the subscriber.

The *NCTA Recommended Practices for Measurements on Cable Television*

*Systems* was published in 1983 by the NCTA under the guidance of the Engineering Committee's Subcommittee for Standards of Good Engineering Practice. It was published "to provide informative, readily updated descriptions of good engineering practices required for the proper running and maintenance of a cable television system." The manual contains procedures and rec-

Summary of industry recommended practices on video performance

Parameter	RS-250B Satellite	NTC 7	HBO	NCTA	Accumulation Method
Differential Gain	>4%	>15%	>8%	>10% (>5%)*	3/2 Power
Differential Phase	>1.5 deg.	>5 deg.	>3 deg.	>5 deg. (>3 deg.)*	3/2 Power
Chrominance-Luminance Delay Inequality	± 26 NS	± 75 NS	± 40 NS	± 150 NS	RSS
Chrominance-Luminance Gain Inequality	± 4 IRE	± 6 IRE	± 3 IRE	-	RSS
Line Time Distortion	>1 IRE	>4 IRE	>4 IRE	-	RSS
Field Time Distortion	>3 IRE Pk-Pk	>4 IRE Pk-Pk	>4 IRE Pk-Pk	-	Linear
Short Time Distortion-Bar	>4 IRE Pk-Pk	>10 IRE Pk-Pk	7 IRE Pk-Pk	>15 IRE Pk-Pk	-
Chrominance-Luminance Intermodulation	>2 IRE	>3 IRE	>3 IRE	-	3/2 Power
Frequency Response	+/- 0.7 dB	+/-0.5 dB	-0.9 dB +/- 0.5 dB	-	RSS
Luminance Nonlinear Distortion	>6 IRE	>10 IRE	-	-	3/2 Power
Chrominance Nonlinear Gain	+/- 2%	+/- 10%	+/- 6%	-	3/2 Power
Chrominance Nonlinear Phase	>2 deg.	>5 deg.	>3 deg.	-	3/2 Power
Video Gain	+/- 2 IRE	+/- 3 IRE	+/- 3 IRE	-	RSS
Weighted Video S/N	<56 dB	<53 dB	<52 dB	<50 dB (<55 dB)*	RSS

Accumulation Methods: \*Preferred

Linear:  $D = d_1 + d_2 + d_3 + \dots$

3/2 Power:  $D = (d_1^{3/2} + d_2^{3/2} + d_3^{3/2} + \dots)^{2/3}$

RSS:  $D = (d_1^2 + d_2^2 + d_3^2 + \dots)^{1/2}$

complexity and number of "hops" in the transmission path: short haul, medium haul, satellite, long haul, and end-to-end. Short haul recommendations are the most stringent, with

ommended practices for the distribution plant and headend, as well as the satellite link. The manual is currently being revised, and we should see a new publication within the next year. ■



## You'd Expect A Family As Distinguished As C-COR To Produce More Than One Ph.D.

And it has. The latest member of our family to earn the degree is the Parallel Hybrid Device (PHD) trunk amplifier. Designed for the intermediate system reach — between push-pull and feedforward applications, it has many of the features of its more powerful brothers. And it provides a rare mix of performance and economy. The other PHD family members are bridger modules, terminating bridgers, and line extenders.

With this latest addition, C-COR now offers a complete line of high quality amplifiers — trunks,

bridgers, and line extenders — for every application from the simple rural to the complex metropolitan CATV installation.

Our push/pull, parallel hybrid, feedforward and mini-trunk amplifiers are available in a wide range of bandwidths. And they're all fully compatible with such auxiliary devices as equalizers, pads and power supplies.

Most importantly, C-COR's cable distribution products come with the industry's first three-year warranty. And they're backed by a company

with a reputation for service and quality, and employees who care.

To find out more about the pride of the C-COR family, call 1-800-233-2267 (in Pa. 814-238-2461) or write to us at 60 Decibel Road, State College, Pa. 16801.

**C-COR**  
ELECTRONICS INC. We're Out To Give You  
The Best Reception In The Industry.  
Reader Service Number 7



### Scrambling in Congress

As the 101st Congress is about to convene, let's take a look at the most significant thing that the recently adjourned 100th Congress did with respect to the cable industry in 1988.

Actually, the most significant news is what Congress did *not* do. Specifically, Congress did not enact the legislation introduced by Sen. Gore and Rep. Tauzin that would have stripped cable programmers of the right to choose the retail distributors of their satellite services. Defeating the Gore bill was the number one legislative priority of the cable industry last year.

The bill would have effectively prevented programmers from entering into exclusivity arrangements with cable operators or from determining that their program services ought best be marketed by the cable industry. It would have required programmers to deal with any and all third-party distributors of scrambled programming to backyard dish owners. And it would have subjected the terms and conditions on which programming is distributed to backyard dish owners to federal regulation.

In a competitive video marketplace, alternative distributors have an interest in developing unique programming that distinguishes their products from their competitors. Thus, the cable in-

dustry has spent years nurturing the development of cable programming services and identifying itself with those new services. Programmers also benefit from exclusive relationships with cable. Cable operators are more likely to advertise programming that is theirs alone.

#### Now seen as beneficial

Moreover, programmers may prefer to deal with established retailers with whom they have longstanding relationships rather than with retailers whose capabilities and backgrounds are unknown. It's for reasons like these that exclusivity arrangements are now viewed by economists, courts and policymakers as generally beneficial and pro-competitive.

Nevertheless, the Gore bill garnered significant support in Congress during the last two years. The bill was presented as a populist measure, aimed at breaking the cable "monopoly" and making programming available at reasonable prices to dish owners. In the early days of the 100th Congress, dish owners mobilized significant support, and many senators and representatives were tugged in the direction of supporting the bill.

But once program services began scrambling, it soon became clear that dish owners really had little, if anything, to gain from the Gore bill. Satellite services were not withholding their programming from dish owners. Dish owners could pick up the phone and order services directly from programmers, either on an *a la carte* basis or in packages assembled by the programmers. They could buy them from local cable operators or from third-party distributors like the National Rural Telecommunications Cooperative. Most importantly, they could buy at a price comparable to—and often less than—that paid by cable subscribers.

It was becoming clear, in other words, that a competitive marketplace for the delivery of scrambled service was developing, and that neither dish owners nor other consumers would be served by subjecting this marketplace to federal regulation or by requiring programmers to deal with anyone and everyone who wanted to sell their product. Indeed, it was becoming clear that it was only those would-be retailers and not dish owners who were the real beneficiaries of the bill.

#### Tauzin backed off

In the House, Tauzin dropped the most troublesome aspects of the legislation—the requirements that programmers deal with all retailers of service to dish owners.

Then, in September, two of the remaining provisions in his bill were adopted by the House Telecommunications Subcommittee as part of what would become the Satellite Home Viewers Act—the law that also gave satellite resale carriers and others a compulsory license to sell broadcast signals to dish owners.

The first of those provisions increased the penalties for theft of satellite-delivered programming. The amendment made unauthorized descrambling for commercial gain a felony, punishable by up to \$50,000 and/or two years imprisonment for the first offense and up to \$100,000 and/or five years imprisonment for subsequent convictions. Those who sold "black boxes" for unauthorized descrambling could be fined \$500,000 and jailed for five years.

The second Tauzin amendment directed the FCC to investigate the need for a universal encryption standard and authorized the FCC to establish such a standard if and when it appeared necessary.

#### Dead—for now

Adoption of these provisions removed pressure in the House for any further legislation dealing with scrambling. But Gore continued to press his bill in the Senate. Support for the bill was eroding, especially in light of the distribution contracts signed by the NRTC and several major program services. New opponents of the bill appeared, including Sen. Helms, who worried that the bill would promote the availability of R-rated and X-rated programming.

Still, the prognosis was uncertain when Gore brought the bill to the floor for a vote on Oct. 7. Following a debate, the Senate tabled the bill by a vote of 43-36, ending the battle. There was reason to hope that the issue had, in fact, been resolved once and for all.

But such hopes may have been premature. Five days later, Gore again attacked the cable industry and announced his intention to reintroduce scrambling legislation in 1989. So, there may yet be another round in this fight in the new year. ■

By Michael Schooler, Deputy General Counsel, NCTA

*the*

**SOURCE**

**Take your signal from Sony.**



Sony's FSR-1100 satellite video receiver delivers a clear signal you can depend on. For CATV, SMATV, broadcast or business television, the FSR-1100 is the most reliable, flexible, high performance commercial satellite receiver available for the money.

Whether you're operating on the Ku or C band, Sony's FSR-1100 receiver provides the superior video and audio reception viewers expect. The FSR-1100's unique adjustable detector bandwidth allows quality reception even under adverse signal conditions. And its advanced operating features make it easy to use.

When you choose the FSR-1100 you're choosing Sony quality. Sony's unsurpassed experience and commitment to excellence in professional broadcast and industrial video equipment coupled with Midwest's outstanding support and service make a winning combination that can't be beat. Get the picture? You will if you take your signal from Sony.

For more information about the Sony FSR-1100 call one of our sales representatives today.

**SONY**® is a trademark of Sony.

  
**MIDWEST**  
Communications Corp.

One Sperti Drive  
Edgewood, KY 41017  
**1-800-543-1584**  
In Kentucky 606-331-8990

### Economics vs. common sense

Fredrick Rosales' discussion of "Converter maintenance vs. replacement" (*CED*, October 1988, p.44) is unnecessarily complex and not at all practical. Also, his application of discounted cash flow techniques is not entirely accurate.

First, we don't see how he arrived at his 5 percent discount rate. The discount rate which is used in this type of calculation should be a company's cost of capital or how much it costs for the money they need to run their business. In its simplest form, the discount rate is the weighted average of the corporation's cost of debt and equity. Typical levels range from 10 percent on up. The best way to find out what rate to use is to call your company controller or treasurer.

Using Mr. Rosales numbers, if it cost us a total of \$39.50 to pick up and repair a converter and we could replace it for \$45.00, we might opt to go ahead and repair it if it looks OK and runs well.

#### Probably the same

If we consider only the economics, our decision would probably be the same next year, in five years or in eight years unless we experience drastically different inflation rates on our pick-up and repair charges as opposed to the purchase price. Also, as long as the converter is still in reasonably good shape, we would probably continue to repair it each time it comes in. Obviously, there comes a point where it may make sense to pitch some of the converters which keep coming in with problems. If you put a note inside them as they are repaired, you can identify the chronic troublemakers and get rid of them. A little common sense can go a long way here.

There are some other "soft" issues which Mr. Rosales doesn't seem to be concerned with, which sometimes are more important than the strict economics he discusses. As operators, we have to weigh economics against our subscribers' perceptions of our company and system. These perceptions are, to a large extent, shaped by our equipment appearance, equipment reliability (how often subscribers have to call the blasted cable company for a service call) and the perceived state of the art of this equipment. Unfortunately this

perception can sometimes make the difference between a healthy, growing system and a stagnant or declining one.

#### The power of talk

People talk. If the talk is about us and our crummy, old equipment, it may discourage potential subscribers from signing up. It may also be the final straw that causes our marginal customers to drop our service and finally be rid of that awful box!

Suppose we have an old converter which works like a champ but looks like a piece of junk, especially on top of some of our subscribers' high-tech TV equipment. Regardless of the economics involved, it may be time to replace it, especially if we are having other problems in our system.

Like it or not, we sometimes have to make tough business decisions which are based on some of these soft issues, especially when there is more at stake than converters. In this case, it may be appropriate to replace our out-of-date equipment regardless of whether it is only eight or even five years old.

#### Other important issues

Besides just the appearance and reliability of the converters, there are other important soft issues which need to be considered. In light of the growing number of available channels, rapidly changing technology, the advent of PPV, in-home and out-of-home addressability, and changing subscriber tastes, we think Mr. Rosales' choice of a 10-year life is overly optimistic. Maybe it makes economic and technical sense, however, we can't imagine keeping converters that long.

We would prefer to assume a shorter life of say, five years. You then might want to add a residual or resale value which could be discounted back to the present to determine the actual present value of the converter.

We don't think discounted cash flow analyses are necessarily the best approach for converter purchase/repair decisions. It's too easy to influence the outcome by changing the assumptions.

Instead of succumbing to paralysis by overanalysis, let's do what makes good business "sense"—first. Take time to consider the hard facts and the soft issues and then do what, in your opinion, is the right thing to do.

**James W. Pattison**

**General Manager  
Cardinal Communications  
Peru/Wabash Ind.**

### Collision course

I read with great interest (although a little belatedly) the article in your November issue titled, "Personnel shortage hitting contractors hard" (p.24). This is a topic that is very near and dear to our hearts here at NCTI and your treatment was very accurate.

We too see that the lack of qualified personnel is on a direct collision course with the industry's growing need for quality, trained personnel, especially in the construction and installation areas.

In response to this concern we have worked closely with Triangle Tech of Pittsburgh, Penn. to establish a vocational training program that can produce qualified, well-trained entry-level technical personnel for the industry. And I must say the results have been extremely impressive.

While the program was just begun this year, it has already turned out two graduating classes of CATV technicians, and all were immediately hired by cable operators and construction firms.

Under the program, Triangle Tech submitted its instructors to extensive training and testing by NCTI before classes were allowed to begin. The classes use NCTI's Installer Course as text materials. The courses are taught in the classroom with practical hands-on training in pole climbing and installation techniques. NCTI grades the individual lessons, monitors students' progress and ensures that the overall content of the program is current with cable industry procedures and techniques. Students must also pass an individual final exam administered by NCTI.

Based on the tremendous success of this program, NCTI is currently carefully evaluating other vocational training schools to find partners for additional programs. We believe that in order to make a significant contribution to this problem we'll need several programs throughout the country.

We'll keep you posted on our progress in this area. Meanwhile, keep up the fine reporting.

**Tom Brooksher  
Marketing Director  
National Cable Television Institute**





## Introducing the Sony FSR-1100 high-performance C/Ku satellite receiver.

Better signal reception means more satisfied viewers. And whether it's CATV, SMATV, broadcast or business television, a better picture starts with the FSR-1100 satellite receiver from Sony.

### Performance/Feature Highlights

- Typical threshold extension: 7 dB
- Selectable 24/31 MHz IF bandwidth
- 3 audio outputs: 2 tunable plus 1 fixed subcarrier
- Easy-to-use 10-key tuning plus video fine tuning
- 2-digit strength indicator for precise antenna positioning
- 24 preset C band channels
- Programmable memory for presetting of Ku band channels plus audio subcarrier frequencies, polarization and IF bandwidth
- Composite and auxiliary outputs for compatibility with most external decoders
- Input frequency band: 950 MHz-1450 MHz

Simply put, the FSR-1100 is one of the most flexible, reliable, high-performance commercial satellite receivers for the money. And that's a claim backed by Sony's unparalleled experience in professional broadcast and industrial video equipment.

Whether you're operating in Ku or C band, the FSR-1100 delivers superb video and audio reception. Sony's unique adjustable detector

bandwidth can provide improved picture quality under adverse signal conditions. And advanced operating features provide unsurpassed ease of use.

### HEMT LNB's

For heightened Ku band performance, look into Sony's ultra-low-noise block down converters. The first LNB's in the U.S. to utilize Sony's advanced HEMT (High Electron Mobility Transistor) technology, Sony's LNB's achieve exceptionally low noise figures, to 1.6 dB (typical). For sensitivity, stability, reliability and uniformity, they establish new standards of performance, surpassing all currently available GaAs MESFET units.

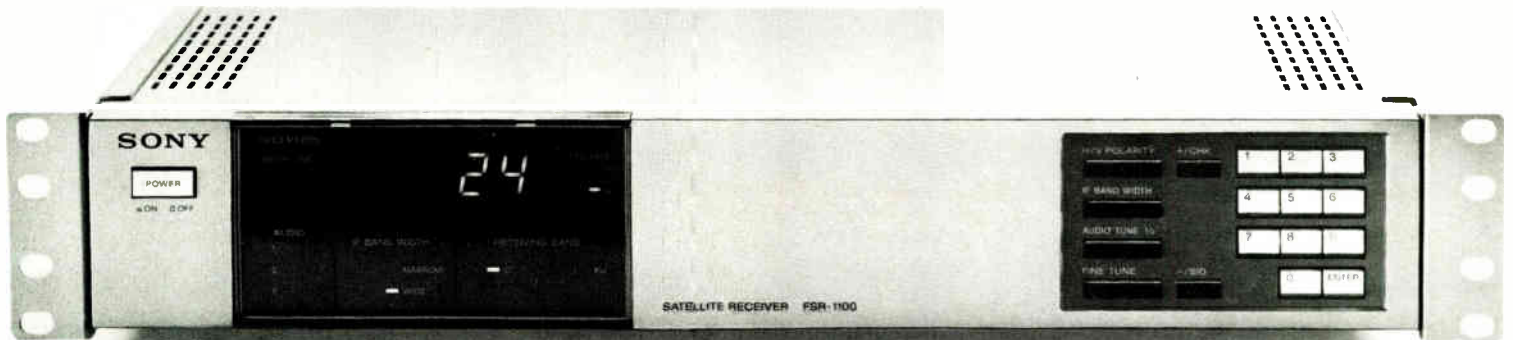
Sounds impressive? Just imagine how impressed your viewers will be. Write or call for more details on these and other Sony Satellite Communications products.

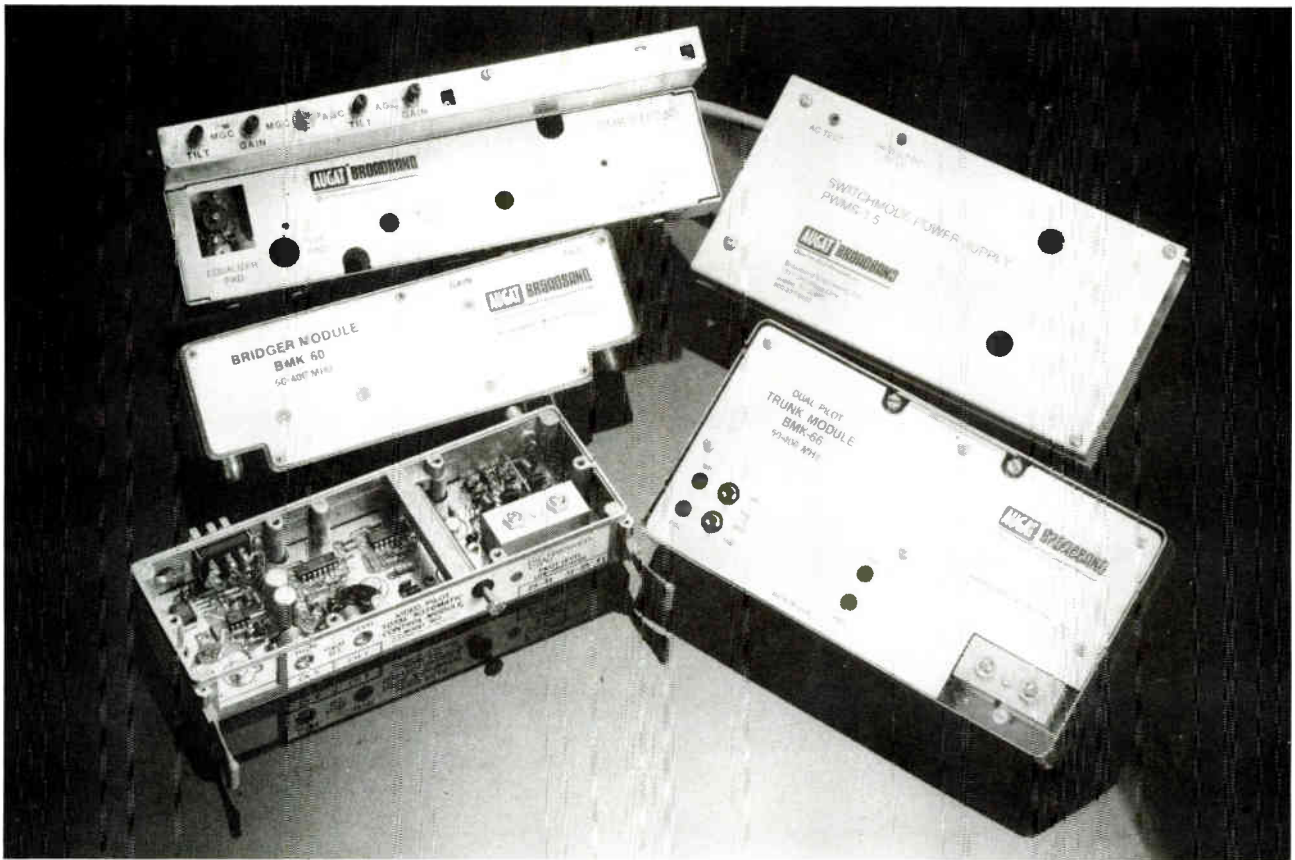


# SONY®

Satellite Communications, Information Systems Company, Sony Corporation of America, Sony Drive, Park Ridge, New Jersey 07656 (201) 930-7022; Or contact the following authorized Sony Satellite Communications Dealer: Midwest Communications Corp., One Sperti Drive, Edgewood, KY 41017 (800) 543-1584 (606) 331-8990

# SONY BRINGS A BETTER PICTURE DOWN TO EARTH.





## Broadband: The leader in upgrade electronics

Upgrading rather than rebuilding has been the cost effective way of extending the life of cable systems by many years thus adding profits to the bottom line.

Broadband originated the concept of upgrading almost 9 years ago and we have continued our leadership ever since.

You can feel confident with the technical superiority and reliability that we have always been known for.

We don't look for quick fixes, we engineer long term solutions to your upgrading problems.

The result is electronics better than the original equipment that you are upgrading.

We stand behind our product too. Our upgrades have a one-year warranty and we are always there to discuss any immediate problems by phone.

For more information call Augat Communications Group at 206-932-8428 or write to P.O. Box 1110, Seattle, Washington 98111.

**For quality, performance and service, call Broadband**

**AUGAT<sup>®</sup> BROADBAND**

*Quality and Innovation*

Reader Service Number 10

# Winds of technological change blow in Anaheim

Those who revel in such symbolism would have found it amusing that the Anaheim area of California was buffeted by strong Santa Ana winds during the 1988 Western Cable Show. For these were not just any winds—you could say these were the winds of change.

A simple walk of the Western Show floor was all that was necessary to drive home the point that fiber optic technology for CATV use has finally arrived. Not only were the traditional fiber manufacturers like Catel Telecommunications, American Lightwave Systems and Synchronous Communications present and showing their fiber wares, so were several traditional CATV equipment vendors like Scientific-Atlanta and Jerrold. And some new faces and names made their presence known, hoping to cash in on the interest in the new technology.

## More than just products

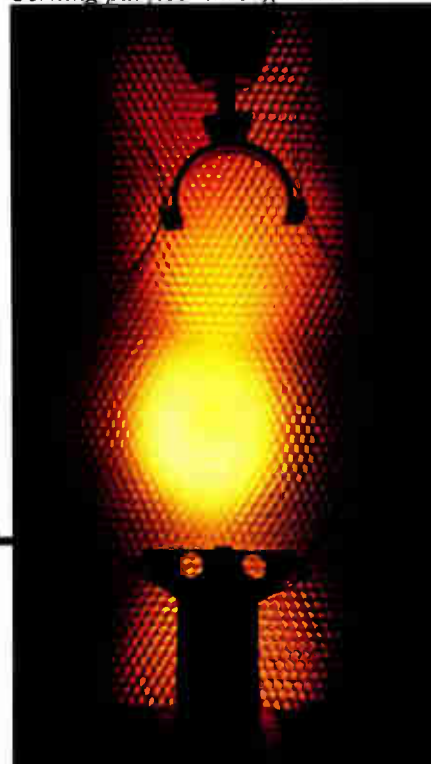
But even that wasn't the *real* news. It was the indication that this technology is indeed viable that made this Show interesting. Talk of real-world experiences, business agreements between vendors, a plan to develop the

"next generation" of distributed feed-back (DFB) lasers and announcements of significant orders for equipment dominated the three-day confab. That should have been more than enough to convince the most die-hard skeptic that fiber is truly on its way in CATV trunks and distribution legs.

Witness some of the fiber news emanating from the Show:

- Jones Intercable made it known

### *Corning put fiber through torture*



as a point of departure, is yet to be decided.

The HDTV debate has reignited competition over spectrum. Will HDTV be a satellite format or only terrestrial? And what about the 160 million TV sets out there when a set bought today has a 50 percent chance of being around 13 years from now?

According to Brugliera, a standard is 18 months to two years away. After that is determined, how long before we have product? Investments must be made now for development of product that's three years or more away. Will

it plans to upgrade its Broward County, Fla. system with an AM fiber system manufactured by Catel (See In the News, p.86 for details).

- Jerrold showed an FM trunking system and an AM system designed for the backbone approach while Scientific-Atlanta showed its AM system, part of a huge product introduction for that company.

- Ortel agreed to develop the next generation of high-power, low-distortion lasers for General Instrument and displayed a new receiver that apparently ups the ante in this area.

- Times Fiber (ALS) and Synchronous, two companies known for high-quality FM fiber optic trunking equipment, showed new AM systems.

- Panasonic Industrial Co. showed its AM fiber system.

The other "hot" technical topic these days—high definition television or HDTV—took a back seat to fiber, but was discussed in two panel sessions (see session coverage). Zenith displayed its Spectrum Compatible HDTV system and Faroudja Labs, manufacturer of equipment that improves standard NTSC signals, was present in the Jerrold/General Instrument booth.

Clearly the emphasis in Anaheim

we have different national standards which will impact economies of scale? Will a de facto standard emerge before the FCC decides on a more equitable standard?

Brugliera presented some statistics. Will the consumer spring for an HDTV set costing around \$4,000 when the bulk of the market is for sets under 30 inches and less than 3 percent of the market is for sets costing \$1,000 or more?

The cost is due to size but the large screen is necessary to see differences in resolution between NTSC and HDTV pictures. Weight and cabinet depth begin to also be a problem since cabinets deeper than 32 inches cannot fit in the door.

## The open architecture idea

Brenda Fox, general counsel and

*Continued on page 30*

## The issues of HDTV

Among all the issues related to HDTV, aspect ratio still stirs debate, according to Vito Brugliera, vice president of marketing and production planning at Zenith. HDTV is a large-screen experience but the need for wide aspect is yet to be proven, he says. Brugliera made his comments during an HDTV proponents roundtable discussion.

Global issues that remain, according to Brugliera, are technical, economic and political. How various proponent systems will work in real-world environments is unknown. Just how to obtain NTSC compatibility, a requirement of the FCC, whether you manipulate the signal within NTSC or take it

## **Jerrold's New "S" Series Headend Equipment Offers A Wide Spectrum Of Capability For Small System Budgets.**

**U**ntil now, it's been almost impossible for small cable operations to get superior performance without spending a small fortune. That is, until now. We, at the Jerrold Division of General Instrument, are introducing a new line of headend equipment that performs on par with the larger cable TV systems at costs that are in line with limited budgets.

### **Small Systems Built To Meet Large Demands**

With this totally new series, you can now equip your headend with frequency agility from 50 to 450 MHz, affording 60 channel capability. A full 60 dBmV output is standard on the S450P, Frequency Agile Heterodyne Processor and S450M, Frequency Agile Modulator to allow for combining without amplification. All units have been designed to make optimal use of limited headend rack space. For example, the S450M, S450P, and S890D, Frequency Agile Demodulator are each only  $1\frac{3}{4}$ " high so that they take-up only one EIA rack unit. They all have front panel controls that make in-field modifications without removing the unit from the headend rack.

The SI450R-VCII, C/Ku Switchable Satellite Receiver integrates a unique modular VideoCipher® II descrambling module that eliminates up to 7" of rack space. Switchable to either C or Ku band, the SI450R accepts signals from 950 to 1450 MHz. Jerrold's SI450R offers the premium performance required for large cable TV systems while offering affordability for small systems.

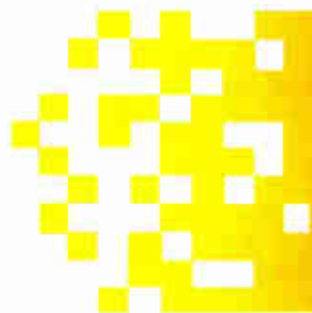


# **SPACE-AGE PERFORMANCE AT A DOWN TO EARTH PRICE**

### **Maximum Capability, Minimum Cost**

We also offer 48 hour in-warranty replacement on all "S" series products. And as an option, Jerrold also offers a convenient headend pre-pack service.

All of this gives more capability than ever before to systems on a budget. For more information about Jerrold's all new "S" series of headend equipment, get in touch with your Jerrold Account Representative or contact Jerrold Division, General Instrument Corporation, 2200 Byberry Road, Hathoro, PA 19040, (215)-674-4800. More than ever before, it pays to go with the leader.

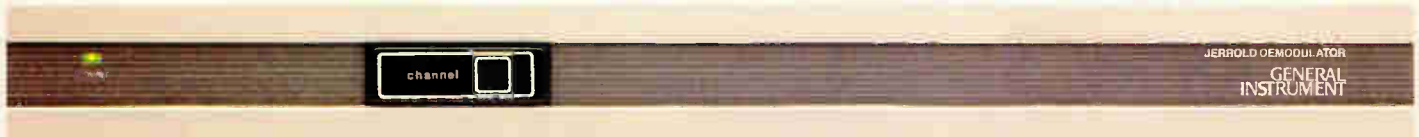


**JERROLD**  
where innovation is a trad



**S450M**  
**Frequency Agile Modulator**

- Frequency Agile from 50 to 450 MHz
- Front Panel Controls
- 60 dBmV Output
- BTSC Stereo Compatible



**S890D**  
**Frequency Agile Demodulator**

- Accepts VHF, UHF And All Cable Channels To 470 MHz For Standard, HRC and IRC Frequency formats
- Sub-Band Option Available
- MPX Output for BTSC Stereo Decoding



**S450P**  
**Frequency Agile Heterodyne Processor**

- Accepts VHF, UHF And All Cable Channels To 450 MHz
- 450 MHz Output Capability
- Front Panel Controls
- 60 dBmV Output



**S1450R-VCII,**  
**Satellite Receiver**

Available Early 1989

- 950 to 1450 MHz Block Conversion Input
- Digitally Synthesized Video And Audio Tuning
- Integrated VideoCipher® II Descrambling Module
- "C"/"Ku" Band Switchable

**GENERAL  
INSTRUMENT**

was on fiber, though. More companies than ever came with working displays and traditional FM houses showed their ability to give MSOs what they want by offering AM systems designed for the backbone or similar system architectures.

(For those who haven't been following the fiber market, the "backbone" approach was conceived and popularized by American Television and Communications. It calls for the

transmission of CATV signals over fiber from the headend to nodes located in various neighborhoods. From there the fiber is joined to traditional coaxial cable and sent to the various drop locations. The benefits include shorter amp cascades, better signal quality, lower maintenance costs and increased bandwidth.)

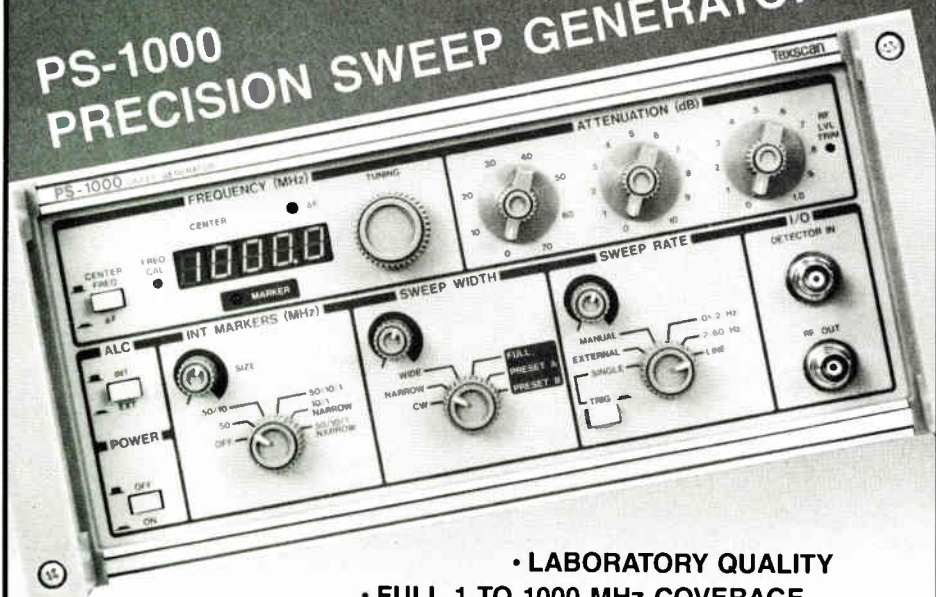
**Ortel makes news**

Some vendors who came to their first

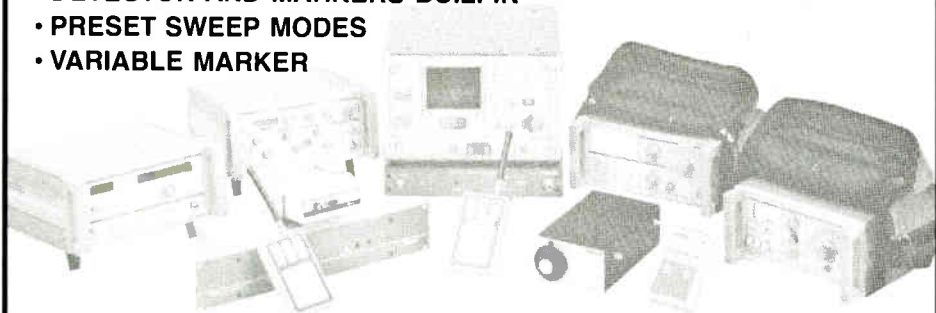
show with small booths and products originally intended for other applications returned with additional or refined products meant for the rigors of the CATV world. Ortel, for example, marked it's one-year anniversary in the cable business by signing an agreement with General Instrument, and showing new and improved products.

The GI/Jerrold agreement calls for Ortel to develop and supply high power, low noise and distortion AM lasers specifically for CATV applications. The DFB laser will be the critical component in GI's next generation AM optical transmitter. No financial or timeta-

**NEW**  
**PS-1000 PRECISION SWEEP GENERATOR**



- LABORATORY QUALITY
- FULL 1 TO 1000 MHz COVERAGE
- COMPACT SIZE — EASILY PORTABLE
- DETECTOR AND MARKERS BUILT-IN
- PRESET SWEEP MODES
- VARIABLE MARKER



**EXPERIENCE THE POWER**

**Tekscan**

TEKSCAN INSTRUMENTS • 3169 NORTH SHADELAND AVENUE  
INDIANAPOLIS, INDIANA 46226

Reader Service Number 12 (317) 545-4196 (800) 344-2412 FAX (317) 547-2490



*Ortel's System 6000 TVRO link*

ble details were disclosed.

On the other side of the laser coin, Ortel showed its 5601A Broadband Link product, which utilizes Fabry-Perot lasers without an isolator. The AM link can transmit up to 20 channels over 10 kilometers through a single fiber, according to Larry Stark, director of marketing at Ortel. Specs include a frequency range of 5 MHz to 550 MHz, typical carrier-to-noise (C/N) values of 49 dB for 20 channels at 10 km and a typical link loss of 22 dB.

Also, a new receiver from Ortel operates near the theoretical limit of noise performance without distortion, according to Stark. Model 4605A receiver uses a unique design (patent pending) to provide high C/N with little distortion. For example, to achieve C/N output of <53 dB with modulation depth per channel of 5 percent, the receiver needs an optical power input of -6 dBm.

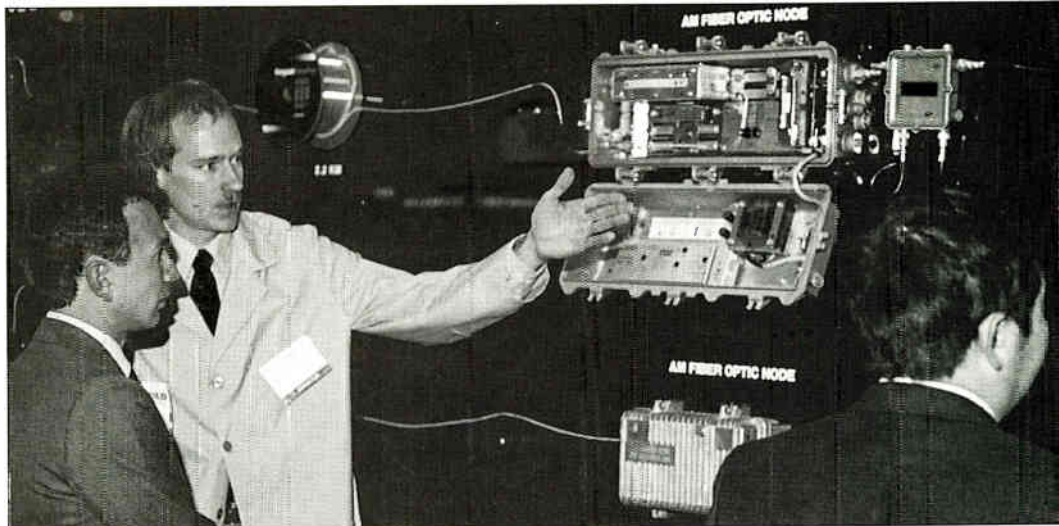
Finally, Ortel introduced the System 6000 TVRO fiber optic link, a system designed to transmit the LNB output from a satellite earth station to a remote receiver or headend as far as 15 miles away. The system consists of a model 6300A transmitter and a model 6400A receiver and all 12 channels from a single polarization can be transmitted. A custom unit for transmitting both polarizations can be special ordered from the company. Each unit takes up one headend rack space and AGC is included in the units. The system costs \$16,000.

## WESTERN SHOW

### Olson Technology

A fiber earth station link was also introduced by Olson Technology. The Opto-Sat system utilizes the 950 MHz to 1450 MHz output from the LNB and transports it up to 20 miles without repeating. No additional modulation equipment is required because all satellite channels available from the LNB are also available at the receiver.

For both polarizations, the cost of the Opto-Sat hardware is \$15,500, not including the two required fibers.



*Jerrold displayed both FM and AM fiber systems.*

### GI/Jerrold

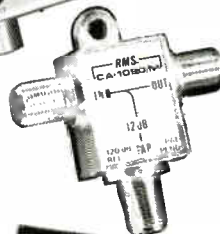
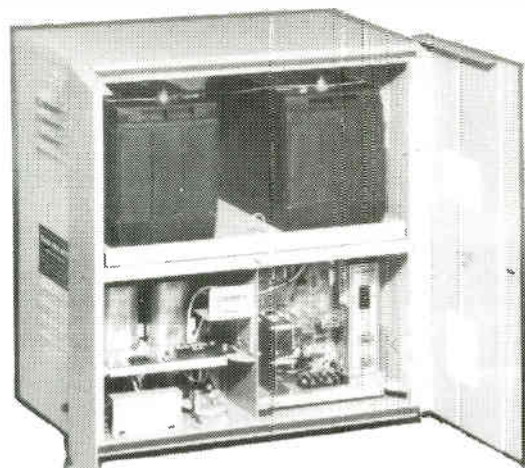
Despite its agreement with Ortel for an advanced laser transmitter, General Instrument/Jerrold showed up with a fully functional FM supertrunk/AM point-to-multipoint system in its booth. Products of the Applied Media Lab, the two systems will be available to operators next year (first quarter for the

FM product, second quarter for the AM system).

The FM product demonstration consisted of signals from five FM modulators combined into a single-mode fiber optic transmitter and a stereo generator. The fiber was stretched from the Jerrold booth to the Corning Glass Works booth on the other side of the convention hall. There the fiber was submitted to Corning's torture test

(chambers consisting of bending and twisting tests and various environmental demonstrations) and sent back to the Jerrold booth to a fiber optic receiver and five FM demodulators.

The signals were then sent into AM modulators and combined into a high performance AM transmitter that uses DFB lasers. From there, a Corning splitter was used to split the signal into two branches and two different types



# IN STOCK!

**RMS MAINTAINS A REVOLVING INVENTORY OF QUALITY...**

- [ ] Power Supplies
- [ ] Standby Power Supplies
- [ ] Directional Taps
- [ ] Directional Couplers
- [ ] Splitters
- [ ] Attenuators
- [ ] Matching Transformers
- [ ] Traps
- [ ] Filters
- [ ] Pedestals and Enclosures
- [ ] Installers Tools
- [ ] Connectors

at affordable prices! Contact your RMS Account Exec for prompt service. Don't settle for less than RMS.

**RMS ELECTRONICS, INC.** 40 years experience

621 ROUTE 46, HASBROUCK HEIGHTS, N.J. 07604  
CALL COLLECT: (201) 288-8833 (New Jersey Only) - FAX: (201) 288-1625

**TOLL FREE: (800) 223-8312**

(Continental U.S.A., Puerto Rico, U.S. Virgin Is.)

## WESTERN SHOW

of optical receivers, where light energy was converted to RF energy.

The FM product can be used to send 16 channels over a single fiber a distance of 25 miles with repeating, according to Dave Robinson, director of fiber optic programs.

End-of-line performance is 60 dB C/N and the signals will meet other RS250B medium-haul specs. The AM system will give 52 dB C/N performance with a 6 dB optical loss budget,

with -65 composite triple beat and -62 dB composite second order. The transmitter has a target price of \$15,000 and the receivers will cost \$5,000 for a strand-mounted version and \$7,000 for a dedicated node.

In fact, two AM fiber branches were demonstrated. The first had an optical receiver housed in an X-series amp housing and the second was a smaller, independent housing for feeding existing trunk amps.

### Times Fiber/ALS

Times Fiber hosted American Lightwave Systems in its booth. ALS demonstrated its new LiteAmp 1300 and LiteAmp 1500 AM fiber systems, designed to replace AML links and long coaxial trunk runs. Two versions are being planned; one for strand-mount (available second quarter 1988) and one for headend mounting. Both versions offer 42-channel delivery over one 15 km fiber, with a C/N ratio of 51 dB at the receive end and distortions are down at least 60 dB.

Secondly, ALS introduced its new low-cost FM fiber trunking system. The FT-1300CQ system combines the functions of demultiplexing and demodulating into a single product. It can be configured as a complete FM-to-AM system or as a standalone FM product.

If the system is used to interconnect existing headends, the system can take advantage of the AM modulators already installed. And the system is compatible with all baseband scrambling schemes, according to John Holobinko, vice president of sales and marketing at ALS. The FT-1300CQ system features modular, slide-in design.

### Panasonic

A newcomer to AM fiber optics is Panasonic. Through its parent company Matsushita, the company is offering a system that delivers 42 video channels a distance of 10 miles over a single fiber. Panasonic is targeting 55 dB C/N, better than -60 dB CSO and -65 dB CTB. The system features a DFB laser, PIN diode receiver as part of the strand-mounted receiver package and the transmitter/receiver is expected to cost \$20,000 per set.

Panasonic expects to be able to begin shipping the system sometime in the May or June 1989 time frame, said Jim Slade, manager of marketing. The system is presently being tested in ATC's Hawaii division, with more equipment due to be delivered there in December and January.

### Scientific-Atlanta

Scientific-Atlanta's demonstration of fiber optic technology became a full-fledged product offering at this Show. In fact, S-A introduced more products at this Show than at any previous convention. From off-premise addressability to a new bridger and line extender, the company had plenty to talk about. Including fiber optics: a



# Ask for Doyle

Meet Doyle Haywood, President and founder of Applied Instruments, Inc. Not your typical corporate executive. In fact, when Doyle's not on the phone reviewing a unique application of an Applied Instruments product, he's most likely camped out in the engineering department working on a new design. You won't find a more enthusiastic and knowledgeable person when it comes to solving your broadband test equipment needs. Under Doyle's direction, Applied Instruments has developed many innovative test products for the CATV and LAN industries. So, next time you've got a unique RF instrumentation problem, pick up the phone, call Applied Instruments, and...ask for Doyle.

Applied Instruments, Inc.  
51 South 16th Avenue  
Beech Grove, IN 46107

## 317-782-4331



**APPLIED INSTRUMENTS, INC.**

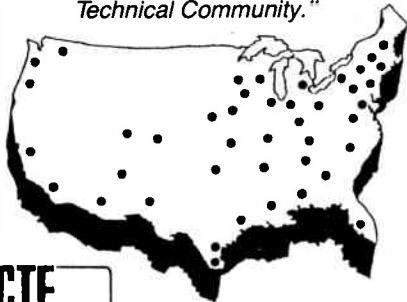
BROADBAND COMMUNICATION INSTRUMENTATION  
Reader Service Number 14



**CONGRATULATIONS**  
to  
**JIM CHIDDIX**  
**CED Man of the Year**

From SCTE and its 44 Chapters  
and Meeting Groups nationwide.

*"Serving the Broadband Industry's  
Technical Community."*



**SCTE**

The Society of  
Cable Television Engineers, Inc.

**Jim Chiddix,**  
**He's Our Man.**

**ATC CONGRATULATES**  
**JIM CHIDDIX**  
**AS MAN OF THE YEAR**  
**IN 1988.**

**ATC**

AMERICAN TELEVISION AND COMMUNICATIONS CORPORATION

*Providing Entertainment and Information Choices  
160 Inverness Drive West, Englewood, Colorado 80112*

Jim Chiddix is helping  
the CATV industry  
prepare for the future...

From all of us at  
Triple Crown Electronics  
congratulations and continued success  
to you and ATC.

**TRIPLE CROWN**  **ELECTRONICS**

4560 Fieldgate Dr.  
Mississauga, ON L4W 3W6

(416) 629-1111  
1-800-387-3205

**Congratulations**

**JIM**

 **PIONEER**  
PIONEER COMMUNICATIONS OF AMERICA, INC.

## WESTERN SHOW

strand-mounted optical receiver and an optical splice case were on display and pictures delivered by the system were shown.

Although fiber news was easy to find on the floor, so were new products from the more traditional CATV vendors.

tion; and Eidak Corp. has introduced scrambling technology designed to secure pay-per-view programming from home VCR recording.

### AML Specialties

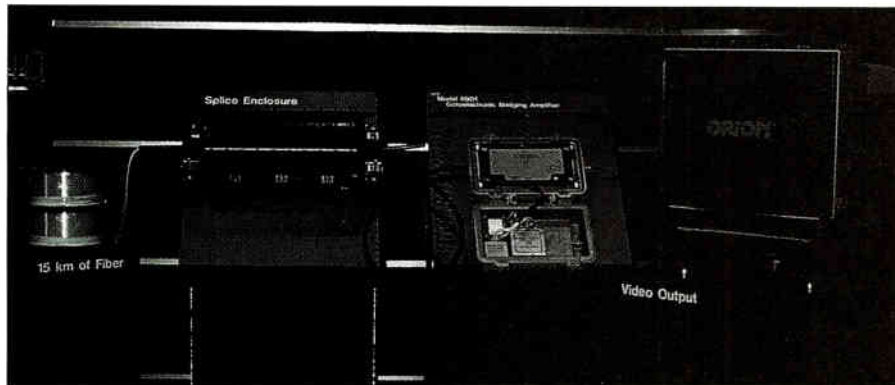
AML Specialties was started by a

The products announced so far include a family of transmitters and receivers designed for most typical applications. Even more surprising, however, was the news that AML Specialties is working on some proprietary technology that will wed AML and fiber optics. Watch this group for some product announcements in the near future.

### Eidak Corp.

Eidak Corp. was started by industry veterans Richard Leghorn and Graham Stubbs to capture the potentially lucrative PPV film protection market. The industry has recognized that one way to recapture much of the videocassette rental market is to have Hollywood release films to the PPV market before they're put on cassette. If the film can be protected from taping by home VCRs, that window of opportunity could be opened by the cable industry.

Eidak Corp. proposes to do just that. The PPV picture is watchable on the television just like any other, but it's unrecordable. No additional equipment has to be placed in the home and the system is transparent to a cable system. It works by "seeing" the differ-



Scientific-Atlanta showed off its AM fiber products.

From leakage detection devices to new AML hardware and digital audio services, this Western Show truly turned out to be a technologist's dream.

The Show also marked the debut for two new start-up firms. AML Specialties has come into the CATV market looking to give Hughes some competi-

tion; and Eidak Corp. has introduced scrambling technology designed to secure pay-per-view programming from home VCR recording. A total of six products have been developed so far and others will be announced soon, according to William Margiotta of AML Specialties.

## CONGRATULATIONS

to

## JIM CHIDDIX

and ATC

and best of fortunes  
in the future.

Your friends at  
Warner Cable Communications Inc.



*the live wire*

## CONGRATULATIONS

to

## JIM CHIDDIX

and ATC

for Jim's

well-deserved selection

as

CED's 1988

**"MAN OF THE YEAR"**



Cox Cable  
Communications

# Jerrold Applied Media Lab

...exploring new paths to cable's future

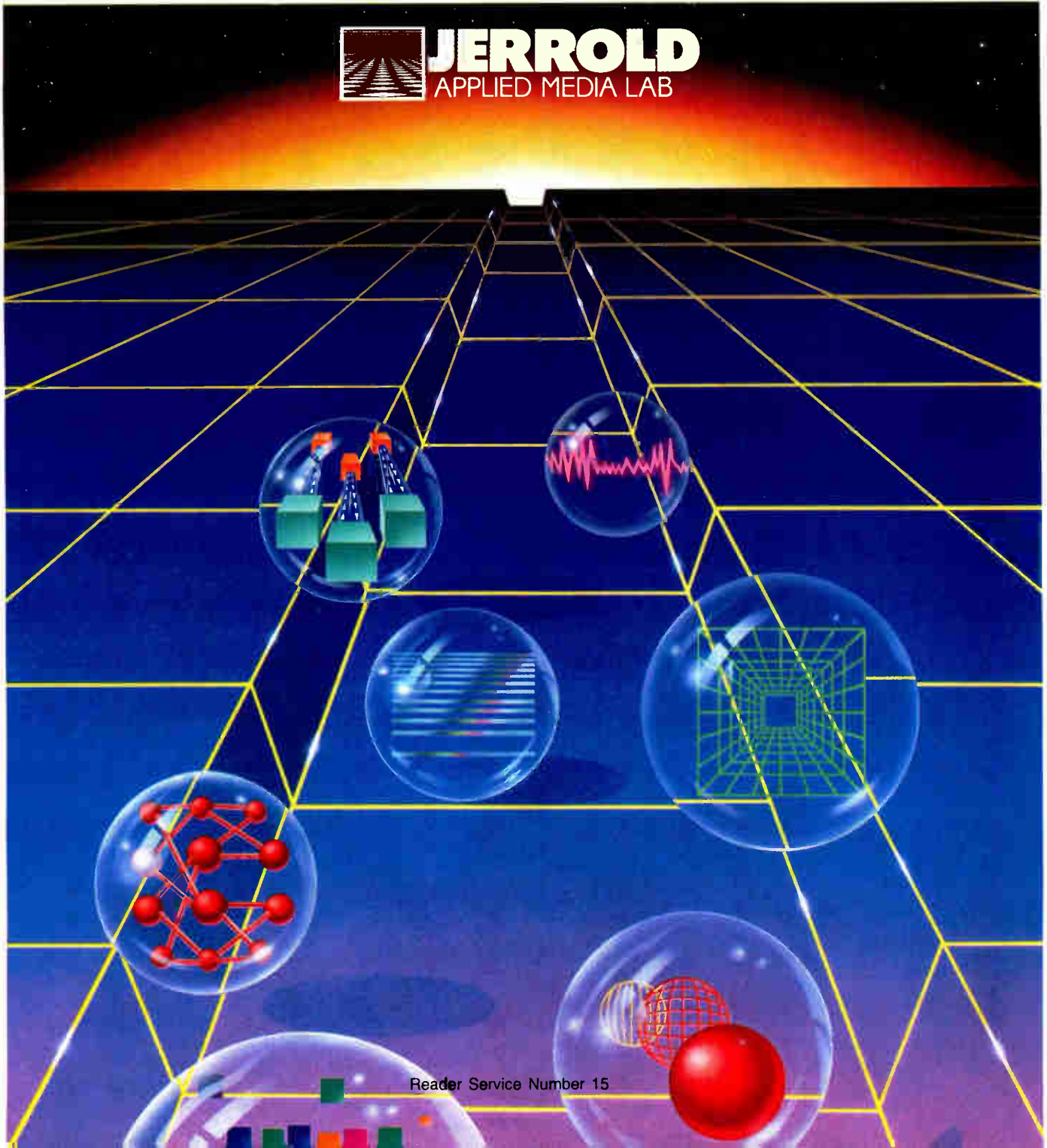
Cable television's broadband communications "pipeline" into the home is an enormous resource with a potential that remains largely untapped.

Exploitation of this potential depends upon a fusion of subscriber needs and technical R&D. Jerrold's Applied Media Lab is focused on the development of new technology to improve cable television and provide more choices for subscribers.

With your input and participation, the Applied Media Lab can serve as a conduit between today's technological innovations and tomorrow's practical applications.

For a brochure on current activity areas, contact Jerrold Division, General Instrument Corporation, 2200 Byberry Road, Hatboro, PA 19040. (215) 674-4800.

- HDTV • Interactivity • Fiber Optics • Digital Audio • Data
- Headroom • Advanced Scrambling



ence between the TV and the VCR, according to Stubbs, Eidak's executive vice president.

A VCR records information diagonally across the videotape with the recording drum rotating at 30 times per second (matching the film speed of 30 frames per second. VCRs cannot handle a large increase or decrease in that speed, while a TV can. The Eidak system periodically speeds and slows that rate, rendering a taped copy of the film distorted and unwatchable. Meanwhile, the television picture is seemingly untouched.

The system is presently undergoing field testing in Viacom's Milwaukee system and will also be tested in a Continental system in Massachusetts. National rollout of the system is expected in 1989. Operators using the system will have to place one small piece of equipment—which will be provided by Eidak at no charge—in the headend.

**Magnavox**

Magnavox announced a new status monitoring product designed for cable systems and local area networks. The MLS/DSS-MI line monitor with modem interface is similar to its sister product MLM/DSS-60, but can operate in one-way CATV systems or at a remote site. It can also be used in dual cable LANs.

This new version of the product is generally used where a return RF path is not available, spectrum is too crowded or the two-way system is not directly linked to the central computer. It can be connected directly to a laptop computer for portable applications.

And, in its own quiet way, Magnavox demonstrated its own FM fiber supertrunking system. Through parent company N.V. Philips, Magnavox is offering AM fiber transmitters and receivers and is reportedly developing more products in this area.

**Wavetek**

On the test equipment front, Wavetek brought a

*Continued from page 21*

VP for special projects, NCTA, raised the issue of what is going to work on cable television and urged leaving the door open to multiple standards and multiport open architecture. She pointed out that encryption capability is needed by the cable industry but with the standards debate centering around broadcast, little is heard about encryption. The compression of signals in some proponent systems may preclude adding encryption for cable transmission.

Rupert Stow, director of product system analysis at CBS, laid out the issue of international standards and their implications for the marketplace in program production and distribution. In Europe, Stow explained, there are two electronics giants who control almost completely their television market and who together control one-third of television set manufacturing in the U.S.

Japan comes in as a close second and Europe is determined to resist importation of Japanese HDTV sets. They have rapidly developed an incompatible production standard to the 1125 line system. They intend to reduce by 75 percent the importation of programming from the U.S.

The U.S. will lose over \$2 billion a year if this protectionist policy succeeds. Hollywood receives 39 percent of its revenues from export. For cable, this will mean radically increasing costs of program production. Among other things, Stow emphasized that broadcasters recognize that they must

achieve and maintain parity with all other distribution media or cease to exist.

Larry Irving, senior counsel/mass media, House Subcommittee on Telecommunications and Finance was next. Irving, counsel to the congressional body with oversight of the FCC, trade issues, and National Telecommunication and Information Association (NTIA), said the organization may be the only governmental body able to reconcile the competing parties. According to Irving, the Subcommittee's primary goals in the HDTV debate are, "Make sure you don't upset the competitive balance for technological reasons between the competing distribution media and also concerned with the impact on consumers."

The Subcommittee is seeking responses from the competing parties and the public to fundamental questions regarding government's role, standards, economic assessments, spinoffs, jobs, balance of trade, domestic or foreign ownership or manufacture, licensing, anti-trust immunity, R&D, and the formation of consortiums. They expect responses by February 1989.

Brugliera brought the consumer into the discussion and while lauding the consumer's long term good economic judgment, he warned that multiple standards will confuse the public. "And when the consumer is confused," says Brugliera, "one thing that doesn't happen is a remunerectomy. He doesn't let go of his money."

—George Sell



Wavetek's CLM-1000

number of new products to the Show, including a couple of leakage detection products, two new meters and a new sweep.

The CLR-4 leak detector/locator is a four-channel scanning detector designed to scan four video frequencies and emit a locator tone which varies in pitch in proportion to the field strength of the leak. LEDs indicate which of the four carriers is being received and a sync buzz switch helps determine possible

off-air reception.

The new CLR-1 "Ferret" detector is a pager-sized, belt-clipped unit that monitors a video carrier frequency and emits a tone upon detecting a video modulated signal. A visual indication of relative field strength is provided via LEDs.

Wavetek's CLM 1000 "Condor" field strength meter is frequency agile and was designed specifically to test for compliance with FCC cumulative leakage index (CLI) parameters. The meter can be configured to measure field strength with direct readout in microvolts per meter, at any distance from 10 to 100 feet. Antenna factor info is programmed into the Condor's non-volatile RAM and accessed in the measurement process to provide accuracy at different measurement frequencies.

Different instrument settings can

*Continued on page 34*



**We're out to convert the cable industry.**

**Panasonic's new TZ-PC 140/170 series cable converters carry the industry's first 5-year warranty.**

Reliability. It's what you demand from CATV converters. It's how you avoid costly service calls and replacements. It's what you expect from Panasonic.

Now, Panasonic, the industry's leader, proudly unveils a new standard in reliability: the new PC 140 and 170 series cable converters. And we're backing them up with an unprecedented 5-year warranty.

That 5-year warranty covers a high-performance package: 550-MHz/85-channel, phase-locked synthesizer circuitry, an all-function, wireless remote, built-in BTSC stereo-compatibility and Up-Down Channel Scan. Plus Sleep Timer, a Parental Guidance Control option and more.

For product or dealer information, call (201) 392-4709. Panasonic's new PC 140/170 series cable converters: the means to end-user satisfaction.



**Panasonic**  
**CATV Products**

## HDTV proponents tout benefits of various system attributes

**Y**ves Faroudja, founder and president of Faroudja Laboratories, started the HDTV technical session by announcing the successful transmission of his super-NTSC system, an ATV system that operates within NTSC parameters. The signal was beamed from Paris via satellite to a small town in France and projected on an 18-foot screen in a theater before a paying audience. Reportedly, the presentation equalled 35 mm film quality. "We are proving existence by existing," Faroudja claimed. After covering his many other successes, primarily in Japan and the U.S. broadcasting industry, Faroudja launched into a discussion of his super-NTSC system.

He argues that fully digital television, from the camera to the set, will come by the year 2000 and, therefore, it makes no sense to change standards just for 10 years. A totally new system would not have enough time for amortization. He proposes his system as an interim improvement to NTSC.

According to Faroudja, what the American consumer seems to want today is a larger picture, improved audio with CD impact, a variable aspect ratio, no ghosts, no noise, and no transmission problems, and some line doubling and enhancements. "That's all that's needed and that's all we are doing with super-NTSC," Faroudja emphasized.

### Within or without NTSC

Robert McFarlane of the senior technical staff of Philips Laboratories discussed recent developments with Philips' HDS-NA (High Definition System for North America).

NTSC compatibility was goal at Philips and compatibility with all distribution media. They are now working on a one-and-a-half channel approach, with a 6 MHz main channel (NTSC) and a 3 MHz augmentation channel (HDTV) that permits expansion and enhancement.

The system employs an FM signal for satellite transmission with reconfiguring to terrestrial AM transmission with a low cost transcoder. Requirements that were assumed in the design of the system include a wide-screen aspect ratio, CD-quality sound, no motion artifacts, resolution using

1050 lines progressive scan, full NTSC compatibility, with the main channel unaltered or only slightly enhanced, and a pan and scan capability.

The augmentation channel, separated out from the satellite signal by the transcoder, will contain a band-passed line difference signal for interlacing with the 525-line NTSC channel, the panels, the high frequency luminance signal, and digital audio, with pan and scan located in the NTSC vertical blanking interval (VBI). Time expansion of components will reduce echos. Power is reduced by using double-sideband 100 percent modulation, companding, and there is no sync level. Later, they will be using digital modulation, according to McFarlane.

McFarlane announced that arrangements have been made with Hughes Communications for a satellite transmission test and in a couple of months a test of the terrestrial transmission will also be conducted.

The David Sarnoff Research Center is the proponent of the Advanced Compatible Television (ACTV) system which is structured to be introduced in an evolutionary manner, allowing for marketplace factors to determine the level of advancement.

Dr. James Carnes, vice president of consumer electronics and information sciences at the Center, discussed, among other things, why he believes the U.S. needs a different HDTV standard than those for Europe or Japan, how ACTV works, and presented an entry-level ACTV-E system, and commented on cable and HDTV standards.

According to Carnes, the size of the U.S. obviates using DBS as opposed to Japan's and Europe's emphasis on satellite delivery of HDTV. The U.S. has a large, privately owned broadcast industry with several networks and over 1,000 local stations, and a large, growing privately owned cable TV industry.

The U.S. has a major investment in NTSC equipment, and consumers are accustomed to receiving upwards of 50 channels of programming. In this environment, HDTV must meet these criteria, according to Carnes: Delivery by terrestrial broadcast and cable, signal compatibility with NTSC, and the route to HDTV must be evolutionary.

Carnes presented the technical pro-

file of the ACTV approach. ACTV-1 is 6 MHz single channel format that provides NTSC receivers with the NTSC portion of the ACTV signal, and ACTV receivers the full advanced signal. ACTV-2 provides a second additional 6 MHz channel containing video augmentation and digital audio. ACTV-2 will enter when spectrum becomes available and large screen sets are introduced. It will be compatible across NTSC and ACTV-1.

ACTV-1 provides wide aspect ratio, 1050 scan lines, with 30 percent increased resolution vertical and horizontal over NTSC, and digital stereo audio. ACTV-2 provides a second channel improving the horizontal resolution to 650 lines and vertical to 750 lines.

An "entry level" ACTV-E offers cable operators and broadcasters an evolutionary way of offering ACTV by simple retrofitting of NTSC equipment. Starting with a 525-line 2-to-1 interlaced camera retrofitted to scan for wide aspect ratio, the signal passes through an ACTV-1 encoder at the headend or just before the transmitter. The only difference is no vertical resolution enhancement because no RF quadrature modulation is needed. The viewer will see all the other enhancements of ACTV-1.

At a point where it is justified, ACTV-1 equipment can be purchased and added to the ACTV-E equipment in place. ACTV-2 can wait for a market pull to justify the investment. "When will that be?" Carnes asked. "I don't believe anyone knows. Maybe soon, maybe 10 to 15 years. The beauty of the ACTV approach is we don't have to know the answer to that question right now." Carnes said hardware will be available at year's end and they hope to run real RF field tests in the first half of 1989.

### The gold standard

Carnes urged the cable industry to not jump to the decision to develop its own standard, which he feels could confuse and perhaps result in the U.S. missing out. He urged a common standard and the generation of program material from all sources.

What's needed is cable expertise and financial backing, says Carnes. "We've all heard of the Golden Rule. He who has the gold, makes the rules." He pointed out that the standards-making process is now slanted toward terrestrial broadcast because that's where the funding is coming from.

*Continued on page 34*

**CONGRATULATIONS**  
**Jim Chiddix,**  
**MAN**  
**OF**  
**THE YEAR.**

 **Comm/Scope Inc.**  
THE Cable in Cable TV.

PO Box 1729, Hickory, NC 28603, 800-982-1708 (800-222-6808 in NC), Telex: 802-166



## WESTERN SHOW

*Continued from page 30*

be programmed and recalled easily to save set-up time and information about the leak can be saved and later dumped to a printer. The info can also be loaded to an IBM-compatible PC for further

data manipulation. The Condor will be available in February and carries a price of \$2,495.

Also new is the SAM 2000 signal level meter. The LCD readout pro-

vides tuned frequency or channel information as well as measurement results. A traditional analog meter is provided for signal peaking. Calibration information and user specific tun-

ing info can be stored in memory. Numerous functions can be keyboard configured and accessed with one or two keystrokes. The SAM 2000 is priced at \$2,195.



*Texscan's PS-1000Z sweep.*

The 1882A Sweepless Sweep analyzer provides stand-

alone frequency response analysis or with a conventional continuous sweep generator as a reference source for testing vacant spectrum areas. Special notch filter modules for the 1801C bench sweep or 1855B sweep transmitter to allow the continuous sweep to "step around" active carriers. A number of other spectrum test capabilities are also provided for in the unit.

### Texscan

Texscan Instruments displayed a  
*Continued on page 38*

*Continued from page 32*

The Zenith system proposal was spelled out by Wayne Luplow, executive director, electronic systems and engineering services, Zenith Electronics. To Luplow, the true HDTV attributes are improved picture definition, double vertical and double horizontal resolution, improved audio, improved noise performance, larger screen sizes, and a wider aspect ratio.

### Full HDTV

The Zenith system is a simulcast system using an additional 6 MHz channel per each NTSC channel. The additional channel is simulcast over unused spectrum. According to Luplow, a full 30 MHz of HDTV is encoded into the additional channel and the display set renders the full 30 MHz of information. Resolution is increased using 787.5 lines, which is three-halves of the 525 lines, progressively scanned. Ac-

cording to Luplow, this exceeds the 1050 lines interlaced for resolution. The field rate equals NTSC's.

The simulcast HDTV channel contains two 3 MHz sideband in phase components. Modulation format is double-sideband suppressed carrier in the center of the band to avoid adjacent channel interference, using quadrature modulation. The VBI contains video and audio data. Power requirements are dramatically decreased. The system is cable, satellite, VCR and fiber optic compatible, says Luplow.

Component delivery allows premium services to be offered with optional encrypted security. Power reduction enables improved signal-to-noise without cable plant rebuilding.

—George Sell

# CLIDE

## Control Leakage Index Data Easily

A **powerful** solution to your system's CLI Management problems.

*Easy to use • Menu driven for ease of operation  
Wide selection of printed reports • Inexpensive*

CLIDE is a software program designed and developed by a cable TV engineer to aid CATV technicians in controlling RF signal leakage in their cable TV system.



*Get the facts before you buy.  
Remember, all software is  
"not created equal!"*

For details call (717) 267-3939

*Sold and supported by a company  
known for their genuine customer support!*



**Telecommunication  
Products Corporation**  
Chambersburg, PA 17201

## NEW! AVCOM PSA-37D

### PORTABLE SPECTRUM ANALYZER WITH DIGITAL FREQUENCY READOUT



AVCOM INTRODUCES THE NEW PSA-37D PORTABLE SPECTRUM ANALYZER WITH DIGITAL FREQUENCY READOUT. AVCOM'S NEW PSA-37D Portable Spectrum Analyzer has a 4 digit front panel frequency readout controlled by a rotary frequency adjustment control. Frequency ranges that the PSA-37D cover are 0 to 500 MHz, 500 to 1000 MHz, 950 to 1450 MHz, 1250 to 1750 MHz and 3.7 to 4.2 GHz. The PSA-37D Portable Spectrum Analyzer is lightweight, portable, battery operated, ideal for field test situations. A built-in DC block with a +18 VDC powers LNAs and BDCs with the flip of a switch. All other performance characteristics and features are the same as the PSA-35A which has become an industry standard for satellite communications work. **\$2475**



### COM-96T

The COM-96T Ku/C Band Receiver is compatible with all Ku and C Band LNAs and BDCs operating in the 950 to 1450 MHz range, providing complete 4 and 12 GHz performance in one system. Highly stable oscillators eliminate frequency drift in this fully agile receiver, and allow operation over wide temperature ranges. Special threshold extension circuitry enhances video quality. Threshold peaking and triple IF filters allow the COM-96T to receive international transmissions. This double-conversion, high performance receiver sells for **\$939**.

# AVCOM®

500 SOUTHLAKE BOULEVARD, RICHMOND, VA 23236  
Tel. (804) 794-2500 FAX (804) 794-8284 Telex 701-545

Reader Service Number 18





## *We've cast a new light on efficiency.*

Efficiency comes in many colors...and Lectro has them all for you.

- Super efficient units for lower power bills.
- Simple, plug-in modular designs for quicker, safer maintenance.
- Status monitoring compatibility with all major electronic vendors.
- The savvy of 50 years in the business

and the promise we're here when you need us.

- Superior technology and quality for indefinite life.
- The widest, and most available product line to meet your needs.

Lectro means efficiency. Make us prove it. Call 1-800-551-3790.



 **Lectro**

MADE IN U.S.A.

**More power  
to you!**

Reader Service Number 19

Congratulations

**JIM  
CHIDDIX**

**CED  
Man of the Year**

from all of us at

*United Artists Communications, Inc.*

Congratulations to  
CED's

MAN OF THE YEAR

**JIM CHIDDIX**

With warmest Aloha  
from  
your friends at



Congratulations

**Jim Chiddix**

CED Man of the Year



United Cable Television Corp.  
Denver Technological Center  
4700 South Syracuse Parkway  
Denver, Colorado 80237

Congratulations to

**JIM CHIDDIX**

Man of the Year

from the  
NCTA Engineering Committee

## Signal leakage: take note, the deadline approaches

As July 1990, when cable systems come under new FCC rules regarding signal leakage, approaches, cable operators need to get prepared to comply with the cumulative leakage index (CLI) rules and quarterly monitoring and maintenance performance. The FCC will not take kindly to operators who do not strictly comply. The result if you don't comply could mean loss of the use of certain channels that are shared with aeronautics and amateur radio.

Technical seminars on this topic are being held by the NCTA across the nation. And, at the Western Show, the SCTE sponsored a technical session on the subject.

The session was moderated by Robert Dickenson, president of Dovetail Systems and a long time player in this field.

Dickenson expressed his encouragement at the response he has seen by the industry at the various seminars and sessions in recent times.

### A useful computer program

Roy Ehman, director of engineering, Jones Intercable, presented a comprehensive and useful computer program available from him that collects, organizes and computes the facts and figures necessary for the annual CLI report to the FCC. The program, CLI.WK1, developed in Lotus 1-2-3 format, can be obtained by sending a floppy disk with a self-addressed envelope to Pam King or Bruce Catter at Jones Intercable.

Ehman also spelled out the criteria that should be applied to any commercially available CLI management programs before purchase. According to Ehman, such programs should be compact and not "a memory hog." They should not require ownership of other programs in order to run the CLI program. They should be versatile regarding input units. A program should print out acceptable FCC logs and work sheets. They should provide random access of leak records. And, the pro-

gram of choice should be failsafe in the event of a power surge or failure while running the program.

The information generated by a CLI program should also include useful management data. Leaks by size, "fix," and per mile is needed. An audit trail will tell you who made the last entry of information. The program should report activity and the oldest leak date and location. Data on the maximum, minimum, and average days to repair will also aid an engineering manager, Ehman pointed out.

### In the air

An airborne method for testing for leakage was presented by Chris Duros, general manager of CableTrak Inc. Duros explained that the threshold for detecting leaks during a fly-over equals the point where the level of leakage crosses over into non-compliance with FCC rules.

The basic equipment needed is a small aircraft, a receiver/detector, and a method of logging findings. The receiver must detect off-set signals as low as one microvolt. Data logged should include the tracking of the

*Continued on page 38*



### Long Cable Electronics

"For the Finest in Converter Repair"  
"Equipment Brokered"

**LOW COST**  
**FLAT RATE BILLING**  
**FREE PICKUP AND DELIVERY**  
**FAST TURNAROUND**  
**WARRANTED REPAIRS**

RECONDITIONED CONVERTER  
SPECIALS—IN STOCK!  
RECONDITIONED JERROLD  
ADDRESSABLE BOARDS  
IN STOCK

### PARTS

Call for parts flyer

Cosmetics for Jerrold, Hamlin, Others  
Bezels, Overlays, Knobs

### Popular Replacement Parts

Keypads, Proms, Transformers,  
ICs, Caps, Transistors, etc.



Long Cable Electronics

1228 Albany Street • Schenectady, NY 12304

Reader Service Number 20

## Keep your crews from blowing a fuse.

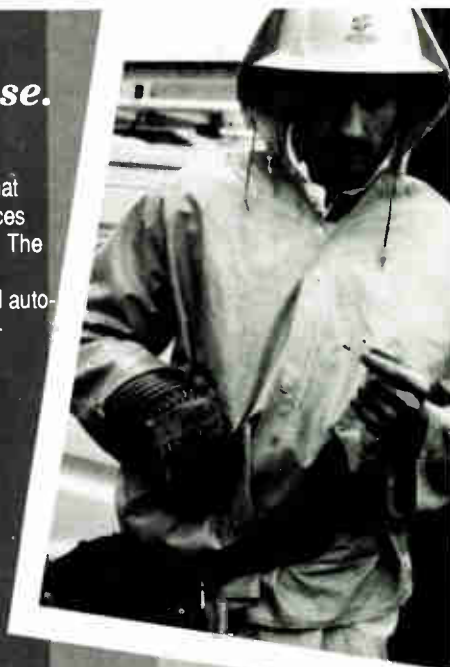
Introducing the Smart Breaker from GTE Sylvania. It's a new solid-state protector that prevents circuit damage and sharply reduces service calls resulting from current surges. The Smart Breaker opens to protect the circuit during a short-term overload condition and automatically resets and restores service afterwards. Moreover, the Smart Breaker



will remain open during long-term overloads, and can be simply reset once the fault condition is removed.

No more blown fuses. No more unnecessary service calls. No long-term annoying screen flashing. No kidding.

The Smart Breaker. A smart choice. From GTE Sylvania.



**SYLVANIA GTE**  
Control Devices  
Route 35, Standish, ME 04084  
207-642-4535  
Reader Service Number 21

*Continued from page 34*

new signal level meter and a new sweep generator. The Spectrum 700A signal level meter has been specially designed to compensate for temperature swings, making it ideal for outdoor use. The unit covers the 5 MHz to 600 MHz frequency range and front panel controls and large meter make measurements simple and easy to read.

Also new is the PS-1000Z sweep generator. It covers the 1 MHz to 1000 MHz range with better than  $\pm 0.25$  dB flatness and output level is adjustable over an 80 dB range in one-tenth calibrated steps. Other features include a five-digit digital display of center frequency, sweep width or variable marker frequency with 100 kHz resolution; a sweep band preset capability to allow rapid changes between frequently used settings and built-in harmonic markers, among others. The unit is priced at \$3,999.

On the amplifier side of the house, Texscan debuted 550 MHz modules for much of its T series of equipment. According to Bert Henscheid, director of R&D, the modules for feedforward and power addition have been developed and a module for the line extender

*Continued on page 50*

*Continued from page 37*

flight path over the system.

A frequency should be selected that falls within FAA frequencies of 108 MHz to 137 MHz. Care should be taken avoid harmonics, and you should recognize that there will be a lot of environmental interference from various sources.

The map used should detail the service area and the general topography of the area. Specific permission may be needed to fly in the area. Overflight will be at 1,500 feet above ground level. Since the readings taken will be cumulative, the flight path need not follow actual cable runs but should cover the entire service area with discrete parallel overflights.

Data collection, according to Duros, depends on what is to be accomplished. If the calibration curve for the detector is known, the raw data can be converted to microvolts or decibel values relative to the  $10 \mu\text{V}/\text{m}$  benchmark for leakage. Airborne data collected can be merged later with field strength data.

**Conflicting inputs?**

Steve Raimondi, vice president of

engineering with United Artists Cable Systems, gave a talk about his experience correlating airborne data and ground-base data. The densely populated suburban area had been ground-base tested and found to be within compliance, but the flyover data showed hot spots in excess of the amount allowed. After locating and repairing these hot spots, another flight showed failure again. Older cable-ready sets were later found to generate much of the leakage.

**A fair warning**

John Wong, assistant to the chief of engineering at the FCC, warned that the Commission is not about to alter the rules. Wong stated that requiring cable systems to vacate channels when a system is out of compliance may be remote, because they have other ways and means at their disposal such as fining systems.

Data reviewed last year of cable systems indicated at that time that 54 percent of systems were out of compliance with the average being  $300 \mu\text{V}$  over the threshold. Nineteen percent exceeded  $450 \mu\text{V}$ .

—George Sell

# You & Cable Link

We buy, repair, & sell  
converters



(614) 221-3131

Cable Link, Inc. Your source for CATV equipment

# WISE CHOICE

**Jim Chiddix**

**CED Man of the Year**

Congratulations to Jim Chiddix  
of ATC

from Midwest CATV  
your nationwide distributor.

**MIDWEST**

**CATV**

A division of Midwest Corporation

*More than supplies. Solutions.*

## Fiber evolution in CATV advances at Western Show

While most agree fiber-to-the-home is clouded in the distant future, the continuing evolution of fiber optics applications in cable television reached further into the distribution plant, judging by the presentations made at this year's Western Cable Show technical sessions. In fact, the only coaxial cable left hanging in the system of the immediate future was the drop cable.

At the first session, moderated by Joe Van Loan, formerly Viacom's vice president of engineering and now a consultant, Frank Little, project manager for fiber optic development at Scientific-Atlanta, offered "A Primer for the Marriage of Coaxial Cable and Fiber."

Little's talk concerned what distribution people in cable worry about in fiber. To relieve some concerns, Little created analytic models and translated types of distortions found in standard AM transmission over coaxial cable, such as harmonics, second order and

third order distortions, and beats relative to fundamental signals and their composite calculations in multi-channel input situations into the equivalent terms in the non-linear lasers and optical fiber environment.

Little pointed out that lasers, however, can also have distortions of linearity and noise by back reflections, particularly in an analog environment, caused by splicing, use of a photodetector with a different back reflection characteristic, etc., and this will give errors in calculations. Composite calculations will give less error because discrete calculations may vary depending on the greater or lesser error deviation at any specific frequency where measurement is made.

### Fiber earth station links

Brent Bayon, regional manager for Viacom systems in Washington and Oregon, presented information on a recent project which links a remote



David Fellows

satellite earth station to a headend via a 4 GHz fiber optic path.

Satellite reception in the Pacific Northwest is difficult at best and the location of the headend was also microwave and RFI congested, said Bayon. A mile and a half from the headend, a site was found shielded from micro-

*Continued on page 42*

### Can't decide who to listen to?

When every sales rep you talk to sounds like all the rest ...



*Our sales team will give you the straight facts, honest answers and most of all the best quality service available.*

**GIVE US A CALL.**

Your CATV Distributor  
and Manufacturers' Representative.

**JERRY CONN ASSOCIATES, INC.**



P.O. Box 444  
Chambersburg, PA 17201  
In USA 800-233-7600  
In PA 800-692-7370

## WANTED!

The growth of our company is due to the quality of our past performance.

We wish to continue with quality work and steady growth.

We are looking for career-oriented men and women who are qualified in the following areas:

- Supervision
- Aerial Construction
- Underground Construction
- Technician
- Engineering
- Installation

Contact Jill at:

**LAKESHORE  
CABLE CONTRACTORS, INC.**  
2524 Park St., Muskegon, MI 49444  
(616) 733-2852

# 110%

That's the kind of effort we put out. Because that's what it takes to become the leading CATV standby power system manufacturer in North America. That's what it takes to design the technology that sets the standards in the industry. And that's what it takes to beat the competition.

**Efficiency.** Alpha has developed standby power supply transformers rated at 94% efficiency – the highest in the industry. And this without sacrificing quality, thanks to superior engineering.

**Cost of Ownership.** Alpha systems cost less because our efficiency, reliability and performance monitoring result in lower maintenance and operating costs.

**Modularity.** Alpha pioneered functional modularity. Just add simple plug-in components

and your standby power system is updated with the latest innovations from Alpha's R&D labs.

**Uninterrupted Power.** Alpha's transfer time is so immediate that we offer standby power with the advantages of uninterruptible power. Uninterrupted power means uninterrupted service to your subscribers.

**Innovation.** We're never content. We're always looking for ways to improve. That's why the industry looks to Alpha for innovations in standby power. Single ferro-resonant design. Temperature compensation. "Smart" battery charging. Performance monitoring. Status monitoring. Major innovations resulting in real bene-

fits – and all introduced by Alpha Technologies.

And have we finished yet? Don't bet on it.



**We're Here to Back You Up.**

3767 Alpha Way Bellingham, WA 98225  
206-647-2360 FAX 206-671-4936

7033 Antrim Ave. Burnaby, B.C. V5J 4M5  
TELEX: 04-356760 FAX: 604-430-3903

Reader Service Number 25

*Continued from page 40*

wave interference by hills. A Simulsat antenna was constructed that receives all Ku- and C-band satellite signals.

Coax, AML and AM fiber all were considered but an FM 4 GHz, eight-fiber link was found to be the best approach economically and performance-wise. "The link is almost transparent," Bayon related. "Of the noise that is added by the link, most of it is from the laser." Total cost including construction of the Simulsat antenna and construction of outside plant was \$150,000.

**More backbone**

Well-known to those who follow the development of fiber optics, Jim Chiddix, senior vice president of engineering and technology at ATC, discussed "Strategic Issues with Fiber and Cable." Chiddix emphasized that in the growing competitive situation vis-a-vis multi-channel MDS, DBS and the telcos, cable must cut costs, improve service and improve product. Cable television must continue to stress its best strengths, such as greater choice.

The tree-and-branch architecture was reviewed. Chiddix described the fiber backbone overlay as a first step; useful



*John Holobinko*

over the next five or 10 years. Using the old drop cable, shortened coaxial distribution lines and very short trunk runs translates into greater reliability and more transparent distribution systems.

According to Chiddix, cost factors change as you push fiber further out into the distribution plant. Costs are

lowered by removing amplifiers but costs increase at conversion points between fiber and coax. The optimum distance to push fiber today (which will change as the cost of conversion technology comes down) is to the point where a cascade of four amplifiers follows, which would be about \$50 per subscriber for the backbone overlay.

Fiber changes one of the key variables: amplifier cascades. The benefits gained can be spent in other areas. If a goal is increasing channel capacity without changing out the coax in our systems, fiber can be a big help, said Chiddix.

What link performance is necessary? For a 60-channel system, 55 dB C/N or better, 65 dB or better for CTB, CSO and cross-mod, and a power budget of 10 dB, which would give good reach, are the ideal specifications. While no vendors can show these specs today, Chiddix stated, many are close and quite usable. AM backbone systems can be built today with off-the-shelf equipment.

**Different AM approaches**

Two approaches to AM fiber are  
*Continued on page 44*

**CONGRATULATIONS  
JIM CHIDDIX!**

Jones Intercable congratulates Jim Chiddix on receiving the 1988 "Man of the Year Award."

We applaud his continued efforts in leading the charge for the use of fiber optics in cable systems. We appreciate and admire his outstanding performance and dedication to technology within the cable industry.

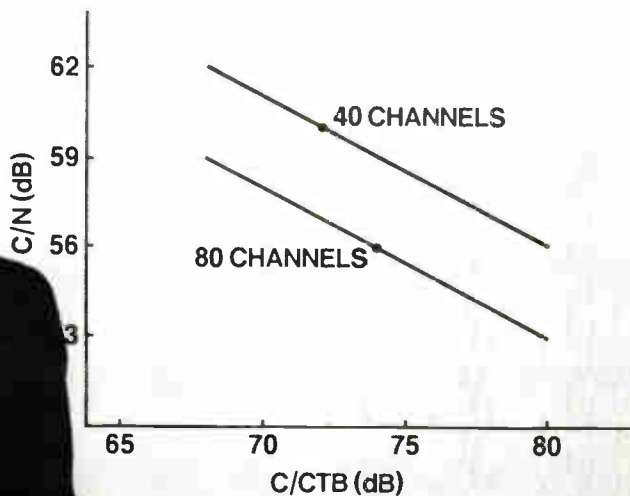


**Congratulations  
to  
JIM CHIDDIX  
CED 1988  
MAN OF THE YEAR  
from**





**"Deliver 40 channels with 60dB C/N over 32 kilometers now. No more waiting."**



**CATV operators can have tomorrow's quality today.**

This "new" AML system teams high power solid-state SSTX-145 transmitters with the high performance 550 MHz compact outdoor COR series receiving hubs to deliver the highest signal quality of any AM-modulated transmission system on the market today.

Pass the quality on to your subscribers by locating inexpensive AML receiving hubs throughout the service area, and keep the cascades short. At the same time you gain the system design flexibility, operations dependability and cost-effectiveness you've come to expect from Hughes AML.

Clustering and regional networking have never been easier or more cost-effective. You don't have to sacrifice transmission distance to get a high quality signal. And you can jump immediately to high-density subscriber areas without costly and time consuming construction through marginal revenue areas.

For more information, contact Hughes Aircraft Company, Microwave Communications Products toll free: (800) 227-7359, ext. 6233. In California: (213) 517-6233. In Canada: COMLINK Systems Inc., Pickering, Ontario, (416) 831-8282.

*Hughes AML is more than hardware.*

**HUGHES**



*Continued from page 42*  
 available. One is direct modulation of a laser with a complete RF broadband signal, going through a single fiber link, detecting the signal and going out with a complete RF signal again. It is the simplest and most desirable approach but it pushes the technology, Chiddix said.

The other approach is breaking the spectrum into pieces, hitting lasers with each piece, going through multiple fibers, detecting each spectrum piece, then combining for the full spectrum. This will give the ideal specs but cost goes up.

ATC's demonstration system being built on Oahu, Hawaii will feature two FM trunks across the island to fiber backbone links running to distribution nodes and four-amp cascades. The Orlando system is being built in the way ATC believes will be the future architecture for CATV systems. The city will be encircled with a digital FM supertrunk loop feeding hubs around the metropolitan area. Fiber backbone from the hubs reaches the neighborhoods for conversion to existing coaxial cable to subscribers.

ATC's Manhattan system is being considered for feeding all 350 trunk

bridgers with AM fiber backbone which would reduce cascades to a few distribution amplifiers.

In presenting a paper entitled, "Tran-shub—The Transmission of AM and FM Using Fiber," Jim Hood, president and CEO of Catel Telecommunications, explored costs of equipment and specific applications of the Tran-shub family of strand-mounted conversion nodes. For AM supertrunking applications, assuming 16 channels per fiber, specifications achievable are the RS-250B short haul (broadcast) specs with 60 dB S/N, with a reach of 626 kilometers at a cost of \$2,500 per channel. The costs are high but it is the best performance available, according to Hood. In engineering these systems, specification tradeoffs include distance, channels per fiber and costs.

Tran-shub I is Catel's conversion unit for FM to AM signals. It costs \$1,700 per channel and soon will take 40 channels per fiber and achieve 60 dB performance, Hood claimed.

Catel's newest product is Tran-shub III, capable of delivering up to 80 channels on three fibers, with a maximum of six fibers. The higher number of channels per fiber increases distortions but lowers costs per channel.

"With this technique you can achieve -70 dBc second order, -65 dBc composite triple beat, and 52 or 53 dB S/N, depending on the length of the run and the number of channels per fiber," Hood said.

Long distances for trunking, up to 40 kilometers, should use FM, but short distances can go all the way with AM. However, using optical repeaters, an FM span can go as far as 100 kilometers.

**Architectures of the future**

During the afternoon session, David Fellows, VP and GM of distribution, headend and earth station systems for Scientific-Atlanta, presented what he sees as the "Strategic Issues in Fiber Applications."

But fiber is not one of these issues. To Fellows, the real issues are quality of the cable system and the signal that is delivered to customers, reliability, bandwidth, competition and operating effectiveness.

Can fiber improve quality, Fellows asked? In a 450 MHz system with four-amp cascades and end-of-the-line performance of 44.1 dB C/N and 54.7

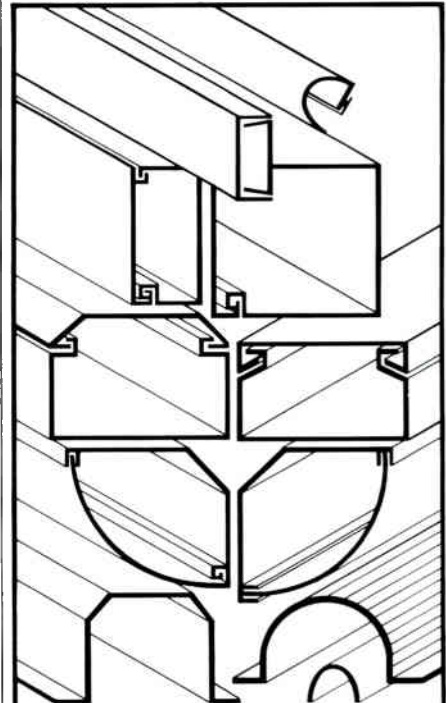
*Continued on page 48*



**but our tools are here to stay!**

- Made in the U.S.A.
- Proven in the field for durability
- Hand-crafted from precision parts
- Service-oriented manufacturer

Reader Service Number 27



**THE BEST YOU CAN BUY**  
 - IN QUALITY AND PRICE.

**CABLETEK CENTER PRODUCTS, INC.**  
 850 TAYLOR STREET  
 ELYRIA, OH 44035



1-800-562-9378 • ELYRIA 216-365-3889

Jim Chiddix of ATC  
discovered long ago  
the power of a positive attitude  
and the importance of planning for the future.

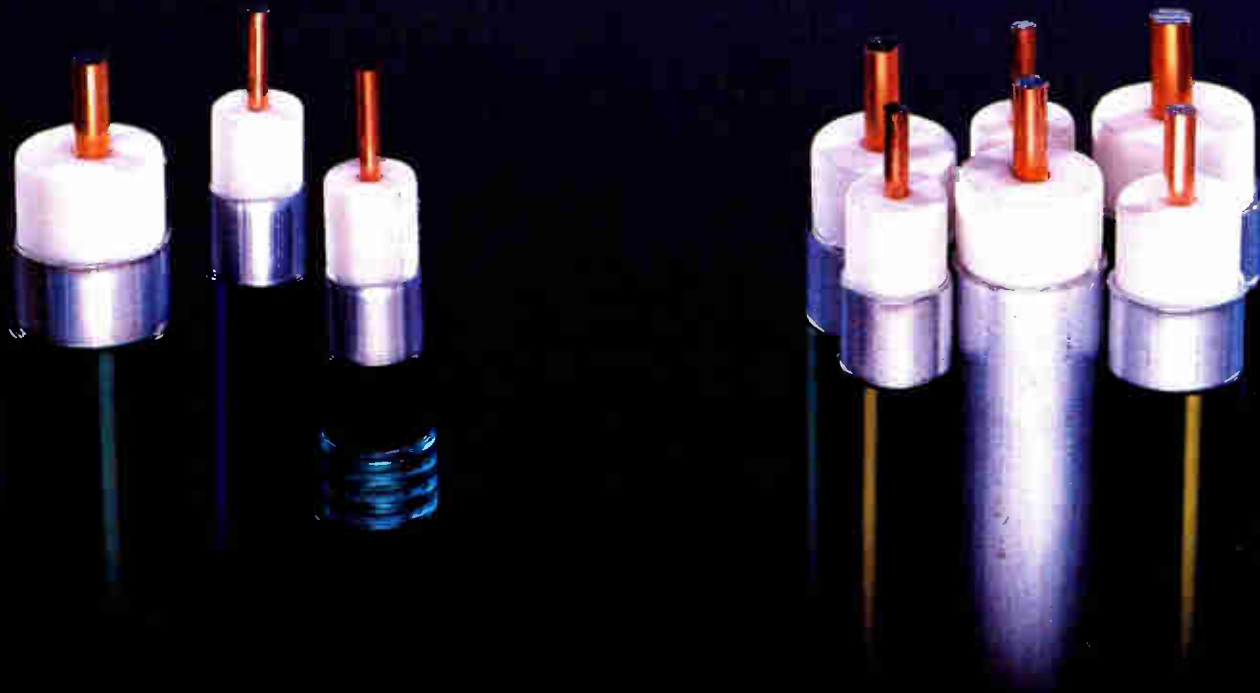
We salute Jim for his determination  
and dedication to  
the CATV industry.

**Texscan**  
COMMUNICATION  
PRODUCTS DIVISION  
El Paso, Texas

**Texscan**  
Indianapolis, Indiana

**MSI**  
Salt Lake City, Utah

# THE Cable



## **From The Company With A Vision For Cable.**


Over the 40-year history of the CATV industry, many technological changes have occurred. Comm/Scope has always stayed ahead of those changes with innovative new

# n Cable TV.



products. What was true in the past is still true today and our commitment to the industry means that it will still be true tomorrow. From drop cable to trunk and distribution cables. Even fiber optic cables. We've got it all. We are 'The CABLE in CABLE TV.'

For more information about PIII, QR, Cable Guard, Super Trunk, Drop Cable, Optical Reach or any of our great line of products, call us today 800/982-1708 (800/222-6808 in NC).

 **Comm/Scope Inc.**  
THE Cable in Cable TV.

PO Box 1729, Hickory, NC 28603 800 982-1708 (800/222-6808 in NC), Telex: 802-166

Reader Service Number 29

*Continued from page 44*

dB CTB, how good does the fiber have to be to achieve Super-VHS quality (47 dB C/N) or studio quality (51 dB C/N)? Fiber performance needed to be 48.6 dB and 62.3 dB to match Super-VHS levels. To match studio quality, fiber must perform at 54.6 dB and 69 dB.

Regarding bandwidth, Fellows looked at upgrades from 300 MHz to 450 MHz without changing trunk amplifiers or feeder locations. Looking at upgrades from 300 MHz to 550 MHz, Fellows says, you have to at least re-space feeder amplifiers.

Focusing on competition, Fellows urged that cable must compete with or co-exist with tape rentals, telcos and DBS. With tape rentals, the first issue is quality. The second is an IPPV video on demand service and the third is programming, and both relate to bandwidth and quality. With competition coming from the telcos, fiber for CATV is a factor in system architecture. With DBS competition, the barrier for entry is the cost of DBS infrastructure and the limited programming. But in all cases, Fellows advises, "Fiber is a tool but not a magic answer."

Can fiber increase operating effectiveness? Fellows answers in the affirmative. According to Fellows, fiber offers marketing flexibility, control of operating costs, and customer friendliness. Fellows recommends an evolutionary introduction of fiber. Coax will be complemented by fiber and not obsoleted, Fellows said.

### Doing business

In discussing the "Evolution of Fiber Optic Trunking Systems," John Holobinko, vice president for marketing and sales at American Lightwave Systems, stressed that different system architectures cannot be viewed as just different modes of delivery. They also effect reporting of system outages, levels of personnel sophistication, and subscriber interface equipment. Each architecture requires a different way of doing business.

The cost of signal gain is cheap in coax, but in fiber it's dear. The cost of bandwidth is low in coax and orders of magnitude in fiber. Splitting is easy in coax, costly in fiber.

For fiber to the home in a tree-and-branch architecture, bandwidth from headend to subscriber are equal, according to Holobinko. The cost of signal gain is higher the farther out in the system. The demand for linearity is on optical devices and more costly the

further out in system you go.

How practical is it to bring fiber to the home in a star-switched technology? Getting close to the subscriber, says Holobinko, the gain is low, bandwidth is low, linearity can be moderate, and costs of optical devices low. But Holobinko argues that these factors do not dictate the star-switched as the best approach. The radical change in business operations required with this architecture precludes its use in CATV.

He pointed out that subscriber interface equipment is a problem for changing architectures. Cable-compatible sets as currently configured will slow fiber's introduction as well as other architectures.

For the future, an evolutionary extension of fiber into tree-and-branch architecture CATV systems is the way Holobinko suggests. Alternate architectures will come only after improvements to the tree-and-branch are exhausted. But if CATV can get around the subscriber interface problems, cable operators can begin to explore alternate architectures that will ease the introduction of services such as HDTV, video jukebox and IPPV.

### Other architectures

David Large, director of video product planning at Raynet Corp., presented a paper entitled "Video Distribution Using Tapped Bus Architecture" (see page 64). Large discussed tree-and-branch and star-switched architectural comparisons, and introduced a new architecture that draws upon both.

Dave Robinson, director of fiber optic technology for the Jerrold Division of General Instrument, compared "Fiber Optic Architectures for Cable TV," on the basis of economic feasibility.

Robinson argued that none of the architectures being shown are economically justified in the next five years.

Robinson spelled out that the CATV system of the future must:

- deliver over 100 channels;
- have high performance with S/N at 52 dB;
- deliver HDTV and be two-way;
- offer multi-channel PPV;
- have real-time interactivity;
- transmit digital audio;
- have voice capability;
- be user friendly'
- be reliable, and;
- be low in cost (around \$1,000 per sub).

The current CATV system is much

maligned, says Robinson, and very underrated. The tree-and-branch system is user friendly and of low cost. At \$500 per sub for a full two-way system, offering multi-channel PPV, store and forward technology, with 80 channels, and digital audio, the system is not bad in Robinson's eyes. But it has limited voice capability and room for reliability improvement. Fiber optic trunking can improve picture quality and reliability somewhat, suggests Robinson.

Robinson then compared the double star-switched system (telco) with headend and hubs, fiber to the home, and a converter. The major drawback is the extremely high cost of \$15,000 per subscriber. In like volumes it could come down to \$3,000 per sub. The capacity is limited due to limits and costs of switched technology and the bandwidth hunger of digital modulation. But the bottom line is it's inefficient for broadband to the home.

### Some weighty problems

With the fiber bus system, Robinson feels that capacity improvements can be made using FM in this type system. The big problem is the distribution terminal. There are space and reliability problems in the terminal. They are large, complex and costly. But in like volumes, its costs would be around \$1,500 per sub. A U.K. fiber bus system Robinson referred to had low capacity, high loss in passive splits, and high real estate costs.

For a fiber tree-and-branch, with optical amplifiers, no cost estimate can be given because they don't exist yet.

In the Mini-hub concept, the star-switched hub serves 1,000 subs, employs coax from the headend to the hubs. According to Robinson, this system has limited reliability. Multimode fiber limits bandwidth distance, it's not user friendly, and costs are over \$1,000 per sub.

A cable TV star, fiber to tap system, would have capacity improvements with FM and wave-division multiplexing, and a cost less than \$1,000 per sub five years out, but it is not as efficient as a tree-and-branch system. Robinson concluded it is currently not viable for today's services.

'It's good science to look at fiber to the home, full fiber distribution systems,' said Robinson, "but really for our needs today, what's being shown on the trade show floor in fiber optic technology is what we need to concentrate on in the next five years.

—George Sell

# **ANIXTER CABLE TV**

**SALUTES**

## **JIM CHIDDIX CED'S MAN OF THE YEAR**



**“It’s people like ATC’s Jim Chiddix that make cable TV the exciting and technically advanced industry that it is. Jim’s contributions have helped give the cable TV industry a competitive edge. His pioneering use of fiber optics and other technologies has challenged us all to move forward in cooperative efforts to best serve the subscribers. In fact, Anixter’s new fiber optic AM Laser Link Cable TV System is in large part due to Jim’s visionary thinking of what can happen when great companies work together.”**

A handwritten signature in white ink on a blue background. The signature is cursive and appears to read 'John Egan'.

**John Egan  
President & CEO  
Anixter Cable TV**

*Continued from page 38*  
will be coming "soon." Five-fifty in the Pathmaker series consists of feedforward and power addition in the trunk amps and in power addition in the bridger. Taps and passives for 600 MHz were also shown.

**EZ Guide**

EZ Guide Inc. debuted a remote unit that combines a TV programming guide into a remote control. The remote will

allow the viewer to select a channel from the guide displayed on the TV and then automatically tunes the TV to the desired channel. The remote consists of a joystick and push buttons.

An integral part of the system is the EZ Guide interface box and connects between the cable feed and the TV set. This box is used for receiving, storing and displaying TV guide information. Using the joystick on the remote, the viewer selects from an on-screen dis-

play and the TV is then tuned to the proper channel.

Guide scheduling information is updated constantly by downloading info located on a cable FM subcarrier. The headend units needed for this will be provided by EZ Guide. The system can be used to suggest certain programming to the viewer, lock out channels from children and provide up to the minute news, sports and weather information.

**Zenith**

Although it won't do all of those



*Zenith's PCCII remote.*

functions, Zenith's newest generation multi-brand remote now operates 100 different devices (39 TV brands, 45 VCR brands and 16 cable converters). The Personal Control Center (PCC) II was demonstrated for the first time in Anaheim and orders for the unit are already above those received for the first PCC, according to Zenith executives.

The device doesn't "learn" all the different functions like most universal remotes do, the information is programmed at the factory. Viewers simply set a series of toggle switches for their brands of electronics and the remote takes over from there. Of course, the most functions are operable via Zenith brand electronics.

Also new from Zenith is an automatic A/B switch that allows pay-TV subscribers to use remote controllable features of their cable-compatible TVs without manually flipping an A/B switch.

—Roger Brown

# Congratulations

## Jim Chiddix

### Man of the Year

From

Your Friends

at

Home Box Office, Inc.



**CONGRATULATIONS**

**to a man whose ideas are**

**LIGHT YEARS AHEAD**

**JIM CHIDDIX**

**from your Friends and Admirers at**

**JERROLD**

. . . where innovation is a tradition

**MAN OF THE YEAR**



# Jim Chiddix: forging new CATV technologies

**A** year ago, many people in the CATV industry didn't give Jim Chiddix's fiber optic backbone concept any chance of coming to fruition in a CATV system anywhere. After all, the hardware for such a project was non-existent and there was some doubt if lasers could be found that were linear enough to deliver high-quality video signals long distances.

Now, however, it's apparent Chiddix, senior vice president of engineering and technology at American Television and Communications, and his staff of hard-working engineers has stood the industry on its head. Where two years ago there was one or two fiber optic vendors attending the Western Show, this year there were about a dozen in attendance.

## Opened new markets

By taking the seed of an idea and turning it into reality, an entire new market has been opened for manufacturers of optical hardware. For that, CED's distinguished panel of judges has named Chiddix the 1988 Man of the Year.

(The panel consisted of last year's winner, Wendell Bailey, vice president of science and technology at NCTA; Nick Worth, vice president of engineering at TeleCable; and Bob Luff, group vice president of engineering and technology for Jones Intercable.)

The chief criteria for the Man of the Year selection is impact upon the industry and/or system operations. When Nick Worth heard that, his mind was made up. "The word 'impact' immediately triggered Jim Chiddix's name for me primarily because he is pioneering a technology that may lead to a fundamental change in the way we deliver our programming to subscribers," says Worth.

Indeed it may. In essence, Chiddix has been advocating the use of fiber to shorten amplifier cascades in cable systems. By doing so, reliability is improved, picture quality takes a quantum leap and channel capacity is immediately increased. Labor savings are also realized because it's simple to sweep a short cascade and the fiber

itself is a passive medium that requires little or no maintenance.

## Called the 'backbone'

The approach has been termed the "backbone" method of signal delivery. It's an evolutionary technology, which makes it a favorite of financial people because the old coax plant doesn't have to be scrapped. System managers and technicians will like the idea because bandwidth can be increased two or three steps without respacing amplifiers already in place.

Chiddix and Dave Pangrac, director of engineering at ATC, originally began expressing their idea around the industry, mostly to rooms of skeptics. As manufacturers began making pro-

## A typical beginning

His career began inauspiciously enough. A trip to Hawaii while still a senior at Cornell resulted in his relocation to the islands, where he landed a job with Cablevision Inc. as a repairman of headend equipment and rental TVs. Chiddix thrived in the tiny lease-back system, which was owned by a local telco, and soon he was elevated to a management position after the FCC ordered the telcos to divest themselves. Eventually he became the system's general manager.

After rolling out pay-TV to the subscribers, Chiddix designed and built videotape equipment designed to automatically tape and play back satellite feeds. This was necessary because of

A trip to Hawaii while still a senior at Cornell resulted in his relocation to the islands, where he landed a job with Cablevision Inc.



gress in developing hardware that would work, however, Chiddix and Pangrac became popular figures on the lecture circuit, averaging at least one fiber presentation per week to almost anyone who would listen. Now, neither one of them can attend a trade show in peace.

Chiddix is perhaps the personification of a true cable-TV pioneer. During his long career, he's been involved with a significant number of "firsts," mostly during his tenure at Oceanic Cablevision in Honolulu.

Addressability, satellite signal delivery, stand-alone pay TV, pay-per-view, data transmission, videotape automation and commercial insertion were all technologies Chiddix was involved with early on.

the time difference between Hawaii and the mainland. The company he founded, CRC Electronics, later made commercial insertion equipment, too.

## Named vice president

In 1978, Jim became vice president of engineering at Oceanic Cablevision, a system with about 30,000 subscribers. While there, he oversaw the installation of the first earth station in the state of Hawaii, rolled out additional pay services and installed an Oak addressable system. The success of addressability led to an early experiment with pay-per-view that grew into a significant portion of the system's revenue stream.

"I always felt he was brilliant," says

## MAN OF THE YEAR

Don Carroll, president of Oceanic. "He struggled a bit at first, as anyone coming to a system this size would, but he became one of the best managers we've ever had at Oceanic." Carroll said Chiddix's calm demeanor allowed him to grasp complicated issues and make decisions without getting involved in emotions.

In 1981, the growing Oceanic system was acquired by ATC. Through acquisition and additional construction, the system has grown steadily. Today it is the country's eighth-largest system with nearly 200,000 subs.

### First fiber project

As part of the effort to keep up with the system's growth, Chiddix in 1984 supervised the installation of an FM supertrunk that tied two headends together.

The two facilities were separated by 14 miles of rugged, mountainous terrain. It was Chiddix's first effort with fiber and it would foreshadow his future success with the medium.

At about the same time, some four time zones to the east, Dave Pangrac and Don Gall were in ATC's Kansas City system determining how to make

the system's institutional network more efficient. The system already had a

Through the ATC corporate grapevine, Pangrac and Chiddix became aware of what the other was doing.

one-channel, multimode fiber optic link between City Hall and the system headend (the franchise required it), but what drove Pangrac to fiber was the cost of terminal equipment. At that time, it was actually cheaper to purchase fiber optic modems than RF modems.

Through the ATC corporate grapevine, Pangrac and Chiddix became aware of what the other was doing, recalls Pangrac. Both men actually went farther with their fiber projects

than they had approval to do, but obviously, everything worked out positively. "The thing that brought us together was that we walked the narrow edge of unemployment," jokes Pangrac.

### Infamous conversation

It was during a conversation between Pangrac and Gall in Kansas City that the backbone idea was first germinated. Those two were reminiscing about "the good old days" when cable systems had short cascades and delivered very good pictures. In contrast, the Kansas City system was long and had many amplifiers dedicated to the same trunk line, so reliability was always a question. Then they came upon the idea of breaking the system up into a series of nodes or cells and feeding each cell with fiber.

The process began when Don Gall saw an ad for Ortel Corp. in a technical trade journal and the initial dialogue started.

Somewhere in the middle of all that, Chiddix was hired by ATC's corporate headquarters in Denver as vice president of engineering, with responsibility for engineering and research and



*J. L. Speckman & Associates, Inc.*  
dba/SAI Engineering

Your total CATV Supplier

wishes to  
congratulate

**Jim  
Chiddix**

as

**Man of the Year!**



**Jim,**  
for your continuing  
tradition of excellence  
in the CATV Industry,  
the staff of CALAN  
would like to extend  
congratulations  
and say  
thank you.

The following companies would like to extend their  
congratulations to  
**JIM CHIDDIX**  
of ATC  
for his outstanding achievements. Thanks Jim.



WESTEC COMMUNICATIONS, INC.



## MAN OF THE YEAR

development. One of his first moves was to hire Pangrac as his director of engineering and charge him with investigating and spearheading the fiber backbone project.

### Rooms of skeptics

At first, gaining support for the project both from their colleagues at other MSOs and from equipment manufacturers was a long, uphill climb. Laser and receiver manufacturers were used to talking a different language—they had never heard of composite triple beat, composite second order and carrier-to-noise specifications. Fiber equipment manufacturers told ATC that AM would never work because the lasers were too noisy. And everyone else thought fiber was simply black magic.

It was clear early on that fiber-to-the-home didn't make sense economically, Chiddix says. In fact, coaxial cable drops, which account for roughly half of all the cable out there, were in fine shape and capable of delivering up to 1 GHz of bandwidth. No, the goal was to replace at least part of the trunking system.

### Favorable timing

When the conversations with Ortel and others began, timing was in ATC's favor. A new, more linear laser family was being developed for high-speed digital uses. And because laser manufacturers were hungry to identify new markets to replace the saturated digi-

dollars to meet our needs, and we, in turn, would buy their final product. And that's how it worked out," says the bearded 42-year-old Chiddix.

That, too, has turned out to be a key reason why Chiddix was chosen by the panel as Man of the Year. This relationship between MSO and vendor will become more important as the cable

'We felt if we showed the size of the market to existing optical component (makers), they would spend *their* R&D dollars to meet our needs.'



tal marketplace, "we had some hungry manufacturers looking for new applications for their products," Chiddix says.

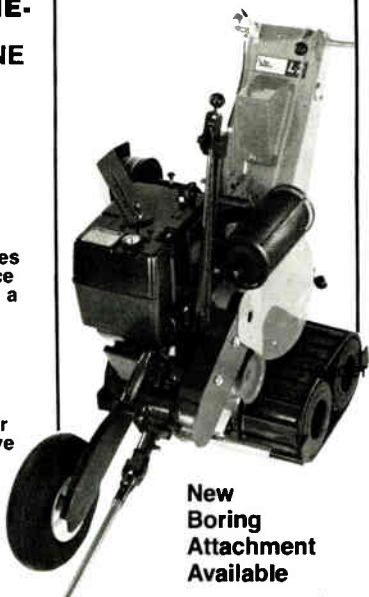
"We felt if we showed the size of the market to existing optical component (makers), they would spend *their* R&D

industry struggles to keep telcos, DBS, MMDS and other alternative entertainment delivery methods off its back. The entire process that has occurred over the past year should be viewed as a model for CATV when it comes to future equipment development.

# COST EFFECTIVE AND VERSATILE

**WITHOUT A LINE-WARD LINE LAYING MACHINE YOU COULD BE MISSING THE BEST BUY ON THE MARKET!**

- 800 lb. Of Efficient Strength At Your Fingertips
- Solid, Handcrafted Construction Assures Rugged Performance
- Continuing to make a record number of drops in-service for more than 16 years
- Not just low maintenance and downtime, but with proper care the gear case may never have to be opened for repairs.
- Moves On Tracks, Not Wheels, For Superior Traction
- No Restoration
- Up To 16" Depths



**New Boring Attachment Available**

**And, Our Machines Can Literally Turn On A Dime!**

The Unique, patented design of the L-2 positions the weight and the blade in the exact center of the machine.

**See For Yourself**

Call For A Free On-Site Demonstration Or, Write For Our Color Brochure

**Don't Settle For Less!**

Service Number 30



Line-Ward Corp.  
157 Seneca Creek Road  
Buffalo, New York 14224  
(716) 675-7373

### New relationships forged

"The one thing (this) has done that people have not noticed so much might be the most important thing in the end," agrees Wendell Bailey. "Vendors of equipment have opened their eyes to the possibility that cable is a business for them."

Bob Luff of Jones agrees. "Through Jim's leadership, the ATC engineering group has moved the industry significantly ahead in fiber technology." Luff credits Chiddix and crew for establishing the dialogue between CATV and optics vendors. Luff also recognizes Chiddix for being so open with the other MSOs. "Not only was I welcome, but so were our engineers in ATC's lab," he says.

That spirit of cooperation between customer and equipment vendor, where every effort is made to identify products and then build them, is what Chiddix hopes will be his lasting contribution. "It's the accomplishment I'm most proud of," he says.

"We didn't want to try to invent something," says Chiddix. "It wasn't appropriate or necessary" for ATC to develop those products, he says. After all, if it's a good idea and it works, the

## MAN OF THE YEAR

vendors will more than recoup their development expenditures through sales. "We have a lot of buying power as an industry—the thing we've got to focus on is defining our needs."

### Sparking a wild fire

Since then, the idea has caught on in an unprecedented way. Even industry veterans like Bailey cannot recall a time when so many vendors introduced products that use essentially the same technological approach. Even Chiddix himself is surprised at the furor he helped spark.

"I think initially we hoped to get one or two (manufacturers) interested," he says. "But we really have struck a nerve. But it was really a matter of timing. We've gotten enthusiastic response not only from traditional optics suppliers like AT&T, but also we sparked a lot of interest on the part of the traditional cable suppliers like Jerrold and Scientific-Atlanta.

"This represents a real opportunity for them—not only for fiber systems, but if we can upgrade our systems using fiber, there's an opportunity there for them to sell the industry upgrade electronics for the remaining coaxial parts of the system. Once you've got a fiber backbone, it isn't clear that 550 MHz is the highest frequency of interest. It may be 700 MHz or 800 MHz or a gigahertz," Chiddix says.

### Quiet, unassuming, but tough

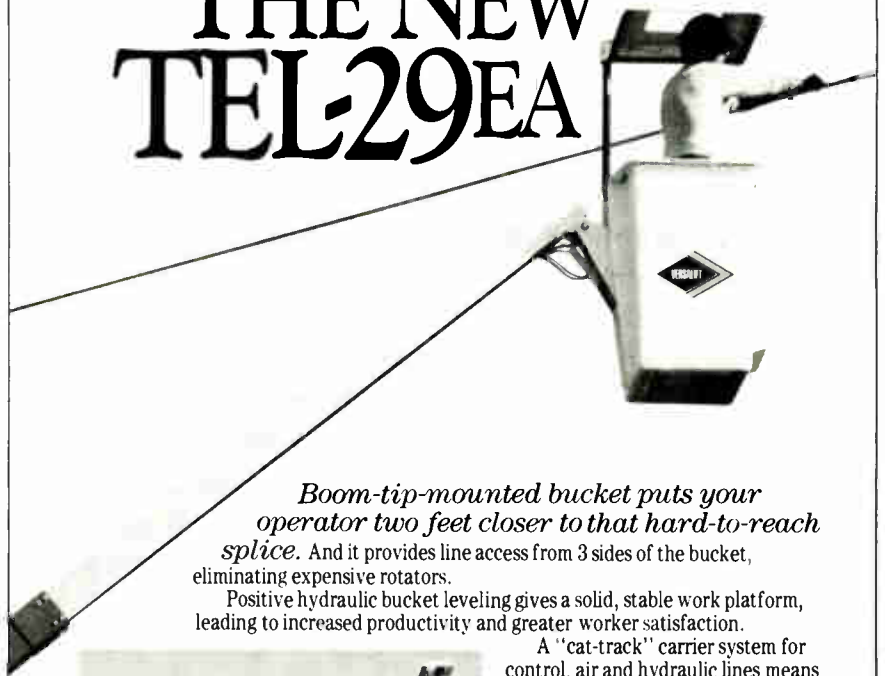
It's that type of thoughtful insight that has really gained the respect of other engineers. "Jim is one of the best engineers I know," says Bailey. "He has a nice, quiet management style, but when he talks, all the engineers listen because he's thoughtful and takes a thorough approach to the engineering issues."

That quiet, unassuming style of management is what makes him a pleasure to work for, says Pangrac. "It's certainly not like working for anybody, it's more like working with somebody," he says. "He's extremely demanding, but he believes that if you're on his staff, you're there because you have some ability." Pangrac says. Chiddix will reward the hard work by backing up his people in a pinch, too.

"You have a feeling he'd never actually get mad at you, but if he was disappointed in what you're doing, you would feel as if you'd been yelled at," says Bailey.

VERSALIFT

# GAIN MORE SIDE REACH AND BETTER LINE ACCESS WITH THE NEW TEL-29EA



*Boom-tip-mounted bucket puts your operator two feet closer to that hard-to-reach splice.* And it provides line access from 3 sides of the bucket, eliminating expensive rotators.

Positive hydraulic bucket leveling gives a solid, stable work platform, leading to increased productivity and greater worker satisfaction.

A "cat-track" carrier system for control, air and hydraulic lines means less maintenance, more "up-time."

The VERSALIFT TEL-29EA can be mounted on any 10,500 dual rear wheel chassis with 60" C.A. and can be tailored to meet any aerial work requirement.

See your VERSALIFT Distributor for complete specifications, pricing and a demonstration!

It's TIME to  
check out VERSALIFT!

  
**TIME**  
MANUFACTURING COMPANY

P.O. Box 20368 Waco, Texas 76702-0368  
(817) 776-0900 TELEX (910) 894-5218 FAX (817) 776-7531



T E L - 2 9 E A

Reader Service Number 31

# VERSALIFT

In this increasingly competitive industry,  
you must have the winning edge.

**Congratulations to  
Jim Chiddix  
of ATC  
the "Winner" of  
CED's Man of the Year.**

From all your friends at Scientific-Atlanta,  
thank you for your contributions to  
insuring the industry's continued success.

**Scientific  
Atlanta**

**Our customers are the winners.**



## MAN OF THE YEAR

But beyond all the nice talk, Chiddix, Pangrac and Gall have dreamed up an idea that got to the heart of the cable industry—delivering better pictures in a more reliable manner. Prior to this discussion, signal quality (or the lack of it) was an issue often talked about quietly, but not in open forums. Now that a solution is apparently at hand, the subject is talked about freely.

### A fundamental change

"What Jim is working on is as fundamental as the small aperture earth station, which I think revolutionized cable by opening the floodgates to creative programmers," says Nick Worth. This work "may (allow CATV to) make a smooth transition...to technology that will keep us in the driver's seat (in terms of) having the most efficient distribution technology—and Jim was the one who unlocked the gate."

Both Worth and Bailey agree that the full impact of the technology won't be felt or understood for years to come. But both agree that these kinds of ideas and developments don't come along often.

For example, Worth previously

viewed fiber as a point-to-point delivery method and thought "it would be years before we could adopt it advantageously." Where he used to associate fiber-to-the-home with telcos, "maybe we'll be the first one there," says Worth now.

officer of Catel Telecommunications. "His work on AM has been fundamental to bringing that technology to where it is today.

"I think 1989 is going to be the year for fiber and he's certainly been the absolute prime mover from the the

'There's been a lot of careless talk about head-to-head competition and about the race to the home.'



### The AM champion

Of course, the fiber equipment manufacturers owe a lot of Chiddix and his staff. "In my mind, Jim's done more for bringing fiber into CATV than any other person I can think of," says Jim Hood, president and chief operating

cable TV industry to make it happen. He's been demanding, yet supportive of our work."

Bailey believes Chiddix has that relationship with all the vendors ATC does business with. "You talk to any vendor and they'll tell you they love and hate going to Chiddix" for product

All of us at  
**Cable Exchange**  
 wish to extend our  
 congratulations  
 to  
**Jim Chiddix**  
 CED's Man of the Year!



CONGRATULATIONS

to

**JIM  
 CHIDDIX**



P.O. Box 5630  
 Terminal Annex  
 Denver, Colorado 80217



625 East Taylor Ave.  
 Sunnyvale, CA 94086

**We at RMT wish  
 to extend our  
 CONGRATULATIONS  
 to  
 JIM CHIDDIX,  
 CED's 1988  
 MAN OF THE  
 YEAR.**

Sales                      Repairs  
 Manufacturing        Brokerage

**(408)733-4830**

or

**(800)228-0633**

evaluations, he says. "They hate it because he's a tough critic, but they love it because they know if they pay attention they can improve what they're trying to do."

Despite all the attention ATC has received, the second-largest MSO isn't leading the pack when it comes to implementation. Others, like Jones and TCI, have announced commitments to installing systems in 1989 and Catel's Jim Hood knows of several other planned projects. But that doesn't worry Chiddix; his fight was to get the industry to embrace the technology and to get vendors to build products for everyone to use. That way, the subscriber becomes the ultimate beneficiary.

**Plans for 1989**

ATC will install a "fair number" of FM supertrunks and a few AM systems for AML replacement or backup. From there, installation of the backbone will follow and will "substantially accelerate" in the coming years as ATC performs upgrades on a number of properties, Chiddix says.

What's next? Better hardware, for one thing. Chiddix says substantial technological breakthroughs are still

to be expected. "There are systems in production now that are usable sys-

**'If you're going to get into a competitive business, you don't want to be the high-priced provider.'**

tems, but we fully expect them to get better," he says. "There's no law of physics, there's nothing inherent in the quantum mechanics of lasers that tells us we're anywhere close to the maximum performance we can expect from an AM broadband fiber link" and competition is driving that research to very high levels.

**The telco issue**

The ever-pragmatic Chiddix also has

a uniquely calm approach to the telcos and the fiber-to-the-home scenario. He believes the glass medium will eventually make its way to the home, but not until it's affordable, which translates to five or 10 years from now.

"There's been a lot of careless talk about head-to-head competition and about the race to the home," he says. "The talk usually ignores the fundamental technological challenges of fiber delivery of video to the home and the economic hurdles to be crossed." It's highly unlikely that telcos will rewire existing facilities to deliver video in a competitive environment, he believes.

"If you're going to get into a competitive business, you don't want to be the high-priced provider," he adds. "We're not talking about a rate-base regulated business here, we're talking about business with a firmly entrenched incumbent, namely us. I have trouble picturing telcos doing what is basically an overbuild with fiber in the reasonably near future."

In addition, the tree-and-branch network architecture employed by CATV is simpler and ultimately less expensive to place. As long as cable can offer a fiber system that is compatible with the electronics in the house (AM), the

**A Well Deserved  
Congratulations to**

**Jim  
Chiddix**

**CED Man Of The Year**

**From All Of Us At  
Sencore Electronics  
"Innovatively Designed With  
Your Time In Mind ..."**

**SENCORE**

**3200 Sencore Drive  
Sioux Falls, SD 57107  
1-800-843-3338**

**CONGRATULATIONS**

**to  
JIM  
CHIDDIX**

**CED Man of the Year**



**Rogers  
Cablesystems Inc.**

**Suite 2600, Commercial Union Tower  
P.O. Box 249  
Toronto Dominion Centre  
Toronto, Ontario M5K 1J5  
416-864-2373**

**Congratulations**

**JIM CHIDDIX**

**from**

**all of us here**

**at**



**COMSONICS<sup>®</sup> INC.**  
AN EMPLOYEE OWNED CORPORATION



### Tap Into Optimal Performance With Jerrold's New Line Of Brass Port Taps

**F**or almost 15 years, Jerrold's FFT line of taps has been the standard by which all other taps are measured. With the introduction of the new "J" series of taps with brass ports, the standards just got tougher.

Following the tradition of superior performance that is synonymous with Jerrold, the "J" series was introduced only after it survived rigorous laboratory and field tests. Taps must perform consistently in hostile environments that prove disastrous to lesser products. That's why Jerrold selects from only the finest and most durable materials, then relentlessly tests and retests until positive that our taps can withstand the punishment received in the field.

The new "J" series of FFT taps contain all of the familiar qualities of the "H" series with the addition of brass ports so that they will provide maximum protection in hostile corrosion environments. These ports have been lengthened from  $\frac{1}{4}$ " to  $\frac{1}{2}$ " to accommodate locking terminators, security shields, or weather boots. "J" series taps are available in 2, 4, and 8 port configuration and are priced the same as competitive brass port taps.

So why settle for less? For more information on Jerrold's new line of brass port taps, get in touch with your Jerrold Account Representative or contact Jerrold Division, General Instrument Corporation, 2200 Byberry Road, Hatboro, PA 19040, (215) 674-4800.

# GET DOWN TO BRASS TAPS



**JERROLD**  
... where innovation is a tradition

**GENERAL  
INSTRUMENT**

## MAN OF THE YEAR

problems and cost associated with modulation conversions are completely avoided. Digital means of delivery is promising, but it necessitates the installation of a conversion box (commonly referred to as an interface unit) somewhere in the home. Chiddix be-

lieves that approach is counterproductive—the effort should be made in removing hardware from the home. Elliot, believes the off-premise approach to broadband delivery is a key element in cable's future. But unlike Elliot, Chiddix thinks it ought to be done at the pole. The approach gives operators four immediate benefits: labor cost savings through fewer truck

the competition," Chiddix says. "I personally believe the value goes beyond that."

It's obvious Chiddix has given plenty of thought to the ramifications of what he's advocating. For his efforts, ATC made him a senior vice president in December 1987 and he was asked to join the senior management group when it moved from Denver to Stamford, Conn. last summer. Even though the past two years have seen him move about one-third the way around the globe, Chiddix says he plans to stay involved in the industry to which he has devoted his working life. "It's a field that gets more exciting every year," he says.

As optimistic as Chiddix is, he's quick to warn against complacency. "We need to get used to the idea we're living in a world of competition," he says. "We must use technology along with good business practices to ensure our future. The defense against competition is not in seeing the enemy coming, it's in having your own house in order."

If you think that's a crazy idea, remember what Jim was saying a year ago. Are you listening?

—Roger Brown

**'The defense against competition is not in seeing the enemy coming, it's in having your own house in order.'**



lieves that approach is counterproductive—the effort should be made in removing hardware from the home.

### The off-premise system

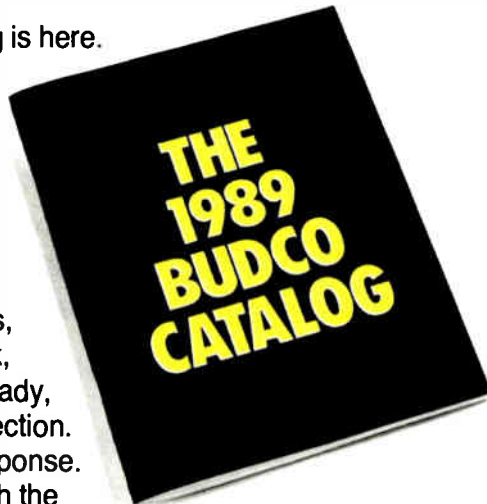
Which is why he, like TCI's Tom

rolls; service call reduction because drops could be made more rugged; all homes would be available for PPV; and customers would be made happy again. "I don't know what that's worth in dollars...but there is some value even if it only better positions CATV versus

# FREE CATALOG!

The 1989 BUDCO catalog is here. Call us for your free copy. You'll find an expanded selection of identification, installation, and security products; and much more.

BUDCO is a stocking distributor for: Lemco Tools, Aervoe-Pacific, Masterlock, MultiLink, Gilbert, W. H. Brady, and Tyton Corp. Great selection. Superior quality. Quick response. Fair prices. It all comes with the 1989 BUDCO catalog.



# 1-800-331-2246\*

\*IN OKLAHOMA, CALL COLLECT (918) 252-3420 / FAX: (918) 252-1997

**Budco** P.O. Box 3065, Tulsa, OK 74101

We are proud to join in congratulating

**JIM CHIDDIX**  
of ATC

as the  
**Overwhelming Choice**  
for CED Magazine's

**MAN OF THE YEAR!!!**

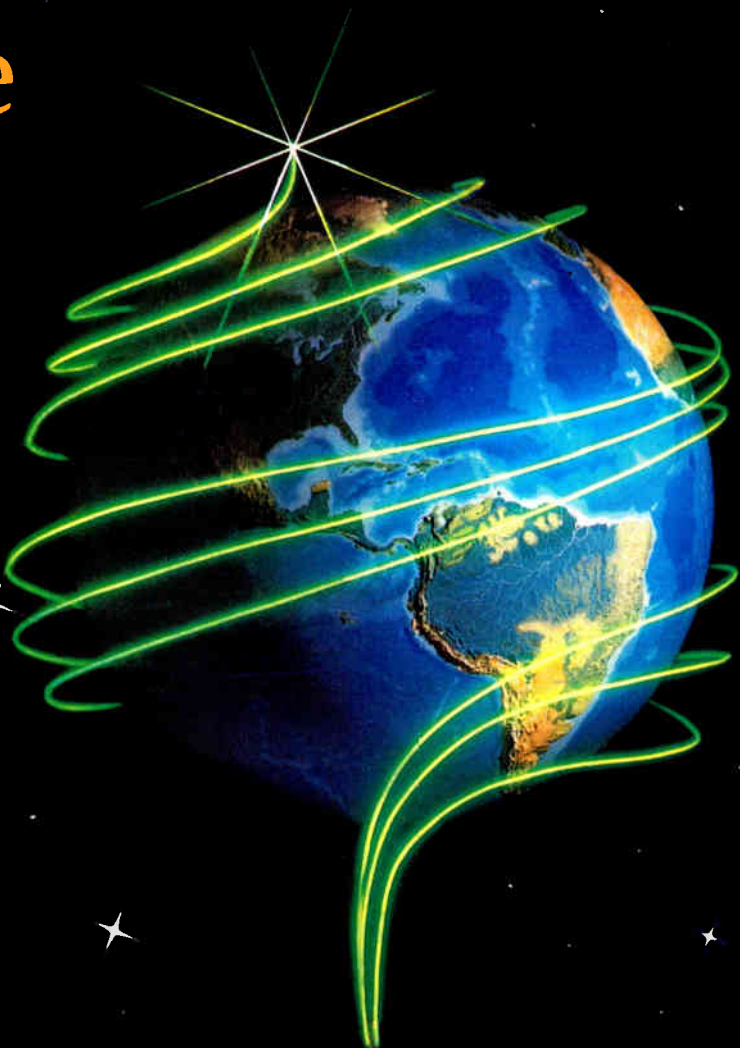


(STANDARD TELEPHONES AND CABLES)

(formerly trading as  
Stantel and Manufacturer of  
Optical Video Transmission Systems  
for the CATV Industry)

# Connecting Advanced Technology To One Of The World's Fastest Growing Industries.

From Fiber Optics to Addressable  
Systems, Cable Services brings  
state-of-the-art technology to you.



Cable Services Company/Inc.



## FIBER TO THE HOME

same channels are present in all parts of the network simultaneously. Thus, the total number of available services is equal to the instantaneous channel capacity of the system. While that capacity has grown to the point that new construction typically supports 80 channels, fewer than 8 percent of cable systems are estimated to have a channel capacity in excess of 54 channels.<sup>5</sup> A continuing proliferation of programming services, new market opportunities and political demands makes desirable every wider program selection capability.

### Evolution of this network using fiber

**Properties.** Fiber is a very different transmission medium than coaxial cable. In order to best utilize this new tool, it is important to understand its characteristics.

The loss of single-mode fiber cable is dramatically less than coax—around 0.01 dB/100 ft. This means that rather than having to place trunk amplifiers every 2,000 feet or so, it is possible to construct non-amplified spans of 20 miles or more.

Similarly, the bandwidth of the fiber itself is very high, extending to many

gigahertz, so that the transmission medium itself will never be a factor in future bandwidth expansions.

The fiber does have one property that constrains ultimate capacity: it is limited in its ability to handle large amounts of light. Various effects limit the maximum transmitted power to between +10 dBm and +20 dBm, depending on distance.<sup>6,7</sup> This, combined with practically achievable laser and receiver noise levels, limits the theoretical maximum optical loss in any link.

The cost of fiber cable is currently about 1.5 times that of coax, depending of the cable structure and number of fibers used. That cost, however, is dominated by the cable sheath, with individual fibers costing only 5 cents to 10 cents per foot in large quantity.

The use of fiber, however, requires devices to convert electrical signals to optical signals and back again. It is the cost and capabilities of these devices that is pacing the deployment of fiber in cable television systems. Only recently, for instance, have sufficient linearity and noise levels been attained to permit the transmission of relatively large number of AM-VSB channels. It is now predicted that it will be practical

to carry 80 channels of AM video through an optical loss of nearly 20 dB and still achieve a C/N ratio that meets NCTA recommended standards of 43 dB.<sup>8</sup>

### Currently proposed uses of fiber

The first use of fiber has been for interconnection of hubs, headends, and earth stations. In general, fiber is now price-competitive with equivalent microwave technologies, both AM and FM, and superior to supertrunks. Furthermore, it offers improved reliability and significant opportunities for bandwidth expansion.

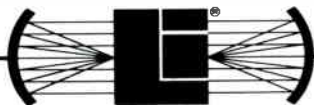
Under the leadership of American Television and Communications, fiber is now moving deeper into the network. Using a technique they have called the "fiber backbone," the long trunk lines are broken into segments of six to eight amplifiers. The center of each segment is fed with an independent fiber cable to create short trunk lines of only a few amplifiers (see Figure 2).<sup>9</sup> By shortening the cascade lengths, dramatic improvements are gained in both network reliability and C/N performance.

An inevitable trade-off that must be made in this approach. If the cascades

## CONGRATULATIONS **JIM CHIDDIX** MAN OF THE YEAR

Thanks, Jim, for helping  
make the CATV Industry's  
future a SOUND one.

From your friends at  
Leaming Industries.



**LEAMING INDUSTRIES**

Now at our new address:

15539 Barranca Parkway  
Irvine, CA 92718  
(714) 727-4144

Congratulations  
to

**Jim Chiddix**  
a smart choice  
for CED's  
Man of the Year

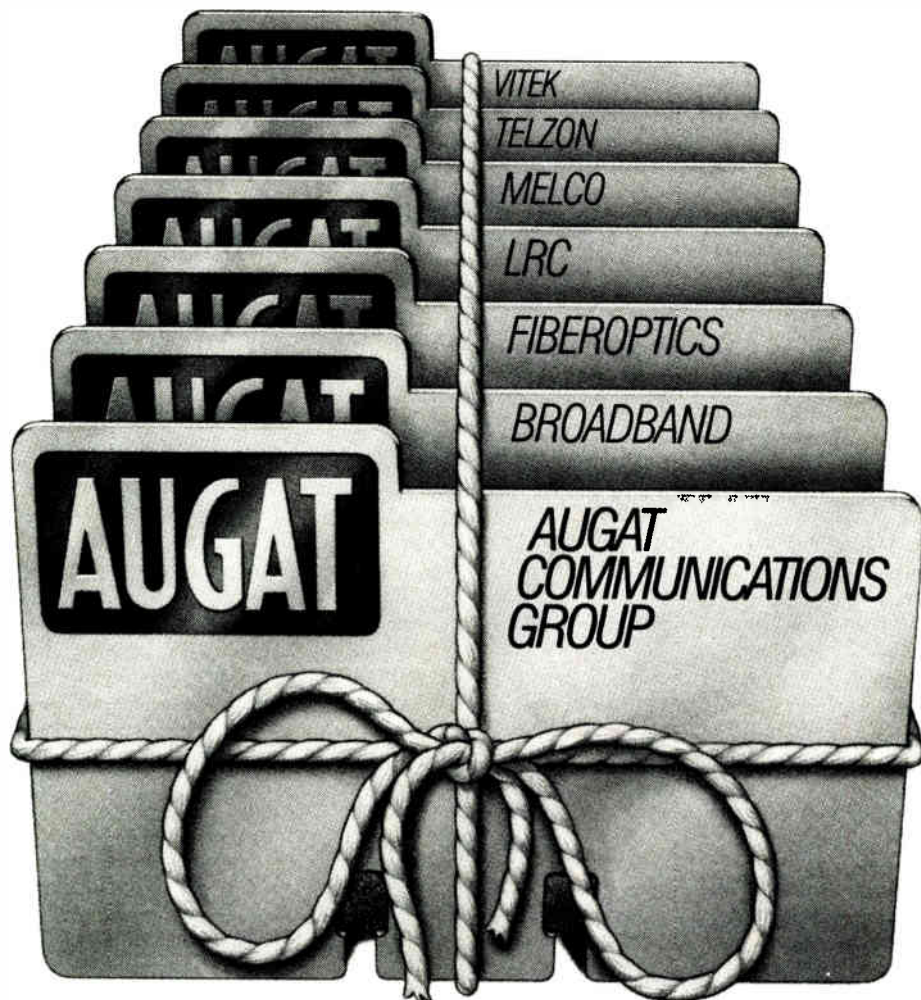
From all of us at

**MAGNAVOX**  
CATV SYSTEMS CO.

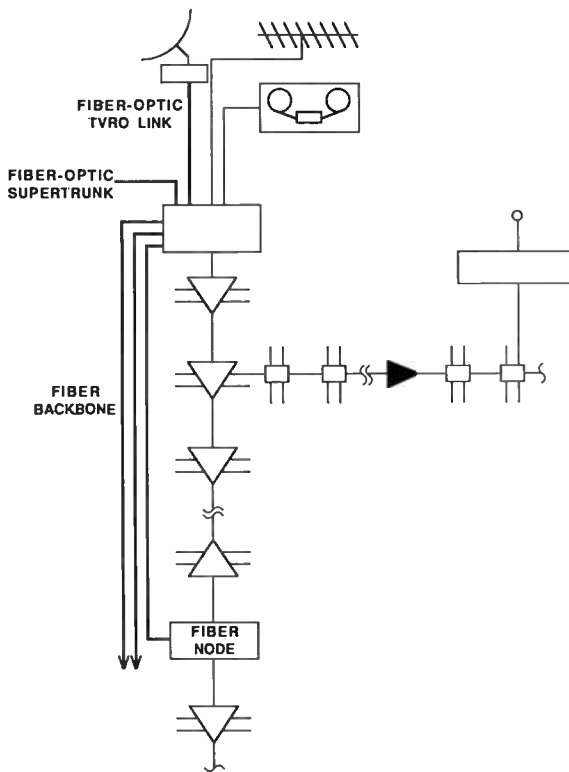
A DIVISION OF NORTH AMERICAN PHILIPS CORPORATION  
100 FAIRGROUNDS DR., MANLIUS, NY 13104  
(315) 682-9105 1-800-448-5171 NYS 1-800-522-7464  
FACSIMILE (315) 682-9006  
TELEX 937-329 MAG CATV MNLS

The smart choice for broadband distribution equipment.

CONGRATULATIONS  
**JIM CHIDDIX**  
CED'S MAN OF THE YEAR



**Figure 2. Current fiber optic applications in CATV**



are made very short, maximum improvement is achieved in performance, but the cost of optical transmitters, receivers and fiber gets to be shared among fewer customers. Longer cascades are less expensive, but achieve less benefit. It appears that "fiber nodes" serving about 500 customers may be optimal, but this places severe restraints on the allowable cost of the optical components and on any signal processing at the optical hubs.

Other limitations to the fiber backbone approach are related to the remaining coaxial portion of the network. Although some trade-offs can be made among them, the problems are:

- The bandwidth is still limited by the remaining amplifiers.
- The highest distortion portion of the network is unchanged.
- The microreflections caused by the in-line tapped distribution are still present.

### Fiber star digital network approach

**Description.** Not being constrained by an existing video distribution system, some people within the telephone industry have proposed a dramatically different kind of approach (see Figure

to a receiver at each dwelling. There the 600 MB/s digital signal is broken down into the individual signals and routed to separate set-top units that re-create the original analog video signals.

Since all program selection is done at the headend, the channel selector in the set-top unit merely transmits requests back to the headend where they are used to program the switch.

**Characteristics.** By moving all service level control (switching) to a central location and using dedicated transmission lines for each subscriber, the star net-

work achieves theoretically infinite program selection without having to simultaneously transmit large number of channels on each fiber. Thus any and all program suppliers can gain access to the network. This simultaneously avoids arguments sometimes raised about cable operators acting as a "gateway" to limit program choices and opens up new market opportunities for limited-appeal services that are not justifiable on common-bandwidth systems.

A second advantage of the network is high theoretical signal quality. Point-to-point transmission of digitized video can easily achieve very high quality, practically limited only by the encoding algorithms used.

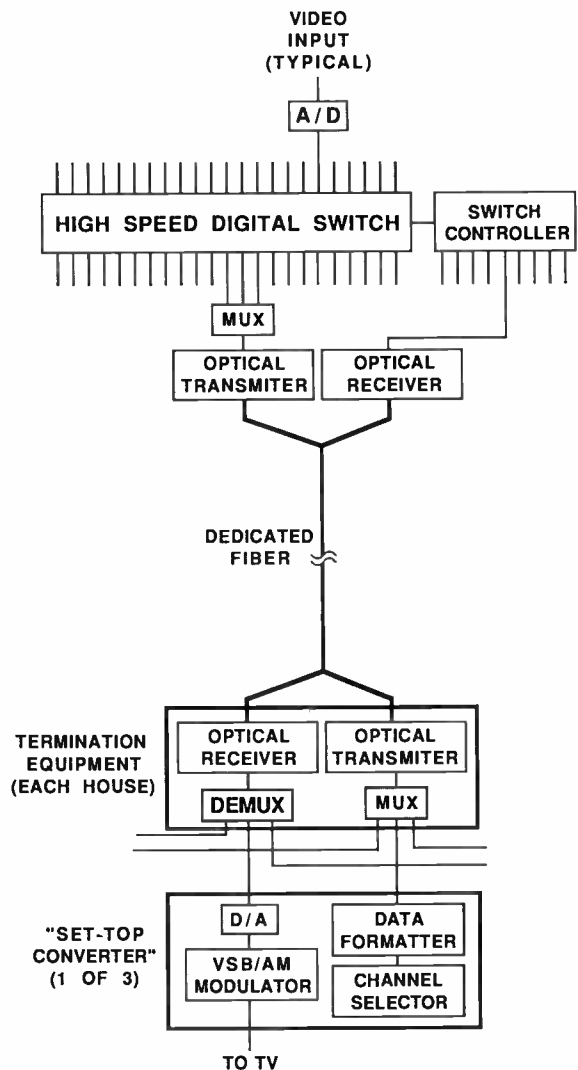
Finally, digital transmission, even at the high speeds required for digitized video, are well within the current

work achieves theoretically infinite program selection without having to simultaneously transmit large number of channels on each fiber. Thus any and all program suppliers can gain access to the network. This simultaneously avoids arguments sometimes raised about cable operators acting as a "gateway" to limit program choices and opens up new market opportunities for limited-appeal services that are not justifiable on common-bandwidth systems.

A second advantage of the network is high theoretical signal quality. Point-to-point transmission of digitized video can easily achieve very high quality, practically limited only by the encoding algorithms used.

Finally, digital transmission, even at the high speeds required for digitized video, are well within the current

**Figure 3. Digital star video network**





New!  
Snap-N-Seal

# Positive seal. And zero leakage.\*

Having trouble finding the dependability you need in an "F" connector? LRC has the answer.

Our new Snap-N-Seal™ "F" Connector is triple sealed for maximum environmental protection. This means a significant reduction in maintenance and increased life of subscriber drops.

There's no crimping—Snap-N-Seal just snaps on. A 360-degree compression on the cable jacket ensures a complete radial seal, eliminating the moisture migration experienced on traditional "F" connectors -- RF leakage is virtually eliminated.

We've taken care of another of your headaches, too. The front seal on our Snap-N-Seal eliminates the problems that rubber boots can cause because of inconsistency of port lengths on mating equipment.

Installation is a snap. A convenient tool is required for cable preparation and connector installation.

For detailed information on how you can reduce maintenance and increase subscriber drop life, call or write LRC Electronics.

*Snap-N-Seal is a trademark of AUGAT/LRC Electronics.*

*\*Send for performance data.*

For more information call or write: LRC Electronics, Inc., 901 South Avenue, P.O. Box 111, Horseheads, NY 14845. Phone 607/739-3844.



WE'RE AUGAT COMMUNICATIONS GROUP. WE TIE IT ALL TOGETHER...WITH EASE.

## FIBER TO THE HOME

state of the art while analog transmission, particularly AM, is still in a development phase.

Unfortunately, the Broadband Integrated Services Digital Network (BISDN) is very expensive, even when costs are shared between telephone and video applications. Average telephone loop lengths are around 4,000 feet, for instance, whereas shared coaxial cable footage in a coaxial network is around 50 to 70 feet. Not only that, but each customer has to bear the full cost of two optical transmitters and receivers, high speed digital multiplexers and demultiplexers and a set-top unit for each piece of video equipment.

Aside from that, the network is format-specific. It does not provide for FM radio transmission, for instance. HDTV transmission would presumably require a changeout of equipment at both the headend (to encode the signal) and in the home (to re-create the analog signal). Provision of BTSC stereo audio would apparently require a BTSC encoder in each home.

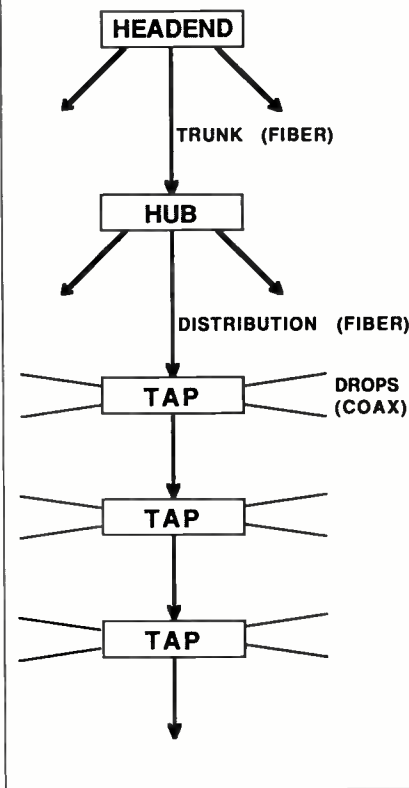
In addition to the hardware cost to support individual subscribers, there are severe potential operational problems. At every half-hour interval, a significant number of subscribers will typically change channels at least once and perhaps several times. Creating a communications and computer network capable of processing several hundred thousand requests within a space of a minute and responding to each within a second or so is not a minor task!

Finally, this system is "consumer surly" in the extreme. In a cable television system using addressable converters, it is still generally possible to bypass the converter for basic services and to eliminate it altogether for non-premium subscribers or non-premium second-set hookups, FM hookups, etc. With the digital tree network, the set-top unit is required for *each termination in the home*. This means that such niceties as hooking up a VCR and TV for independent channel viewing and recording, timed-multi-channel recordings, use of remote controls and picture-in-picture capabilities will be virtually impossible.

### The star-bus topology

**Description of basic network.** Figure 4 shows a diagram of a network approach that brings fiber to the front of each home in a much more efficient way. In this topology, a headend connects to multiple hubs in a manner very similar to today's cable networks.

Figure 4. Star-bus architecture



From the hub, however, emanate many passively tapped distribution lines. Based on the loss of single-mode fiber and predicted optical budgets for AM systems, it should be possible to serve eight to 15 taps on each such line and to construct lines up to three miles long. Taps could be placed in accordance with current coaxial practices serving two to eight customers each. Finally, use of coaxial drop cable is compatible with all existing in-home equipment.

This topology preserves the full optical bandwidth of the system, limited only by the electro-optical devices used. The "cascade length" of the system is *two* and is uniform throughout the network. Further, it allows several customers to share the cost of optical receivers at each tap and many to share the cost of each distribution optical transmitter. Because the individual distribution lines follow roughly the same routes as would coaxial distribution, the cable use per passing should be similar.

If lines of the lengths suggested can be built, then each hub can easily serve 4,000 to 10,000 passings, which is sufficient to support a higher cost for the headend-to-hub link and hub signal processing than the fiber backbone

approach.

**Characteristics.** This star-bus network achieves a degree of compatibility with existing coax networks sufficient that fiber hubs could be added to existing systems. As a simple linear network it is compatible with in-place service control methods and, like them, can evolve to addressable interdiction.

It is obviously much less expensive than the BISDN star approach. It achieves nearly the same degree of cost-sharing as a traditional coaxial network. The same consumer-friendly coaxial drop systems are used.

What the this basic system achieves are the significant advantages of fiber, including:

- Complete lack of ingress and egress except at the drop level.
- Virtually complete elimination of micro-reflection problems (since optical devices are typically much more precisely matched than equivalent coaxial taps).
- Very high reliability by the elimination of cascaded amplifiers.
- Future upgrades requiring only replacement of active devices.

### Network enhancements

This network, however, also allows an important feature of the star network that is not practical in a tree-and-branch network—the provision of switched services. In the star network very wide program selection is practical because different services can be carried on each of the dedicated transmission lines (space division multiplexing) The proposed network also makes possible a high degree of such multiplexing without the extreme measure of individual lines by taking advantage of two factors:

- Each hub is fed by a separate line from the headend and each set of taps by a separate line from the hub.
- Despite a requirement for wide viewing choice, most television viewing is limited to a few channels most of the time.

Any study of viewing habits will show that, even in high channel-count systems, the vast majority of television viewing is concentrated among relatively few channels. If a portion of the total instantaneous bandwidth of the system is devoted to provision of the most popular services, then the remainder could be programmed on a demand basis by customers with each distribution line capable of carrying different switched services.

This is illustrated in Figure 5, which

# Strongest link.

Your satellite receiver is the first link in the transmission chain. And one thing you can always count on—the head-end signal never gets better than it is at the receiver.

Which is a very good reason to specify Standard's Agile 40 C/K Satellite Receiver—but it's not the only reason.

The Agile 40 C/K was designed from the ground up solely for commercial applications. So it has all the features

cable operators need most: rock-solid 100 kHz PLL tuning and total flexibility for the most accurate C/Ku-band operation; 70 MHz IF with a front-panel test point to minimize terrestrial interference; and a power supply built for the demands of 24-hour-a-day operation.

The Agile 40 C/K is also the receiver to have when you're expanding your headend. Because our internal 950-1450 MHz active loop-thru design eliminates signal splitters, so you can add up to 16 additional receivers on the same polarity—with no signal loss.

And because it draws only 32 watts maximum, the 40 C/K runs cooler, lasts longer, and saves money year after year. So you'll probably never need our five-year replacement/warranty program.

To get the best signal, start with the peace of mind that only quality equipment can give you. Link up with an Agile 40 C/K.

For pricing and specifications, contact the SATCOM Division for the Standard representative nearest you.

 **Standard**  
Communications  
SATCOM Division

P.O. Box 92151  
Los Angeles, CA 90009-2151  
Telephone: (800) 243-1357  
In California (800) 824-7766  
Reader Service Number 36



shows switching distributed among the headend, the hub and the individual drop addressable control scheme (shown here as interdiction). Compared with the star network, only occasional-access channels are

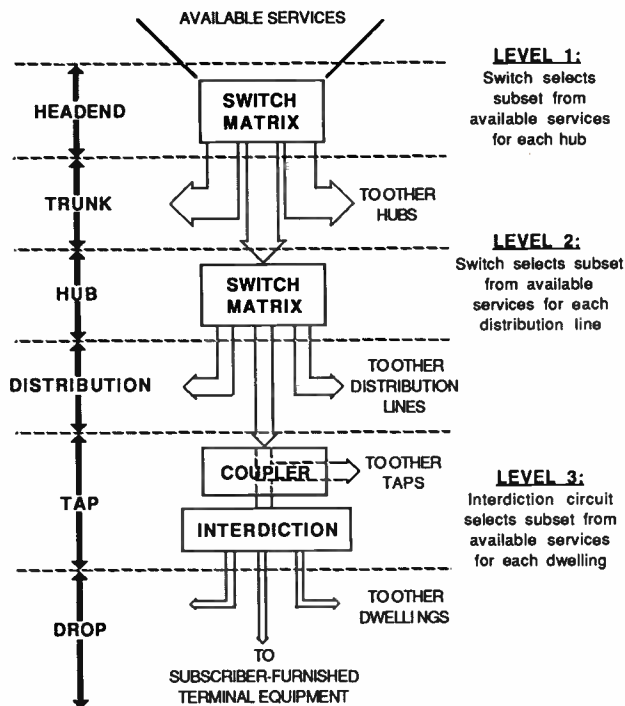
placed in the switched network, so that the peak transaction rate is far lower.

The headend switch can be made arbitrarily large to accommodate all desired services. In response to subscriber requests, a subset of those services is transmitted to each hub, and at the hub a subset is added to the common channels provided

to each distribution line. Finally, if relevant, the normal addressable control system can block access to all but the requesting subscriber.

Although this illustration shows switching at both headend and hub, in fact it could be implemented with a single level of control. If, for instance, the number of switched services were not

Figure 5. Switched service provision over star-bus network



great, it might be less expensive to deliver the full set of possible services to each hub, thereby eliminating the headend switch. Alternatively, if the system were constructed with more hubs serving fewer customers each, then switching might be employed only at the headend, and a common set of switched services transmitted on all of the distribution lines fed from each hub.

**New market opportunities**

The ability to transcend the instantaneous channel capacity of the network and offer a large selection of video channels opens the door to several new or expanded markets, including:

• **Classified advertising.**

Although still-frame classified advertising is used in the cable industry, it is sharply limited because of its inefficiencies: viewers are forced to wait for a specific time slot to view products. The avail-

  
*J. L. Speckman & Associates, Inc.*  
*"We Meet Your Specifications"*

Here's the specs.

Call Speckman!



ONE CALL DOES IT ALL!

- Cable
- Distribution
- Headend
- Drop Materials

- Safety Equipment
- Strand and Hardware
- Hand Tools

Reader Service Number 37

**1-800-826-4710 Toll Free**  
**419-394-7890 Corp.**  
**419-394-5308 FAX**

**Emergency Services**  
**800-826-4710**


*J. L. Speckman & Associates, Inc.*  
dba SAI Engineering

# The Word is Leaking Out.


In case you haven't heard, the word in CLI testing is CLI-MATE™ a mobile signal leakage audit service conducted exclusively by Cablelogic.

- **CLI-MATE™** can pinpoint your individual leak locations with over 90% accuracy.
- **CLI-MATE™** conforms to FCC regulations for CLI reporting. And...
- **CLI-MATE™** will furnish you with a comprehensive data analysis of your plant. All for about half of what you would pay for an inhouse program.

If you need help locating leaks, the word is...



Call today for more details and a cost analysis for testing your cable plant.  
**303/730-8885**



P.O. BOX 2617 LITTLETON, CO 80181

Reader Service Number 38

## FIBER TO THE HOME

ability of many channels would allow very specific product categories and could allow cable to become a major competitor to newspapers in this category.

• **Pay-per-view.** One of the major impediments to faster growth of the PPV industry is the inconvenience to the subscriber of infrequent start times for any given movie. With sufficient channel capacity, sufficient start times could be made available to take away this current advantage of the video rental business.

• **Education.** "Educational access channels" have been typically underutilized for a number of reasons, including their scarcity and their universal accessibility. On the other hand, the ability to deliver for-credit classes to select audiences through the network should be attractive to many schools, particularly at the college and vocational level.

### Conclusions

As opposed to merely replacing portions of the current coaxial network, the proposed approach provides the advantages of fiber all the way to the front of the home, leaving in place the

cost-effective coaxial drop technology.

The Network Comparison Chart, Figure 6, illustrates the characteristics of the three networks analyzed here. It can be seen that the proposed star-bus topology retains the cost benefits of current tree structures (which result from a high degree of sharing of

Figure 6

### NETWORK COMPARISON

CHARACTERISTIC	COAXIAL TREE-AND-BRANCH	B-ISDN SWITCHED STAR	STAR/BUS
INSTANTANEOUS CHANNEL DELIVERY	30-80	3	80
CHANNEL SELECTION CAPACITY	30-80	HIGH	HIGH
BANDWIDTH ALLOCATION	COMMON	DEDICATED	HYBRID
SWITCHING	AT DROP	CENTRALIZED	DISTRIBUTED
CABLE USAGE PER PASSING	70 FEET	4000 FEET	70 FEET
CPE FOR VIDEO RECEPTION	OPTIONAL	REQUIRED	OPTIONAL

resources among customers) while taking advantage of network segmentation to allow provision of switched services. ■

*For a complete list of references, contact the CED editorial department, 600 S. Cherry St., Denver, CO 80222.*

## HEADEND EQUIPMENT REPAIRS!

- Receivers
- Processors
- Strip Amps
- Field Meters
- FCC Offset Modification
- LNC

All makes and models repaired.  
10-15 working day turn around  
complete repair reports  
90 day warranty

**800-346-3083**

Call for quotes on distribution and S.A. addressable converter repairs.



**Midwest  
CATV Engineering**

1818 N. Went Street, Mishawaka, IN 46545

Reader Service Number 39

# TOWER CABLE CLIPS

**for proven quality and economy.**

**Tower—the world's largest supplier.  
22 different sized cable clips.**

- Pre-assembled with plated, hardened, *masonry nails* for hardwood, masonry and cement block.
- Fits most cables from .10" to .63". Available in black, white and grey. For indoor and outdoor use.
- Sure-fit for quick simple installation.
- Tower cable clips distinctive design avoids damage to cable jacket.
- Stocked by leading distributors such as Anixter, Midwest, Graybar, Merit, Resco, The Drop Shop, Cable TV Supply, Signal Vision, TVC Supply, etc.

- Tower, Made in England — Major suppliers to the US CATV industry and the British Telephone Co. for many years.

Write today for free samples and literature.

**WELDONE TRADING CO. INC.**  
1401 Legendre Street W., Suite 106  
Montreal, Quebec H4N 2S2  
(514) 381-8861, 387-2503

EXCLUSIVE UNITED STATES IMPORTER

Reader Service Number 40

## FiberLAN gets the nod to build fiber optic project in Houston

FiberLAN Inc. of Triangle Park, N.C. recently announced that it has been awarded a contract to construct Phase I of a high-speed telecommunications network in the city of Houston for Network Communications Inc. The construction is scheduled to begin immediately and completion of this initial phase is expected within six months. Connections to the network are anticipated to be offered in early 1989.

The franchise to construct and operate a fiber optic based communications system serving the greater Houston metro area was granted by the City of Houston to Network Communications in 1987. The first phase of the project will serve more than 30 buildings in the central business district and surrounding area, including the city's principal corporate and interexchange carrier offices. Future plans include high-quality video and LAN (Ethernet and Token Ring) interconnection.

When completed, the backbone cable system will incorporate more than 21,000 meters (roughly 13 miles) of high-fiber count cable and incorporate almost 2.6 million meters of single mode optical fiber and more than 1,200 optical terminations. Reliability and security will be maximized through use of diverse circuit routing and existing power company underground conduit. For more information call (919) 549-4500.

### New MAP/TOP standards available

The North American Manufacturing Automation Protocol (MAP) and Technical and Office Protocol (TOP) users group recently announced the availability of version 3.0 MAP/TOP standards.

MAP specifications detail requirements for local area networks within manufacturing environments. TOP specs outline requirements for networking in business and technical offices. The MAP/TOP specs are being sold only as a set for \$300. A discount price, \$200, is offered to individual members and corporate affiliate members. For more information call (313) 271-1500, Ext. 547.

Cactus Computer Inc. of Carrollton, Texas recently announced "Logical Zone Software" for Macintosh II com-

puters. The package allows up to 65,025 directly connected Mac IIs or gateway nodes to communicate over Ethernet or Broadband cabling. This exceeds the existing boundary of 255 for directly connected Macintoshes via the AppleTalk protocols.

The Logical Zone Software, including selector software, lists for \$95 per Mac II and operates with Apple Computer's EtherTalk Board, or Cactus' BroadTalk Adaptor Board. The Logical Zone Gateway that connects LocalTalk cabling to Ethernet lists for \$2,805. For more information call (214) 416-0525.

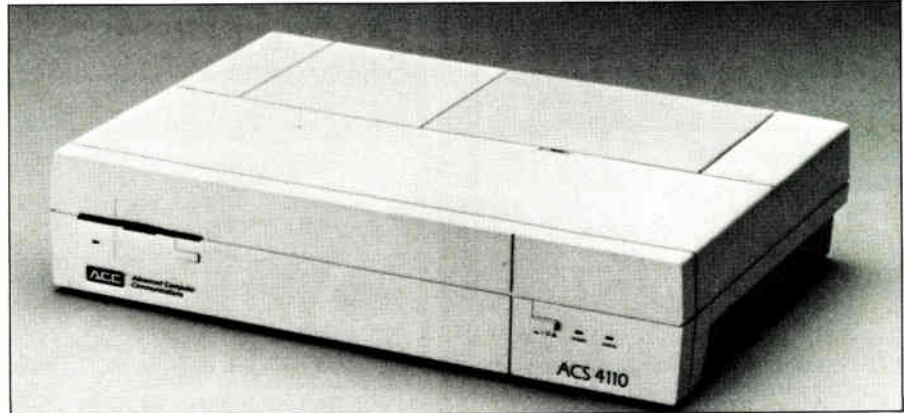
Advanced Computer Communications of Santa Barbara introduced a new high performance remote Ethernet bridge. The product features spanning tree protocol (IEEE 802.1), T-1 data transmission and full-scale network

works using multiple protocols simultaneously. The base configuration supports 32 devices attached through telco-standard connectors, and is capable of connecting up to 96 ports by inserting eight-port add-in cards into the chassis.

The 6130 Broadband Network Adapter Card can connect up to 3,000 IBM PC/XT, AT, PS/2 (models 25 and 30) and compatibles to a multichannel broadband network using the IEEE 802.3 standard 192.25 MHz frequency offset.

LocalNet TCP/IP v2.02 is a "terminate and stay resident" software program providing PC connectivity to TCP/IP hosts over a LocalNet multi-protocol network.

The Netware v2.11 enhancement release of Novell's operating system provides high performance file and resource sharing with extended security features and network management accounting. It also supports LocalNet 4140, 6120 and 6130 adapter cards in a multiple protocol environment via Sytek's Multi-Protocol Driver. For de-



ACC's ACS 4111 bridge

management. The unit connects to either standard or thinwire Ethernets and supports one or two synchronous serial communications lines with a variety of interface types.

For details, call (805) 963-9431.

### Sytek intros new products

Sytek of Mountain View, Calif. introduced four new products: the 4296 Modular Ethernet Terminal Server; the 6130 Broadband Network Adapter Card; the v2.02 upgrade to LocalNet TCP/IP and the v2.11 upgrade to Novell's NetWare operating system.

The 4296 offers full-function connectivity with extensive security and management functions for networking ascii RE-232 devices over Ethernet net-

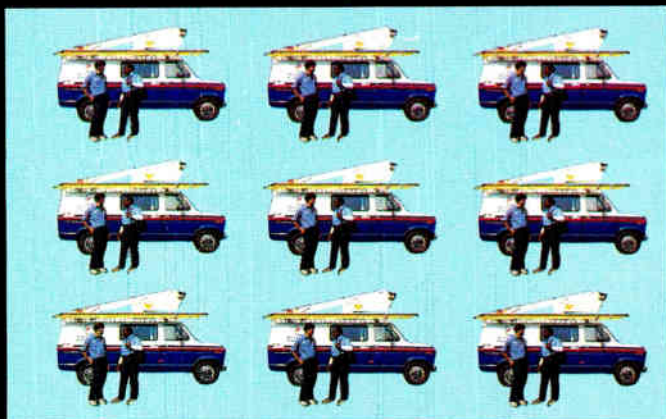
tails, call Sytek, (415) 966-7400.

### Token ring consortium formed

3Com Communications of Santa Clara, Calif. and Madge Networks Ltd. of London recently announced the organization of Open Token Foundation (OTF), a consortium of manufacturers and users of token ring computer network products concerned with ensuring the interoperability of their products.

In addition to 3Com and Madge, others planning to participate include: Texas Instruments; NCR Corp.; Memorex Telex Corp.; Sytek; National Semiconductor Corp. and Western Digital Corp. For more information call (408) 970-1102.

# NOW THERE ARE TWO WAYS TO COLLECT SYSTEM-WIDE SPECTRAL DATA.



## SEND THE WHOLE FLEET.

When you put Magnavox Line Monitors (MLM) to work it's like placing a spectrum analyzer at every critical point in your broadband system. MLM can monitor your entire system from any remote location and warn you when it strays from set parameters.

Unlike other status monitoring systems that typically measure just one or two signals, MLM monitors and measures all the signals in your CATV and LAN system. So you can quickly and automatically localize frequency-related faults and even identify other types of system performance degradation. With MLM your technicians spend their time fixing a problem, not tracking it down.

MLM has some features you'd find in more expensive digital spectrum analyzers. Like colorful and informative graphics that tell you at a glance how your system is performing. And storage and retrieval that gives you a complete record of system performance. MLM gives you all these features in an attractively-priced package, so you can install as many line monitors as you need to cover your whole system.

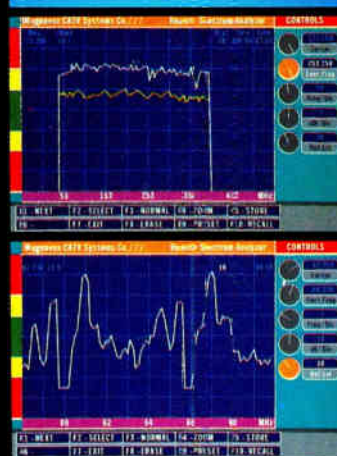
MLM is from Magnavox, a company you've come to know for quality, reliability and service. For application information and an MLM demonstration, call your Magnavox representative.



## GIVE ONE COMMAND WITH THE MAGNAVOX LINE MONITOR.



Compact MLM module is enclosed in a rugged housing that withstands the extreme environments of a cable system.



MLM display showing sweep response. White is actual response; yellow is stored response.

MLM display showing the video, color and sound carriers of Channel 3 with upper adjacent channel picture carrier and lower adjacent sound and color carrier also shown.

# MAGNAVOX

## CATV SYSTEMS CO.

A DIVISION OF CONSOLIDATED ELECTRONICS INDUSTRIES CORP.  
 100 Fairgrounds Drive, Manlius, NY 13104  
 (315) 682-9105 Fax: (315) 682-9006  
 Call 1-800-448-5171 (In New York 1-800-522-7464)

Reader Service Number 41

# Curing terrestrial interference

**T**VRO systems may guarantee more viewing channels, but there is no guarantee they will be interference free. A variety of interference problems occur in TVRO systems that range from light sparklies to total picture wipeout. Accounting for approximately 90 percent of the problem is the telephone company through its microwave towers in the land relay network. Both telephone and TVRO transmissions share the frequency band of 3.7 GHz to 4.3 GHz.

Too often terrestrial interference (TI) is a turn-on surprise. If so, its cure will be much more expensive than if it is anticipated.

Since statistics show that TI is an ever-present problem, it should be given the importance of all other project contingencies and applicable suppression techniques integrated into system installation skills.

## Transmit scheme and symptoms

Figure 1 shows that there are 25 4 GHz TI frequencies allocated in the TVRO band, nationwide. However, a given microwave relay antenna is allowed to transmit only up to six of these. These must be spaced 80 MHz apart and each of these "lands" midway between two TVRO transponders (see Figure 2). The interfering frequency will cause the most trouble on the co-polarized, adjacent channel with some degradation on the other adjacent channel. Therefore, the usual "signature" of 4 GHz TI is pairs of degraded channels alternating with pairs of good (or better) channels.

**Sources of TI information.** Professional frequency coordinators (see list) maintain computer bases of all approved transmit towers and their parameters. Using this base, they can provide specific TI information for any area.

**TI frequency listings.** Frequency coordinators sometimes call these "computer culls." These are site maps in tabular form. These list the location of towers, their transmit frequencies, the expected level of TI at your site for each frequency and the TVRO channels affected.

By Glyn Bostick, Microwave Filter Company Inc.

Using this information, you can tell whether or not the channels you intend to use will be affected and to what degree. This allows you to plan screens to block specific towers or to order appropriate filters.

## Site maps.

These are maps of restricted areas, centered on your TVRO site. These show only the TI transmissions expected to reach your site, their levels and direction of arrival. This is perhaps the most useful document available for considering the defense of a particular site. They allow quantitative planning and budgeting into the overall project cost. Since the direction and strength of each TI frequency is known, the size and location of screens can be planned and specific filters can be priced.

## Filtering

With the growth in popularity of block receivers, a notch filter in the block downconverter line before the receiver is the most effective means of filtering. Unfortunately, conventional L/C filters for the final IF are not always convenient or applicable to many

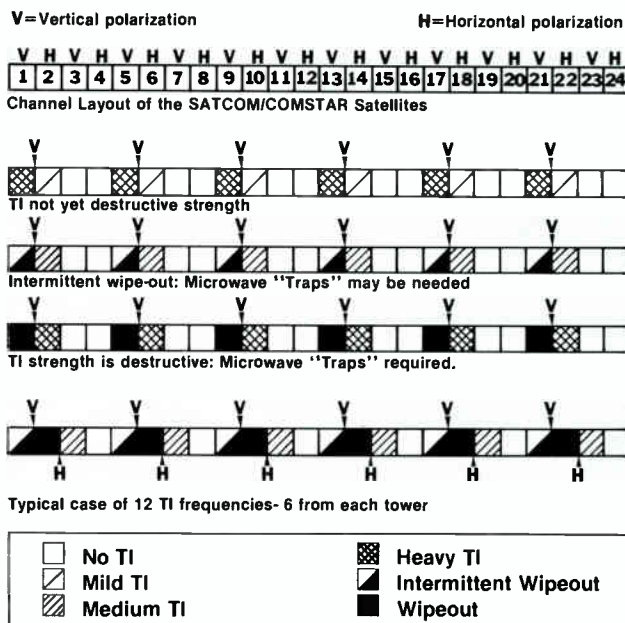
Figure 1

LOCATION OF POTENTIAL 4 GHz INTERFERING CARRIERS

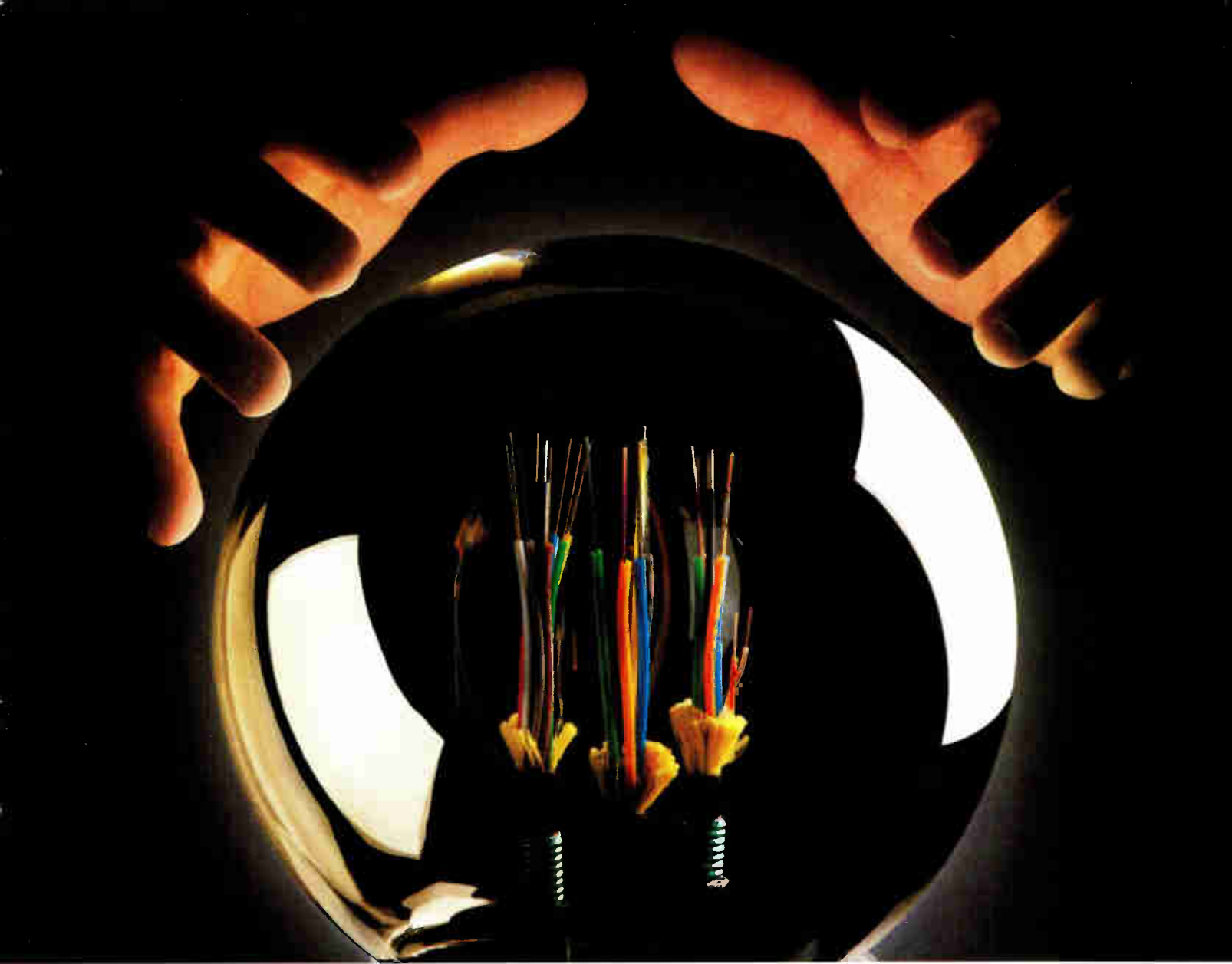
SATELLITE* TRANSPONDER	POSSIBLE INTERFERING CARRIER
1-(3720) MHz	3710, 3730 MHz
2-(3740)	3730, 3750
3-(3760)	3750, 3770
4-(3780)	3770, 3790
5-(3800)	3790, 3810
6-(3820)	3810, 3830
7-(3840)	3830, 3850
8-(3860)	3850, 3870
9-(3880)	3870, 3890
10-(3900)	3890, 3910
11-(3920)	3910, 3930
12-(3940)	3930, 3950
13-(3960)	3950, 3970
14-(3980)	3970, 3990
15-(4000)	3990, 4010
16-(4020)	4010, 4030
17-(4040)	4030, 4050
18-(4060)	4050, 4070
19-(4080)	4070, 4090
20-(4100)	4090, 4110
21-(4120)	4110, 4130
22-(4140)	4130, 4150
23-(4160)	4150, 4170
24-(4180)	4170, 4190

\*Satcom/Comstar  
24 transponder satellite

Figure 2







# CableVision.

No one's been more farsighted in designing fiber optic cable than Siecor. As a result, our cable design is virtually the same today as it was nearly ten years ago. In the same time span, many of our competitors have redesigned their cables two and three times or more. And guess what? Their cables now look amazingly like ours.

One reason our design hasn't changed—and the reason it's so widely imitated—is simple. We anticipated the craftsman's most important needs.

In doing so, we introduced stranded loose tube design which groups fibers in tubes. This way, it provides the best protection during stripping and splicing. And makes fibers easy to identify and manage.

Furthermore, we designed a cable that's friendly to fiber—protecting it from environmental stress. And finally, we allowed for changing fiber optic technology. Our cable carries multimode or single mode signals at any transmission rate. It transmits at all wavelengths. And it accommodates the use of evolving splicing techniques.

The fact is, no better cable has come along in the last ten years. And no cable can prepare your system better for the future.

So talk to the company with the vision to see what's ahead in fiber optics. Call 704/327-5998. Or write Siecor Corporation, Literature Department (CO) TV-1, 489 Siecor Park, Hickory, NC 28603-0489.

**SIECOR**



Clear picture (No TI)

of the block receivers on the market. This is because many block receivers do not have a final IF loop-out and the IF, when accessible, is likely to be in the UHF range (300 MHz to 700 MHz) where filters and traps are not readily available or expensive. Final IF filters fail on AFC receivers when the TI becomes stronger than the satellite signal: the receiver automatically tunes to the stronger signal, and detunes the channel.

Block filtering has recently made its

this is due to AFC detuning or saturation of the second converter inside the receiver. Because the interference is prevented from "beating" through the second converter, video quality is usually better than that obtained with

appearance and offers superior operating results. Notching the interference in the block, before the receiver, prevents the AFC detuning action and will even cure channel wipeouts where

final IF filtering.

Filters for serving a single receiver consists of a notch tunable over the entire block band—to suppress the carrier degrading the viewed channel. Single receiver filtering becomes very expensive where many receivers operate off the TVRO system, and it becomes more economical to notch before the power divider with a multiple notch filter. ■



Medium TI (Picture intact, lots of interference.)

Dear Jim:

Best Wishes

From All the Guys  
in the Trenches at:

**RTK**  
CORPORATION

From your friends in the west  
to one of the very best.

CONGRATULATIONS

JIM CHIDDIX

*CED Man of the Year*

from the Board of Directors  
and Members  
of the

California Cable Television Association

**Partial list of frequency coordinators:**

**American Trans Communications**  
80 Field Point Road  
Greenwich, Conn. 06830  
(203) 661-7390

(415) 848-4331

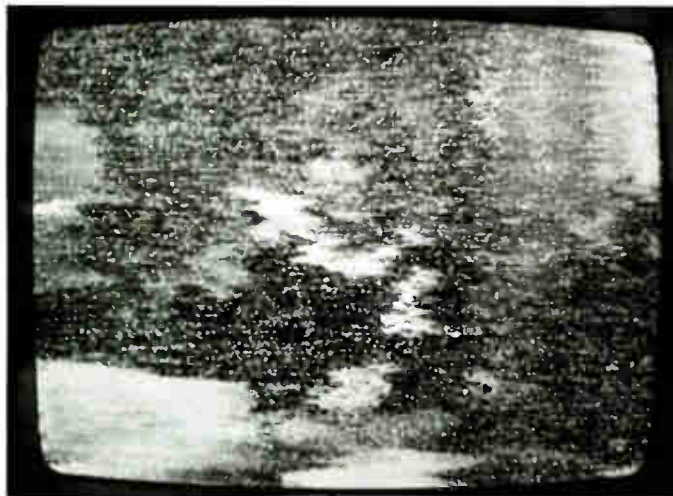
**Spectrum Planning Inc.**  
251 West Renner Road  
Richardson, Texas 75080  
(214) 680-1000

11720 Sunrise Valley Drive  
Reston, Va. 22091  
(703) 620-6300

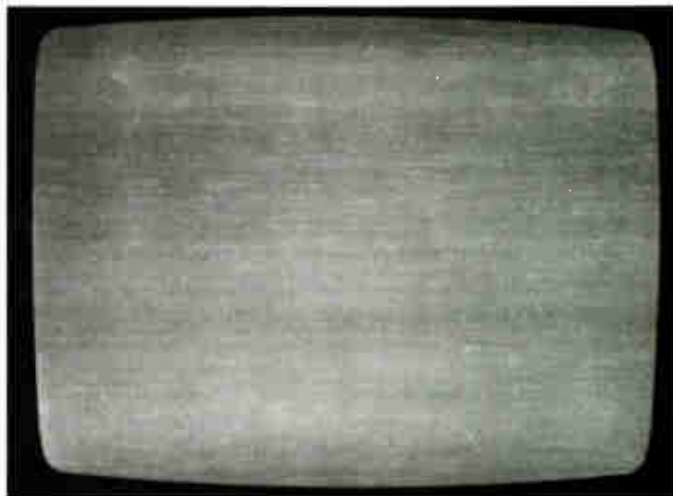
**Commercial Satellite Systems**  
2955 Russell St.  
Berkeley, Calif. 84705

**Comsearch Inc.**

**CS Communications Inc.**  
2929 Eskridge Road #P1  
Fairfax, Va. 22031  
(703) 560-0080



*Heavy TI (Picture breaking up.)*



*Steady wipe-out (No picture.)*

A "HIGH FIVE" TO

🍏

JIM CHIDDIX OF ATC

🍏

FROM ALL YOUR FRIENDS AT

MTV NETWORKS  
**SHOWTIME NETWORKS INC.**

## WHAT'S AHEAD

# SCTE

**January 10 Cascade Range Chapter** will meet. Call Norrie Bush, (206) 254-3228, for information on time, subject matter and location of the meeting.

**January 10 Central Illinois Chapter** will host a technical seminar. Call Tony Lasher, (217) 784-5518, for info.

**January 17 Florida Chapter, Central Florida Group**, will gather for a technical seminar. Call Keith Kreager, (407) 844-7227, for details.

**January 18 Florida Chapter, Gulf Coast Group**, will meet for a technical seminar. Call Dick Kirn, (813) 924-8541, for details.

**January 18 Mt. Rainier Meeting Group** will host a technical seminar on microwave transmission at the Oyster Bay Inn in Bremer-

ton, Wash. Contact Sally Kinsman, (206) 867-1433, for more information.

**January 18 North Central Texas Chapter** will host a technical seminar. Call Vern Kahler, (817) 265-7766, for info.

**January 18 Ohio Valley Chapter** will meet to discuss video and audio signals and systems. Paul Beeman of Viacom Networks will be the guest speaker. The meeting will be held at the Ramada Inn East. Call Robert Heim, (419) 627-0800, for more info.

**January 18 Razorback Chapter** will meet at the Days Inn in Little Rock. Call Jim Dickerson, (501) 777-4684, for details about the meeting.

**January 25 North Country Chapter** will host a

seminar emphasizing a review of the BCT/E category III (transportation systems) material (the chapter will administer the test on Wednesday, Feb. 22). The seminar will be held at the Sheraton Midway Hotel located at I-94 and Hamline Drive in St. Paul, Minn. Speakers will be announced later.

**January 31 SCTE National Headquarters** will present a satellite tele-seminar program that is a review of BCT/E Category V (data networking and architecture) exam. The seminar will feature Al Koulas of American Cablesystems, who was taped at the Cable-Tec Expo '88 in San Francisco. The program will air from noon to 1 p.m. Eastern time on Transponder 7 of Satcom F3R.



C-COR Electronics' "state of the art" seminars are three-day events designed to instruct relatively new technicians in basic theory, installation and maintenance of cable TV systems. Attendance is limited to a maximum of three persons from one system. The fee is \$150.

**January 24-26 C-COR**

*Electronics Technical Seminar* will be held in Los Angeles. Call Shelley Parker, (800) 233-2267 Ext. 326, to register or to get more info.

**February 21-23 C-COR Electronics Technical Seminar** will be held in Charlottesville, Va. Call Shelley Parker, (800) 233-2267 Ext. 326, to register or for more information.



**Illinois Bell**  
AN AMERITECH COMPANY

**January 10-12 Illinois Bell** will host a seminar in Phoenix, Ariz. on fiber optic communications systems for the local loop. The course costs \$775, including lunches, refreshments and all course materials. Call (312) 655-3096 for registration information.

**January 24-26 Illinois Bell** will offer the fiber course for the final time in Westmont, Illinois. Call (312) 655-3096 to register.

**January 24-25 Illinois Bell** will provide a seminar consisting of a light technical overview of Integrated Services Digital Network (ISDN) in San Antonio, Texas. The course costs \$795 and includes lunches, refreshments and course materials. Call (312) 655-3093 for additional details. The course will be repeated Feb. 14-15 in Chicago, Feb. 27-March 3 on a Bahamas Cruise and March 28-29 in Hilton Head, S.C.



The NCTA is sponsoring a series of free regional seminars focusing on signal leakage and cable system compliance with the FCC's CLI requirements. The seminars will focus on successful programs and techniques and vendors will have a forum to present their products and services. Remember, cable systems only have until July 1, 1990 to show the FCC they are in compli-

ance with those rules.

**January 7-8 NCTA CLI seminar** will be held at the Airport Hilton in Albuquerque. Call (202) 775-3637 to pre-register.

**February 14-15 the NCTA CLI seminar** will be held at the Airport Hilton in Atlanta. Call (202) 775-3637 to pre-register.

Also, the seminar will be held in Philadelphia in late February.



Please send your schedule of events to:  
CED, Event, 600, S.

Cherry Street, Suite 400,  
Denver, CO 80222, (303)  
393-7449.

**CATEL**  
THE CLEAR CHOICE IN FIBER

**CATEL**

**CONGRATULATES**

**JIM CHIDDIX**

**MAN OF THE YEAR**

*4050 Technology Place . Fremont,. California 94537 . 415/659-8988*

# CLASSIFIEDS

## HELP WANTED

### ATTENTION TECHNICIANS AND INSTALLERS

C4 Media Cable will pay top salaries to technicians and installers for positions in systems in our southeast region (VA, NC, SC, GA, TN).

Prior cable TV experience a must, excellent opportunities for advancement. Benefit package includes vehicle, health, life, dental, vision.

Please forward resume or call:

**Scott Madison**  
Director of Engineering  
C4 Media Cable  
450 Maple Avenue, East  
Suite 301  
Vienna, Virginia 22180  
(703) 281-7120

**Leader in the placement of Cable Television Professionals**  
Call toll free 1-800/433-2160; In Texas call collect 817/599-7623.

#### TECHNICAL      MANAGEMENT      TECHNICIANS

- |                          |                    |                        |
|--------------------------|--------------------|------------------------|
| 1. VP ENG, TX, \$60K     | CH TCH, E, \$30K   | HDEND TCH, W, \$30K    |
| 2. DIR ENG, E, \$55K     | TCH MGR, SW, \$30K | HDEND MICRO, SE, \$24K |
| 3. DIR ENG, MW, \$40K    | TCH MGR, W, \$38K  | LN TCH, W, \$10/HR     |
| 4. TCH TRAINER, E, \$40K | CH TCH, W, \$35K   | LN TCH, E, \$25K       |
| 5. CH ENG, NE, \$45K     | TCH MGR, W, \$32K  | LN TCH, NE, \$10/HR    |
| 6. TCH MGR, E, \$40K     | MGR/TCH, E, \$25K  | LN TCH, E, \$12/HR     |
| 7. INST MGR, E, \$30K    | MGR/TCH, W, \$22K  | LN TCH, MW, \$9/HR     |
| 8. TCH MGR, E, \$30K     | CH TCH, W, \$30K   | LN TCH, NE, \$11/HR    |
| 9. CH TCH, NE, \$23K     | CH TCH, E, \$30K   | LN TCH, E, \$11/HR     |
| 10. CH TCH, NE, \$31K    | CH TCH, NE, \$30K  | LD TCH, SE, \$10/HR    |

FAX: 817-599-4483



**JIM YOUNG & ASSOCIATES**

One Young Plaza 1235 Ranger Highway Weatherford, TX 76087  
Call for information about these and many other opportunities nationwide.

### Baker Scott & Co. EXECUTIVE SEARCH

1259 Route 46 Parsippany, NJ 07054 201 263-3355

**Specialists in the COMMUNICATIONS  
INDUSTRY**

CABLE TV/BROADCAST TELECOMMUNICATIONS  
DIVISION DIVISION

POSITIONS AVAILABLE AT ALL LEVELS OF  
MANAGEMENT, COAST TO COAST

Call or write in CONFIDENCE

FEE PAID

**"WE DON'T TALK CABLE, WE KNOW CABLE"**  
PRINCIPALS DAVID ALLEN & JUDY BOUER

### SENIOR TV CABLE CONVERTER DESIGN ENGINEER

Spectradyne Inc., a high technology growth oriented company located in Richardson, has an opening for a Senior Design Engineer with experience in MATV/CATV system and equipment design.

Position involves product development and design for TV converter units and headend equipment. Requirements include a BSEE or equivalent and five or more years experience in TV cable converter box design. MATV/CATV field and equipment design experiences a plus. Must have good communication skills. Salary commensurate with qualifications and experience.

Spectradyne offers an excellent benefit package. Send resume and salary history to:

#### SPECTRADYNE INC.

Human Resources  
1501 N. Plano Road  
Richardson, TX 75083

Equal Opportunity Employer

### FIELD ENGINEERS

Growing wireless cable MSO has an immediate need for N.Y.C. & Wash., D.C. metro area Field Engineers who can work independently in a challenging position. A minimum of 2 years hands-on experience is required in the following areas: microwave STL's; RF system; CATV H/E's; base band switching and measurements. FCC license desired. Position requires test equipment set-up, system troubleshooting, data collection and report preparation. Travel required. Excellent compensation/benefit package. Please send resume with salary requirements to: Human Resources, P.O. Box CN3307, Livonta, MI. 48151. An E.O.E. M/F

### MAINTENANCE TECHNICIANS

50,000 subscriber cable system located in the suburbs of Philadelphia is searching for self-motivated individuals to assume responsibility for system maintenance. Large MSO offers competitive wages and comprehensive benefits. If you are looking for a company that will offer you a challenge and opportunity for advancement, send a resume to:

CED 010189

Equal Opportunity Employer

### NATIONAL SALES MANAGER

This position requires a successful individual who has a track record in direct sales management. Individual needs to be aggressive and able to design, implement and operate remarketing campaigns on a long term continuing basis. Geography covers 250 small rural communities in five mid-western states. High earnings opportunity for an experienced and motivated person. Includes good benefits package. Please send complete resume to:

**General Manager**  
**Douglas Cable Communications**  
4100 SW Southgate Drive  
Topeka, KS 66609

**HELP WANTED**

**TECHNICAL SUPERVISOR**

50,000 subscriber cable system located in the suburbs of Philadelphia is searching for self-motivated individuals to assume responsibility for system maintenance. Large MSO offers competitive wages and comprehensive benefits. If you are looking for a company that will offer you a challenge and opportunity for advancement, send a resume to:

**CED 010189:1**

Equal Opportunity Employer

**EQUIPMENT FOR SALE/RENT**

**WANTED:  
SURPLUS CABLE EQUIPMENT**

Jerrold, Oak, Hamlin & Scientific  
Atlanta equipment.  
**Highest Prices Paid**  
Cable Equipment Brokerage Co.  
**(818) 709-3724**

**VIDEO SUPPLIES**

CABLES • CONNECTORS • CANARE • BELDEN • SWITCHCRAFT • D.A.'s • TIES • BATTERIES • NEUTRIK • 60 INTERFACE BOXES • TAPE • 500 DIFF. TAPE LABELS • GAFFERS TAPE • CASES • PATCH BAYS • LIGHTS • ACOUSTIC FOAM • FORMS • MICROPHONES • SONEK • STANDS • MOUNTS • WIND SCREENS • ZEPPELINS • FIBRE OPTICS • RACKS • DUCT • REELS • TESTERS • FILTERS • CHEMICALS • TOOLS • ON-AIR LIGHTS • DEGAUSSERS • INTERFACE DEVICES • HEADPHONES • CLIPS • SWITCHES • CAM & S-VHS CABLE

*Very Unique Professional Catalog FREE!*

**MARKERTEK VIDEO SUPPLY**  
145 Ulster Ave., Saugerties, NY 12477 U.S.A.  
TOLL FREE **1-800-522-2025**  
In NY: 914-246-3036

**EQUIP. FOR SALE/RENT**

**AERIAL BUCKET TRUCKS**

Large selection geared for CATV  
**STANDARD TRUCK & EQUIPMENT CO.**  
1155 Hill St. S.E.  
Atlanta, GA 30315  
Phone: 1-800-241-9357 **BUCKET TRUCKS**



**Bucket Trucks—Used**

Telsta, Versa-Lift, Digger Derricks—10 in Stock. 30 other Utility Construction Trucks.  
**"We Buy and Sell!"**  
**Opdyke, Inc.** (Philadelphia Area)  
3123 Bethlehem Pike (215) 721-4444  
Hatfield, Pa. 19440

**EMERGENCY ALERT SYSTEMS**

by  
**Idea/onics**

69 channels 14 day delivery  
compatible with all headends  
under \$3,000

**(701) 786-3904**

24 channel units also available.

**BUSINESS DIRECTORY**

**TRY US!!**

Serving the Cable TV industry  
with over 5,000 line products

**"NATIONWIDE"**  
**(419) 394-7890**



**NT'L 800-826-4710**

*J. L. Speckman & Associates, Inc.*  
dba/SAI Engineering

1301 McKinley Rd., P.O. Box 2288, St. Marys, OH 45885

**NaCom**

BUILDING COMMUNICATION SYSTEMS THROUGHOUT AMERICA

- Installations (including fiber optics)
- Converter exchanges, PPV, audits, special projects
- MDU, SMATV, & LAN Pre/postwiring
- Strand mapping, engineering, signal leakage
- Design (AutoCAD)
- Aerial/underground construction

1900 E. Dublin-Granville Rd., Columbus, Ohio 43229  
614/895-1313 • 800/848-3998 • FAX 614/895-8942



**CABLE SYSTEM SURVEY CO.**

MAPPING • DESIGN • AS-BUILTS  
COMPLETE DRAFTING SERVICES

**GET IT AS-BUILT  
BEFORE YOU GET IT REBUILT**

17 Peddler's Row  
Newark, DE 19702  
(302) 368-2436

518 North Main Street  
Tekonsha, MI 49092  
(517) 767-4185

*White Sands*

**Jumper Cables**

Custom connectors and cables for all aspects of CATV.  
Gilbert AHS All types of cable from  
Magnavox Belden  
Pyramid F59-81 Times  
LRC and others Comm Scope  
Quick delivery on all colors with lengths from 6' to 15'.

Write or call: **(602) 581-0331**  
335 West Melinda Drive, Phoenix, AZ 85027

**HOW TO RESPOND TO A BLIND BOX:**

CED (Blind Box No.) c/o CED, 600 So. Cherry Street, Suite 400, Denver, CO 80222.

## TCI and Jones announce significant fiber commitments

With fiber optic news busting out all over the Western Show floor and a number of other venues last month, it's difficult to stay on top of all the developments. But two of the most significant announcements concerned TCI and Jones Intercable and their plans with fiber. TCI has hooked up with Anixter and has committed to purchase fully half of the Laser Link systems the supplier presently has; and Jones will utilize Catel's TransHub III AM system to upgrade its Broward County, Fla. system with an innovative architecture.

TCI announced it plans to jump on the fiber bandwagon in a big way in 1989, committing millions to buying and installing up to half of Anixter's Laser Link product over the coming year. Anixter's hardware makes use of the AT&T distributed feedback laser.

The fiber products will allow TCI to cut amplifier cascades in half, at least, and deliver better pictures. "It's amazing," said J.C. Sparkman, executive vice president and COO of TCI, of the technology.

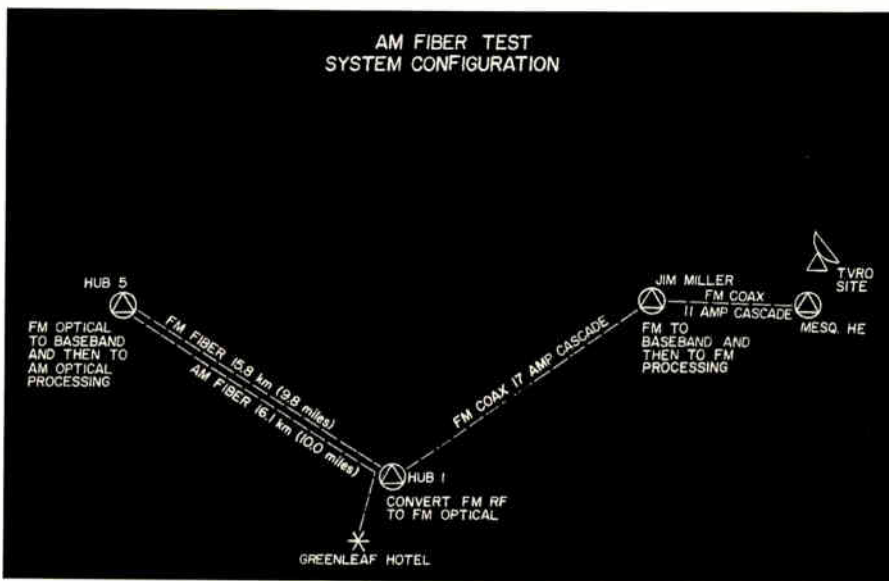
By reducing cascades and utilizing NTSC improvement equipment like Faroudja's (which TCI is testing in a few of its systems), Sparkman said cable companies could deliver better pictures without changing to HDTV transmission standards. "If we delivered NTSC's full capacity to TVs today...we'd have close to HDTV pictures

now," he said.

Sparkman was so optimistic because of the results of a test undertaken in Heritage's Dallas system. A fiber link was installed to replace an AML run (see schematic) and proved to be more rugged than anyone anticipated. Therefore, TCI is proposing fiber runs be

chitecture was as follows: Signals from the headend were sent out through 11 trunk amps, reprocessed and sent through 17 more amps to a hub site. They were then frequency modulated and sent through 10.5 miles of fiber, converted to AM and sent another 11 miles. Despite the distance and numerous conversions, the results were very positive; carrier-to-noise at the receive end was 55 dB, and CTB was 68 dB down (worst case), said TCI officials.

Officials from AT&T emphasized



The Dallas fiber test set-up.

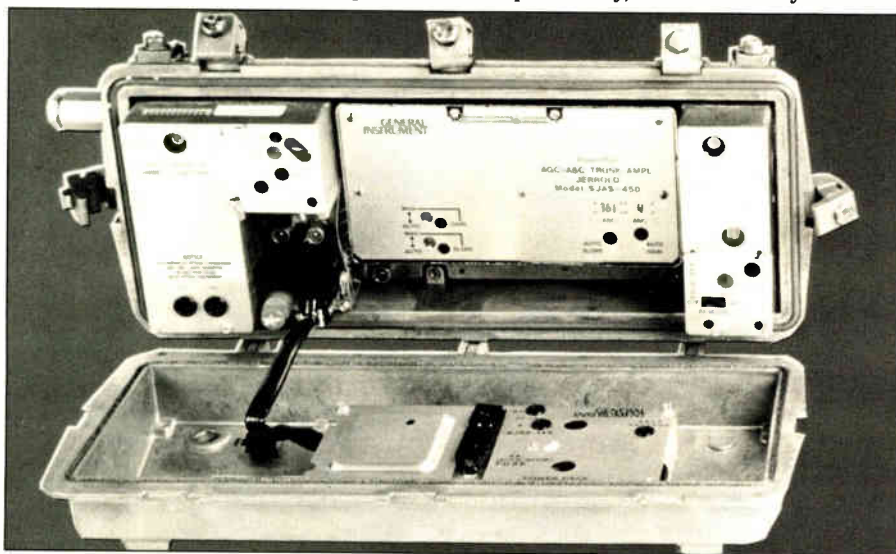
placed in a number of systems in parallel with AML hops for backup purposes, according to Tom Elliot, director of R&D at TCI.

Specifically, the Dallas system ar-

that it's unlikely all the AM systems it has built would withstand such treatment. The laser used in this system is obviously a "hero" laser, they said.

John Egan, president of Anixter Cable, said his company will produce 1,000 AM fiber systems next year, doubling the production rate from the present four units per week to eight per week and escalating from there. Egan said he feels it's important for the industry to get past the laser debate and begin implementing the technology so production rates can be increased and prices are allowed to fall. Right now, the Anixter product costs \$30,000 and each laser must be hand-picked, he said.

At the receive end, Anixter has modified a Jerrold trunk amp and made room for the receiver inside the housing. That way, the unit can be strand-mounted as usual, the only difference being that light energy enters the unit and RF energy leaves it. Other manufacturer's trunk housings



Specially modified Jerrold amp housing accommodates Laser Link.



can also be specially modified without much effort.

**Jones commits to Catel's hardware**

Jones Intercable is also investing in the promises made by fiber. The growing Broward County, Fla. system currently consists of about 800 miles of coax cable and serves about 35,000 subs, according to Bob Luff, group vice president of engineering and technology at Jones. The 300-MHz system has one microwave link that experiences outages often because of the severe weather that often buffets Florida.

The upgrade presently underway will ultimately consist of 50 lasers, 52 receive sites or "points of presence," which will limit amplifier cascades to five amps maximum, says Luff. The hardware picked by Jones is Catel's TransHub III product. Jones was scheduled to receive the first three units in December, with more units to follow each month. The project is supposed to be completed by late summer.

Uniquely, the system, which has been dubbed "CAN" by Jones (for cable-area network) will not call for amplifiers to be "turned around," as ATC plans. Instead, they'll be kept in place and used as a redundant, or backup, path. An automatic A/B switch will be housed with the optical receiver so if a receiver fails, the coax system is kicked in. The fiber routes will parallel the coax runs, often within a block or two.

Six-fiber cable will be used, four of which will be activated with between 12 and 18 channels each. The longest fiber run will be about 19 kms. Much of the system will be constructed aeri-

ally.

Surprisingly, the system will not take advantage of high-performance DFB lasers, opting instead for the less expensive Fabry-Perot variety, according to Luff.

"The industry has to think beyond this brick wall of 550 MHz," said Luff. "It's time to talk about 750 MHz and 1 GHz amplifiers." That obviously wasn't possible when cable systems had 40-amp cascades, but when fiber is

used to reduce cascade lengths, bandwidth can be increased substantially without paying penalties on quality.

**Related products**

Speaking of fiber, a number of new fiber-related products were introduced recently.

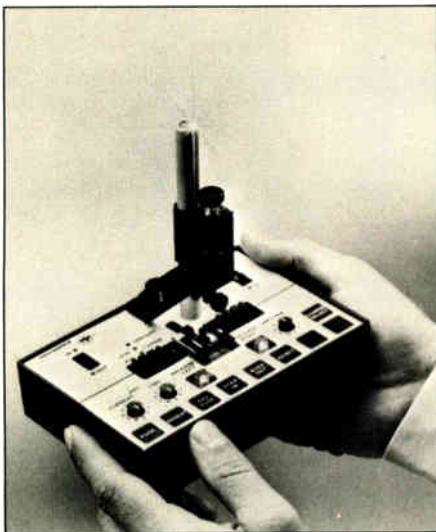
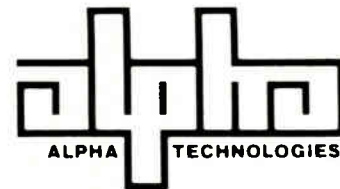
**Preformed Line Products** has introduced the FiberLign micro fusion splicer to provide precision filed splices

# CONGRATULATIONS

To

JIM CHIDDIX  
MAN OF THE YEAR

From all of us at  
Alpha Technologies



*FiberLign fusion splicer.*

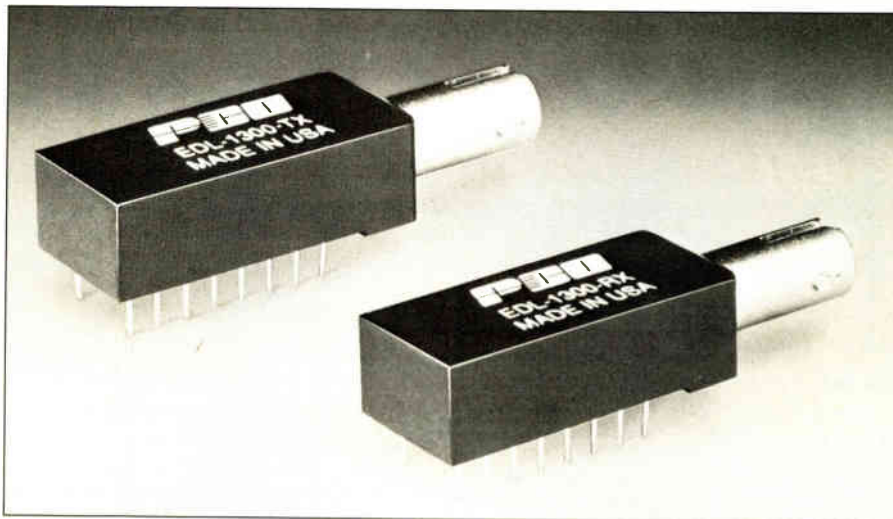
in confined areas. The 4-inch-by-5-inch self-contained portable unit weighs less than two pounds and is designed for emergency repair and resoration of single-mode fibers.

An internal NiCad battery provides up to 100 splices on a full charge and a warning indicator signals when re-charge is required. The splicer uses a precise transparent V block to assure outer cladding alignment while the fibers are held in a three-finger clamp assembly with coarse adjustments available.

AC arc time and intensity can be controlled to accommodate environmental conditions and fiber types. Typical splice loss is between 0.1 dB and 0.5 dB on single-mode fibers. A 50X microscope provides visual inspection for dirt or other contaminants. For details, call Preformed Line Products, (216) 461-5200.

A 10 kHz to 1 GHz pigtailed fiber optic analog receiver touting high sensitivity and linearity has been developed by **Anadigics**. The AAR10010 is the first of several hybrid integrated opto-electronic products featuring gallium arsenide ICs the company plans to introduce.

Typical applications of the receiver



PCO's fiber optic data link.

include CATV FDM/AM and FDM/FM supertrunks and backbones and telco subscriber loops, among others. Anadigics officials say the receiver offers 62 dB C/N, +18 dBm third order intercept and -75 dBc third order distortion. The receiver is available in a pigtailed 14-pin DIP with 50/125 multimode fiber and ST connector, but other options are available. Call (201) 668-5000 for details.

A new miniature ultraviolet light source designed to make the splicing of optical fibers easier has been developed by **Norland Products Inc.** The UVC mini-lamp is portable, battery operated and constructed to permanently bond ultraviolet curing splices to allow for hands-free curing without interfering with the splice or fibers.

The unit operates on four AA batteries and can run on a supplied 9-volt

# CONGRATULATIONS JIM CHIDDIX

*For your devotion to our industry, your quest for signal quality  
and your sincere commitment to the future of cable.*

*We congratulate you and wish you continued  
success in the new year. THE CED STAFF.*



## IN THE NEWS

AC adapter or cigarette lighter adapter. The device is priced at \$225. For information, call (201) 545-7828.

PCO Inc. announced a moderate-speed addition to its line of digital interfaces. The EDL-1300 fiber data link transmits serial digital TTL data over multimode fiber distances in excess of 2 kms at up to 50 megabits per second.

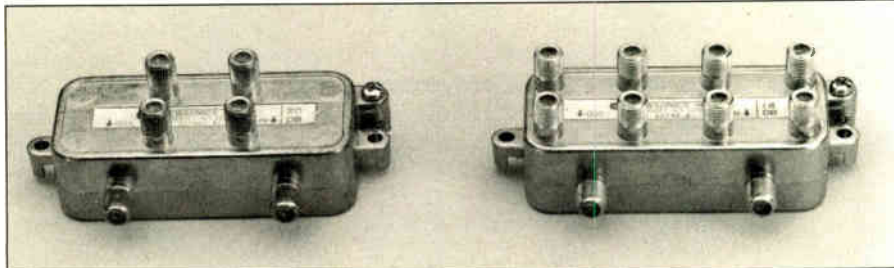
The product consists of miniature transmitter and receiver modules housed in a 16-pin DIP containing an integral ST compatible connector coupling. The link is designed for LAN and WAN applications. Each set is priced at \$320 in quantity. Call (818) 700-1233 for info.

### Getting better pictures

A new line of video signal processors has been designed to eliminate cross-color and cross-luminance, annoying artifacts often found in NTSC pictures. Central Dynamics, headquartered in Montreal, has introduced Stage\*1 E-NTSC digital encoders, decoders and translators that use digital processing and filtering techniques to provide enhanced NTSC images, which are often indistinguishable from RGB and

component color signals, according to a company spokesman.

The products use special filtering methods to properly shape the signal spectrum and separate chrominance and luminance information. This allows cross-color and cross-luminance to be eliminated. For info, call (514) 697-0810.



Viewsonics' indoor/outdoor directional coupler/taps.

Performance Cable TV Products' new universal battery tester enables cable operators to determine the condition of standby power supplies used in their systems. The hand-held tester contains LED indicators which show the condition of a battery while being subjected to a 96-amp electronic load for 10 seconds, which shows the battery's internal impedance (ability to hold a charge).

Other LED indicators show when the tester is connected to an excessive voltage or when the leads are reversed. Lead length is 12 inches and the copper-plated steel clips are color-coded for polarity. Call (404) 443-2788.

A new automated coaxial cable stripper has been introduced by Manger Electric Co. The stripper is designed

to remove the braided shield without damaging the insulating dielectric. The shield can be cut flush, combed out or bloused in preparation for any type of termination technique. For info, call (203) 348-7761.

### Protecting the cable

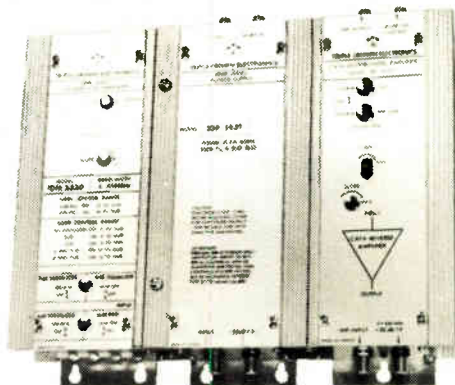
A new cable-in-duct system has been designed by Pirelli Cable to help

# PLUG INTO THE FUTURE

Triple Crown has revolutionized amplifier design. Employ the new IDM Series of 550 MHz amplifiers for your bandwidth requirements today, without restricting your expansion capabilities in the future.

- Fully Modular
- In Field Plug-in Bandwidth Conversion (Forward and Reverse)
- All Set-up Controls Built-in
- Hybrid or Power-Doubled Versions
- Wide Selection of Gain and Diplex Frequencies
- Plug-in Automatic Level Control
- Available in all International Standards

Another cost-effective, long-term solution from the world's foremost producer of indoor distribution amplifiers.



# NEW

## TRIPLE CROWN ELECTRONICS

4560 Fieldgate Drive,  
Mississauga, Ont. L4W 3W6

(416) 629-1111  
800-387-3205 (U.S. Only)

Reader Service Number 43

## IN THE NEWS

protect cable form damage during handling, installation and service. The system, called Poly Duct, uses a conduit loosely extruded over the conductor to provide a flexible pipe that is impact resistant.

In addition, the duct provides protection from acids and other corrosives often found in soil. And the system makes it possible to remove and replace the cable without excavating. Call (201) 687-0250.

New high-quality directional coupler/taps have been introduced by **Viewsonics**. The VSTREL-4 and VSTREL-8 indoor/outdoor taps reportedly exhibit mechanical and electrical characteristics consistent with data quality CATV and LAN requirements.

The dealed zinc housings with gold irridite finish are corrosion free and leakage resistant. Tap-to-tap isolation is 30 dB minimum from 5 MHz to 450 MHz; 25 dB minimum from 450 Mhz to 550 MHz. Return loss is 20 dB minimum and 18 dB minimum over the same ranges. VSTREL-4 costs \$6.60 and VSTREL-8 is priced at \$9.60. For info, call (800) 645-7600.

A new product designed to protect writing panels on taplocks has been

developed by **Budco**. PanelGuard is made of transparent high-impact styrene plastic and protects the 734 Taplock and 402 Panel Tap from ultraviolet rays which often cause the ink to fade or disappear. Call (800) 331-2246, for information and prices.

### SCTE offers insurance

During the Western Show, the **Society of Cable Television Engineers** announced that it has developed an agreement with Smith-Sternau Organization to provide SCTE members with a medical insurance program.

Smith-Sternau represents a number of engineering societies already, including the IEEE, SMPTE, SBE and American Society of Mechanical Engineers, according to Mike Aloisi, SCTE Region 9 director and Member Benefits Committee chairman.

By entering into a "group trust" program, the SCTE will be able to offer its members reduced rates on major medical, excess major medical, term life, hospital indemnity and high-limit accident insurance. Members can choose one or all coverages. A toll-free number will be made available to all members

who desire more information. Call (215) 363-6888 for information.

Does your system carry the **A&E Cable Network**? Have you been told about the network's scrambling plans? If not, you'd better get on the horn because A&E plans to scramble its feed beginning May 1. In fact, A&E will do fixed key scrambling tests in February and will go full-time in May. If all this is news to you, call (212) 210-0680.

Merger mania continues in the cable industry. **First Data Resources** has acquired IntelliTEK Computer Corp. and its operating divisions. What that means is that CableTEK, the billing and MIS people, is now part of FDR, which also performs billing and MIS services for cable operators. The two companies will apparently continue to operate as separate entities.

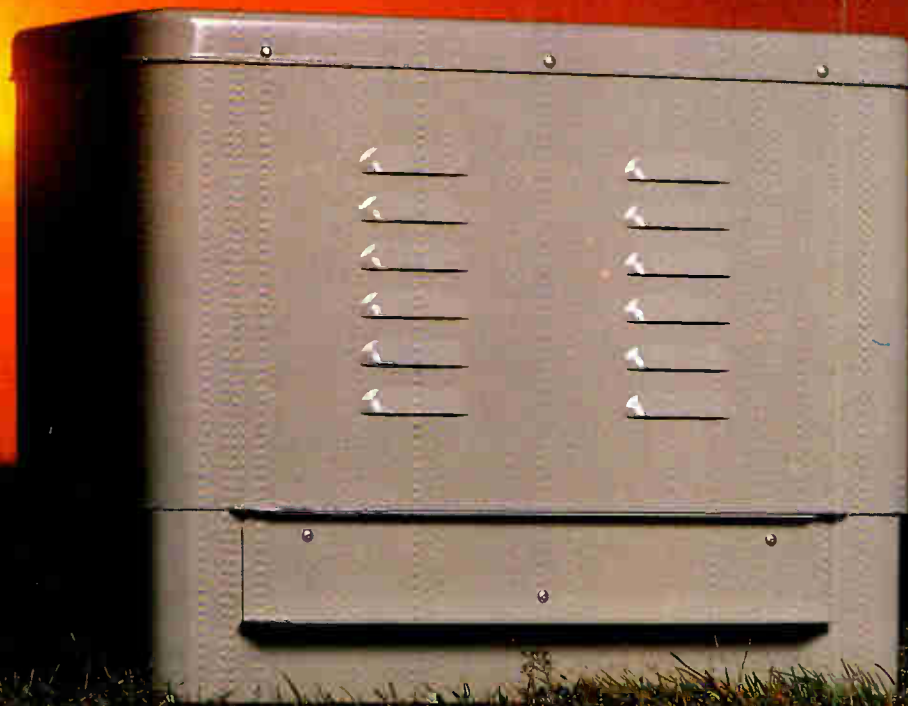
Finally, **Cable Security Systems and Power Guard** has moved its sales and customer services offices to a new facility located at 506 Walker Street in Opelika, Ala. The new mailing address is P.O. Box 2796, Opelika, Ala. 36801. Phone numbers are (205) 742-0050 or (800) 288-1506. The FAX number is (205) 742-0058.

—Roger Brown

Reader Service #	Page #
American Television and Communications . . . . .	27
Adelphia . . . . .	42
Alpha Technologies . . . . .	25, 41, 87
Anixter Communications . . . . .	45, 49, 92
Applied Instruments . . . . .	14, 26
Augut Broadband . . . . .	10, 20
Augut Communications Group . . . . .	10, 67
Augut/LRC Electronics . . . . .	35, 69
Avcom of Virginia . . . . .	18, 34
Budco . . . . .	33, 62
C-COR Electronics . . . . .	7, 15, 65
CCTA . . . . .	78
Cable Exchange . . . . .	59
Cable Link . . . . .	22, 38
Cable Prep/Ben Hughes Comm. . . . .	27, 44
Cable Services . . . . .	34, 63
Cablelogic Corp. . . . .	38, 72
Cable Tek Center Products . . . . .	28, 44
Calan . . . . .	54
Catel Telecommunications . . . . .	81
Commscope, Inc. . . . .	29, 33, 46-47
Comsonics . . . . .	60
Cox Cable . . . . .	28
Eastern International . . . . .	5, 11
GTE Sylvania . . . . .	21, 37
General Inst./Jerrold . . . . .	11, 15, 32, 22-23, 29, 51, 61
HBO . . . . .	50
Hughes Microwave . . . . .	26, 43
Jerry Conn Associates . . . . .	23, 40
Jones Intercable . . . . .	42, 40
Lakeshore . . . . .	24, 40
Leaming . . . . .	66
Lectro Products Inc. . . . .	19, 35
Lineward . . . . .	30, 56
Long Cable Elec. . . . .	20, 37

Reader Service #	Page #
MTV Networks/Showtime Networks . . . . .	79
Magnavox CATV . . . . .	41, 66, 75
Midwest CATV . . . . .	1, 2, 39
Midwest CATV Engineering . . . . .	39, 73
Midwest Communications . . . . .	8, 17
NCTA Engineering Committee . . . . .	36
Nexus Engineering . . . . .	3, 5
Oceanic Cablevision . . . . .	36
Panasonic . . . . .	16, 31
Pioneer Communications . . . . .	27
Power Guard . . . . .	6, 13
RMS Electronics . . . . .	13, 25
RMT Engineering . . . . .	59
RTK Corp. . . . .	78
Reliable Electric . . . . .	44, 91
Rogers Cable Systems . . . . .	60
SCTE . . . . .	27
STC . . . . .	62
Scientific-Atlanta . . . . .	58
Sencore . . . . .	60
Siecor Corp. . . . .	42, 77
Sony . . . . .	9, 19
J.L. Speckman & Assoc. . . . .	37, 54, 72
Standard Communications . . . . .	36, 71
TCI . . . . .	59
Telecommunication Products Corp. . . . .	17, 34
Texscan Corp. . . . .	45
Texscan Instruments . . . . .	12, 24
Time Manufacturing . . . . .	31, 57
Trilogy Communications . . . . .	2, 3
Triple Crown Electronics . . . . .	43, 27, 89
United Artists Comm. . . . .	36
United Cable . . . . .	36
Warner Cable . . . . .	28
Wavetek . . . . .	4, 6-7
Weldone Trading Co. . . . .	40, 73

# Replace in 2014 A.D.



Made to last, because cable television is now a lasting proposition. Made to last, because we both know it's just good business to protect valuable equipment inside quality enclosures.

Ours are made to outlast the equipment inside. Ours average 25 years in use. Buy today, don't think about replacement until 2014.

No mystery about why they last. Our nine-step finishing process generates a high gloss weather-fighting

finish that resists corrosion and the onslaughts of acid rain, pollutants and other atmospheric contaminants.

All of those good things, plus security against unauthorized entry and greater mounting space for enclosing passive and active equipment. In a word, reliable. And, after all, our name is Reliable...far and away #1 in pedestals for CATV.

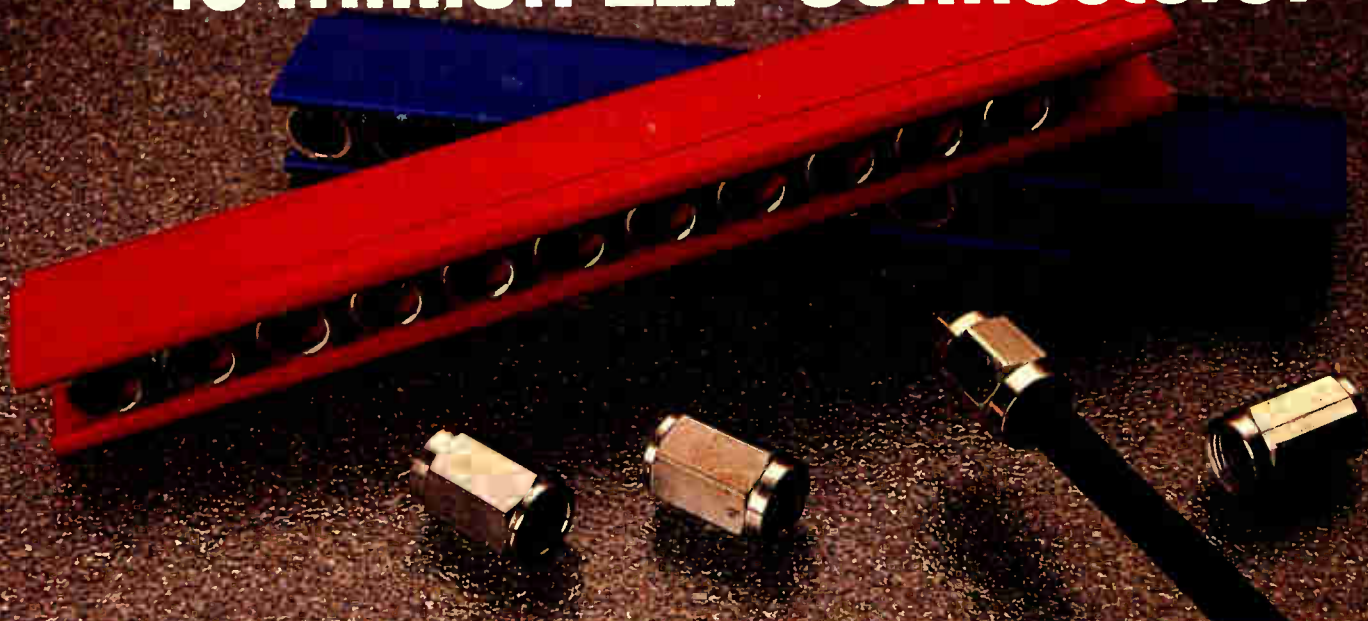
For more information contact Reliable Electric/Utility Products or your authorized distributor.

## **Reliable Electric/Utility Products**

11333 Addison Street/Franklin Park, IL 60131/312-455-8010  
Reader Service Number 44

**RELIANCE**  
COMM/TEC 

# Why have MSO's ordered over 40 million EZF Connectors?



## Lower Maintenance Costs and Improved Customer Satisfaction

In both new builds and rebuilds, users of the EZF connector system are experiencing a dramatic reduction in drop related service calls. RF leakage trouble calls resulting from improper connector installation and corrosion are no longer the single most problem in a CATV system when the EZF connector system is used.

### PROVEN: Fewer problems occur during installation

- One color-coded connector for each cable size minimizes connector selection problems.
- The cable is prepared for installation the same way every time with the EZF cable preparation tool.
- Only a 7/16 inch wrench is needed for installation.
- Cassette packaging facilitates proper installation and reduces connector loss.



- Immediate inspection for proper installation by installers and QC inspectors.

### PROVEN: Fewer problems occur during service life

- A circumferential, environmental seal is automatically made at the connector/cable interface during installation.
- The EZF sealing sleeve supplied with the connector prevents moisture penetration at the connector/port interface.
- Material compatibility and corrosion resistance are ensured by specially selected and tested materials and platings.
- Rugged connector design and consistent installation quality contribute to reduced RF leakage and reliable performance.

**Raychem**

**ANIXTER**

**WEST-ANAHEIM:** (714) 779-0500, (800) 854-0443; **ANCHORAGE:** (907) 274-8525; **DENVER:** (303) 373-9200, (800) 841-1531; **SEATTLE:** (206) 251-6760, (800) 426-7665; **MIDWEST-CHICAGO:** (312) 364-7000, (800) 544-5368; **DALLAS:** (214) 446-7337, (800) 231-5006; **IRON MOUNTAIN, MI:** (906) 774-4111, (800) 624-8358; **SKOKIE, IL HDQTRS:** (312) 677-2600; **EAST-ATLANTA:** (404) 995-5110, (800) 241-5790; **LONG ISLAND, NY:** (516) 293-7788, (800) 645-9510; **NEW JERSEY:** (201) 328-0980, (800) 631-9603; **TAMPA:** (813) 626-7115, (800) 282-9164; **CANADA-CALGARY:** (403) 250-9646; **MONTREAL:** (514) 636-3636; **TORONTO:** (416) 625-5110; **VANCOUVER:** (604) 321-5885.

In an emergency, weekends and holidays or after 5 P.M. call toll free 1 (800) 323-8166.  
CORPORATE OFFICES, ANIXTER BROS., INC., 4711 Golf Road, Skokie, IL 60076, (312) 677-2600

©1989 Anixter Bros., Inc.