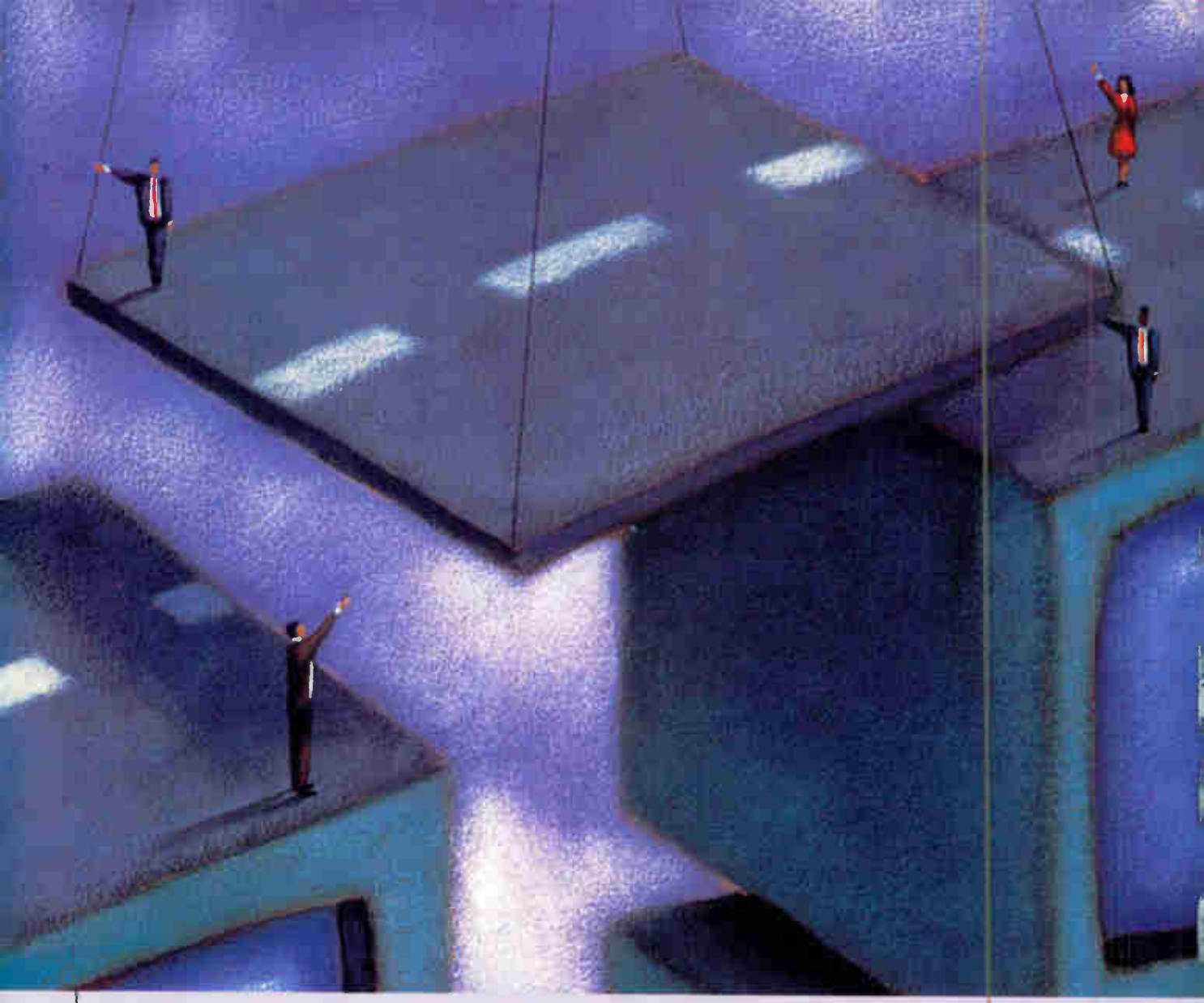
Communications Technology
Official Trade Journal of the Society of Cable Telecommunications Engineers
February 2000

Home Networks 101:
Ban Rat's Nest Wiring

Missed the Western Show?
***CT* Highlights Wired2K**

High-Speed Data Installs: 6 Steps, No Hassles



PHASOR™ DROPS SEAMLESSLY INTO YOUR NETWORK MANAGEMENT SYSTEM

THE ULTIMATE RETURN PATH MANAGEMENT SYSTEM

Now you can snap unparalleled control over your return path into the world's most advanced HFC network management framework. The Phasor™ Return Path Management System integrates seamlessly with Cheetah's Net*Mentor*,™ combining the benefits of our patented DSP-IF™ signal analysis technology with Net*Mentor*'s proven performance.

The Phasor Return Path Management System gives you the speed to catch transient signal impairments as they occur, the power to perform complex time domain analyses, and the flexibility to grow as your needs evolve. Whether implemented as a best-of-breed standalone or integrated with a Net*Mentor* NMS, Phasor is the ultimate return path management tool.

941-756-6000 • info@cheetahtech.com • www.cheetahtech.com

CHEETAH™ TECHNOLOGIES

ENGINEER of Change

Ted S. Woo, Ph.D., and P. E.
Director of Standards
SCTE Member since 1995

Dr. Woo administers the over 150 ANSI standards for the broadband which is comprised of more than 600 professionals, 125 organizations and 25 countries. He also provides support for the SCTE Engineering Committee and its seven subcommittees.

His days are filled with monitoring technical research projects, laboratory studies and data analysis. Woo also handles status monitoring and transponder interoperability testing.

Dr. Woo.....the support behind the technology. It's all about the standards.

contents

FEATURES

Western Cable Wrap-up • 42

Home Networking: Rat's Nest No More • 50

Cover
Design by Tamara Morris

Small Integrated Package. Big Power Performance.

Protecting The **Power** In Communications.

Powernode

Network **Power** Systems

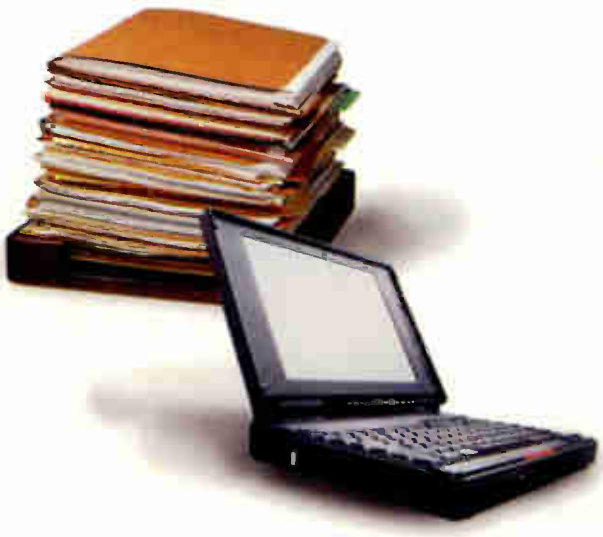
1. XM2 Power Modules – 22.5 Amps, Dual Output.
2. AlphaCell Batteries – Longer Service Life.
3. AlphaGen DC Generator – 3.0kW or 5.0kW, 36V or 48V.
4. Alpha Enclosures – Application Specific Design.
5. Complete Installation Services Available.

Complete power integration. Alpha combines industry-leading power technology to provide maximum power density, unparalleled system reliability and indefinite runtime. All in a single, compact, neighborhood friendly package. Proven solutions from the company with more than 20 years of communications powering experience.

Find** out more:* ***Tel: 360-647-2360 ***Fax***: 360-671-4936 ***www***.alpha.com

ALPHA TECHNOLOGIES

contents

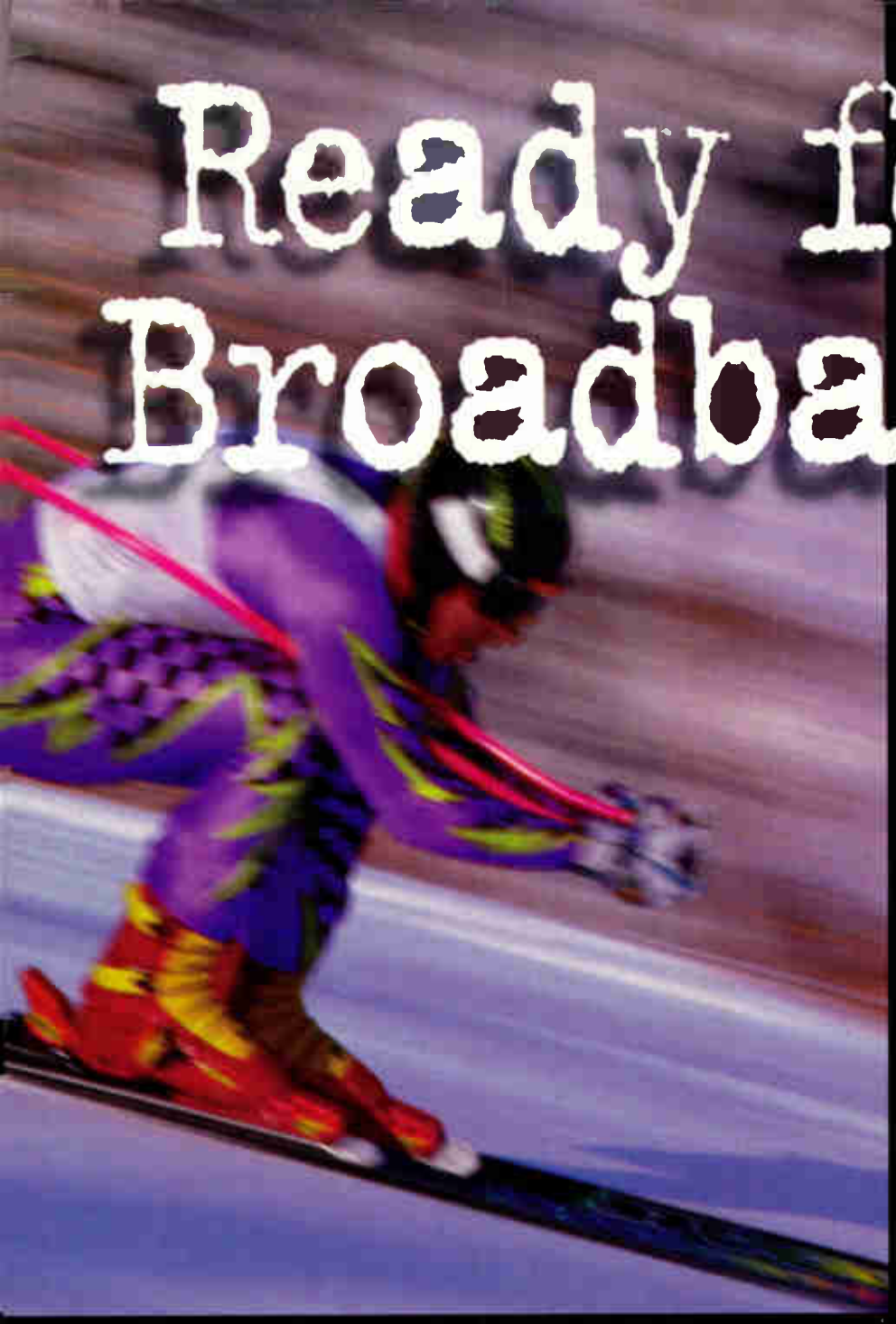


DEPARTMENTS

NEWS & OPINION

REFERENCE

COLUMNS



Ready for Broadband?

Compete at the edge in voice, data and video

Launch a powerful new generation of broadband services. Terayon delivers innovative voice, data and video systems with performance to spare. Fast. Now.

Terayon's highly regarded cable modem access systems are deployed by leading operators worldwide. From advanced S-CDMA systems to our CableLabs-certified DOCSIS products. We have the answer.

Customize your programming lineup, insert ads, and deliver video-on-demand with our innovative CherryPicker digital video systems. Shred the competition.

Power through the turns with our Multigate broadband telephony systems – the most advanced voice and data services over cable. And crack the ice in the exploding SOHO market with our line of IP routers. If you're ready for broadband, run with Terayon. Call or visit us on the web. We'll meet you at the peak.

Broadband Innovation in Voice, Data and Video

TERAYON
COMMUNICATION SYSTEMS

www.terayon.com

TELEPHONE: 888 7 TERAYON or 408 727 4400 FAX: 408 727 6205 E-Mail: info@terayon.com

By Rex Porter

Western Show Dazzles LA

Well, it's over—the final cable show of 1999! Congratulations to Spencer Kaitz, C.J. Hershfield and the California Cable Television Association staff for a strong finish.

The technology hotspot clearly was the CableNET display. More than 60 vendors filled 10,000-plus square feet with Internet protocol (IP), cable modems, high-definition TV (HDTV), OpenCable, Data Over Cable Service Interface Specification (DOCSIS), 3D graphics, digital video, video-on-demand (VOD), voice over IP (VoIP), interactive broadband, point-of-deployment (POD), video streaming, cryptography and just about any technology imaginable. If you missed CableNET, you might as well have stayed home. Special thanks go to Cisco Systems, CommScope, Gilbert Engineering, MediaOne Group, Mountain Cable Industries, PPC, Telecrafter and Thomson Consumer Electronics for supporting the CableNET efforts.

Of course, the rest of the exhibit floor was nothing to sneeze at. I saw everything from a computerized refrigerator, to an IP phone booth, to e-mail via satellite.

And don't forget the parties. The cable modem vendors outdid themselves with the bash they threw featuring Los Lobos and Brian Setzer. Bonnie Raitt delighted audiences during the closing celebration.

There was a lot of talk about Arizona Cable Association's Susan Bitter Smith as she campaigns for Congress in the next election. Hard to imagine how the Arizona Association will replace her after she wins.

The Cable Center and Museum's Acquisition and Documentation Committee also met at the show. If you have old photos, paperwork such as original franchises, electronic devices, or items that need to be in the museum, let me know by e-mail. I'm at tvrex@earthlink.net. Contributors will get proper recognition.

The International Lounge was a huge success again this year, with visitors from around the globe. The sessions were presented to more than 200 international visitors. The technical panel saw a spirited exchange concerning DOCSIS and digital video broadcast (DVB) standards in the international marketplace.

Several Society of Cable Telecommunications Engineers committees also met before the show officially began, and the board of directors held its final meeting of the year. To learn firsthand about some of the important developments, be sure to read the message from Board Chairman Jim Kuhns in the next issue of *CT*.

Rex Porter
Editor-in-Chief

mean Mr. Green

Talk about the best of both worlds: The new Dura-Ped from Marconi Communications combines the hard-headed toughness of a mill-galvanized steel dome with the ultra stability and corrosion-resistance of a flanged HDPE plastic base. Result: a lasting monument to network longevity. Couple it with your choice of tamper-proof locking mechanisms, including the renowned Slam Lock™, and you've got a pedestal that will defy the ravages of time.

MARCONI COMMUNICATIONS

In stock and available now from:

TeleWire SUPPLY
ANTEC Corporation

1-88-TeleWire • telewiresupply.com

SCTE BOARD OF DIRECTORS

Communications Technology

A CT Publications Product

EDITORIAL

EDITOR-IN-CHIEF, Rex Porter (800) 325-0156, ext. 31
EDITOR, Jennifer Whalen (301) 340-7788, ext. 2057
SENIOR EDITOR, Doug Larson (800) 325-0156, ext. 26
MANAGING EDITOR, Ron Hendrickson (800) 325-0156, ext. 19
DEPLOYMENT EDITOR, Jonathan Tombes (301) 340-7788, ext. 2030
CONTRIBUTING EDITOR, Arthur Cole
SENIOR TECHNICAL EDITOR, Ronald J. Hranac
TELEPHONY EDITOR, Justin J. Junkus
TECHNICAL CONSULTANT, Michael Smith
INTERNATIONAL EDITOR, Alex Swan

ADVERTISING/BUSINESS

VICE PRESIDENT AND GROUP PUBLISHER, Nancy Maynard
SENIOR PUBLISHER AND FOUNDER, Paul R. Levine; (800) 325-0156
PUBLISHER, Tim Hermes: (301) 340-7788, ext. 2004
NATIONAL SALES MANAGER, David Gillespie: (800) 325-0156, ext. 35
CENTRAL U.S. & CANADA, Mike Elmer: (800) 325-0156, ext. 34
EAST, James Bohi: (301) 340-7788, ext. 2060
CLASSIFIEDS/CARD DECK SALES, Kelly Aarons: (800) 325-0156, ext. 23
PRODUCTION MANAGER, Joann M. Fato
GROUP ASSISTANT, Cathy Slawson
ADMINISTRATIVE ASSISTANT, Cathy Walker

DESIGN/PRODUCTION

SENIOR GRAPHIC DESIGNER, Tamara Morris
ART DIRECTOR, Mark Cavich
GROUP ART DIRECTOR, Paul Bradley
SENIOR DIRECTOR OF PRODUCTION AND DISTRIBUTION, William Wynne
VICE PRESIDENT OF PUBLISHING OPERATIONS, Janet Allen, CMP

MARKETING

MARKETING DIRECTOR-CABLE GROUP, Marsha Wesley
ASSISTANT DIRECTOR-CONFERENCE SERVICES, Justine Wood
SENIOR CONFERENCE MARKETING MANAGER, Anne Schwartz
EXHIBIT MANAGER, Rick Felperin
PROGRAM MANAGER, Teri Byrnes
PROGRAM COORDINATOR, Meredith Linker
CONFERENCE REGISTRAR, Susan Cuevas

CIRCULATION

CIRCULATION DIRECTOR, Sylvia Sierra
LIST SALES MANAGER, Susan Incarnato
REPRINT SALES ASSOCIATE, Laurie Chilek
Subscription/Client Services—(800) 777-5006

COMMUNICATIONS & AEROSPACE GROUP

SENIOR VICE PRESIDENT, David Shaw
VICE PRESIDENT/GROUP PUBLISHERS,
Scott Chase, Nancy Maynard, Paul McPherson, Heather Farley, Angela Duff
ASSISTANT VICE PRESIDENT & GROUP BUSINESS MANAGER,
Kathleen De Franca
GROUP MARKETING DIRECTOR, Anne Coffey
ADMINISTRATOR, Evie Sanchez

PHILLIPS BUSINESS INFORMATION

CHAIRMAN, Thomas L. Phillips
PRESIDENT, Thomas C. Thompson
SENIOR VICE PRESIDENTS,
David Shaw, Roscoe Smith, Rich Eichler

CT PUBLICATIONS CORP.

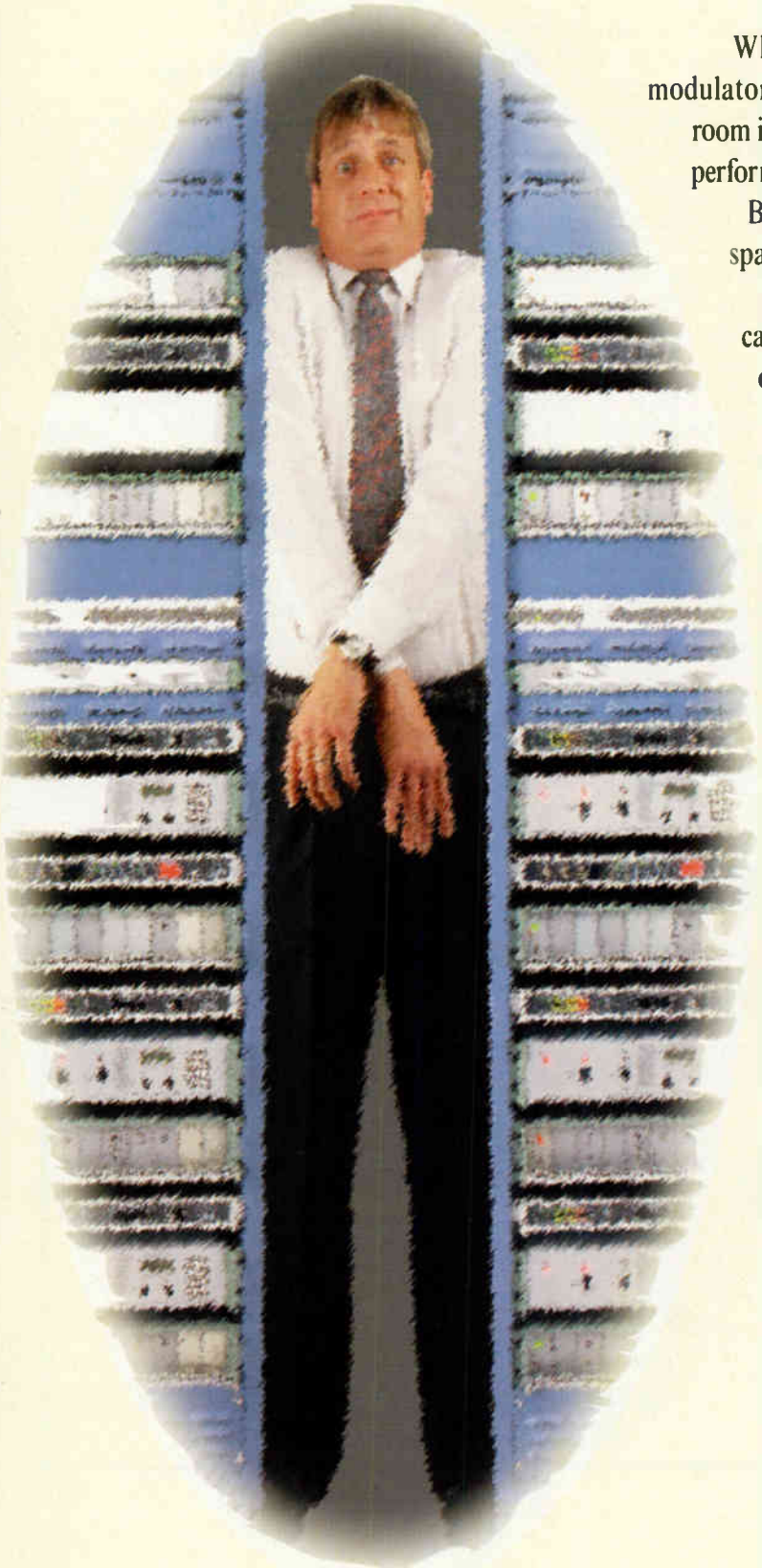
A division of Phillips Business Information Inc.
CT Sales and Editorial Offices
1900 Grant St., Suite 720, Denver, CO 80203
(800) 325-0156; Fax (303) 839-1564

CORPORATE OFFICES

Phillips Business Information Inc.
1201 Seven Locks Road, Suite 300, Potomac, MD 20854
(301) 340-1520; Fax (301) 738-8453
Magazine Group: toll free (888) 340-5075

Website: www.cabletoday.com

STRATUM Series Modulators Relieve Congestion in the Headend.



But that's only the beginning.

When you buy Standard's STRATUM Series of agile modulators, the first thing you notice is you have a lot more room in the headend. That's because you can put eight high-performance modulators in every seven inches of rack space. But you won't have to sacrifice performance to gain space -- STRATUM out-performs most fixed-channel systems, with lower spurious emissions and higher carrier-to-noise ratios, and gives you all the benefits of frequency agility. If you want "stay-on-the-air-no-matter-what" reliability, STRATUM's Smart Link technology can instantly and automatically detect and reroute signals around a fault to a backup module. Built-in IF switching makes EAS easy, and if your hot button is remote control, you can access and control key parameters through our Control Bus... from across the hall or across the country. You might say the STRATUM Series lets you get more into your headend. But it also lets you get more out.

Standard Communications

SATELLITE & BROADBAND DIVISION

The right technology for right now.

800/745-2445
www.standardcomm.com/satcom
P.O. Box 92151
Los Angeles, CA 90009-2151
FAX: 310/532-0397

Breen's Bold Agenda

By Jonathan Tombes, Deployment Editor

Edward Breen has bold plans: finish converging telephony, data and video platforms; begin the mass deployment of Internet protocol (IP) telephony; and build a portfolio that includes such products as wireless home networking.

As new chief of Motorola's Broadband Communications Sector, Breen could actually complete that agenda. The unit Breen heads is the result of the merger between Motorola and General Instrument, where he had been chief executive officer.

"The combination with Motorola just brings us exponential capability in the technology area, specifically as we converge the telephony platform and the data platform onto GI's very significant video and data platform," said Breen in a joint conference with Motorola CEO Chris Galvin in January.

Breen praised Motorola's technological depth, global reach and brand recognition. Galvin said Motorola has provided integrated communications solutions for the person, the work team and the car, but that "with this merger, Motorola is also poised to lead the transition to converged services in the home."

GI closed this deal as demand grew for its advanced set-tops. In December, GI announced that Charter Communications had agreed to purchase a million units. This year Charter will begin deploying GI's advanced interactive digital set-top, the DCT-5000+, which Breen described as "the product in the home that converges video, data and voice all into one device."

After finishing off the convergence of broadband platforms, Breen anticipates "probably starting in about the beginning of 2001 the introduction of mass deployment of IP telephony, beginning here in the United States and some select markets in Europe."

As for new growth areas, Breen identified the merged company's "capability to figure out the home networking product portfolio and to fix that issue for the industry and the cable operators." Breen expects to tie those products together in the home with, most likely, wireless technology.

HSA Restructures Management, Tests VoIP

By Doug Larson, Senior Editor

Broadband Internet service provider (ISP) High Speed Access Corp. is busier than ever. At the Western Show, HSA revealed a slew of new market launches, an Internet protocol (IP) telephony test, and some changes in the company's management structure.

"Our goal and our activities indicate that we've been rapidly expanding the base of our cable relationships, focusing on the ex-urban market," said Dan O'Brien, president and chief operating officer for the company.

On the deployment front, HSA recently added 10 new communities, bringing its total footprint to 90 areas nationwide. HSA's most recent launches include Ft. Gordan, Ga.; Waynesville, Mo.; Rhinelander, Wis.; Gaffney, S.C.; and Classic Cable systems in Idabel, Okla.; Trenton, Mo.; Lebanon, Mo.; Monahans, Texas; Terrell, Texas; and Ft. Scott, Kan.

WITH ENHANCED BROADBAND SOLUTIONS THAT PROVIDE EXTRAORDINARY NETWORK RELIABILITY AND PERFORMANCE, WE ENSURE ABSOLUTELY NOTHING* INTERRUPTS YOUR CUSTOMERS' SERVICE.

* 

Okay, so maybe "nothing" is too strong a word. But that doesn't change our optimistic view of the future.

Because as the promise of broadband takes the industry by storm, C-COR.net stands at the ready. Ready to provide real-world solutions for a brave new world.

Solutions that deliver voice, video, internet, and high-speed data services. Solutions that manage against network failures and system interruptions. Solutions that help you meet the growing demands of your customers.

Look to C-COR.net. Because the winds of change are blowing.

C-COR.net

AT THE CORE OF CONFIDENCE.

Peach Touts Picture-in-Picture Capability

By Jennifer Whalen, Editor

Taking multitasking to a whole new level, Peach Networks demonstrated at the Western Show a new picture-in-picture technology that will allow cable subscribers to play games, use multimedia applications or surf the Web while watching their favorite cable TV programs.

Why the emphasis on picture-in-picture? Cable operators want to deliver enhanced TV rather than simply Internet or games via the TV set, said David Brown, Peach Networks' vice president of new business development and general manager for U.S. operations. "They told us, 'We don't want to take people away from our main business, which is video,'" he said.

How did Peach Networks accomplish this neat trick? The company supplemented the existing Peach Interactive Media Server at the headend with a second server that can handle up to 20 analog or digital video streams.

Subscribers activate the picture-in-picture feature via their single-tuner digital set-top box. Peach used Scientific-Atlanta's set-tops for the demo. The video channel they select is fed to new Interactive Media Server software. The IMS digitizes the video, compresses it to a lower bit rate, combines it with computer output into a single Moving Picture Experts Group (MPEG) stream and sends it to the digital set-top. The channel then pops up in the corner of the TV screen.

Because the video is highly compressed, it is a bit jumpy. But the advantage with the compressed stream is that it consumes only an additional 200 kbps of bandwidth over the average 200 kbps that Peach needs to run its games and other Web-based applications, said Ofir Paz, president and chief executive officer of the company.

The technology is in its demonstration phase and isn't expected to be available for commercial deployment until the middle of the year.

O'Brien said HSA now has 2 million homes under contract, including 1.5 million that already have been deployed.

This launch pace, which has seen the company's subscriber base grow by more than 500 percent over the last year, has resulted in some growing pains. "It's been a fast and furious year that's caused us to hire a lot of new people and change the management structure of the company," said Ron Pitcock, HSA's vice chairman.

Part of this change includes a new focus at the local level. "From an operational standpoint, we've got a new structure, which is essentially a regional, geographically based structure," said O'Brien. Under the new arrangement, HSA has created two new divisions, HSA East and HSA West, and has appointed two division group vice presidents to head them up.

Jim Grillo will take the reigns of HSA's western division, and Jeff Tokar will oversee the company's eastern division. Grillo and Tokar both will report directly to O'Brien.

Other big news during HSA's press briefing was its revelation that it is collaborating with Charter Communications on voice over Internet protocol (VoIP) testing. HSA said it will conduct ongoing Data Over Cable Service Interface Specification (DOCSIS) modem local phone access tests, including IP gateways in its first test market in Georgia, with additional markets to follow. HSA will use multiple vendors, including Lucent, Cisco Systems, General Instrument and Clarent, for the tests and perform parallel IP telephony tests on the varied standards and interoperability issues related to primary-line local access services.

In addition to a discussion of HSA's work in the cable world, O'Brien also touched on his company's strides on a number of additional technology fronts, including digital subscriber line (DSL), Ka band satellite and local multichannel multipoint distribution system (LMDS).

"What we're looking at is being able to have some satellite capacity that can allow us to have no delays in an installation per headend and deliver that capacity bandwidth initially via satellite," said O'Brien. "On the Ka band side, there certainly are five or six providers out there who plan to be able to go to market some time in 2001, and we intend to at least affiliate with them if not create some of our own technology to be able to do that."

Techs On Demand: New Company Eyes Outsourcing

By Jennifer Whalen, Editor

Cable systems facing a shortage of trained digital technicians now have a new company to turn to—or a new competitor for talent, depending on your viewpoint.

Lewis Solomon, formerly with General Instrument, announced during a press conference at the Western Show that he and J.C. Sparkman, former president of TCI, have formed the holding company Broadband Services Inc. The new company initially will install digital devices such as modems, converters, and direct broadcast satellite (DBS) dishes for cable, satellite and telephony companies, as well as provide supply chain management of related equipment.

"The tides of outsourcing that have come to every other industry will come to the cable industry," said Solomon, new co-chairman and chief executive officer of BSI.

So far, BSI has acquired ICS Network Solutions, ICS Repair and J.E.T. Services

Now your Stealth field unit can "view" headend data from the PathTrak Return Path Monitoring System. Simply put, you can be two places at once to quickly find and fix the source of ingress while cutting down on drive time, manpower and work-related frustration.

Not bad for a day's work. Just one catch — you can only get this Find & Fix solution from Wavetek Wandel Goltermann. Want more good ideas? Take a look at our full line of Find & Fix solutions at ***www.wwgsolutions.com*** or call us at ***1-800-851-1202*** and ***317-788-9351***.

WAVETEK
WANDEL
GOLTERMANN
Communications Test Solutions

Inc. to form the nucleus of the new company. Additional acquisitions are planned, Soloman reported.

As a result of the acquisition, BSI has 300 digital technicians, and executives plan an aggressive training and recruitment program. "We have a training school in San Antonio, and our intent is to have 2,500 technicians within a year and a half," Solomon said.

How will BSI attract a nationwide pool of technicians? By offering very competitive compensation packages. "We will push the stock options way down in the company. We will share the riches with everyone in the company, which is an opportunity most digital technicians don't usually have," Soloman explained.

Inventory management: cyber-style

There's not just a shortage of digital technicians in cable. With the upgrade pace still steaming ahead, it's critical that cable companies have the equipment they need when they need it. To solve that need, ICS Network Solutions developed an e-commerce supply chain management and fulfillment system. Charter Communications is the first multiple system operator (MSO) to sign up for the service.

With a graphical user interface (GUI), MSOs can enter the details of their upgrade projects such as type of upgrade, number of miles and nodes, aerial or underground, equipment used (such as amplifier model number and vendor), an expected project completion date and so on. The system then automatically generates a bill of materials for that project, shows which equipment is already in ICS warehouses, projects delivery dates for equipment on order, and even allows operators to electronically transfer funds to pay for equipment purchases.

One of the prime benefits of moving materials management to an e-commerce solution is increasing your ability to forecast what equipment you'll need and when you need it, said Michael Sparkman, president and CEO of ICS. The system looks at equipment needs and consumption rates 30, 60 and 90 days out.

"The problem has been shutting off the flow of products. By the time you shut them off, you end up with a warehouse full of obsolete products," explained Sparkman. "There are several checkpoints to indicate if the flow of goods is in balance. For instance, if you've ordered 30 miles of aerial product, we can tell you based on your history, if you're only building 20 mile of plant (in that timeframe)."

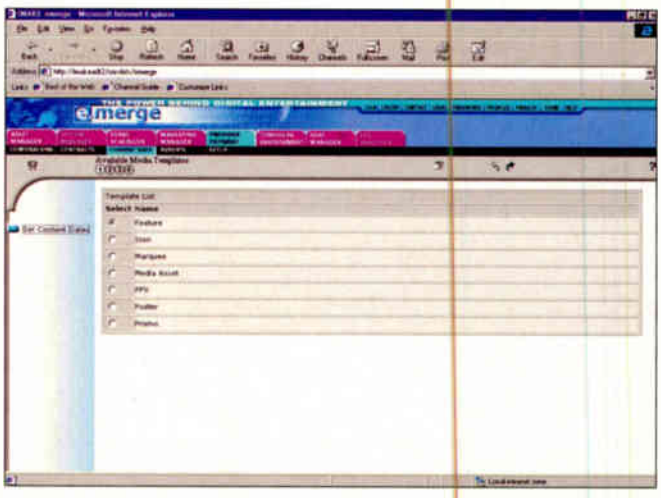
Charter is using the system to manage 150,000 miles of plant upgrades.

IMAKE Tackles Interactive Back Office

By Jennifer Whalen, Editor

So you've just about completed your upgrades, and you're thinking about offering interactive digital services. But what do you do about your back office? IMAKE, recently acquired by 24/7 Media Inc., premiered Version 2.0 of its e.merge support software at the Western Show. The software can help cable operators simplify subscriber and digital asset management and enable them to develop targeted media and advertising packages to generate new revenues.

Version 2 of e.merge is Internet-enabled software that manages the delivery of interactive or broadcast media to subscribers. It features 11 tools that pull from a single database to perform tasks such as scheduling, customer support, billing, marketing, asset management, subscriber management and provisioning.



Version 2 of IMAKE's e.merge support software, which debuted at the Western Cable Show in Los Angeles, is designed to simplify subscriber and digital asset management and develop targeted media.

Users interact with the system via their set-tops. IMAKE used set-tops from Motorola and StellarOne in its demonstration at the show, as well as a video server from SGI and Oracle's video server software.

Improvements to e.merge include changing the programming from Java and C++ to hypertext markup language (HTML), said Nancy Simon, IMAKE's senior marketing manager. "It's now 99 percent HTML, so it's Internet-enabled. This gives you global accessibility. It's also much faster. Java is extremely slow."

IMAKE has added new tools to e.merge. One enhancement is the Provider Payment tool, which performs contract management. "It takes care of real-time billing of advertising, allowing for different rates for usage and flat-rate promotions," explained Simon. "It supports complicated distribution and pay-out schemes, manages complex contracts from multiple organizations, keeps track of the dates when something can be shown and when it expires, and validates the contract terms against actual usage."

Version 2 also supports delivery of targeted advertising. The system interfaces with the set-top to collect data on Web pages viewed and matches that with data in the subscriber profile to determine which ads to stream to the subscriber or Web site in real time.

In addition, e.merge features an electronic program guide (EPG) analyzer that performs real-time editing of EPG feeds. "It assembles EPG feeds from different providers like TV Guide, pay-per-view (PPV) and NVOD (near video-on-demand) offerings," said Simon. "It automatically cleans them or alerts you to overlaps or gaps that you need to fix." Should the programming schedule slip because of a sporting event that runs long, the analyzer is designed to enable the operator to edit the guides in real time and make changes.

The software will operate on Mac, Windows NT and Solaris servers, Simon said.

Digitrans brings something new to DigiCipher®.

Choice.

When it comes to receiving and decrypting digital satellite programming, the options are limited. While the North American standard may be DigiCipher, existing equipment choices have been limited to a single engineering perspective. Until now.

A new perspective

Digitrans, a company fluent in DigiCipher, introduces the first fully licensed alternative for decrypting DigiCipher II satellite programming while providing seamless operation with your existing headend infrastructure. It's the DTE-7100 IRD.

The choice is yours

Now you have alternatives for decrypting DigiCipher II programming and new possibilities for your broadband network. For more information on the DTE-7100 IRD, call Digitrans at 1-800-756-3147 or visit our web site: www.digitrans.com.

DIGITRANS
DIGITAL TRANSMISSION EQUIPMENT

Fluent in DigiCipher®.

15302 Bolsa Chica Street, Huntington Beach, CA 92649 • Phone: (714) 890-8544 • (800) 756-3147 • Fax: (714) 891-2103

www.digitrans.com

StreamPort Sets Sights on Digital Transmission and Measurement Market

By Doug Larson, Senior Editor

Every year, the Western Show provides a forum for newcomers to introduce themselves to the industry. This year was no different. While StreamPort's President and Chief Executive Officer Jim Boeddeker is no stranger—his starring roles include stints at Raychem Corp. and Tektronix—his new company hasn't even celebrated its second birthday.

"In the last 18 months, we've been operating fairly quietly as an OEM (original equipment manufacturer) supplier," said Boeddeker at the company's press conference. "The mission now is to emerge beyond that and to become a recognized technology and market leader in our own right."

The company's two product announcements are the first in a planned series of releases to help the company achieve that mission. The first product is the ruggedized StreamPak T2000 next-generation handheld measurement platform, which was developed in partnership with Italian vendor Telsey.

"The beauty of the instrument ... is that we have this designed in a modular format so you can easily change the technology that you measure by changing the technology module," said Boeddeker.

StreamPak's modules initially will measure quadrature amplitude modulation (QAM) digital TV (DTV) signal streams via the T2020 and T2021 modules, but the company has plans to release additional modules to address Moving Pictures Expert Group (MPEG) quality, cable modem testing, satellite and enhanced analog measurement.

Current in-service automated measurements include signal levels, adjacent channel levels, modulation error rate (MER), estimated noise margin, error vector magnitude (EVM) and bit error rate (BER) before and after forward error correction (FEC).

Boeddeker says StreamPak, which will be sold through ANTEC TeleWire Supply, will be priced under $4,000 to remain competitive with other products on the market.

The second announcement is the company's StreamLink "no new wires" DTV distribution system, which can transmit up to 41 Mbps of DTV over twisted-pair at up to 1,000 feet.

"We take a standard digital stream, whether it's satellite or cable, and we actually remodulate it using some proprietary technology; and we create a link (that) will travel right over the top of your POTS (plain old telephone service) wires," said Boeddeker. "So, you can have telephone, fax, ISDN (integrated services digital network) services running over this line, and we overlay this new technology right over the top, and ... it eliminates the need to put coax in or to upgrade the coax that's already there today."

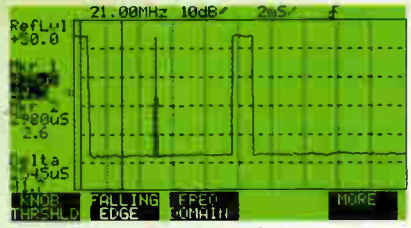
StreamPort is targeting the application at the multiple dwelling unit (MDU) market and will price the product in the $400-per-subscriber range.

NEWS BITES

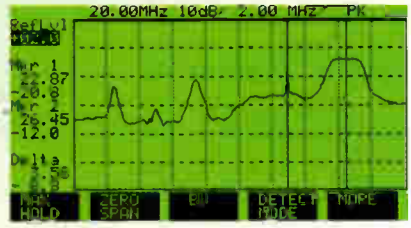
- WorldGate Communications' proxy-based Internet TV solution will port to OpenTV's interactive operating platform later this year. The deal will bring Internet access and e-mail capability to millions of OpenTV enabled digital set-top boxes. Worldgate's Ultra-Thin Client network allows cable operators to concentrate the majority of computing power at the headend.
- Cox Digital Telephone has surpassed the 100,000-customer mark. The phone service is available in Orange County, Calif.; Omaha, Neb.; San Diego; Phoenix; Oklahoma City; Hampton Roads, Va.; and Hartford, Conn. Nearly 50 percent of customers buy more than one line from Cox, and 80 percent subscribe to Cox Long Distance.
- SeaChange International has acquired Digital Video Arts, Ltd. Both companies sell custom set-top software. They had recently begun integrating SeaChange's video server-based Interactive Television System (ITV) with the Digital Video Arts Video-On-Demand (VOD) application. Digital Video retains its name and operations in Dresher, Pa. CT

GET A RETURN ON YOUR DIGITAL TEST INVESTMENT

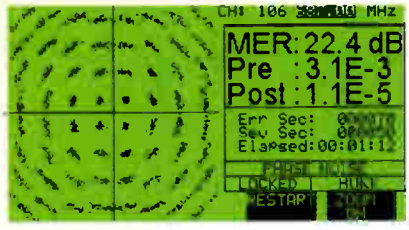
Digital QAM and Return Testing in One Instrument



Fast Zero Span Mode for accurate measurement of return path modem signals.



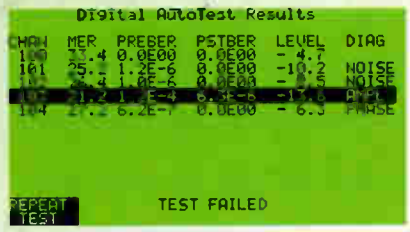
Fast, full function 5-860 MHz Spectrum Mode for tracking down ingress.



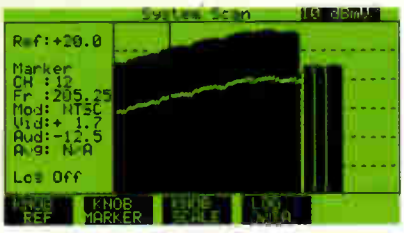
64 and 256 QAM Measurements with Hukk's exclusive Automatic Constellation Diagnosis*.

Introducing The New Hukk

CR1200R Digital Signal Analyzer with return path testing



Auto Test automatically checks all of your digital channels and diagnoses any problems.



Full functioned Analog and Digital Signal Level Meter eliminates the need for a second instrument.

Accurate digital power reading over any bandwidth without correction factors.

See for yourself how the new Hukk CR1200R can solve all of your digital and return path testing problems at a price you would expect to pay for digital only testing. Call for a demo in your system today. You'll see why Hukk Engineering is the leader in digital cable testing.

3250-D Peachtree Corners Circle
Norcross GA 30092
Phone: 888.236.8948
770.446.6086
Fax: 770.446.6850
www.hukk.com

Hukk ENGINEERING

A Sunrise Telecom Company

*Patent pending

On-line seminars on digital and return path testing - www.hukk.com

By Jonathan Tombes

Threatening a Giant Over Service: A Municipality Enters the Broadband Fray

In its CableBridge subscriber management system, Enhanced Telecommunications Inc. has provided the City of Thomasville, Ga., with an accurate service weapon—a sort of back-office slingshot with which to challenge broadband Goliath AT&T.

Explaining why Thomasville got into the cable business, the city's information systems manager Don Atkinson said, "One of the things was that our local provider (AT&T) had continual cost increases without really increasing services."

Already an Internet service provider (ISP) itself, Thomasville put in a broadband solution including a new headend and more than 200 miles of hybrid fiber/coax (HFC) plant that allowed the city to offer high-speed Internet and TV service over cable modems.

Flexibility and control

"In the television portion of our service," said Atkinson, "we wanted to offer a great deal of flexibility that was controlled by the customer." CableBridge allows for both customer control and remote service enhancement or diagnostic checks on the operator side. "Every tap to the customer is addressable in this system," he said.

CableBridge enabled Thomasville to offer flexibility and control that, Atkinson said, "the other provider in our community could not or does not provide." It also allowed Thomasville to consolidate the billing of all city services. "A lot of people love the option of single billing so they can pay it at one time," said Atkinson. "Others like to stagger their payments."

Operators may see convergent billing—with its attendant "sticker shock"—as a double-edged sword. But ETI chief Peter M. Pifer said from the operator's side it clearly is a cost-cutter. "If it costs you 80 cents to send out a bill and if you've got 100,000 subscribers, you're talking close to $1 million a year."

Former president of Massachusetts-based Microwave Associates and previously an engineer with Scientific-Atlanta, Pifer said that Thomasville "is one of a dozen systems using ETI's CableBridge product for convergent billing."

Service integration

A stand-alone UNIX-based computer system, CableBridge is designed to help providers of telephone and utility services that are expanding into cable TV solve the problem of service integration. Such operators already are maintaining customer accounts, assigning prices to different services, processing payments and managing technician work.

CableBridge enables the operator to perform additional cable TV functions such as managing the inventory of addressable devices, defining pay-per-view (PPV) schedules, processing PPV orders, and providing on-line transactions to an addressable systems controller such as S-A's System Manager, Blonder-Tongue's Video-Central or ETI's City Manager.

"The way the system is configured," said Atkinson, "we perform the function to install the service, just like any other service. Turning on HBO is no different than some of the other things we do with the other usual services like electric, gas and water; except in this set of services, the action from the time the customer rep goes into the utility billing system is immediate."

Atkinson said his competitor's subs "would have to wait potentially one to three days before they got that service."

> "If it costs you 80 cents to send out a bill and if you've got 100,000 subscribers, you're talking close to $1 million a year."
>
> —Peter M. Pifer, ETI

The road ahead

Over the past three months, the City of Thomasville has enrolled 1,000 subscribers in a market of about 9,000 and is aiming for another 4,000. Its success so far suggests that amidst technological convergence and mega-mergers, the fight over service continues. Keep your eyes peeled for plucky contenders such as the City of Thomasville and ETI. CT

Jonathan Tombes is deployment editor for "Communications Technology." He can be reached via e-mail at jtombes@phillips.com.

New!
AVAILABLE NOW!

DOCSIS Cable Modem

Features:

DOCSIS Certified

•

Up to 40Mbps Downstream and 10Mbps Upstream

•

Support for up to 16 PCs

•

SNMP Support

•

Self-Installation Wizard Software

•

Advanced Diagnostics

•

Front Panel Display with Diagnostic LEDs

•

Software Field Upgradable

•

Low Power Consumption at Less than 8 watts

http://internet.toshiba.com
cablesales@networks.toshiba.com
949.461.4840

In Touch with Tomorrow
TOSHIBA

CL CableLabs CERTIFIED

DOCSIS Certified! Toshiba has now made DOCSIS certification a reality. No longer do you have to settle for a 'DOCSIS-compliant' cable modem when you can have the 'real thing'.

Toshiba's DOCSIS Cable Modem has been certified by CableLabs to meet the rigorous interoperability requirements of the DOCSIS standard. It also offers many advanced features designed to make installation and support easier and less expensive, e.g., self-installation software wizard, advanced diagnostics, and fast provisioning just to name a few.

Dare to Compare. We challenge you. Take a hands-on test drive and discover for yourself how well the Toshiba DOCSIS Cable Modem performs. Speed, ease of installation, interoperability, supportability... feature for feature the Toshiba DOCSIS Cable Modem delivers the goods and is available now.

Don't Delay! Give us a call and we'll arrange a personal test drive with the 'real thing', a Toshiba DOCSIS Cable Modem.

But we have to warn you... you won't want to settle for less.

Get Your 2000 Award Nominations In

The Society of Cable Telecommunications Engineers is dedicated to recognizing excellence in the cable telecommunications industry through its distinguished Awards Program and is now accepting nominations for its spring 2000 awards.

Keith Hayes (left) presents the 1999 Member of the Year Award to Antonio Huerta at Expo '99.

The honors are bestowed upon deserving individuals and companies based upon specific criteria. All recipients will be recognized at the Annual Awards Luncheon at Cable-Tec Expo 2000 in Las Vegas. Spring 2000 award opportunities include:

- The Member of the Year Award recognizes an SCTE member who has made the most significant contributions to the Society through active participation in its programs and efforts during the past year. Anyone can be nominated. Deadline is March 1.
- SCTE inducts members who have made extraordinary contributions to the professional development of the Society and the broadband industry into its Hall of Fame. Deadline is March 1.
- The Field Operations Award recognizes the efforts of individuals who develop or improve a tool or procedure that enhances the work performed by installers, technicians and linemen. Deadline is March 1.
- Designed to identify and acknowledge the achievements of individuals within the cable technical community who have demonstrated significant personal and professional growth, the Personal Achievement Award is open to any active SCTE member. Deadline is March 15.
- The Safety Recognition Award is based on a company's Occupational Safety and Health Administration rating as determined from the OSHA 200 log. It has three tiers of award recognition—one for multiple system operators (MSOs); one for contractors; and one for systems, regions or divisions. Deadline is May 1.

Also in the offing are the 2000 Chapter Awards, including Chapter of the Year, Leadership Circle and Towering Acheivement. The deadline for nominations is Feb. 15. All SCTE members are encouraged to submit entries for their chapters and meeting groups. Nominators should submit a letter, not to exceed four pages, giving specific details to support the nomination.

For more eligibility and application information on the Spring 2000 Awards, contact the SCTE Membership Services Department at (800) 542-5040 or e-mail membership@scte.org. Information and nomination forms also are online at www.scte.org.

For more application information or Chapter Awards, contact Lilibet Coe at (610) 363-6888, ext. 227, e-mail lcoe@scte.org or visit the SCTE Web site at www.scte.org.

Candidates Line up for 2000 Board

Here's your chance to get involved. SCTE has lined up the nominees for its 2000-2001 Board of Directors election, with the following individuals vying for open board seats for the 2000-2001 term:

- Region 3: Eric Brownell, AT&T BIS
- Region 4: Henry Ciccone, Mastec North America; M.J. Jackson, Alcoa Fujikura; William Karnes, ISC Datacom
- Region 5: Steven Dyche, St. Joseph Cablevision; Brian Hemmings, Thomas & Betts; Percy Kirk, Multimedia Cablevision
- Region 7: Jim Kuhns, Terayon Communications
- Region 8: Don Shackelford, Time Warner Cable; Steve Christopher, Thomas & Betts
- Region 10: Wes Burton, MediaOne; Max Henry, Time Warner Cable
- Region 12: Walt Ciciora, EnCamera Sciences; Bob Foote, TeleWire Supply
- At-Large: Ron Hranac, High Speed Access; Anthony Werner, AT&T BIS

The primary function of the board is to provide direction for the Society. The board determines the Society's long-term planning, looks at where the organization is and charts the course for its future. "Our purpose is to give the membership a voice within the Society," stated 1999-2000 Chairman Jim Kuhns.

Election packages containing the ballots were mailed to all SCTE active members in mid-January. Ballots must be postmarked by March 15 and returned to the Society's accounting firm no later than March 28; results will be announced in mid-April. Newly elected directors will take office at Cable-Tec Expo 2000 to be held June 5-8 in Las Vegas. CT

DX
ANTENNA

It Can Receive Satellite Signals In A Microsecond.

Sending It To You, However, Takes A Full Day.

The DIR-777
DigiCipher® II Digital Satellite Receiver

INTRODUCING DX COMMUNICATIONS QUIKSHIP DIGITAL SOLUTIONS. ORDERED TODAY. DELIVERED TOMORROW.

For years, you've trusted DX for the finest satellite reception products and we've always delivered. Now, with the introduction of our first digital line, DX provides a comprehensive, one-stop solution for all your analog AND digital needs. The DIR-777 represents a powerful addition to your headend configuration— the next generation in a long line of breakthrough products from DX, the world's leading supplier of CATV delivery products. For pricing and vital statistics, call DX Communications now. DX Communications, at the leading edge in digital reception.

DX Communications: 1520 S. Powerline Rd., Ste. F, Deerfield Beach, Florida 33442 (888) 293-5856

DX Communications is a Division of Itochu Cable Services Inc.

By Ron Hranac

Internet Security: High-Speed Peace of Mind

"Welcome to the world of high-speed Internet access," you tell your new cable modem customer, "and by the way, here are a few of the potential risks associated with being online."

What? You don't include that last part? You ought to—not as a scare tactic, but as good common-sense advice. The Internet's advantages far outweigh its disadvantages, but there are folks out there who may try to do anything from some harmless snooping on your computer's hard drive—think of it as turning the doorknob to see if it's locked—to doing actual harm.

The always-on nature of a high-speed cable modem Internet connection easily lends itself to security abuse. Under the Data Over Cable Service Interface Specification (DOCSIS) standard, user data privacy across a cable network is achieved by encrypting customers' data traffic flow. But this doesn't necessarily guarantee security once you've entered the realm of the Internet.

Not to worry. Here are some preventive measures that you and your customers can take to minimize security problems.

Warning: file and print sharing

As a first step, anyone using an always-on connection ought to turn off Windows file and print sharing. An always-on connection, be it cable modem or digital subscriber line (DSL) modem, in conjunction with active file and print sharing functions, is an open invitation for someone to try to dig through your files and maybe even cause damage.

To turn off these functions, you need to go to the Windows control panel, which can be found by clicking Start | Settings | Control Panel. When you've reached Control Panel, double-click Network. Look for the File and Print Sharing button, and click it once. A File and Print Sharing dialogue box will appear. In it you'll find two items that, unless changed previously, will have check marks beside them. One is "I want to be able to give others access to my files," and the other is, "I want to be able to allow others to print to my printer(s)." Uncheck both of these by clicking on the respective boxes. Click OK to close this dialogue box. Then click OK to close the Network window. Close the Control Panel.

Internet Security "to do" List:

- Turn off Windows file and print sharing.
- Purchase, install and use a regularly updated anti-virus program.
- Download and install security patches for Windows and your Internet browser.
- Set your browser to accept only signed downloads.
- Purchase personal firewall and intrusion detection software packages.

Anti-virus defense

These days, it's all too easy to get a computer virus. Many viruses are just plain annoying, but others will do serious file or data damage. Viruses may come as an attachment to an e-mail message, located on a floppy disk given to you by someone else, or hidden in an application or related file as a macro.

Before you ask the question, "Do you really know anyone who has been the victim of a computer virus?" let me state right here that I have. One of the most recent examples was unknowingly included as a macro with someone's résumé. (The sender was rather embarrassed.) Thank goodness I have and use an anti-virus program. It identified the virus and took care of it.

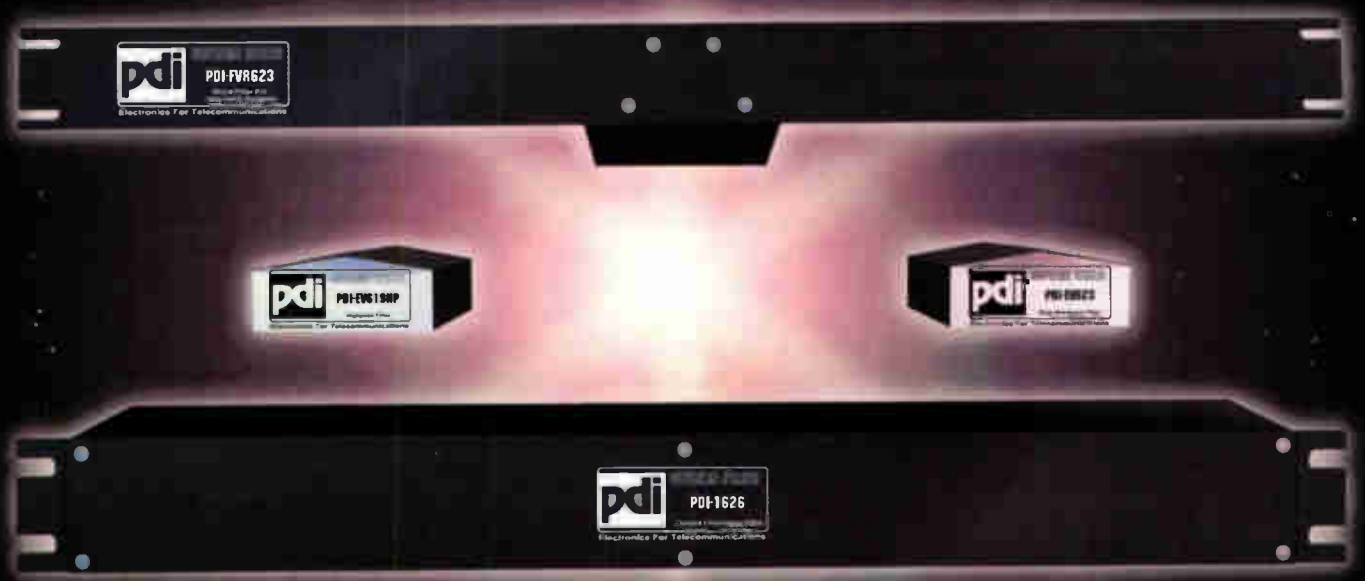
My favorite program is Symantec's Norton AntiVirus. About every two weeks or so, I use Norton's LiveUpdate feature, which downloads the latest virus definitions from Symantec's Web site. I use Norton AntiVirus to scan my computer's hard drive weekly and have the program's defaults set to allow continuous background monitoring. Heed this advice: Check every e-mail attachment with your anti-virus program before opening it.

Security patches

Before downloading and installing security patches for Windows and your Internet browser, make certain you are using the latest versions of Windows 95 or 98 and your favorite browser. Next, keep those versions up-to-date by regularly downloading software updates and security patches. With regard to Windows 95, Windows 98 and Internet Explorer, Microsoft does a good job of posting security and other patches on its Web site. These patches update the respective programs and are available free of charge. I download a patch about once a month or whenever new ones are available.

If you've encountered patches, you'll be in for a surprise. There will be a ton of upgrades you need to download and install. Figure on some serious download time, depending on your Internet connection speed. Some updates must be

PDI's
CUSTOM FILTERS



Why Buy PDI Filters?

- **PDI Custom Builds To Meet Your Requirements**
  PDI can build a filter for almost any application at a cost far less than what you would expect. All of our filters are built in the USA.
- **We Will Provide An Evaluation Unit In A Few Days**
  PDI engineers will work with you until you get exactly what you want.
- **Orders Are Filled In Weeks Not Months**
  PDI can fill large orders in just a matter of weeks. In many cases we can get you your units in a week or less.
- **You Can Expect Superior Performance**
  PDI engineers custom build your filters, individually testing each unit to comfortably meet all specifications.
- **Used By MSO's Worldwide**
  Over the past six years PDI has built custom filters and tier traps for the majority of top MSO's.

We Manufacture:

- channel deletion filters
- brick walls
- highpass filters
- lowpass filters
- wide bandpass filters
- band rejection filters
- general bandpass filters
- highly selective bandpass filters
- noise filters for fiber optic system
- split band filters for fiber optic systems
- pilot carrier traps
- fm narrow bandpass filters
- higher performance diplex filter networks
- custom tier traps

6353 West Rogers Circle • Bay 6 • Boca Raton, Florida 33487 • 561.998.0600 • Fax 561.998.0608 • 1.800.242.1606

downloaded and installed separately, which means you'll have to go back for the other updates. Still, it's worth it from the perspective of simple peace of mind. Here's how to do it.

See http://windowsupdate.microsoft.com and click PRODUCT UPDATES. (If you use Windows 98, click Start | Windows Update, which will take you directly to the Web site). An onscreen window will appear that says: "Please wait... Windows Update is customizing the product updates catalog for your computer. This is done without sending any information to Microsoft." This process checks your computer's version of Windows and Internet Explorer to see what updates and patches are necessary. Four categories of updates will appear in the subsequent list: Critical Updates, Picks of the Month, Recommended Updates and Additional Windows Features. At a minimum, I recommend that you download those under Critical Updates.

Choose the desired updates, then click Download. This will get you a Download Checklist, where you can confirm your selections, view instructions (I generally skip the instructions), and start the download. Click Start Download. A window will appear that contains Microsoft's license agreement for the updates. To accept, click Yes, and the download will begin. After the download is complete, installation will begin. In most cases, you will have to restart Windows to finish the installations. Just follow the prompts.

If you use Netscape Navigator, go to Netscape's Web site at www.netscape.com. Click Download, and you'll be taken to a page that summarizes various available updates, including the latest version of Navigator if you're not already using it.

Browsers

Without going into details, let me suggest setting your browser to accept only signed downloads. Be sure to examine the digital certificates of all downloads. Check your browser's manual or help files for more information.

Personal firewalls

If you have a computer at the office and it's connected to a local area network (LAN), the odds are pretty good that your company has installed a dedicated firewall to provide appropriate network protection. Commercial hardware-based firewalls usually are impractical and too expensive for the home environment, but a solution that's almost as good is software firewalls, sometimes called personal firewalls.

Personal firewalls prevent most outside attacks, including Back Orifice, denial of service and cyber stalkers. One package that has received favorable reviews is AtGuard, which was recently licensed to Symantec Corp. and ASCII Network Technology. No longer available from the original developer, AtGuard will be offered as part of Norton Internet Security 2000.

Another personal firewall software package, ConSeal Private Desktop for Windows 95/98, is available for $49.95. More information can be found at www.signal9.com.

Intrusion detection

Commercial software is available that will bring even more peace of mind. For instance, you might want to consider intrusion detection, identification and protection software such as BlackICE Defender. This package is available direct for $39.95 from www.networkice.com. With this software, you choose a level of security protection from the list of Paranoid, Nervous, Cautious and Trusting. The program does the rest. It's not a firewall per se, but it does dynamically adjust the degree of your computer's security while it watches for attacks and intrusions, then blocks access from the intruder's Internet protocol (IP) address.

There you have it. Follow the recommendations in this month's column, and you can rest a little easier with that always-on Internet connection. There certainly are other measures available for additional protection, but those outlined here will be a good start and should provide the most practical protection. Happy surfing! CT

Ron Hranac is vice president of RF engineering for Denver-based High Speed Access Corp. He also is senior technical editor for "Communications Technology." He can be reached via e-mail at rhranac@aol.com.

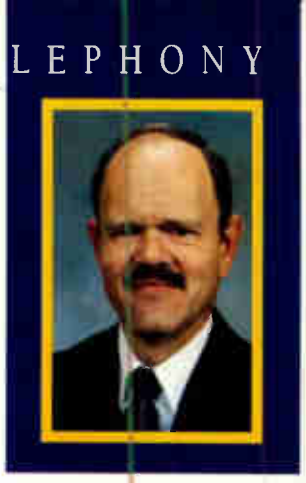
IN THE VOD BUSINESS, A 4 YEAR OLD'S THE EXPERT

4 years of field experience set DIVA apart from every other VOD supplier. We've worked with 8 MSOs to deploy video-on-demand and have learned from the most demanding critics: paying customers. What's in it for you? Field-proven hardware, software, and services optimized across multiple plant configurations, set-top boxes, and billing systems. And that should make your choice of VOD suppliers... child's play. For more information call 650.779.3111.

DIVA

The Leader in VOD Solutions

By Justin J. Junkus



Carrier-Grade Criteria For Powering Systems

"Carrier grade" has been given a lot of play in Internet protocol (IP) telephony publications. Like every other buzzword, this term has been misapplied and misused. It's easy to fall into the trap of thinking that you understand the meaning of carrier grade and other IP telephony buzzwords and perhaps add some connotations of your own in the process.

Throughout this year, a number of these columns will discuss components I believe are necessary in a cable system to provide carrier-grade cable telephony. I will be looking at what is included in each of the components that makes it carrier grade and what the implications are for maintenance personnel. The majority of this column will look at backup system powering, a critical element if a system is to be called carrier grade.

"Five nines" reliability

First, a clarification. Vendors can truthfully claim a system component is carrier grade even though in your application it does not provide carrier-grade service. Perhaps the best examples are IP telephony gateway products.

Many vendors are modifying network-side gateways they have developed for interexchange carriers (IXCs) to provide access gateway functions. While their network products can legitimately be called carrier grade, their access adaptations often fall short of providing the functionality that a consumer expects from network-quality telephone service.

The reason is that network gateways differ functionally from access gateways.

In telephony power systems, the key attribute for carrier grade is "five nines" of reliability; in other words, power must be available 99.999 percent of the time. Commercial AC alone cannot provide that guarantee, so backup power is critical.

The reason goes back to the need for "lifeline" service. Even in a world pervaded by ".com," when a customer needs rapid communications in an emergency, he usually grabs the phone.

Many operators, however, gained initial experience with backup power when they began offering high-speed data service. In this case, competition, rather than a need for lifeline service, was the driving force.

Batteries first

The telephone industry achieves high reliability for power systems by setting eight hours of standby power as the standard. Typically, there are two sources of power in each backup system: storage batteries, and an engine-alternator or engine-generator combination. In telephone systems, AC alternators are common because of legacy design; cable systems are more likely to use DC generators.

To keep it simple, we will refer to the combination of engine-energy source in the rest of this column as engine-generator. The fuel source for the engine often is natural gas, although other fuels, such as propane, also may be used when a natural gas feed is not available.

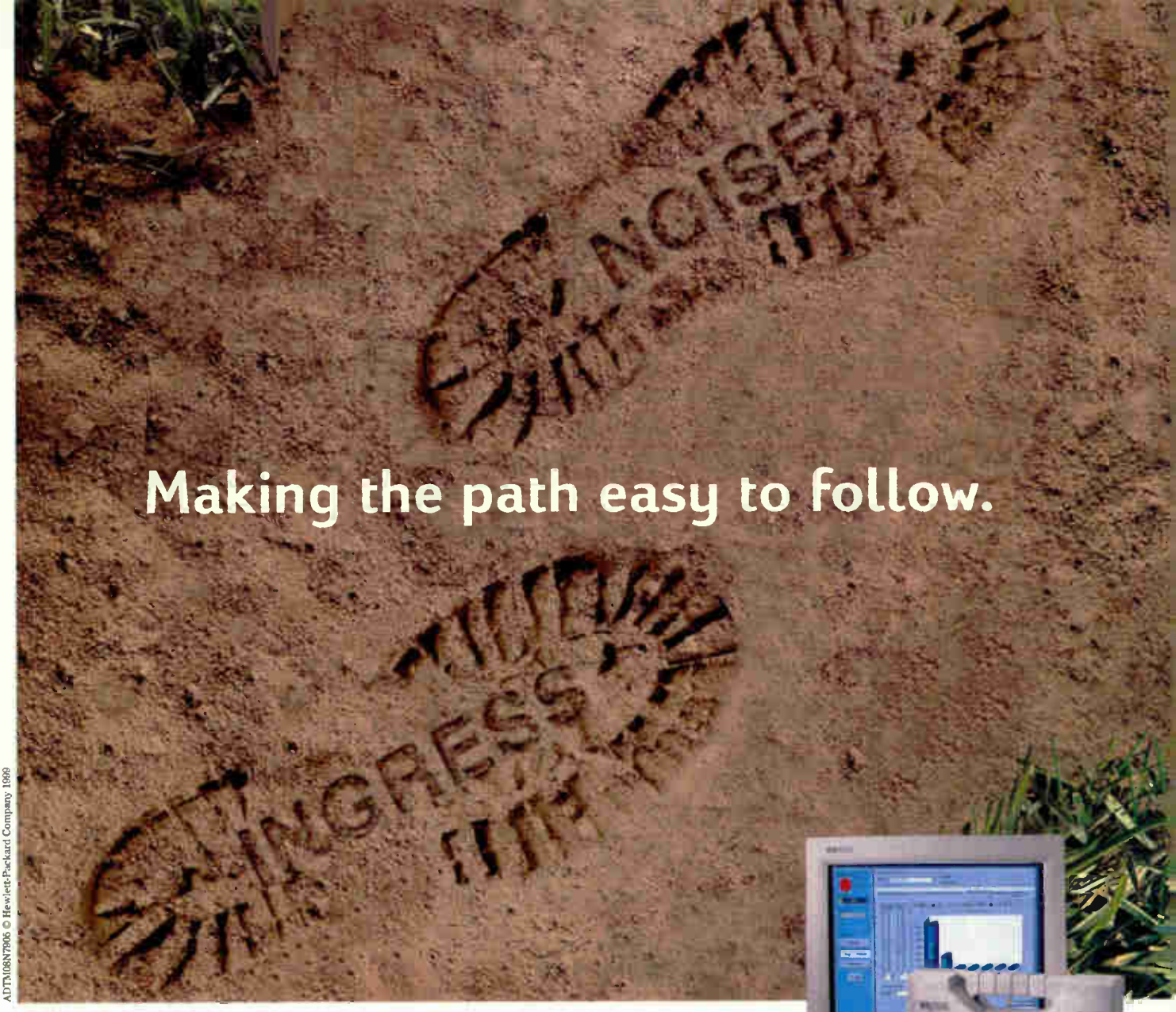
The batteries are the first source of backup power, typically sized to provide one to two hours of capacity for a given plant. After that time, the engine-generator takes over. The engine-generator also will be used if the battery voltage drops below the level needed to maintain acceptable current flows. For cable systems where decentralized power nodes are common, a typical backup system carries a power rating of 3 kW. There are two reasons why batteries are the first backup. The first is that generators or alternators have startup cycle times, which would cause a break in power. The second is that starting and stopping the generator for short power outages would cause excessive wear to both the engine-generator and its starting battery.

As a point of interest, most power outages are substantially shorter than two hours, so the batteries are the real workhorses of backup power systems. Of course, they are recharged from commercial power as soon as power is restored.

> "The telephone industry achieves high reliability for power systems by setting eight hours of standby power as the standard."

Engine-generator maintenance

This order of using the backup resources has implications for the maintenance staff. Given that the engine-generator will (one hopes) be rarely needed, it must be periodically cycled—started, run and turned off—to ensure that it remains in working order. ➤



Making the path easy to follow.

Now with return path monitoring for return path characterization.

Ingress is elusive. Yet time is short. HPs rugged, portable CaLan™ 3010R sweep/ingress analyzer displays ingress problems in the field. The CaLan 3010H detects, measures and reports on ingress at the head-end.

Use CaLan for high resolution forward and return sweep. Measure 60 channels in less than one second and accurately measure digital and bursted (TDMA) power.

HP accessCable™ adds return path monitoring to measure spectral power and record maximum, minimum and average power. Count burst events and identify their duration. Or use *Smart Scan* to find problems for you. HP accessCable alarms each occurence and reports back meaningful data to track ingress.

CaLan Sweep/Ingress Analyzer

Call 800-452-4844 ext. CATV or visit www.hp.com/go/catv to receive the latest information on tracking ingress.

Agilent Technologies
Innovating the HP Way

Per Tom Sloan of Alpha Technologies, the typical maintenance interval is every 30 days. Usually, the cycling is done automatically, but some monitoring systems allow maintenance personnel to initiate a test cycle remotely.

In addition to providing a way to cycle the engine-generator, remote maintenance systems are a way to monitor critical parameters such as oil levels, operating temperature, speed, load and fuel level. Truck rolls can thus be avoided, except when the parameters fall outside of their limits.

Status monitoring can be performed with traditional cable system transponders or with systems that are part of more encompassing network element managers. These element management systems normally use simple network management protocol (SNMP) as the interface protocol.

Even with remote maintenance, however, some tasks still require a truck roll. Oil changes are necessary for the engine-generator after each 100 hours of operation. Sloan has written a paper indicating that engines operate 44 hours per year under conditions of 95 percent AC availability, and 90 percent of outages are shorter than 10 minutes. Typically, an oil change is needed every other year. Batteries need replacing after about four years.

Modular design and noise level

Apart from the factors that make backup power carrier grade, other features also merit consideration during system design. Jack Brian of Antec points out that a modular design can be convenient if power outputs need to be adjusted when subscriber usage or demographics change. Antec's design separates the transformer from the electronics module that interfaces with backup battery. Although a field changeout of modules still would be needed, old modules can be reused elsewhere.

Another factor, unrelated to carrier-grade rating, is the noise level of the engine-generator. Because many of the backup power units in the field will be located close to residences, noise levels need to be minimal. Sloan's paper indicates that engine-generator combinations need to operate at audible sound levels of 67 dBA, measured at a distance of five feet. He points out that at this level, it often is difficult to detect engine-generator operation above ambient noise, such as a passing automobile.

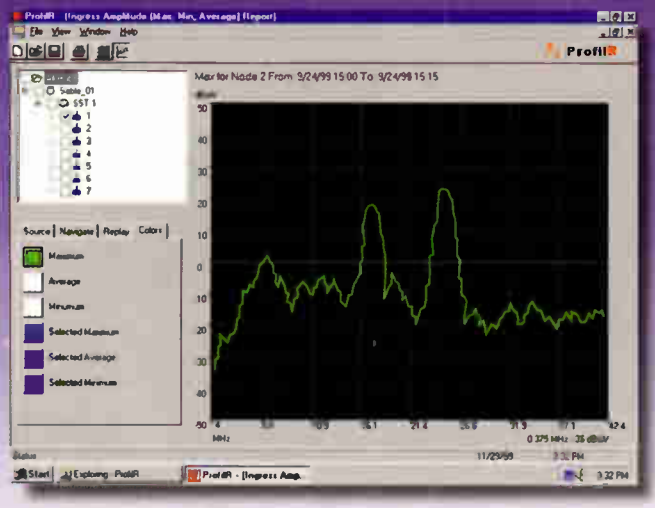
What it all really means

The bottom line is that backup power is necessary for carrier-grade telephony systems. Most of the expense and effort comes at installation because system monitoring can be done remotely.

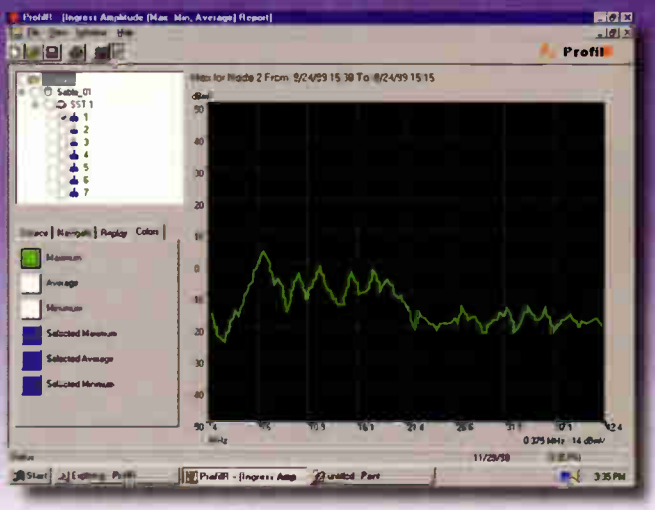
With planning, systems can be designed that require on-site work only every other year. Also with planning, the backup power system will be flexible enough to handle growth and quiet enough to be transparent to your subscribers. CT

Justin Junkus is president of KnowledgeLink, a consulting and training firm specializing in the cable telecommunications industry, and applications engineering director for Antec. To discuss this topic further, you may e-mail him at jjunkus@knowledgelinkinc.com.

Crisis. Management.



Without TraffiControl™, ingress events remain hidden under return traffic



TraffiControl™ measures and plots ingress spectra of bands fully occupied by return traffic

New *TraffiControl*™ lets you see the ingress inside your system's return traffic

TraffiControl™ Now Available On Trilithic's Guardian™ 9580 SST Return Path Analyzer

No doubt about it: where the return path is concerned, ingress is a big problem. Left unchecked, ingress outbreaks can prevent your system from delivering the Internet and other premium services your subscribers have come to expect. It's tough enough now to catch ingress outbreaks and fix them before the phone starts ringing. It'll be even tougher as new services fill your return spectrum, because the majority of ingress will be hidden by the increased return "traffic."

YOU CAN'T BEAT THE SYSTEM

How will you detect ingress when it's hiding in your occupied bandwidths? Fortunately Trilithic, the leader in digital return path maintenance technology, has engineered a solution – a solution that will quite literally change the way you look at ingress. It's called *TraffiControl*™ and it's a new feature of the Trilithic Guardian 9580 SST Return Path Analyzer.

TraffiControl is an advanced Digital Signal Processing (DSP) technology that identifies and removes all the legitimate signals from your scanned return spectrum. What remains is the once elusive ingress spectrum of your entire return band, which the system analyzes against user-set ingress limits. The best part is that *TraffiControl* can be programmed to work automatically. Then, when ingress occurs, the system will tell you about it, giving you time to respond before it causes problems.

TraffiControl is the newest addition to the Trilithic Guardian System, the only fully-integrated, fully-digital family of return path maintenance products on the market. With the addition of *TraffiControl*, the Guardian System takes you from the subscriber, through the distribution system, all the way to the headend for complete ingress detection and, most importantly, resolution.

Call now for the full story on the only automated ingress monitoring system that gives you a real-world picture of your system's return path. It could mean the difference between managing ingress problems or just coping with them.

GUARDIAN™ SYSTEM
Return Path Maintenance Technology

TRILITHIC
The Engineering Guys

Call Now For A Free White Paper (800) 344-2412, (317) 895-3600
(800) 344-2412, (317) 895-3600, (317) 895-3613 (fax), www.trilithic.com

By Jennifer Whalen

OpenCable Rocks Western

Vendors were smiling as Federal Communications Commission Chairman William Kennard toured the Western Show's CableNET display. And they had every right to be happy. Not only did the industry meet the January 2000 deadline for demonstrating interoperable, removable security for set-tops, but any visitor to the show also could see many of those solutions on display in the OpenCable pavilion.

Fourteen companies (see box) gathered at MediaOne's Los Angeles facilities the week before the big show to test their point of deployment (POD) modules, set-tops, integrated TV sets and headends with other vendors' equipment.

"It was controlled madness," said Julius Bagley, Scientific-Atlanta's director of engineering for digital subscriber networks.

You'd be surprise if such tests went off without a hitch, and they didn't. "But the problems were nothing that you wouldn't expect," Bagley said. "The event was about everyone coming to a common interpretation of the specification."

So what were some of the challenges? Bagley noted that there were different interpretations of the use of address lines, bit rates and a few commands. The address lines allow the POD to access the register, explained Bagley, and vendors used the address lines in different ways. "We'll have to agree on a common interpretation, because if you can't read those registers, you can't even get started."

"We've identified which issues to address, and we'll have a set of follow-up meetings to drive agreement down to a common interpretation," Bagley added.

Size matters

It wasn't just interoperability the FCC wanted to see. But the FCC milestones mandated that the POD modules be shown in their correct form factor. S-A and General Instrument both met that milestone. In fact, S-A was happily handing out replicas of its Power Key conditional access module to folks who stopped by the OpenCable pavilion. The POD fits in a Personal Computer Memory Card International Association (PCMCIA) form factor.

In keeping with CableNET's "Outside the Box" theme, attendees could see firsthand that PODs aren't limited to working with set-tops. Microsoft, Philips Semiconductor and SMC Microsystems demonstrated a cable-ready receiver on a personal computer (PC) platform. A front-end demodulator converted the RF cable signal into in-band and out-of band (OOB) digital streams, which were passed to the POD module for filtering and decryption. The POD performed copy protection on the Moving Picture Experts Group (MPEG) multiplex and the service stream, which includes both MPEG service information table and Internet protocol (IP) messages back to the device. Both streams were then passed to the PC platform, which processed the copy-protected multiplexed stream.

In its booth, Mindport, which codeveloped its POD with SMC Microsystems, showed the technology in a smart card format. The smart card can either be issued to a subscriber for use in a set-top or integrated digital TV (DTV) set, or it can be embedded into the PCMCIA form factor, like the traditional POD.

Interop participants

Set-tops/TV sets: General Instrument, LG Electronics, Microsoft, Panasonic, Samsung, Philips, Scientific-Atlanta, Thomson Consumer Electronics, Zenith Electronics
Headends: Divicom, General Instrument, Scientific-Atlanta
POD modules: General Instrument, Mindport/SMC Microsystems, Nagra/SMC Microsystems, Scientific-Atlanta, NDS/SMC Microsystems

Integration

Another unusual fact about the Mindport POD is that the company teamed with Panasonic to show how the technology works with TV sets, although the demo showed a non-form factor prototype.

Meanwhile, at Panasonic's booth, S-A's POD happily operated with Panasonic's integrated DTV set. "It's a significant event that we have an S-A form factor POD working in a consumer electronics device," said Joseph Rodolico, technical marketer for Panasonic. "This is part of our way to solicit feedback and send the message that "Hey, we can do this."

What kind of feedback did Panasonic get? "People love it," Rodolico said. "You don't have to deal with the wired complexity of the set-top. You don't have two remotes, two electronic program guides.... You plug the POD in and you're done."

When will integrated DTV sets hit retail shelves? Few wanted to commit to a time table. "We've no definite plans. We're in the initial stages of defining what the product will be for the industry," Rodolico added. Some issues still to be decided include which models and which screen sizes the market will react to best.

With the cooperative spirit demonstrated by all 14 interop participants, it's clear that the industry will be on track to meet the FCC's July 2000 deadline for removable security. CT

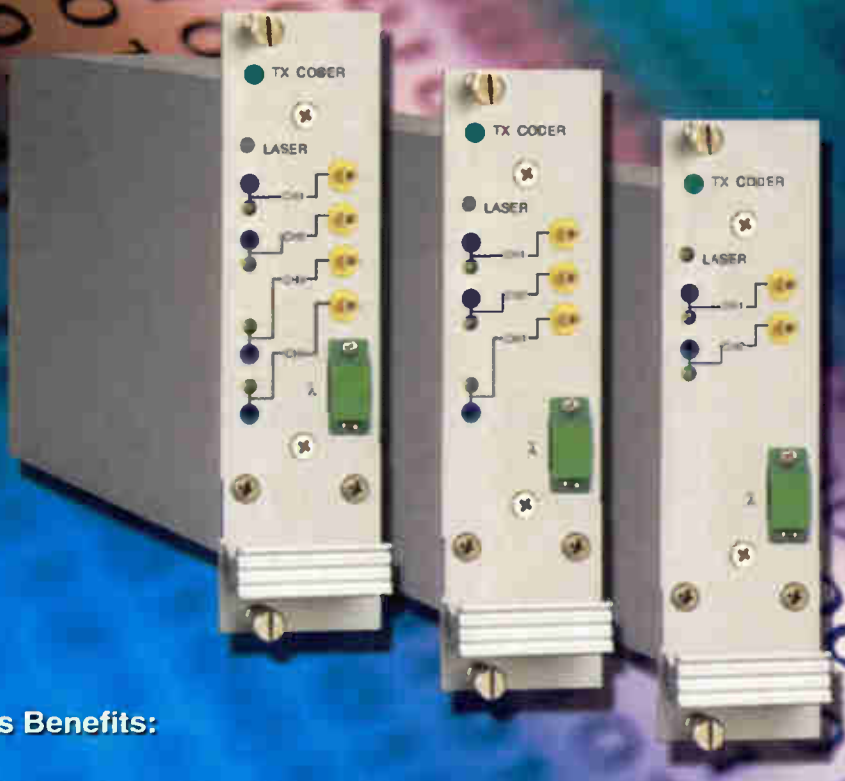
Jennifer Whalen is editor of "Communications Technology." She can be reached via e-mail at jwhalen@phillips.com.

Corvus

DDR - Dynamic Digital Return Path System

with

8, 10 or 12 Bit Sampling



Corvus Benefits:

A total digital solution for maximum return path traffic

Compatible with current HFC architectures

Easily tailored to meet specific requirements for node density and performance levels

Most efficient utilization of fiber assets

Modular and easily expandable without service interruptions

Corvus is a unique and innovative new return path system, developed to provide the highest levels of performance for return signals, while making the most efficient use of fiber assets.

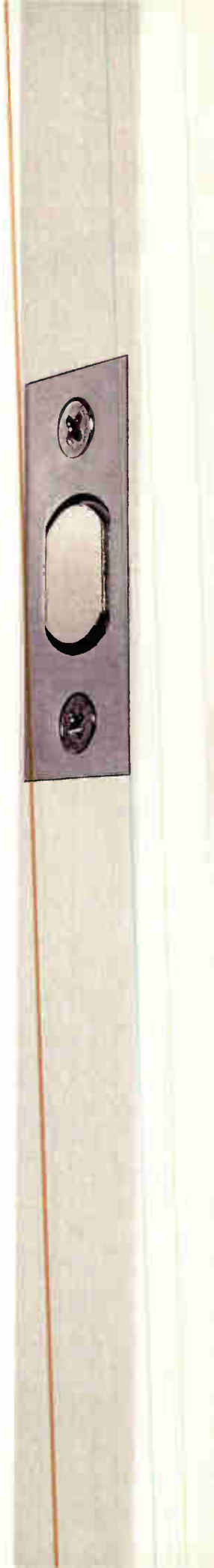
Choice of 8, 10 or 12 Bit sampling allows the return path rate to be matched to the quality required.

Combined with Synchronous 1550 nm DWDM technology, Corvus can transport up to 128 return signals on one optical fiber

Synchronous®

Synchronous Group, Inc.
77 Las Colinas Lane San Jose, CA 95119 USA (800) 659-6750 (408) 362-4800
Fax (408) 362-4826 e-mail sam@syngroup.com http://www.syngroup.com

Unlock
your cable network's full potential.



Lucent Technologies
Bell Labs Innovations

600 Mountain Ave.
Murray Hill, NJ 07974
1-877-534-9182
www.lucent.com/cableconnect

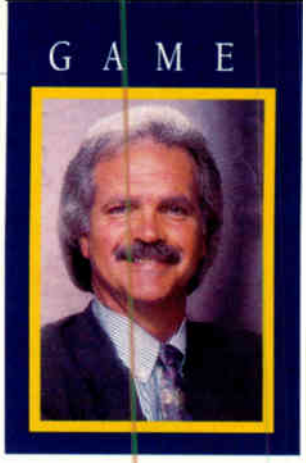
Open the door to new revenues (now!) with Lucent's CableConnect℠ Solutions.

New revenues. New services on one converged network (full-featured telephony, high-speed Internet access, video-on-demand, interactive gaming, much more). New ways to scale up (set your own pace) while protecting your investment. Here's the key: Lucent helps you turn your cable system into a two-way broadband multimedia network. No one knows networks better. That's why no one offers as many choices to fit individual customer needs. We'll provide end-to-end planning and management (as much or as little as you want), even billing and customer care. When you're ready to deploy, so are we (how does today sound?). Give us a call.

We'll hand you the key to your network's future.

We make the things that make communications work.™

By Terry Wright



Dimensions of Invisibility

In my last column (December 1999), I predicted that cyberspace would become increasingly invisible, that many would take it for granted, and that it would become far more secure than we ever imagined. (The concept of an invisible cyberspace emerging is probably more appropriately described as certain aspects of a visible cyberspace fading from our view.)

Security first

Taking cyberspace for granted simply is a byproduct of its invisibility. Unobtrusive security is a key enabler of an invisible cyberspace. Only when the growing community of users becomes comfortable with security will it allow major aspects of cyberspace to become invisible.

From the underlying infrastructure to the produced and consumed content flowing over that infrastructure, from the manufacturers hoping to protect their copyrighted products, to the video-on-demand (VOD) provider ensuring payment for its movies, security isn't just nice—it's necessary.

Security speaks to fundamental service integrity, and any detailed discussion of the topic is best left for another occasion. For present purposes, however, let's assume that sufficient security exists for certain aspects of cyberspace to fade from view.

Just go away

So what aspects of cyberspace will become invisible? The most obvious candidates are the inconveniences—from simple log-on procedures to complex configurations—that we experience when we interact with cyberspace. I doubt any of us would mind if these hassles faded into the ether.

What the heck, let's get even simpler. Do you really enjoy using whatever kind of mouse or pointing device you have? Doesn't it seem kind of backward in our current age of technical marvel to have to point at words or pictures of things? Where, oh where are those voice-activated browsers we've all been so eager to lay hands on? I'll bet you'll be seeing some fairly soon.

How about setting up your new online account? How many times must we type in our e-mail address, telephone number, zip code, interests and so on? This process would be a good candidate for invisibility, too.

"Doesn't it seem kind of backward in our current age of technical marvel to have to point at words or pictures of things?"

Untapped market, slower growth

One reason for making an issue of these inconveniences is that more than 200 million people in the United States have yet to log on to an online service. That number ought to interest those of us delivering online services, especially since in 1999, for the first time, there was a marked decline in the growth of Internet services among fee-paying adults.

Internet services grew 13 percent for the first six months of 1999 vs. almost 60 percent for the same period in 1998. This past year also saw more such adults trying and then abandoning the Internet—9 million in 1999 vs. 3 million in 1998.

This decline in growth is telling us one of two things. Either the Internet has somehow lost a good deal of its value and appeal, or we have exhausted the supply of early adopters and run straight into the rest of the population—that is, just regular ol' nontechnical people.

It is difficult to believe the former because I am personally acquainted with too many of the latter—those who are intimidated by computing or cannot rationalize the time required to get comfortable with "those cumbersome" aspects of it: you know, pointing, clicking and typing cryptic words. It doesn't matter how simple and easy it is. It's a classic example of the perception/reality relation: What really matters is that a majority of the potential users believe it's a hassle.

Internet appliance-generated growth?

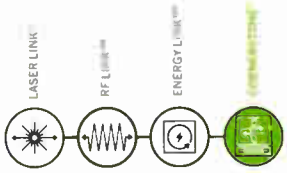
Sure, we all know that these numbers can only improve as all the new Internet appliances find their way into the market. But before these appliances can contribute to the growth of Internet services, someone in an online household, or someone hoping to enable an online household, must purchase them. Besides, any revenues received from focused Internet appliances likely will be limited to the service class upgrade fees users are willing to shell out to accommodate them.

As long as it's Internet protocol (IP)-based, I doubt there is much basis for charging extra money for appliance traffic generated within the home or business (one exception being user-selectable security). And in order to remain viable

TALK

OUR CORNERSTONE® VOICE SOLUTIONS KEEP YOU TALKING, ALL THE WAY TO THE BANK

TOTAL BROADBAND SOLUTIONS
CORNERSTONE® CABLE TELEPHONY PRODUCTS INCLUDE HOST DIGITAL TERMINALS AND VOICE PORTS



Cornerstone. You know the name. It's the most widely deployed cable telephony product in the world. And for good reason. It's got built-in technology that promises to deliver carrier grade service and robustness. Like intelligent frequency hopping. You can't find it anywhere else because only Cornerstone technology from Arris Interactive prevents signals from jumping into noisy return spectrums. And its cable telephony architecture is IP-ready, which will make it simple for you to migrate to IP when the time is right. So go ahead. Make the move into cable telephony. We'll be right by your side, just like we are for all your HFC needs. After all, we're building networks together.

PEOPLE MAKE THE DIFFERENCE

ANTEC

Network Technologies

1-800-FIBER-ME WWW.ANTEC.COM

in the emerging Internet appliance-riddled world, personal computers (PCs) will have to tap into some of the 95 percent of their capacity most of us never use to simplify interacting with cyberspace just to sustain a recognizable market presence.

The bottom line is that I am convinced that plenty of sharp minds are working hard at removing some of the more cumbersome aspects of interacting with cyberspace—that is, adding invisibility.

Invisibility and rules

My point here is to remind you that this process is underway and will shape substantial aspects of cyberspace. The accelerating pace of change may, unfortunately, keep us too busy to notice little things that shouldn't be.

For example, there is a difference between having your own home computer remind you while on the road that tomorrow is your wife's birthday and an advertiser sending a televised digital ad insert to your individual hotel room. There's nothing wrong with the ad itself; it's the advertiser's knowledge you had not yet bought her a birthday gift that gives me the creeps. I don't know about you, but I don't want some company to know that much about my personal life.

We need to be thinking about these issues as the wired world takes form. There are as many subtleties in how cyberspace fades from our view as there are interaction points with cyberspace.

As governments wake up to the revenue-erosion potential of a nontaxed e-commerce economy, change—in the form of imposed rules—is not far behind. Some rules will be good, and some will be shortsighted and look like the work of special interest groups. Which ones become reality is everyone's responsibility.

When you think of what cyberspace could become over the next five or 10 years, it brings a whole new meaning to the phrase "defining moment." Luckily for us, the majority of these defining moments still lie ahead. CT

Terry Wright is chief technology officer in Atlanta-based C-COR.net Corp. He can be reached at (770) 416-9993 or via e-mail at tlwright@convergence.com.

Viewsonics Inc.

Digital Plus Passives

Viewsonics has created the Digital Plus line of passives to meet the increased demands of CATV operators for inter-modulation protection. Along with capacitive protection from transient voltages, the Digital Plus line incorporates improved ferrite design that maintains linear properties in high signal level environments even after suffering a high voltage surge.

Other features include:

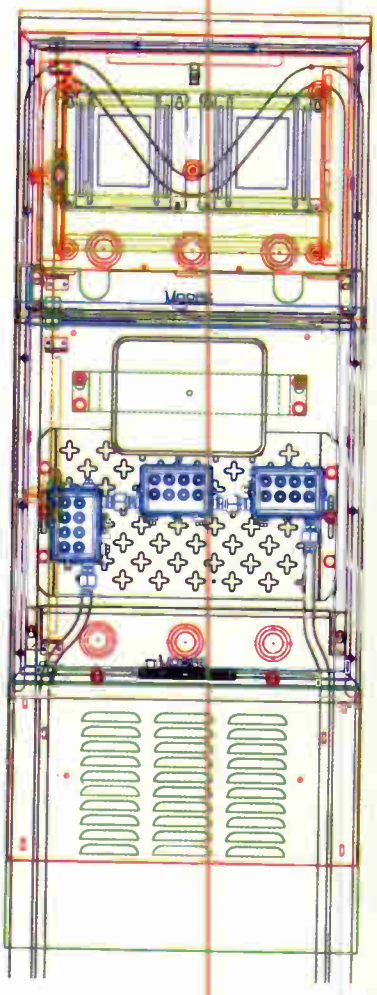
- **Transient Voltage Protection**
- **Inter-modulation Optimized**
- **High Quality Zinc Die Cast Housing**
- **Solder Back RFI Protection**
- **SCTE Type F-ports**
- **Economically Priced**
- **Available in 2, 3, 4, 6, and 8 Way and Various Tap Values**

When you're looking for digital passives that combine durability and flexibility, call Viewsonics at (800) 645-7600 or visit our web site at www.viewsonics.com

3103 N. Andrews Avenue Extension, Pompano Beach, FL. 33064 USA
USA Toll Free: (800) 645-7600 Tel: (954) 971-VIEW (8439)
Fax: (954) 971-4422
Email: viewson@viewsonics.com Web: www.viewsonics.com

Combined Services MDU Security Enclosures

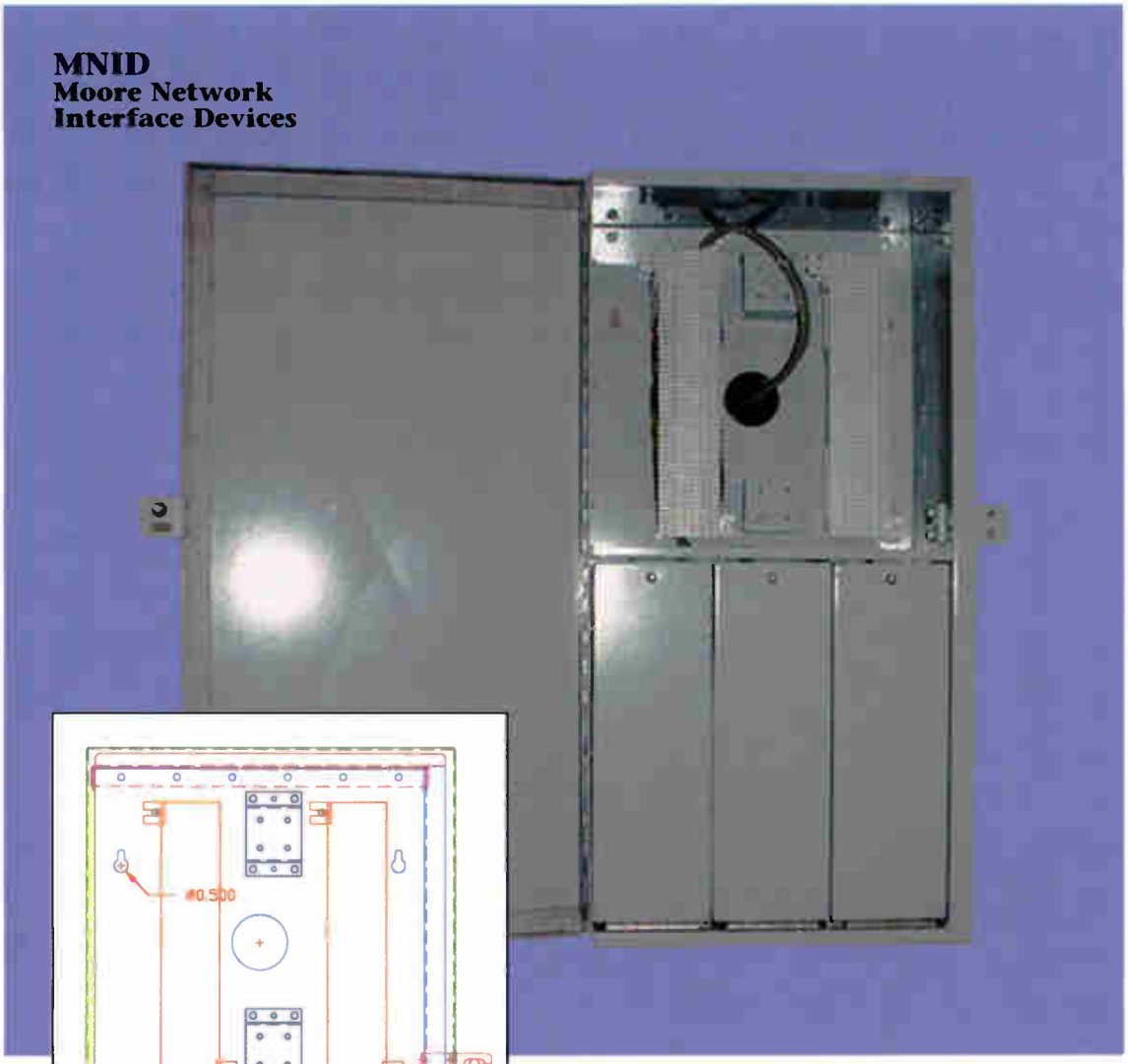
MVT-1527
Moore Video
Telephone Enclosure

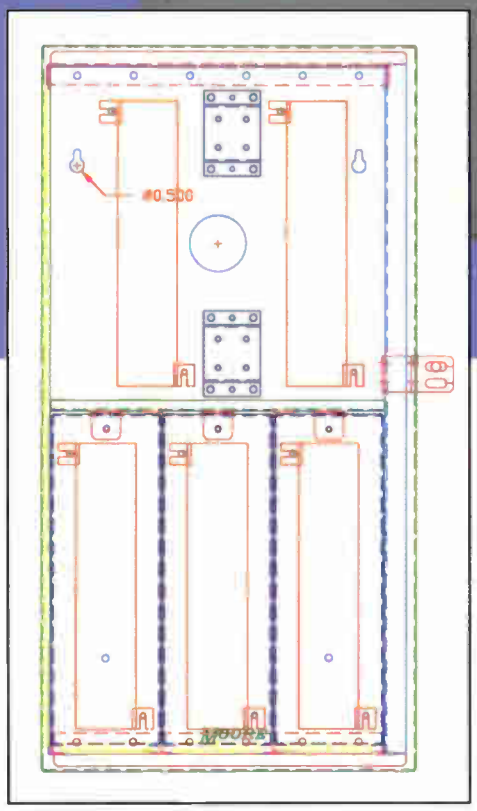


Moore Apartment Boxes For Telephone And Video Service

- Secure enclosures for video, voice and internet terminal gear
- Optimized for technician access to multiple functions
- Tailored for your MDU service plan
- Moore quality assures security and durability
- Built to comply with applicable sections of GR-487-CORE

MNID
Moore Network
Interface Devices





The Leader In Construction Products
For Telecommunications Networks

MOORE

MOORE DIVERSIFIED PRODUCTS, INC • 1441 Sunshine Lane • Lexington, KY 40505-2918
800-769-1441 • 606-299-6653 fax • www.mooredp.com

Western Cable Show

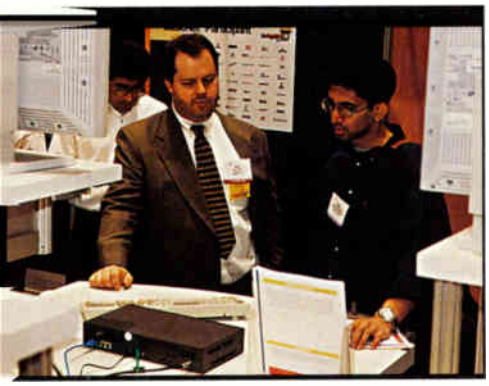
Wired2K Comes Alive

By the *CT* Editorial Staff

Let's talk music for a minute. No, this is not a joke. For many of us, music's just background noise, rather than the soundtrack of our lives, right? Well, not always. Sometimes it's a sign of things to come. And the caliber of the music at 1999's Western Show points to decidedly good times ahead.

Think about it: How often do topnotch, nationally known musicians play at cable shows? Darned seldom, that's how often. Usually, all we get are some barrel-bottom dregs or no-name lounge lizards. But not this time. CableLabs—yes, CableLabs, of all things—pulled in such heavy hitters as Los Lobos and the Brian Setzer Orchestra—if that's not a sign of good times to come, we don't know what would be.

Besides being auspicious, the musical portents also proved accurate. This last Western Show was one to beat the band.



Competition pursues cable into new decade

If anyone thought competition in the broadband industry would slow in this new decade (if not quite new millennium), cable's luminaries trounced that idea thoroughly at the opening general session.

Threats from open access, satellite services and digital subscriber lines (DSL) will continue to eat away at cable's market share. Still, advances in interactive technologies, new services and attention to the customer can help keep cable on top.

Coming on the heels of AT&T's deal to provide open access to MindSpring, it's no surprise that issue got a lot of attention.

Leo Hindery, new chief executive officer of GlobalCenter and former president of AT&T BIS, worried that open access would lead to new threats from streaming video.

"The Internet is an emotional phenomenon like no other we will encounter in our lives. It was my hope that before we got into this emotional fight we would have used the past year to make accommodations," he said. Streaming video is one area he wished the cable industry had spent more time discussing. "Streaming video restrictions will look worse in December 1999 than they would have if we had articulated them in January 1999."

Why the concern over streaming video? Open access will allow consumers to use their Internet service provider (ISP) to "dial around the video business," Hindery warned. "Embedded in the Road Runner and @Home agreements are streaming video restrictions. Those restrictions are now on the table politically," he explained.

Jerald Kent, president and CEO of Charter Communications, saw opportunities in open access. "Three customers out of 100 are taking my data service. But 20 or more of those take America Online. By opening my plant, I think it will drive my penetration," he said. "Open access is one thing, but no one is offering free access. We deserve a fair rate of return for any capacity we give up."

Ted Turner, Time Warner's vice chairman, was more succinct. "It's our wire, and we'll do what we want to with it," he opined with his usual flair. Yes, open access is a threat, but so are satellite and phone companies, he said. "But cable is holding the distribution high ground. The game is ours to lose. ... We need to offer phone service in a high class manner."

New services are the name of the game when it comes to surviving competition, especially when cable's previously unique programming will be available to consumers via other distribution schemes such as direct broadcast satellite (DBS) and DSL. Barry Diller, chairman and CEO of USA Networks, urged system operators to "race forward" with network upgrades and service launches. "Put the money in the ground. Bust all out to offer as many services as you can as fast as you can," he urged. "I live in New York and Los Angeles, and I'm shocked that I have to use ISDN (integrated services digital network) lines."

Interactivity will be a key element of those new services. "No other delivery mechanism has the speed and interactive capacity of our broadband pipe. We have to play to that strength and add interactivity," said Michael Bloomberg, president and CEO of Bloomberg L.P.

The industry also needs to give consumers more control. "People don't want to customize a show," he said, but they do want to watch it when they want it, not when the programmer scheduled it. "That's the technology we have to provide to be competitive."

Bloomberg also emphasized the importance of customer service. "If I were the cable industry, I would try and shower my customer with service," he said. Get more trucks rolling, more service techs calling, and better billing desks established.

"You've got to focus on people for the next decade and get more of them out there."

Building a smarter home

If you missed the opening session, you still had plenty of opportunity to get the scoop on the hottest topics in cable—the California Cable Television Association and the Society of Cable Telecommunications Engineers hosted nearly 40 different panel discussions.

During the "Smart Homes" session, panelists discussed strategies and shared their experiences in building the better community. No, we're not talking about neighborhood watch or lawn beautification, but rather leveraging our broadband infrastructures to deliver a fully integrated suite of networked services to our customers.

The message from each panelist was clear: Smart homes are a reality. "Now is the time," said Cindy Rabe, director of strategic networking for Intel's home networking group. "It's not two years from now. It's not even six months from now."

What is a smart home, you ask? "An E-Home is basically many home devices connected to the Internet and also connected to each other within the home," explained Rabe. "Those range from security devices to PCs (personal computers) to telephones to televisions. Everything that you can imagine at some point in time will probably be connected."

While Rabe applauded the cable and networking industries for fostering this market, she cautioned attendees that the road ahead would be bumpy and that the home environment would become increasingly complex.

Rabe identified three key technologies that will be used to deliver the connected home, all of which fall under the "no new wires" umbrella.

HomePNA uses existing telephony wiring in the home. "We believe that for quite some time into the future, the phoneline's is going to be the predominant way that consumers connect the PCs in their home," said Rabe. Other technologies include wireless home RF for mobile devices, and powerline technology. "The bottom line here is that we think all of these technologies are going to coexist, and there will probably be others in there as well," said Rabe.

Operators also shared their real-world experiences in deploying smart home communities. Woody Faircloth, director of multiple dwelling unit (MDU) and business development for US West, outlined of his company's DC Ranch "connected community" in Scottsdale, Ariz.

"It's set up as a truly technological partnership where we're deploying a pretty extensive bundle of services," said Faircloth. "DC Ranch, in terms of scope, is 3,000 single-family homes, 1,200 of which are MDUs, and about 3 million square feet of office space."

DC Ranch is employing a video digital subscriber line (VDSL) architecture with fiber-to-the-curb (FTTC) to deliver the services. And what are they? Well, US West is offering digital video, voice and data, as well as some new services such as an integrated caller ID/TV service, which displays caller ID information on the subscriber's TV set-a big hit with subscribers. "It has changed the way people use caller ID," said Faircloth.

In terms of future services, Faircloth says US West is exploring other services such as home inventory, which will scan groceries from a consumer's pantry and create a detailed grocery list.

Also speaking from experience was Kimberly Toonen, Cox Communications' vice president of new business development. Toonen described Cox's MultiLink alliance strategy with MDU property owners and management companies in its Orange County, Calif., systems. Under these partnerships, Cox is given exclusive rights to market video, voice and data services through the leasing office in exchange for a cut of the revenue pie.

Toonen says Cox is embracing a "wired to the hilt" specification for maximum plug-and-play opportunities for residents. In particular, Toonen spoke of Cox's Ladera Ranch master planned community project, an 860-MHz system serving 8,100 residents. Ladera Ranch uses advanced networking prewiring to support current and future services and will be able to support beta tests for new services.

But Toonen was quick to point out the subtleties in marketing the smart home. "Don't sell technology," said Toonen. "People frankly don't buy technology—they value applications that make their lives better."

1999's Women in Technology recipient Sally Kinsman of General Instrument, left, accepts the award from 1998's winner, Sheri Sharp (formerly Stinchcomb) of Cox. Photo courtesy of SCTE

Circuit-switched telephony still viable

One of those new applications is telephony, and both circuit-switched and Internet protocol (IP) solutions will coexist for some time.

In a video panel airing on The Cable Channel, Dee Dee Nye, vice president of Lucent Cable Communications, affirmed the near-term viability of circuit-switched technology as part of the telephony solution for the cable industry. "The PSTN (public switched telephone network) is going to last a long time—there are lots of switches out there," said Nye.

Nye and the other panelists, however, stressed the importance of solutions that include both Internet protocol (IP) and circuit-switched technologies, where appropriate. According to Nye, the integrated IP platform "is starting in the access area, from the cable headend to the home." Now, however, at a relatively early point in the call process, the call is handed off to the traditional PSTN.

Another panelist, Mark Coblitz, Comcast vice president of strategic planning, noted that circuit-switched technology

800-331-5997

Refurbished IRD's VCII's VCRS's PLUS

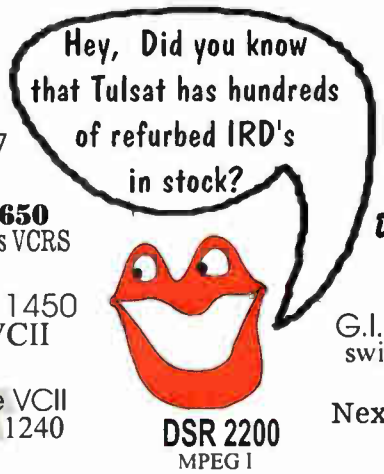
switchable DSR 1500 vcrs & mpeg I

Standard 2001's VCII

DSR 4400 MPEG II

DX 647 VCII

Pico 3200's



DX 747

ISS VCII

SA 9650 VCII Plus VCRS

DSR 4500 MPEG I

G.I. 1450 VCII

G.I. 1000 switchable

Drake VCII IRD 1240

DSR 2200 MPEG I

Nexus IRD2

800-331-5997

1605 E. Iola Broken Arrow, Ok 74012

TULSAT

Modulators

NEW Drake

AGILE 450 mhz 60db

$419 VM2450B

3 Year Factory Warranty
Direct Tuning (no dip switches)
Composite IF Loop

$469 VM2450A

w/additional options

Dual IF Loops-Audio/Video Meters-ESA Input

refurbished

Scientific Atlanta Agile Modulator

Chan 2 thru 36 & A-1 thru A-5

High Output $349 Single Rack

800-331-5997

1605 E. Iola Broken Arrow, Ok 74012

TULSAT

From 1990 to 1999

9 Years in a Row

FACT

Average **Repair Charge** Including Parts

LESS THAN **$100.00**

Modulators
Processors
Receivers
Line Gear
IRD Cards
VCII's

800-331-5997

1605 E. Iola Broken Arrow, Ok 74012

TULSAT

Higest Prices Paid

WANTED

BUY - TRADE - NEW - USED

SA 6130 & 6330

VCII Plus & VCRS

DSR 1500 & 1050

DSR 4400 & 4500

SA 6150 & uhf input

Traps, Taps & Connectors

800-331-5997

1605 E. Iola Broken Arrow, Ok 74012

TULSAT

will not affect the eventual migration to IP for all call handling.

"If you have circuit switches, you pick one set of equipment to implement IP," he said. "If you don't, you come from a different place. It doesn't affect the issue of how we move to IP. We will get there in different ways." Comcast is committed to a total IP solution that would replace circuit switches in the cable plant.

The trick appears to be finding the best applications for each technology. The third panelist, Dr. John Pickens, vice president and chief technical officer of Com21, noted that there are two paradigms for implementing IP in a telephony network. One is as a replacement for Class 5 switches in the network, and the other is to move more functions from the network to the home or office.

"That's the difference between the MGCP (media gateway control protocol) and SIP (simple Internet protocol) approaches," Pickens said. Cost savings may hold the key to which part of the telephone call becomes IP. Nye points out that in access, "there is a 40-50 percent savings" in equipment alone for an integrated voice and data solution using IP.

Technology sizzles on exhibit floor

With more than 400 exhibits spread between two immense halls, the 31,208 attendees had no trouble discovering what technological marvels cable's leading vendors have planned. We've picked a few highlights to include here, and please see *CT*'s Marketplace (on page 100) for more new product launches. But remember, these are just a sampling of the vast array of technology that was on display.

Nortel tackles open access

Nortel Networks attacked the great debate over open access to cable networks for individual ISPs head on.

Nortel Network's Shasta IP Services division showed a new switching system that it claims will allow cable subscribers to choose from a variety of ISPs and provide increased protection against hackers as well.

The Shasta 5000 Broadband Service Node allows the cable operator to provide "wholesale access" to its subscribers. Wholesaling is a technique in which ISPs pay a fee to tap into a network, in this case the cable plant, to access users.

According to David Ginsburg, director of consulting engineering and field marketing for Shasta, the 5000 system operates in two ways: It can either map directly to an ISP or deliver data by "tunneling" through the Shasta switch to a router at the ISP's location.

To date, cable operators have foregone ISP wholesaling, believing that multiple Internet providers on a shared network would overload the system. Instead, the industry has adopted single-provider contracts, usually with the industry-backed Road Runner and @Home services. However, many analysts point to cable's lack of choice as one of the chief drawbacks to cable modem service.

Shasta is using that argument to pitch the system as the more lucrative solution for the cable industry.

"There is good revenue to be made in the wholesaling environment," Ginsburg said. "It may actually be a better business model because there is some resistance to cable modems because you can't choose your own ISP."

Despite its name, the Shasta system is not installed in the node, but takes up a single rack in the headend. The system offers about 10 Gbps of throughput and has the added benefit of providing firewall protection to individual subscribers, something that could appeal greatly to corporate users, home office clients or others who prefer to maintain a continuous broadband connection.

Com21 debuts telephony headend

Com21 has its sights set on cable operators planning to launch IP telephony services. The company demonstrated its new DOXcontroller cable modem termination system (CMTS), which is based on the Data Over Cable Service Interface Specification (DOCSIS) 1.1 cable modem standard. Although the CMTS won't be ready for shipment until the fall, adherence to DOCSIS 1.1 means it can deliver quality of service (QoS), low latency and low jitter to deliver toll-quality voice services, says Buck Gee, vice president of marketing for Com21.

"It's clear that in North America the technology to provide telephone over cable is PacketCable over DOCSIS 1.1," Gee says. "It provides quality of service controls and virtual circuits so you can build independent data streams to each cable modem—one for data and one for voice—so they don't impact each other depending on the amount of traffic sent."

The DOXcontroller scales to support up to 4,000 cable modems. That's twice as many as Com21's original headend system, which was an asynchronous transfer mode (ATM)-based platform.

Com21 plans to hold field trials early this year. Commercial products won't be shipped until after receiving certification by CableLabs, says Gee. But the company is bullish on the industry's move to DOCSIS 1.1.

"We believe that the DOCSIS 1.1 market will begin to happen in the second half of next year, following certification of the new modems. The transition from 1.0 to 1.1 will be fairly rapid," Gee predicts.

Free yourself from the trap

Blonder Tongue Laboratories was busy touting its new HomeControl Single Living Interdiction Unit. Residing on the outside of the customer's home, the single-port interdiction unit fuses the functionality of a trap with the addressability of a set-top. Unlike the days of yore, when signals were scrambled at the headend, HomeControl scrambles the signals at the customer premise before entering the home.

So, what does this mean for you and your subscribers? For one thing, HomeControl will allow you to remotely change your subscriber's service levels via a computer from your headed, unlike traditional traps that require truck rolls.

"We've got a number of operators that ➤

Return Path Maintenance
(You Can't Beat The System)

GUARDIAN™ SYSTEM

Only Trilithic offers a Return Path Maintenance System.
The Guardian System goes from the subscriber, to the pole, to the headend for complete ingress detection, diagnosis and resolution.

The RSVP™. Just connect the GUARDIAN RSVP in place of the subscriber's two way terminal and press the "TEST" button. The RSVP communicates with a 9580-SST reverse path analyzer located in the headend, tests the return path, and gives the installer a simple "PASS" or "FAIL" message and measurement data.

The 9580-SSR™. Up to six SSR field units can communicate with one SST simultaneously. The SSR displays ingress and reverse sweep information. The 9580 and GUARDIAN products are a complete return path maintenance system designed to test and service the entire return path.

The IsoMeter™. Now there is a fast and easy way to test the home cabling for resistance to signal ingress. The RSVP generates a special 28 MHz test signal. The installer uses the IsoMeter to track down leaks in the cabling. Moving in the direction of the leak causes a rise in pitch, quickly pinpointing its location.

The 9580-TPX™. The 9580-TPX offers a very attractive alternative for monitoring a large number of return test points for ingress at a relatively low cost. The TPX is fully compatible with the 9580-SST, expanding capacity up to 64 test points.

The 9580-SST™. The SST headend unit collects balancing and ingress measurement data from one to eight test points, and transmits updated measurements to the SSR field units, the second component of the 9580 system. The SST operates as an ingress monitor, receiving 80 ingress samples per test point, per second.

Ingress Management Software. Allows the operator to set up a powerful ingress monitoring system for hundreds of reverse path test points. IngressManagR™ compares the ingress spectra measured at each test point to its own user-settable limits, logs data, sounds alarms, calls pagers and initiates other programmed responses if the ingress exceeds those limits.

Call Now For A Free White Paper (800) 344-2412, (317) 895-3600

TRILITHIC
The Engineering Guys

(800) 344-2412, (317) 895-3600, (317) 895-3613 (fax), www.trilithic.com

have both set-tops and interdiction systems," said Emily Nikoo, marketing manager for Blonder Tongue. "The interdiction systems essentially need approximately half the number of technicians to cover the truck rolls than do the set-top systems."

Because HomeControl also functions as an addressable forward and return path switch, allowing for ingress control and troubleshooting, the system also will facilitate the deployment of advanced, two-way digital services down the road.

Operators can control up to 550 MHz or 650 MHz with interdiction—so they control all of their analog channels, explained Nikoo. "You can just overlay digital on top of that," she added.

Lucent adds OSS to cable offering

Lucent Technologies has targeted its considerable expertise at developing operational support systems (OSSs) at the cable industry. The company unveiled its CableConnect OSS solution, which handles customer care, billing and network management.

The OSS offering will roll out in several releases over the course of the year, explained Lucent's Richard Baughman. The system is built around five modules, which include service activation and billing, improved fault management, Web-based customer self-care, improved inventory management, and new service creation. The goal of the OSS offering is to automate new service provision, more quickly locate and predict network faults, and speed new service development.

> "Open access is one thing, but no one is offering free access. We deserve a fair rate of return for any capacity we give up."
> —Jerald Kent, Charter

Lucent isn't tackling this task alone. It has signed on two new partners to enhance its OSS offering. Lucent is working with General Instrument to integrate GI's NETsentry management system with CableConnect OSS. This will enable operators to provision, manage and monitor equipment from both companies with the integrated system.

Lucent also has inked a deal with MDSI Mobile Data Solutions to add workforce management to CableConnect OSS. "Technicians will be able to activate services on their own, using a personal digital assistant (PDA)," explained Baughman. This capability can greatly increase the number of service installations that a technician can do in one day, he added.

The workforce management module will accept work generated by order management and fault management applications, automatically dispatch those orders to mobile technicians, manage the work in the field, and capture work results for use by the OSS and other applications.

Mindport, Cisco team for provisioning

As pressure mounts for operators to reduce installation times for cable modem services, vendors are increasing their efforts to develop self-provisioning systems. Mindport and Cisco Systems are working together to integrate Cisco's Subscriber Resource Center software with Mindport's Integrated Business System (IBS) customer care and billing solution. Cisco's SRC is the same software that currently is being used to auto-provision MediaOne's Road Runner cable modem service in Minneapolis.

The two companies also have integrated Cisco's Universal Broadband Router into Mindport's OpenCable digital headend. Mindport will work with Cisco and others to add DOCSIS capability to its OpenCable digital set-top box.

Attendees saw a demo of Mindport's IBS system and prototype OpenCable set-top complete with built-in DOCSIS modem. The demo showed how, by using a smart card, cable customers could upgrade their video services and add high-speed data service without needing to call a customer service representative (CSR) or have a technician install the modem. They also could order pay-per-view (PPV) events and shop. All the charges for the service upgrades and e-commerce purchases then go on a single bill for the subscriber.

Antec on cable fast track

Antec showcased a barrage of new wares designed to push fiber deeper to the home and engineer space-efficient upstream solutions.

"We now have a true end-to-end story and package of services and products that we can offer our customers," said Jack Bryant, president of Antec Network Technologies.

Among the products premiering at the show are two new nodes, the Proteus Scalable Node and the MicroNode. The MicroNode, which uses Gallium Arsenide (GaAs) technology, has been designed for passive or near-passive architectures and features 1-4 high-gain RF outputs, enabling it to replace 2-3 traditional RF amplifiers.

"We've designed the RF section of the MicroNode in such a way that it's laid out in a cavity configuration to provide very good isolation, but more importantly, a lot of flexibility," says Bryant.

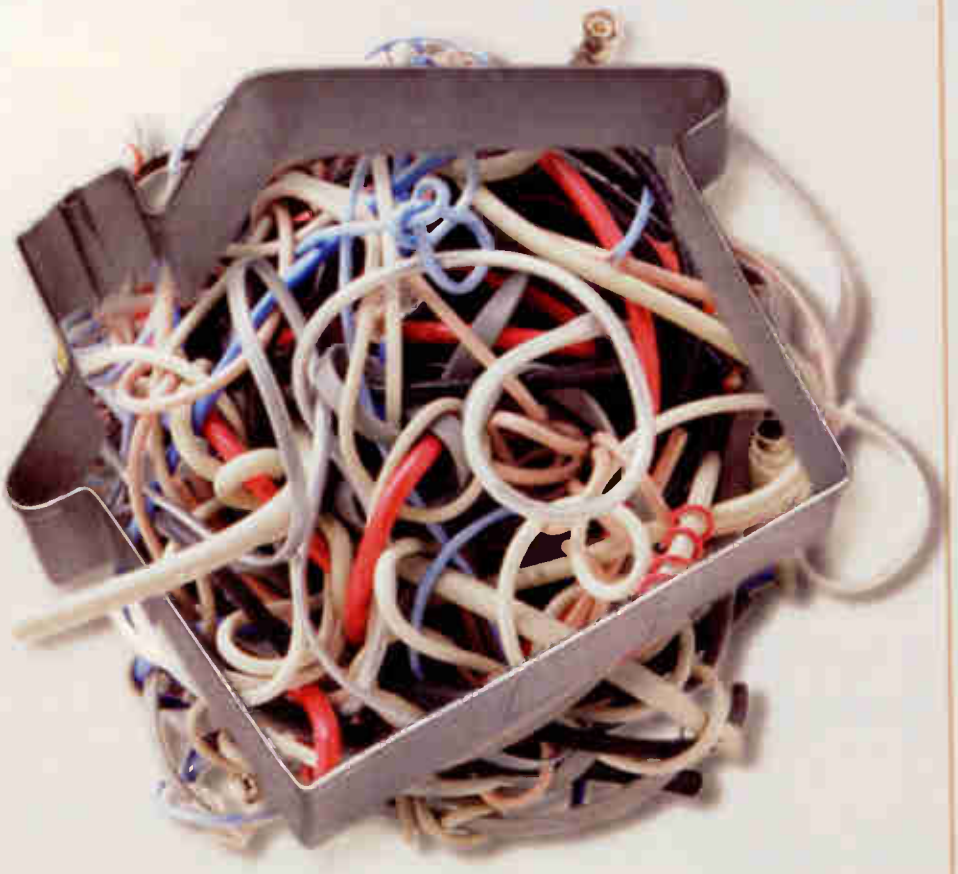
Bryant says the MicroNode is being targeted at the advanced digital return portion of AT&T's LightWire architecture, but also can handle block conversion and conventional 1,310 nm and 1,550 nm analog return transmission.

Parties galore

Of course it wasn't all work at Western '99. If you weren't exhausted from trekking the exhibit floor, you had a variety of top-notch parties to choose from. Everclear, Los Lobos, Brian Setzer, and Bonnie Raiit all dazzled partygoers until the wee hours of the morning. CCTA will have a hard time living up the success of Wired2K, but it's a task the California crew is well prepared to handle. CT

Jennifer Whalen, Doug Larson, Ron Hendrickson, Arthur Cole and Justin Junkus contributed to this report.

Home Networking



Rat's Nest No More

By Sanjeev Verma

101

Computer networks, long a staple of the corporate office, are now poised to invade the home. Home networking promises to usher in the era of the networked home—one in which multiple personal computers (PCs), printers and entertainment devices are connected to form a home network.

The explosive growth in residential Internet access and the number of homes with multiple PCs is largely driving the growing demand for home networking. The Yankee Group, a Boston-based market research and consulting firm, estimates that within two years, more than 25 million homes in the United States will have multiple computers. The need for a computer network arises the moment a consumer buys a second computer and wants to share Internet access and costly peripherals such as printers. The struggle to connect the new computer to the Internet and to the old laser printer, however, can be nearly so frustrating an experience as to drive the proud owner of a new computer stark-raving bonkers.

Home networks past

In the not-so-distant past, home networking involved getting help from a computer networking guru, who in turn would recommend highly sophisticated networking products and then rewire the home for Ethernet, all at considerable expense. No more. An array of technologies and products has come to market that allow consumers to network multiple computers

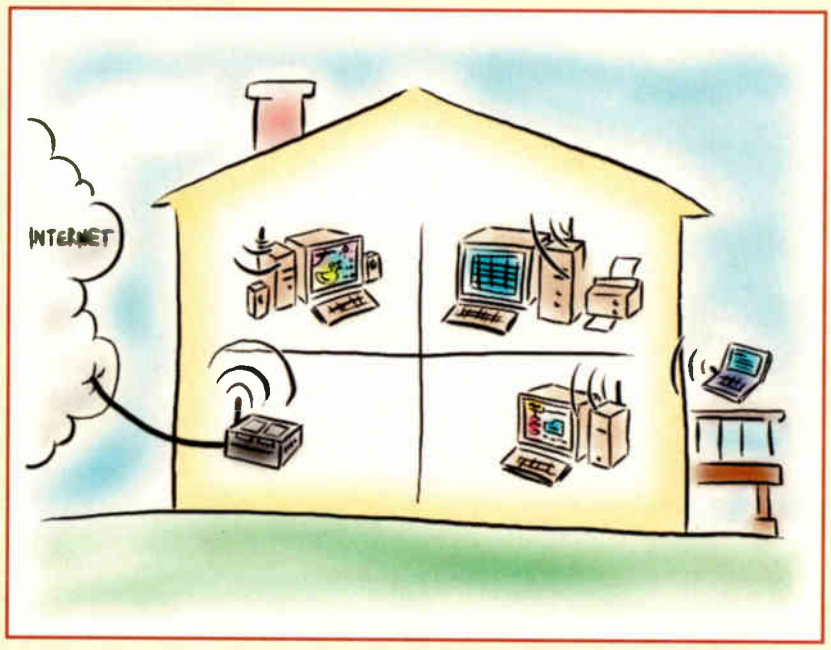
without needing to rewire their homes or learn arcane networking jargon.

Home networks future

Three promising home networking solutions connect computers using no new wires. These "no new wires" networking technologies use wireless technology or reuse a home's telephone or electrical wiring for building a home network.

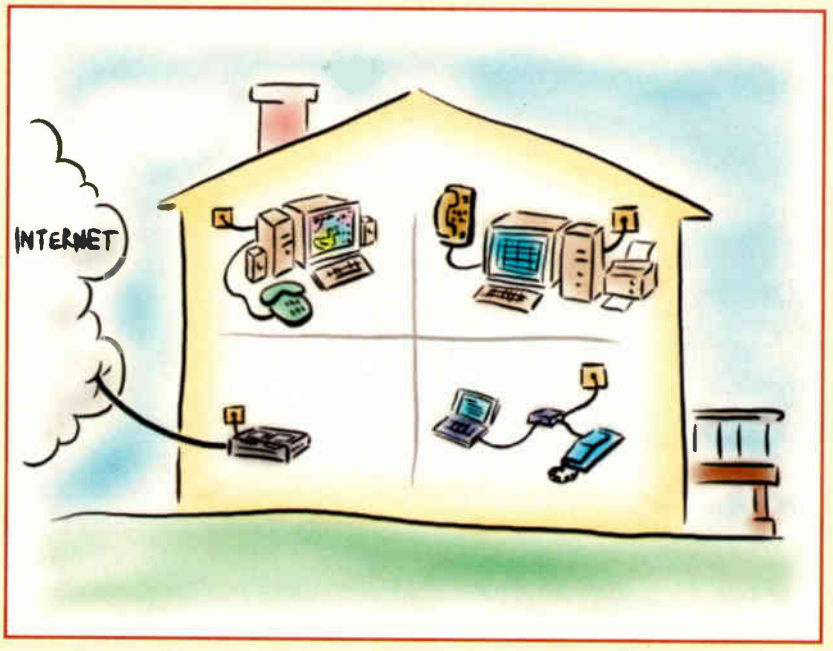
Wireless: Wireless home networking offers users mobility and the freedom to locate computers anywhere in the home. With a wireless network, users can surf the 'Net from a deck or relax with a laptop in bed and listen to MP3 music. Wireless networks operate at speeds of up to 11 Mbps over the unlicensed 2.4 or 5 GHz frequency bands. (See Figure 1 on page 52.)

Figure 1: Wireless home networking



Source: Motorola

Figure 2: Phone line home networking



Source: Motorola

To network a home, the consumer installs a wireless peripheral component interconnect (PCI) or universal serial bus (USB) adapter on the desktop computer. Laptops are best networked with a small wireless Personal Computer Memory Card International Association (PCMCIA) adapter. Consumers are better off with the USB and PCMCIA adapters because they do not require the computer to be opened.

These adapters are available from vendors such as Proxim, as well as most of the leading PC manufacturers. They come with software that allows consumers with little networking knowledge to set up a network and share a dialup Internet connection, printers and drives. To make all the computers in a network communicate with each other, users must make sure that all their adapters support the same wireless technology standard — HomeRF and Institute of Electrical and Electronics Engineers (IEEE) 802.11 are two popular wireless networking standards.

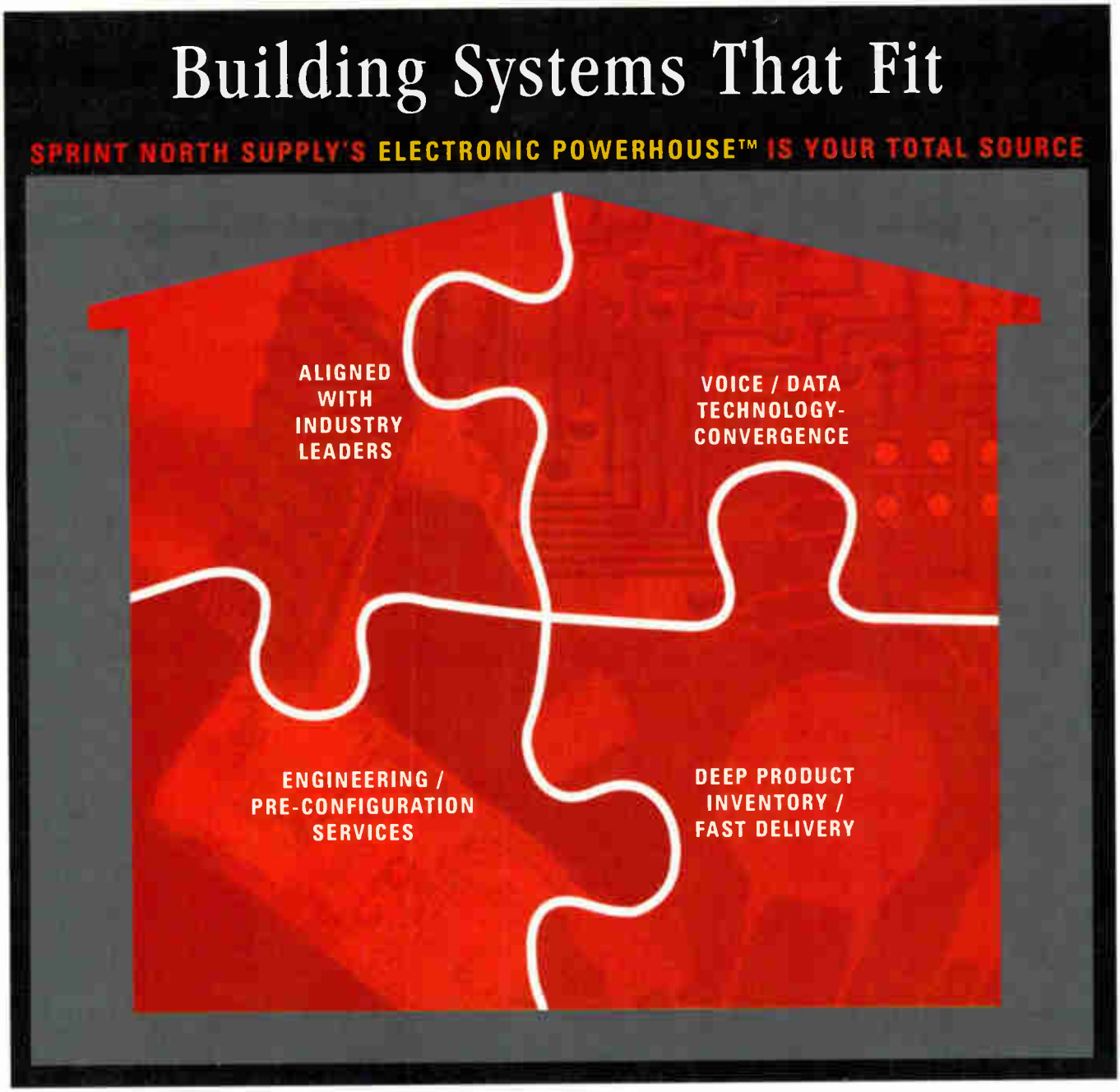
Phone line: Connecting computers over a home's existing phone wiring is another way to build a network. A new industry standard technology called HomePNA (Home Phoneline Network Alliance) has made it possible to send computer data at speeds of up to 10 Mbps over a home's existing phone wires without interfering with phone conversations. (See Figure 2.)

Similarly to the wireless networks, the user installs a USB, PCI or PCMCIA HomePNA adapter on the computer. The adapter has a phone jack built into it, which the user connects to a nearby phone outlet using an ordinary phone cable. Once all the computers in a home have been connected to phone outlets, the user can create a network using home networking software that is bundled with the adapters.

HomePNA adapters are available from vendors such as Linksys and Diamond Multimedia. And many leading PC vendors ship computers with phone line network adapters built in today. While phone line networking is less flexible than wire-

Building Systems That Fit

SPRINT NORTH SUPPLY'S ELECTRONIC POWERHOUSE™ IS YOUR TOTAL SOURCE



Telect CONNECTING THE FUTURE™ · NORTEL NETWORKS · Lucent Technologies Bell Labs Innovations · ADTRAN · EAC CARRIER ACCESS CORPORATION

When you're building an advanced telecommunications network, everything needs to come together as smoothly as possible. You don't have time to contact multiple manufacturers and arrange delivery. You need a one source multi-vendor solution.

Sprint North Supply's strategic relationships with the leading network electronics manufacturers mean that you get the products you need, on time, with the engineering and technical support you demand. Our expertise will help you build systems that fit your needs. Call us now at 800-800-8911 to learn how Sprint North Supply's *Electronic Powerhouse*™ can help you put it all together.

Sprint North Supply
A World of Products.
A Wealth of Resources.℠

www.sprintnorthsupply.com

Visit our Booth #2053
at Wireless 2000.

Sprint

less, it is more economical and works very well for people with only desktop computers (easy access to telephone jacks can be an issue in some homes).

Powerline: Another promising networking technology makes use of the home's electrical power lines to network computers and home appliances. Its appeal lies in its simplicity because devices are networked simply by plugging them into an electrical outlet.

Similarly to the phone line and wireless solutions, each computer needs to have a powerline adapter in order to be networked. The drawbacks of powerline networking include slower speeds, lower reliability compared to wireless and phone line technologies and the lack of a single industry standard.

Today, one can buy powerline-networking products from companies such as Intelogis. A number of technology startups are aggressively pursuing the Holy Grail of high-speed powerline networking, which makes this technology one to watch for in the future.

Broadband home networks

Despite the appeal of new home networking technologies, their adoption has been relatively slow. Consumers have not responded enthusiastically to the prospect of sharing an already slow 56-kbps Internet connection. All that is about to change with the rapid adoption of broadband cable Internet services.

> "The need for a computer network arises the moment a consumer buys a second computer."

These broadband Internet services are fast, very fast—often delivering multimegabit Internet connections. Even more significantly, broadband Internet services are "always on" connections, which means just what it sounds like: if the computer's running, you're on the Internet. There is no need to go through the tedious wait experienced with dialup modems. This combination of high speeds and an always-on connection is expected to drive the adoption of home networks.

Subscribers to broadband services have an Internet connection that they can easily share without degrading the Internet experience. They also tend to own multiple computers. These two facts create a close link between broadband and home networks. Indeed, leading suppliers of broadband modems are introducing all-in-one solutions—cable modems with built-in wireless and phone line home networking.

These home networking modems often are called multiuser modems or gateways. Multiuser modems have built-in networking software, which has reliability benefits. In systems where the user's PC runs the home networking software, if that PC crashes, so does the entire network. When the networking software resides in the gateway, a crashing PC won't take the network down with it.

How it works: wireless

A wireless multiuser cable modem connects to the Internet over a regular TV cable but uses its built-in wireless home networking connection to communicate at high speeds with multiple computers inside the home. It operates much like the base station of a cordless telephone, which plugs into a phone jack to connect to the phone service but communicates with handsets over the air. Another plus for multiuser cable modems is ease of installation—it literally takes three steps and a few minutes to network an entire home, and consumers can do it themselves.

To build a network, a consumer first connects the modem to any operational cable outlet in the home. This step is identical to attaching cable to a TV set and takes less than a minute to complete. Next, a user attaches a wireless adapter to a computer. A wireless USB adapter is a tiny box with a wire attached to it that just plugs into the back of a computer. Adding an adapter to a laptop is just as simple. Simply take a PC card and push it into the laptop's PCMCIA port, and it's done.

The final step is to run some software on the PC to which the adapter is attached. This software typically is provided by the company that makes the adapter or

BOTTOM • LINE

Home Networking Fundamentals

Three promising home networking solutions connect computers using no new wires. These networking technologies use wireless technology or reuse a home's telephone or electrical wiring to build a network. Coupled with broadband high-speed Internet access, these technologies represent the leading edge of the networked household.

Wireless home networking offers users the freedom to locate computers anywhere in the home. Wireless networks operate at speeds of up to 11 Mbps over the unlicensed 2.4 or 5 GHz frequency bands.

Connecting computers over a home's existing phone wiring is another way to build a network. A new industry standard technology called HomePNA (Home Phoneline Network Alliance) has made it possible to send computer data at speeds of up to 10 Mbps over a home's existing phone wires without interfering with phone conversations.

While phone line networking is less flexible than wireless, it is more economical and works well for people with only desktop computers.

Another promising technology uses the home's electrical power lines to network computers and home appliances. Its appeal lies in its simplicity because devices are networked by plugging them into an electrical outlet. The drawbacks of powerline networking include slower speeds, lower reliability compared to wireless and phone line technologies and the lack of a single industry standard.

manage all your assets with e.merge

THE POWER BEHIND DIGITAL ENTERTAINMENT

e.merge™ is a family of ten integrated, internet enabled software modules designed specifically for managing digital entertainment assets, media and services.

MODULE

- **Asset Manager** 1
- Marketing Manager 2
- Provider Payment 3
- Event Scheduler 4
- Subscriber Management 5
- Delivery Manager 6
- EPG Analyzer 7
- Work Force Manager 8
- Billing Manager 9
- Data Distribution Gateway 10

Asset Manager, an enterprise wide software solution, delivers exciting new powers to the world of digital media and physical asset management. Templates define data fields and asset groupings and provide automated tracking of metadata associated with assets. No coding necessary! Key functions include global access; easily incorporated business rules to implement processes such as Shipping and Receiving and Quality Assurance; automated sending and generation of emails and forms; and the ability to associate digital with physical assets, i.e. what features/ads/promos are available on which servers. Simply too much to tell here!

Like more detail? Visit IMAKE™ at http://www.imake.com to see Asset Manager and the complete e.merge suite of business tools, the power behind digital entertainment.

IMAKE

Software and Systems Integration

6700 Rockledge Drive
Suite 101A
Bethesda, MD 20817

301.896.9200 voice
301.897.2130 fax
www.imake.com
e-mail: emerge@imake.com

modem and asks a few simple questions in plain English, such as: "Would you like to connect this computer to your home network? Would you like to share your hard drive and printer?" Users can answer these questions with a few clicks of the mouse and then be instantly networked.

All the computers in the home with wireless adapters attached to them can simultaneously access the Internet through the multiuser modem.

How it works: phone line

Phone line multiuser cable modems are very similar to wireless modems. A phone line multiuser modem has a built-in Data Over Cable Service Interface Specification (DOCSIS) cable modem to bring home the Internet. It also has a standard phone jack built into it.

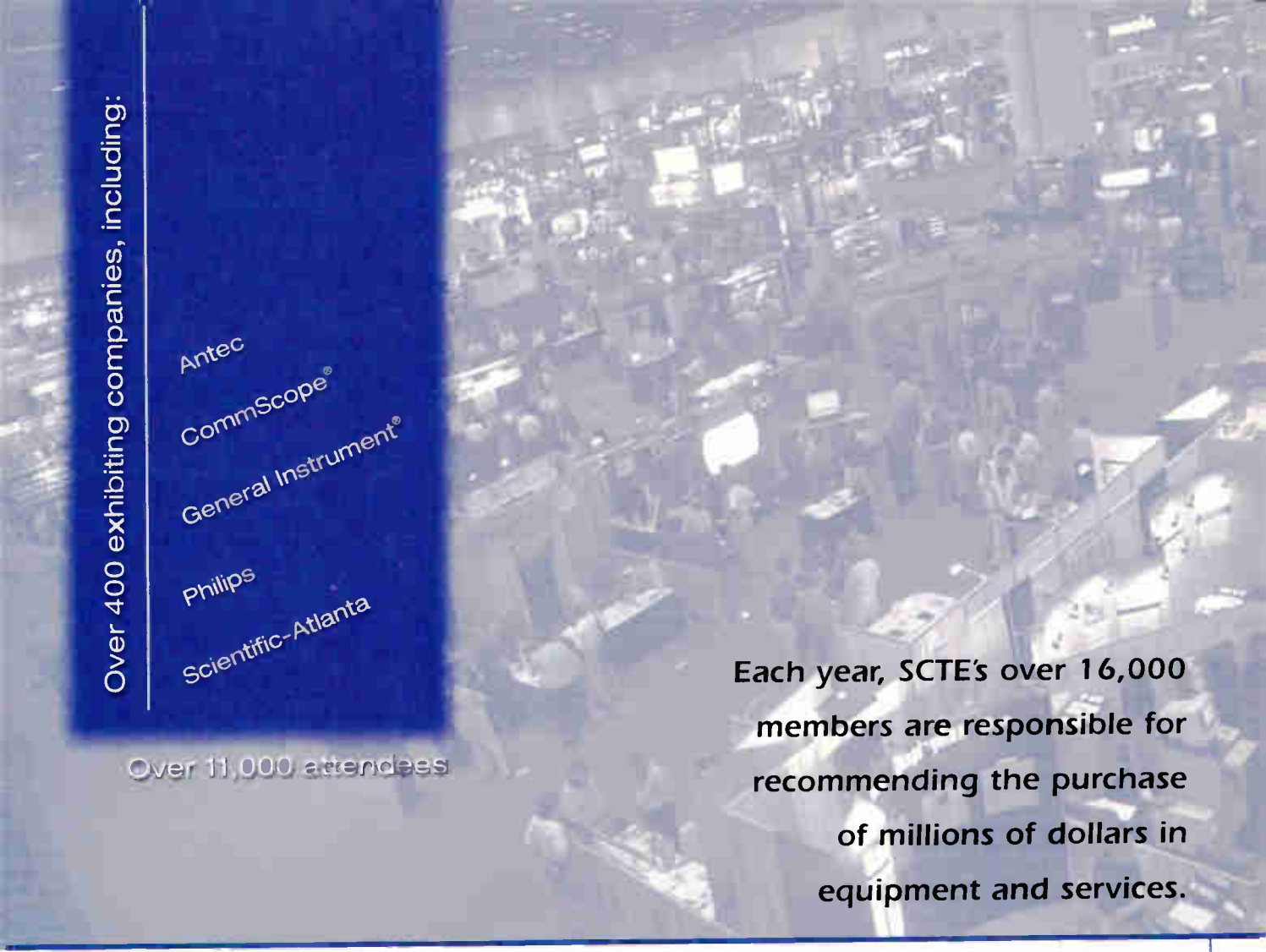
Users can plug one end of a phone wire into the phone jack of the phone line cable modem and attach the other end to a nearby phone jack. The multiuser modem then uses the phone line to make the cable Internet connection available throughout the home. Every phone outlet in the home is instantly transformed into a high-speed Internet jack without interfering with regular telephone service. Computers are connected to the home network by plugging them into any conveniently located phone jack via a USB, PCMCIA or PCI HomePNA adapter.

> "Subscribers to broadband services have an Internet connection that they can easily share without degrading the Internet experience."

The future

Networking home computers is just the beginning. As networking speeds and technologies mature, telephones, cell phones, personal digital assistants (PDAs), consumer entertainment devices and electrical appliances are sure to join the network. Aggressive broadband service providers are gearing up to offer new services that deliver Internet, video, MP3 music, telephony and more to all kinds of networked devices in the home. Try not to be surprised when, in the not-too-distant future, you can turn off your microwave via a cell phone in your car.

Sanjeev Verma is director of product marketing and business development for home networking products at Motorola's Internet Networking Group. He can be reached via e-mail at LSV001@email.mot.com.



Over 400 exhibiting companies, including:

- Antec
- CommScope®
- General Instrument®
- Philips
- Scientific-Atlanta

Over 11,000 attendees

Each year, SCTE's over 16,000 members are responsible for recommending the purchase of millions of dollars in equipment and services.

At Cable-Tec Expo® 2000, you are able to:

- Speak one-on-one with decision-making professionals
- Provide"hands-on" instruction about your products
- Discuss various applications of a product's use or improvement

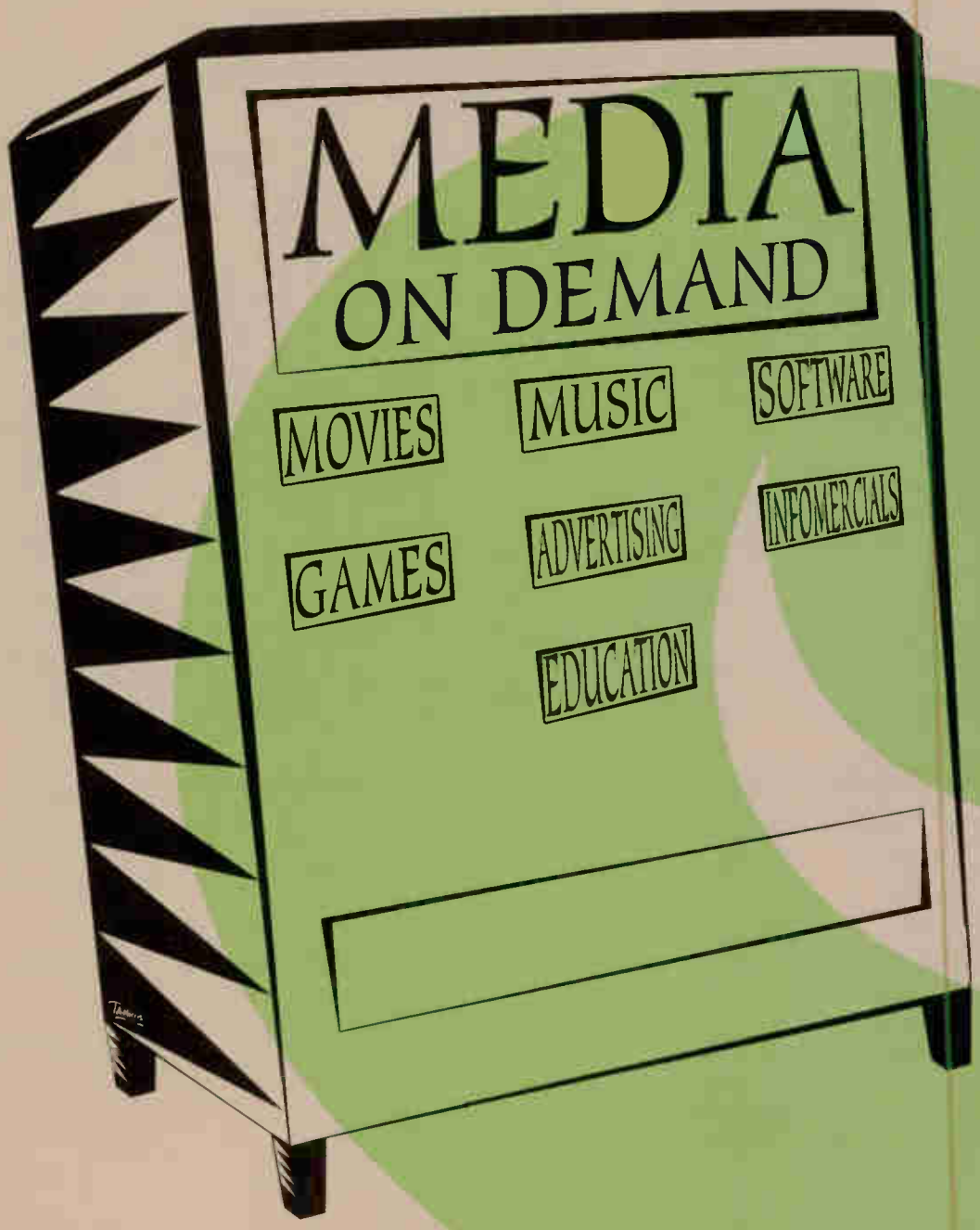
For information on how you can exhibit at Cable-Tec Expo® 2000, contact:

Society of Cable Telecommunications Engineers Inc.
140 Philips Road, Exton, PA 19341-1318
Expo Hotline: 610-363-3822
Toll-free: 800-542-5040
Fax: 610-363-5834
E-mail: lbower@scte.org
Web site: www.scte.org

Cable-Tec Expo® 2000

Monday, June 5 through Thursday, June 8

Las Vegas, NV


MEDIA
ON DEMAND
MOVIES
MUSIC
SOFTWARE
GAMES
ADVERTISING
INFOMERCIALS
EDUCATION

On-Demand Services BREAK FREE of Video Shackles

Software, Local Content Enter the Fold

By Doug Larson

As the saying goes, it's not just for video anymore. The on-demand business, confined until recently to video, now is tackling broader categories, including software, localized content and more.

Don't get me wrong, video-on-demand (VOD) is here to stay. You need only look at the success of a number of market trials and commercial VOD launches across the nation to see the viability and revenue potential of this business. But what many operators and vendors are asking is, why stop with video? We are a society consumed by convenience, as evidenced in the billions spent this past holiday season on online shopping. Perhaps more importantly, we are willing to pay for this convenience. Recognizing this, a number of providers are looking into on-demand opportunities.

New twists on VOD

Besides VOD players, newer breeds of on-demand video providers are emerging. Intertainer is one such example.

"Our primary business is content aggregation and delivery to the consumer," says Joel McConaughy, senior vice president of technology for Intertainer. "We have built an end-to-end distribution system for originating and delivering the content and then managing all of the aspects of transactions and customer service. The Intertainer service is, in its purest terms, a turnkey software application."

Unlike some of the more traditional VOD providers, Intertainer's service currently is available in two delivery formats, depending on the operator's preference. For advanced digital set-tops, Intertainer uses a standard Moving Picture Experts Group (MPEG)-2 stream over quadrature amplitude modulation (QAM). "That content would be high-bandwidth content, typically 3-4 Mbps MPEG-2, same quality as the digital TV (DTV) (channels) that are coming down the pipe," says McConaughy. But the service also can be delivered at a lower bandwidth via Internet protocol (IP) over cable modems.

"The preference has always traditionally been for delivery through the digital set-top box, but we're now getting a lot of interest from operators in terms of cable modem delivery as well," says McConaughy. "Operators will be rolling out the service on both platforms at the same time."

All of Intertainer's content, which includes more than 600 hours of first-run movies, catalog movies, documentaries, filmed concerts, children's programming, recycled TV programs and more, resides on servers located at the cable headend. While Intertainer isn't in the server business, it does integrate its service with all of the usual suspects in this space, including SeaChange and Concurrent.

Another newcomer to this space is Tranz-Send Broadcasting Network, which offers its ClickMovie.com VOD service.

"We can broadcast over any speed system from 56k on up," says Scott Redmond, the company's chief executive officer. "Our sweet spot is 1 Mbps."

An Internet-based system, Tranz-Send uses a proprietary streaming technology to deliver its on-demand movies directly to

BOTTOM • LINE

On-Demand Goes Online With New Offerings

We are a society that lives and dies by convenience. Think about it: What would you do without the remote control for your TV set or your cell phone? For most of us, life without these little gadgets would be unthinkable. This obsession with convenience largely explains the gangbuster pace of high-speed data deployments. Now that we've tasted the fruit of an always-on, virtually instantaneous Internet, we no longer can imagine life at 28.8 kbps.

That's why some new providers are using those very same high-speed lines to deliver real-time, on-demand access to a number of new services that tap into almost every demographic imaginable. In addition to the video-on-demand (VOD) business, we now have on-demand access to entertainment and productivity software, Internet-delivered movies, local weather and sports updates, and a number of new services.

And these are only the tip of the iceberg. Utilizing cable modems and soon to be available Data Over Cable Service Interface Specification (DOCSIS) set-tops, these services are being offered at attractive price points—in some cases they're even free—to the consumer and the cable operator.

TV sets. "Our technology is called Tranz-Cast, and it's not downloading, it's not streaming, it's not multicasting—it's a hybrid intercasting transmission array," says Redmond, adding that his codec, which uses wavelet, fractal and fuzzy-logic algorithms, rides on top of MPEG-2 streams.

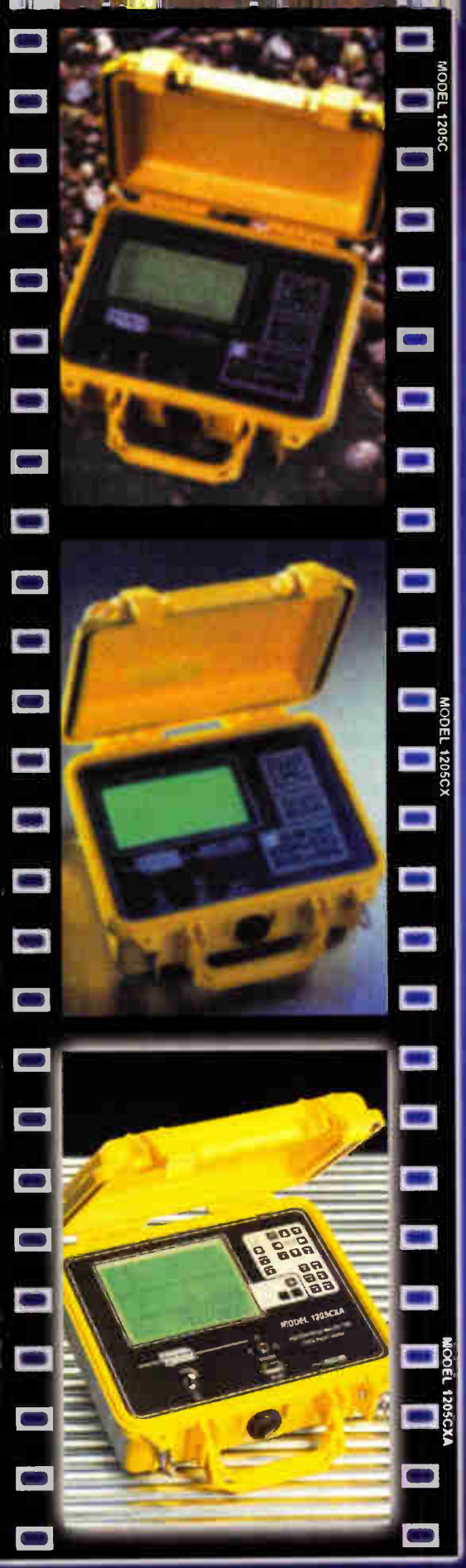
To deliver the service, Tranz-Send offers a Tranz-Muse personal computer (PC) card and receiver unit, which allows the service to bypass the set-top and gives the PC set-top functionality. Redmond says this is a major cost savings to cable operators because they can purchase Tranz-Muse cards in bulk and give them away to consumers, thus reducing their set-top overhead while generating new revenue.

"Doom" on demand

In addition to watching the latest blockbuster movie on-demand, wouldn't it be nice to have real-time access to your favorite software? Into Networks (formerly Arepa.com) and Media Station think so and are actively pursuing this market.

Both companies use client-server architectures to deliver real-time broadband CD-ROM software applications over high-speed data connections to end-user PCs.

"We deploy a content server within the network of a high-speed Internet service provider (ISP)—cable or DSL (digital subscriber line)," says Bill Holding, Into Network's vice president of marketing. "Consumers ... type 'www.playnow.com' to go to our Web site where they will find hundreds of the best CD-ROM software titles available to try for free." ➤



Look what Riser-Bond Instruments has developed for the new millennium!

INTRODUCING

The new and improved

Model 1205CXA

TDR Cable Fault Locator...
the next generation
in a great family of TDRs.

Larger and brighter Liquid Crystal Display for a greatly enhanced viewing area.

Simplified keypad layout and pop-up function menu for more user-friendly operation.

Sub-nanosecond pulse finds small faults that plague high bandwidth systems or cause digital signal interruption.

Simplified waveform storage function for easier cable plant documentation and archiving.

Rugged outside plant packaging.

The Model 1205CXA is the most sophisticated yet easy-to-use TDR available today!

Riser-Bond Instruments is focused on the future!

Riser Bond
INSTRUMENTS
A United Dominion Company

Toll Free U.S.: (800) 688-8377
Telephone: (402) 466-0933
Website: www.riserbond.com
E-mail: info@riserbond.com

The service uses streaming technology to give the end-user instant, on-demand access to these titles without downloading or installing them to a local hard drive.

While similar in basic architecture, Media Station's MediaRemote system takes a different approach to the data delivery. "We virtualized the CD-ROM so that when a customer of ours hits the play button, we mimic the actual mounting of a CD and running it," says John Stinson, Media Station's chief technology officer. "Our CD runs true to the way in which the developer meant it to run."

The company says its service can handle millions of simultaneous users at speeds as low as 256 kbps using predictive block transfer (PBT) compression protocols.

In addition to providing the content and enabling technologies, Media Station and Into Networks also provide bandwidth management systems to help operators manage the data traffic on their networks.

For Media Station, bandwidth management includes a bandwidth detection feature, which allows an operator to probe both the bandwidth of the user's line and the bandwidth between the client machine and the content server at the headend.

"We actually pump data down there for about 5 seconds, measure how much has been received, and figure out what the actual bandwidth is," explains Stinson. "By doing that, we can determine which titles will play in real time and which titles just don't have sufficient bandwidth."

While Media Station's technology also does not require the subscriber to download software, its bandwidth manager does allow the user to download a title that doesn't have sufficient bandwidth to play in real time for play at a later time.

Both companies are pursuing content deals with major operators and cable ISPs. Into Networks, for example, recently announced a partnership with Road Runner under which it will be the exclusive provider of CD-ROM software in several entertainment and productivity categories.

Creative packaging gets a new twist

Not only is on-demand content expanding to include software, games and CD fare, but enhancements to back office support software also let operators create innovative packages. For example, Bethesda, MD-based IMAKE Consulting offers Version 2 of its e.merge software, which lets operators create stream sequences of related media, which could include feature films, promotional spots for other related media, and interactive ads. The subscriber receives all items in the stream package, not just the traditional feature film.

On demand gets local

Other on-demand service providers are focusing on local markets. Take Source Media's Interactive Channel, for example. Interactive Channel's Local Source application makes local content, including news and weather, available to consumers on-demand via the company's Virtual Modem software, a server-centric technology that allows early generation digital set-top boxes to function as cable modems.

"Through our Virtual Modem software, we can access the Web either directly or through sites that are cached and are of

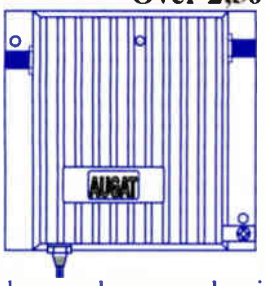
FIND CATV SOLUTIONS ON THE INTERNET at:

www.QRF.com

290+ WEB PAGES of TECH ARTICLES, DATA SHEETS & CATALOG PAGES!
Email: sales@qrf.com

Quality RF Services has Indoor Amplifiers for HEADENDS or ANYWHERE ELSE!

ONE-TIME ONLY! 50% OFF Sale!
When these are GONE, It's OVER!
Over 2,300 units in stock!

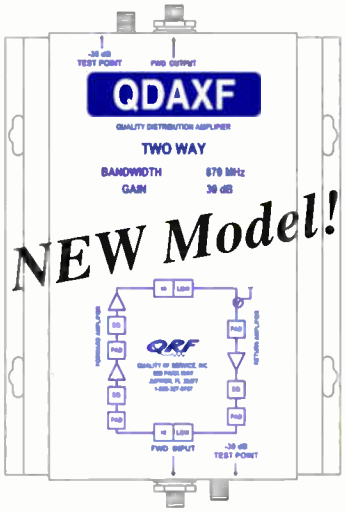


Augat 750 MHz Signal Stretchers on SALE at QRF!

Only $45.00 each!

Push-pull Hybrid Amplifier

We have a large surplus inventory of Augat SS7/21T-1-2W house drop amplifiers -- NEW, in original factory boxes at a great bargain price! These amps have a 22 dB Motorola 750 MHz push-pull hybrid for the forward gain device. Augat pad and EQSS style equalizer can be used before the hybrid. The 5 to 30 MHz return path is passive. Includes a UL approved power transformer. Get yours now for little more than the cost of the hybrid!



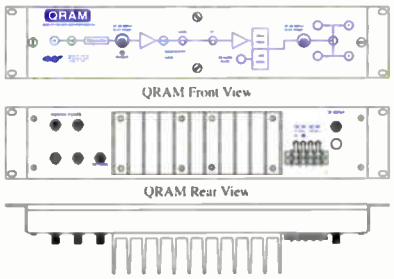
QDAXF 750 MHz
QDAXF 870 MHz

Augat-style FIXED EQ and PAD for high SLOPE and optimum RF linearity! Push-Pull, Power-Doubled, and Quadra-Power for HIGH RF Output in an MDU Wall-Mounted Indoor Amplifier.

5 to 40 MHz Optional Active Return Amp w/Sweep Insertion TP

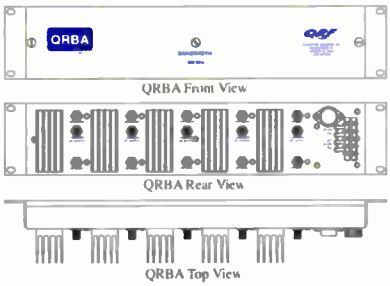
FIXED INTERSTAGE EQ PROVIDES HIGHEST RF OUTPUT SLOPE!

Forward Amplifiers to 860/870 MHz!

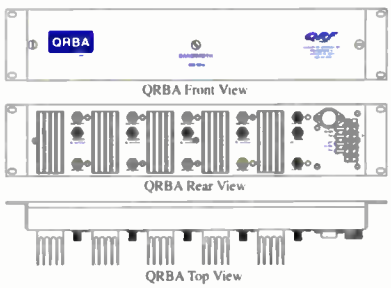


QRAM 550, 750 & 860 MHz Driver Amplifiers Push-Pull, Power-Doubled, Quadra-Power and FEEDFORWARD High Output Versions.

QRBA Low-Gain with High-Isolation for Multiple Franchise Channel Line-ups or RF Modem / Telco Fiber Node Isolation! 550, 750, 860 MHz Forward Isolation!

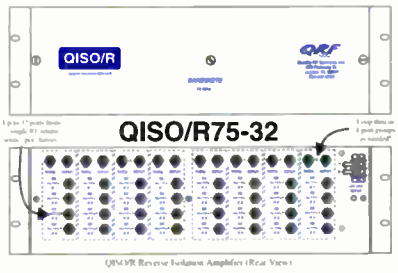


Reverse Amplifiers 5 MHz up to 200 MHz!



QRBA050 or QRBA200 Hybrid Reverse Path Buffer Amplifiers Drive Splitters and Pads for Brute Force Isolation from 5 MHz to 50 MHz or 5 MHz to 200 MHz.

QISO/R75-32 Active Reverse Path Splitter with Eight Independent Amplifiers 5 to 75 MHz Reverse Path Isolation Amplifier for Digital Signal Distribution and Isolation in Headends!



EQs & Pads in stock for all major brands of CATV equipment • Repairs to all types of hybrid amplifiers

Quality RF Services is not a sales agent for Scientific Atlanta, GI/Jerrold or Thomas & Betts(Augat).

VISA MasterCard
Now Accepted Worldwide!

American Express cards are accepted for ALL World-Wide Shipments!

800-327-9767

QUALITY RF SERVICES, INC.
850 PARKWAY STREET
JUPITER, FL 33477

561-747-4998
FAX 561-744-4618

particular relevance to a local community," says Tom Olliver, president of the Interactive Channel, adding that this service is especially valuable to operators in light of recent local-into-local satellite legislation.

To deliver its service, Interactive Channel establishes contractual relationships with local content partners, such as newspapers, radio and TV stations. This content is ported over in a hypertext markup language (HTML) format, integrated though the company's propriety TVML authoring system and presented in an NTSC picture. TVML makes adjustments to font size, clarity, coloration and so forth on Web pages for a TV format.

"What we believe is that, particularly related to this local area, we can build a highly differentiated and first-class product that is totally branded for and around and with the cable operator," says Olliver.

He says Interactive Channel is deployed in three markets, including deals with Cablevision, Cox and Comcast, and has 10 more markets scheduled. He adds that launch costs are low compared to initial digital headend investments. "It's about $10 a digital subscriber amortized over, say, five years—it's nothing," says Olliver.

"What many operators and vendors are asking is, why stop with video?"

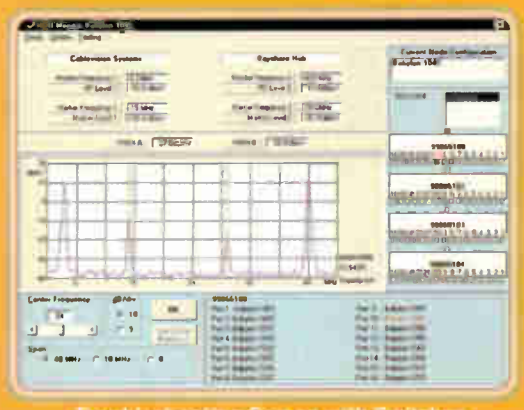
CableSoft also is providing on-demand local content through its SnapFacts suite of 12 customized, on-demand information channels, which include weather, sports, lottery listings, classifieds and so on. For example, in Jacksonville, Fla., where the service currently is being offered by MediaOne, CableSoft has partnered with *Jacksonville Magazine*, a city and regional magazine. Under the partnership, *Jacksonville Magazine* provides local dining, entertainment and event calendar content free to MediaOne subscribers. MediaOne reaps ad revenue from CableSoft's Fast Yellow business directory and Classifinder, a database of classified advertisements for automobiles, help wanted and real estate.

The service can run on analog or digital set-tops and utilizes several transport methods, including out-of-band (OOB), video and vertical blanking interval (VBI).

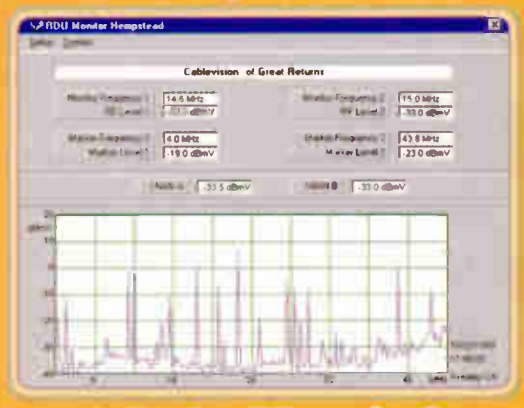
Looking ahead

Interactive services certainly are changing the face of this business, and it's only just begun. So, while no single "killer app" has emerged in digital, and none probably will, providers of on-demand services are giving us lots to choose from. CT

Doug Larson is senior editor of "Communications Technology" in Denver. He may be reached via e-mail at dlarson@phillips.com.



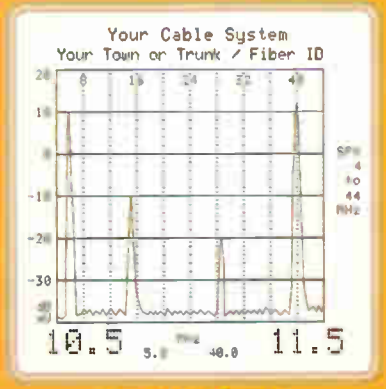
Troubleshooting Screen with Switches



Impulse Noise from 65 Mustang Door Buzzer

The RDU is a new type of return test system. You "see" the live condition of the return spectrum and RF level in dBmV at the HE, from any subscriber's terminal, amplifier, tap or fiber node.

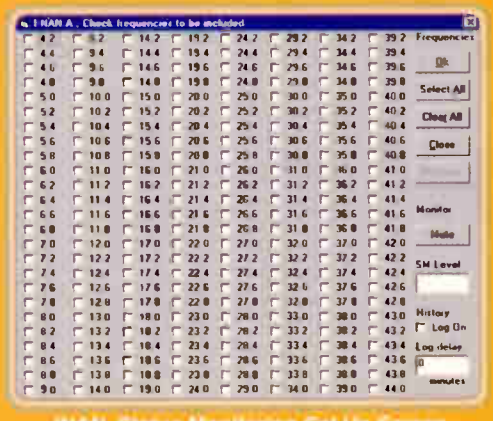
The RDU provides a real time visual display of Carriers, Ingress, Noise, Impulse Noise and Common Path Distortion.



Live Video Screen

With integrated RF switches, the RDU system allows you to select and monitor a single node, a group of nodes or all the nodes in the Hub. Node configurations are created and named by you insuring an intuitive, easy to implement Return Management System.

RDU's Status Monitor the noise floor, where you designate, by frequency. The RDU averages the energy and displays your benchmark *I-NAN* © number. You gauge the noise floor's condition from a trackable number!



INAN Status Monitoring Set Up Screen

I-NAN numbers allow you to judge return performance over time by node or system. *I-NAN* is a flexible, cost effective tool for proactive maintenance of return networks.

The RDU provides frequency agile level cursors with a Delta in dBmV and a time / date stamp for accurate Carrier to Ingress / Noise Ratio tests. Save the results and print later for cost effective engineering operations.

Cycle through your nodes overnight, isolating the problems for morning attention. The RDU insures engineers have a tool for effective maintenance.

See your return system on a TV channel and / or use the high speed, networked data port and access the RDU over Cable or Intranet modems. Up to 384 nodes can be monitored from a single Controller!

Imagine live return at Dispatch, Customer Service and Engineering computers for constant monitoring. The RDU system opens the way to a logical, effective return operation.

CABLE RESOURCES INC.
85M Hoffman Lane
Islandia, NY 11722
FAX: 516-234-4436

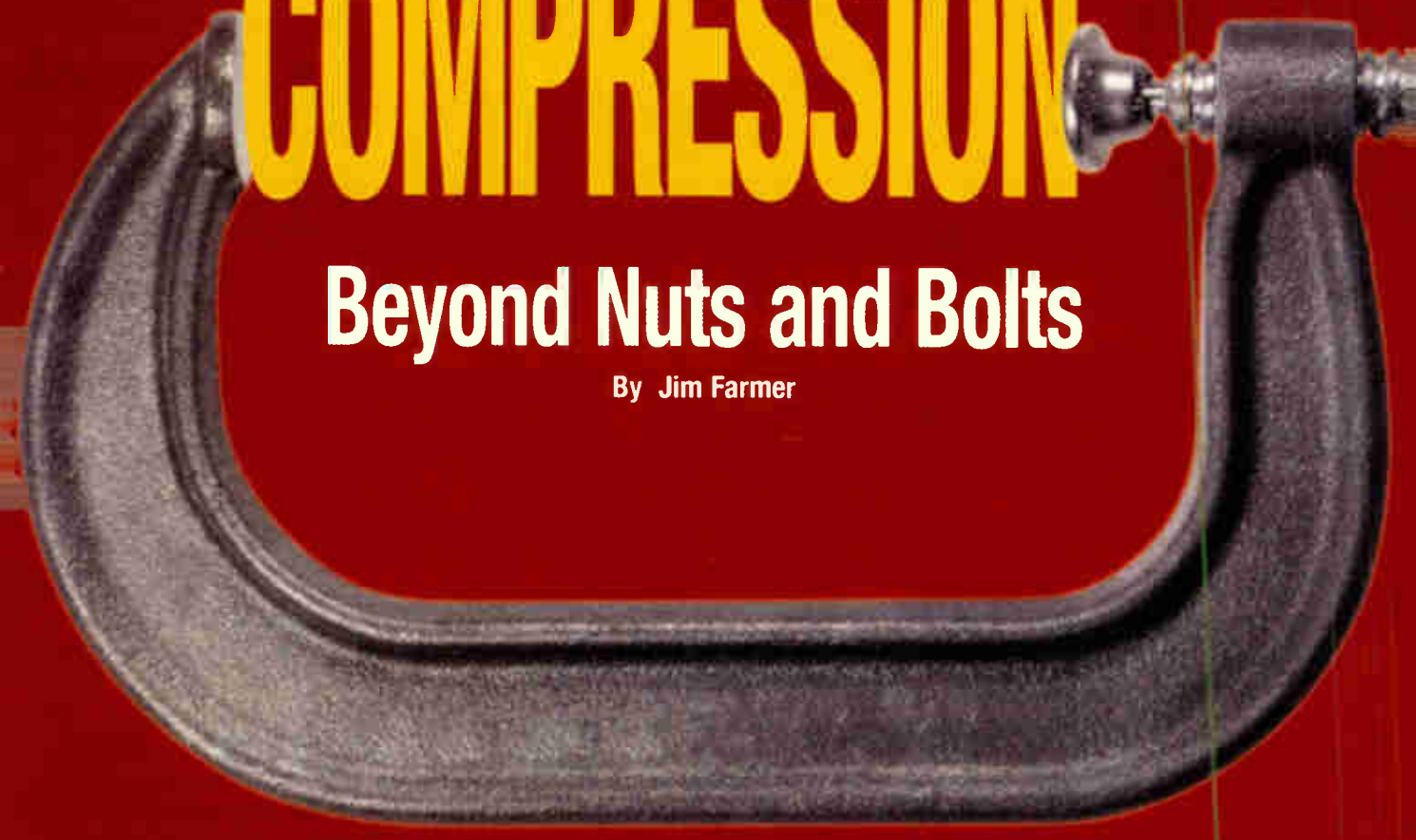
Call 800-537-9995
for Sales and Information!
Browse at cricabletv.com

DIGITAL VI

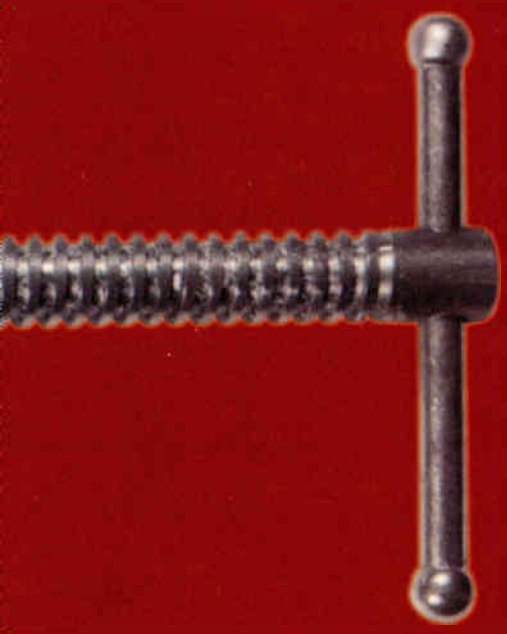
COMPRESSION

Beyond Nuts and Bolts

By Jim Farmer



DEO



Beginning this month and continuing bimonthly in *Communications Technology*, I'll be looking at the fundamentals behind digital TV (DTV). You need information regarding how particular pieces of equipment work, but in order to get the most out of that gear and to efficiently troubleshoot problems, you need a good basic understanding of how the system works. If you would like to see particular points discussed, or if something is unclear, feel free to e-mail me at the address at the end of the article.

DTV vs. HDTV

People sometimes confuse DTV with high definition TV (HDTV). All HDTV today is digital, but not all DTV is HDTV. Actually, there was an analog HDTV system developed in Japan a few years ago called MUSE, and you may still find MUSE-based systems at work in professional content-generation activities, but you won't find MUSE in a consumer setting.

You can transmit DTV at several different resolutions (the number of picture elements, or "pixels" making up the picture). HDTV is the top of this chain, with the most pixels and with widescreen display. In the early movie days, movies were shot with an aspect ratio (ratio of the picture's width to height) of 4:3, and this was adopted for television when the analog standards were developed. Later movies went to several widescreen formats.

I don't know if this is true, but I was told the reason was that in the early days, the movie industry saw television as a competitor, and they went to widescreen to try to prevent TV from usurping their movies. Obviously, that philosophy has changed. Anyway, HDTV uses an aspect ratio of 16:9, which is a pretty good compromise to cover movie widescreen formats.

Both HDTV and lower resolution DTV use pretty much the same technology, though there are a few differences depending on how the signal is transmitted. Before getting into the subject of DTV, let's briefly review a few points of analog TV that will enhance our understanding of digital TV. I'll review only a few points here; for a more in-depth review of analog TV, consult one of the references listed at the end of the story. ➤

Figure 1: Analog scanning of a picture

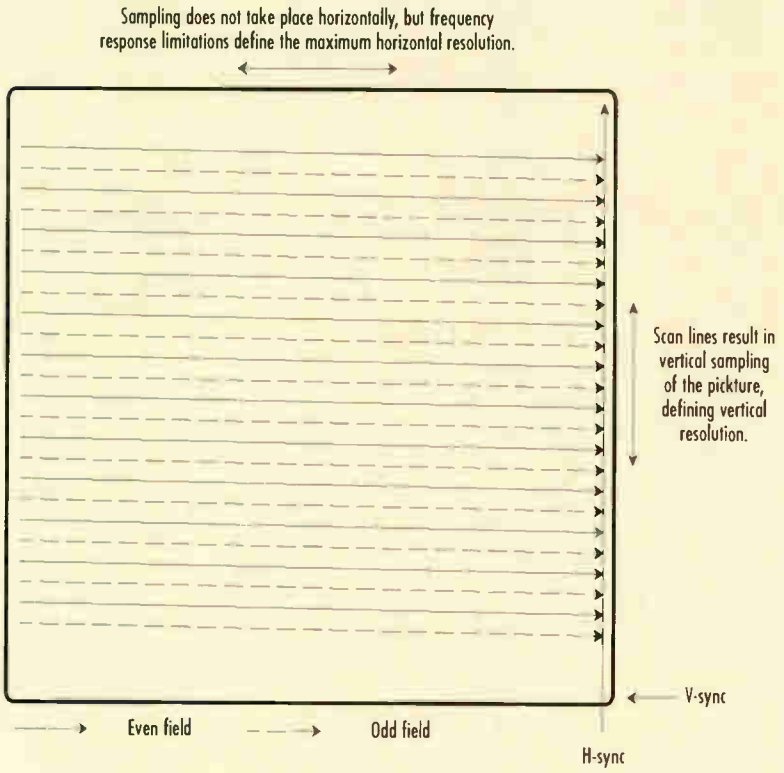
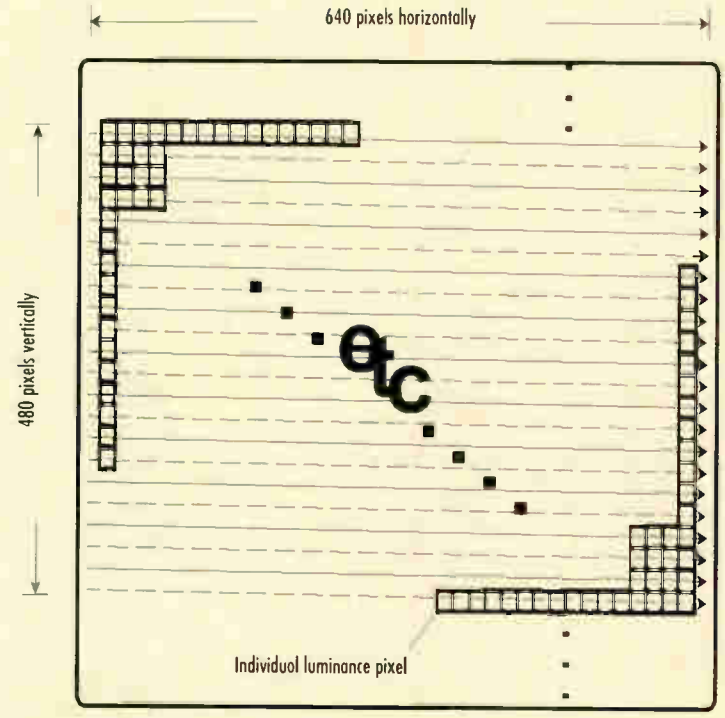


Figure 2: Sampling of a standard definition picture



Analog scanning

Figure 1 illustrates how a picture is scanned in analog TV. This scanned picture is the starting point for digitization. The picture is scanned from the upper left as viewed from the front of the picture tube. The picture is scanned left to right and top to bottom, and an electrical analog of the picture is transmitted.

At the end of each horizontal line, the electron beam is reset to the left side, down from where the first scan started, and a horizontal synchronization pulse (H-sync) is transmitted to the receiver to tell it to reset to the left side. At the bottom of the picture, a vertical sync (V-sync) waveform is generated to tell the receiver to reset to the top of the screen.

Bandwidth reduction is not new with DTV. Analog TV practiced considerable bandwidth reduction consistent with the technology available at the time.

One of the bandwidth reduction techniques was interlaced scanning, which allows a lower frame rate without flicker. Half the lines in the picture are scanned and displayed, then the other half of the lines are scanned. Each time one set of lines is scanned, we have transmitted one "field" of the picture.

The lines of the second field fit in between the lines of the first, as shown by the solid and dashed lines of Figure 1. Together the two fields, which are known as "odd" and "even" fields, make up a complete picture, or "frame." A picture generated in this manner is called an "interlaced picture."

It is possible to not interlace the picture, and there are some advantages to not interlacing. However, there is a major drawback: You would have to display twice as many frames per second to achieve the same level of flicker reduction. If the picture is not interlaced, it is "progressive scanned." There can be some advantages to not starting with an interlaced picture when converting to digital.

In the vertical direction, the scanning lines give us a natural "spatial sampling" of the picture. That is, the picture is broken up into samples in the vertical direction. These samples may take on any luminance value from black to white, but at each point on the picture, the picture content has one and only one value, related to its luminance, or brightness. (Yes, I

pads

equalizers

plug-ins

new & refurbished electronics

passives

refurbished converters

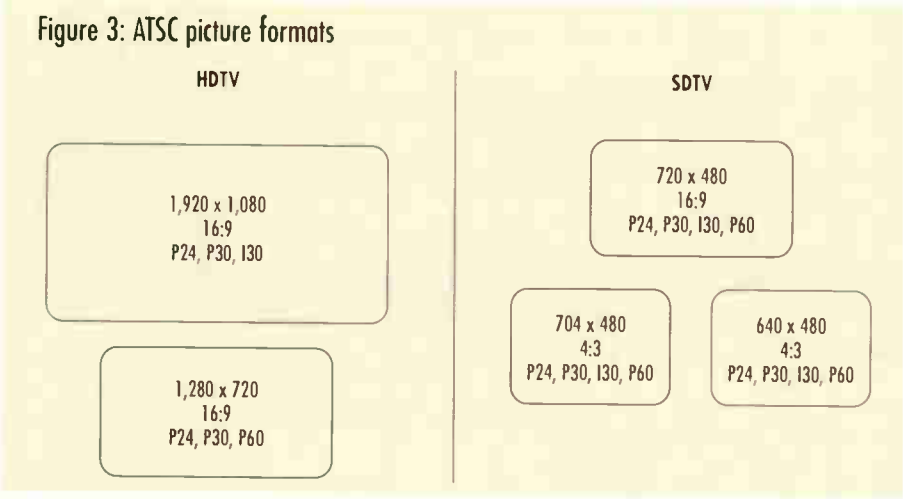
MAINLINE

INCORPORATED

800.444.2288 ■ Phone: 310.715.6518 ■ Fax: 310.715.6695

20917 Higgins Court, Torrance, California 90501 ■ www.mle.com ■ Email: mainline@worldnet.att.net

Figure 3: ATSC picture formats



am aware that we have color pictures and that more information is required to specify the color, but for now think in terms of black-and-white. We'll add color later.)

In NTSC TV, we have a total of 525 horizontal lines in a frame. About 21 or 22 lines in each field are taken by the horizontal blanking interval (HBI), resulting in about 44 lines of the 525 being other than picture content. Thus, we have 481 lines of actual picture content. In practice, the number is somewhat lower, so let's round to 480 lines of picture content. Thus, the vertical resolution of an NTSC picture is 480 lines. Also, the resolution vertically is 480 pixels.

In analog TV, we don't sample the picture horizontally, but we have roughly the same idea in that the maximum frequency response of the system defines how many equivalent pixels we can get horizontally. It turns out that we don't have as much resolution horizontally as we do vertically. For digitizing the picture, we do break the picture into horizontal pixels, each of which is digitized. The equivalent number of pixels in the horizontal direction may be found by multiplying the vertical pixels (480) by 4/3, the ratio of picture width to height. This yields 640 pixels.

Getting ready to digitize the picture

Figure 2 (on page 68) illustrates the sampling of a standard definition (roughly NTSC quality) picture. Each little square represents one luminance pixel. An individual pixel may take on one of a number of values that tell the receiver how bright to make that spot on the screen, but each pixel has only one value.

The first step in creating a DTV signal is to break the picture into pixels as shown, and then each pixel is digitized. We will start manipulating the picture by group of pixels for compression, so we tend to worry more about pixel locations both vertically and horizontally, forgetting about the time axis. Of course, whatever we do must be completed before we start working on the next picture, so we do have very real time constraints. ➤

BOTTOM • LINE

Digital Fundamentals

In this first installment of a series, we begin exploring the theory behind video compression by reviewing the analog signal, which is composed of a number of interlace-scanned horizontal lines. The picture is naturally divided into discrete vertical samples by the scanning process. In the horizontal direction, it is not as obvious that the picture is divided into discrete samples, but in order to digitize the picture, we must sample the picture horizontally as well as vertically. The horizontal sampling does have an analogy in the analog domain: The maximum frequency response of the channel limits the number of signal transitions we can get on a line, effectively establishing a limit in the number of picture elements (pixels) we can display horizontally. Finally, we examine aspect ratio and the different display standards of digital video.

Headed wrong way.

Way behind schedule.

Will be working late again.

Unlimited wireless data. Low flat monthly rate.

AT&T PocketNet® Service

Get time-critical information when you need it with AT&T PocketNet® service. You'll have real-time wireless access to information you can exchange with your drivers: correct pickup information and immediate confirmations captured electronically. Plus, you get caller ID, messaging waiting indicator, and up to ten lines of screen text. Combine AT&T PocketNet service with AT&T Group Calling for one powerful voice and data package. To find out how it can work for your business, call 888 DATA–ATT.

Scheduling new pickups through dispatcher with AT&T PocketNet® service.

Ahead of schedule.

Will get home early.

MITSUBISHI WIRELESS COMMUNICATIONS

AT&T

Display formats

The Advanced Television System Committee is the body in the United States that has led the charge toward a standard for DTV. Some systems predate the ATSC standard, but most new work conforms as closely as possible to ATSC.

The ATSC has defined a number of different picture formats based on the aspect ratio of the picture, either 16:9 or 4:3, and on the number of vertical and horizontal pixels. Figure 3 summarizes the so-called 18 ATSC formats. We say so-called because you can count the options in different ways and get either more or fewer formats.

This information originates in Table 3 of Annex 1 in ATSC standard A/53.3 It is sometimes called the "infamous Table 3" because this is the one part of the ATSC standard that the Federal Communications Commission did not adopt as part of the over-the-air DTV standard. The reason it was not adopted is not technical, and the subject is of considerable consternation to those closest to the process.

On the left side of Figure 3 are the HDTV formats, and on the right are the standard definition (SDTV) formats. The top line of the text in each rectangle shows the number of pixels, horizontal by vertical. The second line shows the aspect ratio, and the third line shows whether the format is interlace-scanned (I) or progressive-scanned (P), and the number of frames per second. The aspect ratio of the rectangles approximates the aspect ratio of the display format, and the height represents the relative vertical resolution of the picture.

> "Most new work conforms as closely as possible to ATSC."

An important thing to note is that, with DTV, the format in which the picture is transmitted and the format in which it is displayed can be different. A TV set could receive a progressive picture and display an interlaced picture, or vice versa.

To display standard aspect ratio pictures on a widescreen set, it is common to just leave black bars on the two sides. Several methods are being practiced to display widescreen on standard aspect ratio sets. The best is to use "pan-and-scan" information that can be transmitted with the picture to tell the display which part of the picture to show. I understand that people are not transmitting the pan-and-scan information yet, though.

In that case, the display uses letterbox format, in which some blank screen is left at the top and bottom of the screen. I have also seen pictures in stores that force the widescreen picture into the narrower 4:3 format, making everyone appear very thin. Presumably, the engineer was having a really bad day when he designed that capability in.

The next step

The next step is to digitize the picture, but this will have to wait until the next installment in April. So hold the thought and keep this magazine because we'll start here next time. CT

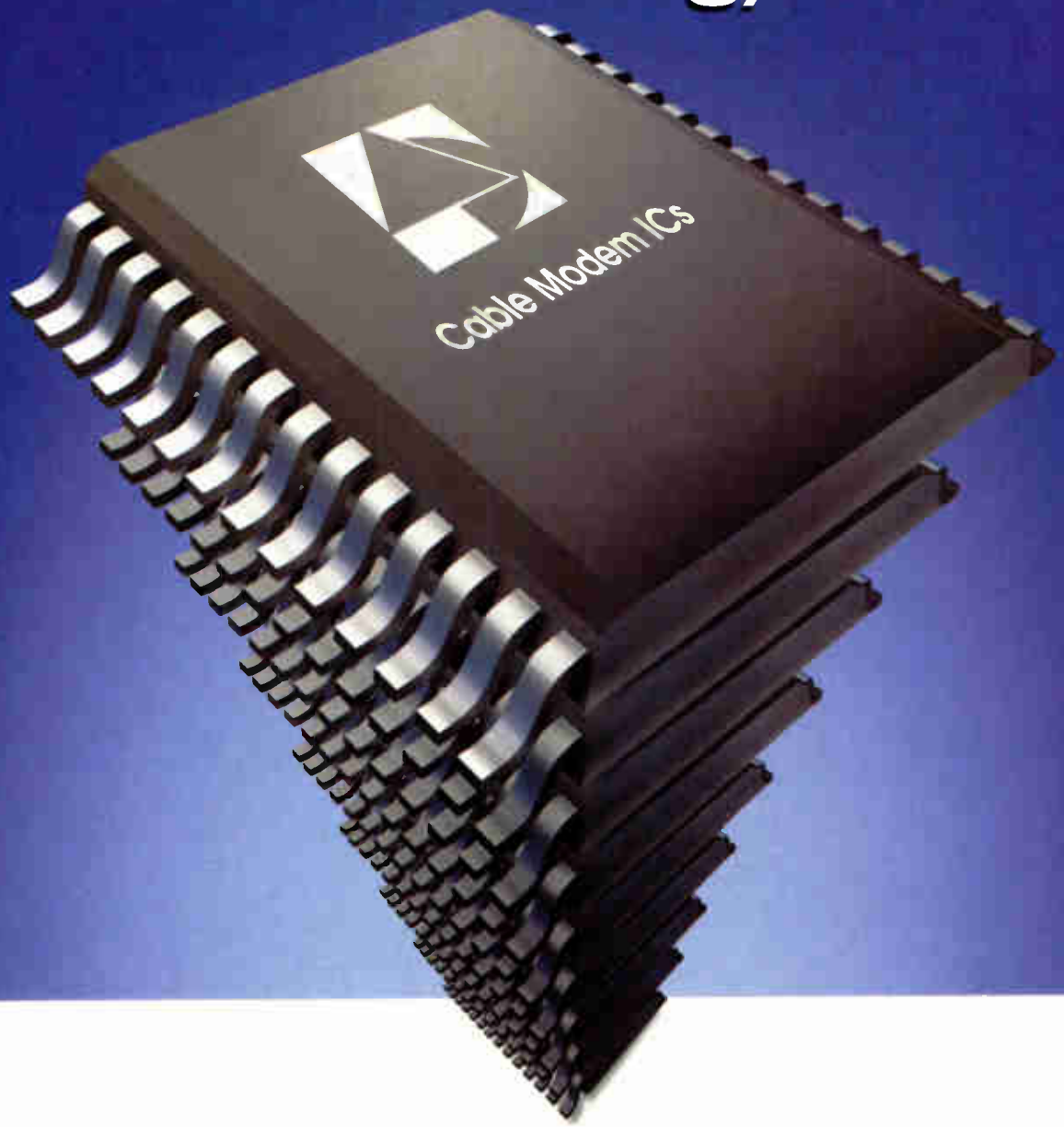
Jim Farmer is the chief technical officer for Antec, and he can be reached via e-mail at jofarmer@mindspring.com.

References

Modern Cable Television Technology: Video, Voice and Data Communications (Chapter 2), Ciciora et. al., Morgan Kaufmann Publishers, 1999.

"On the Road to DTV: Understanding the ATSC DTV Standard;" Isnardi, M., and Seagrave, C.; 1998. This tutorial was presented at the Institute of Electrical and Electronics Engineers International Conference on Consumer Electronics, May 31, 1998. Unfortunately, the slides were available only at the conference. This year's conference, June 11-15 in Los Angeles, may be previewed at www.icce.org. The Web site is under construction as I write this. www.atsc.org.

No one stacks up to our cable modem technology



Upconverters ■ Downconverters ■ Reverse Amplifiers

ANADIGICS has shipped over 2 million cable modem ICs because our products not only meet DOCSIS specifications...they **exceed** them! You'll find other solutions just don't stack up, call us today.

ANADIGICS® On Board

35 Technology Drive Warren, NJ 07059 Tel: 908 668-5000 Fax: 908 668-5132 e-mail: mktg@anadigics.com. Website: www.anadigics.com

(Editor's note: "Communications Technology" continues its series on cable telephony. For a look at how to plan your telephony network and what equipment is available to support your service, see our January 2000 issue, pages 102-122.)

Build From Core Strengths

By Justin J. Junkus

Although the entry of AT&T into the cable business was the event that first made the general public aware that cable is serious about telephony, cable's telephony business is almost ancient history. Telephony is a business that has at least three points of entry: residential services, business services and transport.

Savvy operators have been quietly growing highly profitable telephony business segments since the mid-1990s, and their experiences confirm that residential local access is only one starting point. The fact that some cable telephony ventures now stand on their own, separate from their original cable parents, should be ample proof that building from strength is not only a way for cable operators to enter the telephone business, but it also can give incumbent telcos some powerful competition for consumer dollars.

Business, not just technology

Successful businesses build strategies based on defining markets in the broadest terms and then gaining opportunities by approaching those markets from positions of core strengths and then building a growth strategy. From this perspective, telephony is not just local phone service, but the entire spectrum of connecting a call between subscribers. The operator's challenge becomes how best to match core strengths and experience within this definition.

Cox, for example, has been a leader in this area. Cox has a long history of experience with high-speed fiber-optic distribution. As early as 1987, the company began budgeting for the rebuild of its cable infrastructure into a fiber-optic broadband network. That commitment evolved into a self-healing, 100-percent synchronous optical network (SONET)-based backbone reaching throughout the company's metropolitan service areas.

The reliable, high-speed backbone is exactly what large- and medium-sized businesses need to interconnect locations, and Cox has capitalized on its investment to offer just that service. Today, Cox offers high-speed transport both to large businesses and government entities, with customers as diverse as Langley Air Force Base and Deaconess Hospital of Oklahoma City.

In addition to business services, Cox also started offering residential telephony access to owners of multiple dwelling units (MDUs), where they had previous strong relationships with real estate investment trusts (REITs) as a cable TV provider. From this toehold, Cox expanded to offering single-family telephony service. More than 100,000 customers subscribe to Cox Digital Telephone, the company's local residential telephone service.

Now, Cox is moving to a new business market, where its experiences in both large business and single-family offerings can be further leveraged. The company is building an organization to serve the needs of small to medium businesses, using tactics similar to those of cable's residential telephony providers, with a business twist. The

BOTTOM • LINE

Telephony: The Broadband View

Operators need to define their telephony markets in the broadest possible terms and grow the breadth of their offerings from initial core strengths and experience. Some starting points are high-speed fiber-optic distribution, residential multiple dwelling unit (MDU) applications and the packaging of broadband business services.

In the long run, consumer needs rather than technology should determine which applications make sense as offerings. Although Internet protocol (IP) telephony is a platform for future services, it need not be the first telephony technology implementation for cable operators. Circuit-switched telephony implementations can be installed to satisfy immediate consumer demand for full service telephony offerings while IP telephony is being defined by technical trials such as Comcast's Union, N.J., offering.

approach uses a direct sales force, not mail or telemarketing, and hooks to different services that will make subscribers reluctant to change providers.

Some examples include telephony access and customer premises equipment combined with video offerings of business TV channels such as CNN, and discounts for business employees' residential telephone service. The experience Cox gained with residential installation and back office processes is directly applicable to the small business market.

Telephony can fuel growth

Other companies have entered telephony from other avenues. MediaOne, for example, began by offering multifamily residential service in Atlanta and Florida. As the company built on relationships with MDU owners, MediaOne learned new processes unique to the telephone industry, such as how to handle provisioning and customer service. It then moved to single-family service, and now, says Steve Lang, executive director of finance and corporate public relations, telephony is "everywhere we are" with availability increasing in all MediaOne markets.

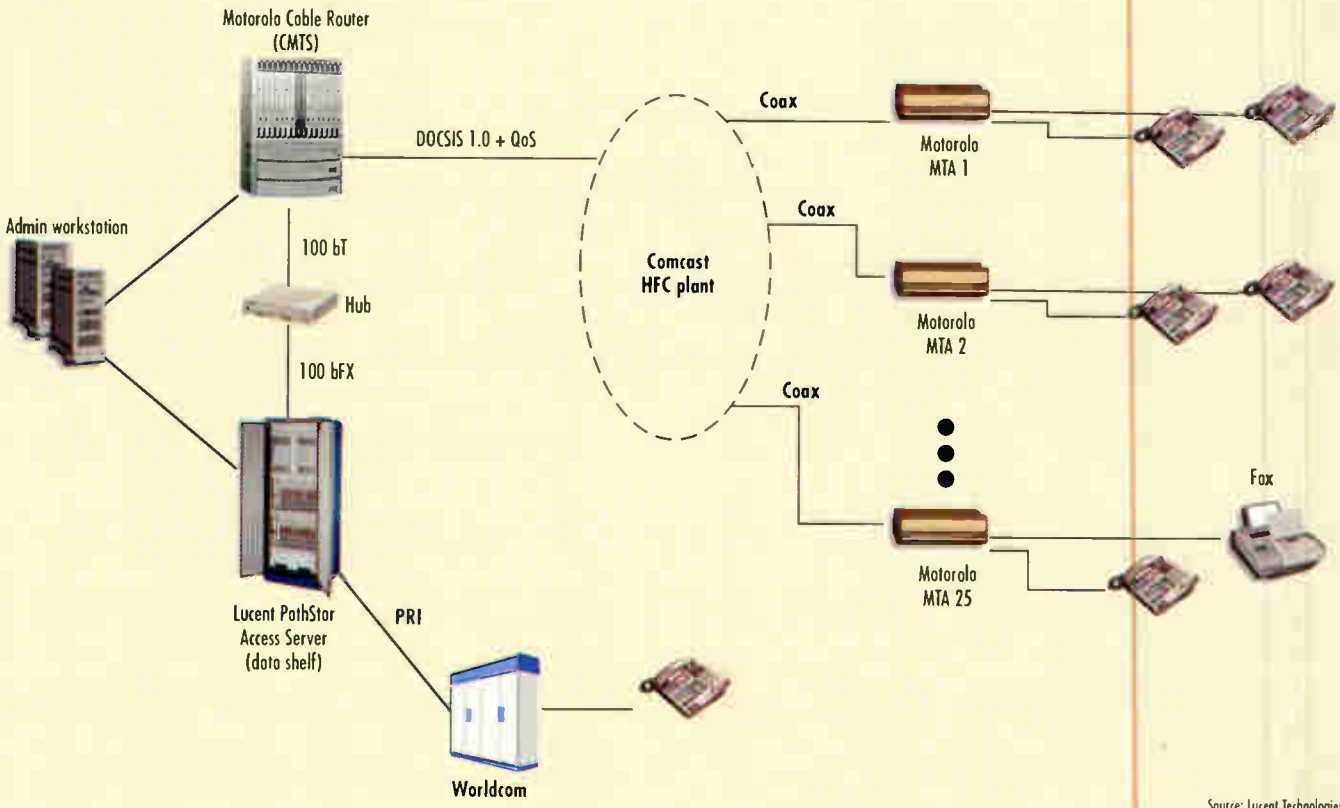
Cable's residential telephony service offerings are increasing. Although exact counts are impossible to obtain because of the number of providers and the dynamic nature of the market, most sources indicate around 300,000 lines in service at the end of 1999. At least 10 multiple system operators (MSOs) have telephony service offerings, although the offerings tend to be in clusters around metropolitan markets, such as Los Angeles or the upper Atlantic seaboard.

Providing long distance service for credit card callers is another example of a market entry point. Adelphia has grown its business from interexchange interconnect to consumer offerings using this route. If you think about building from strengths, you will not be surprised to see the company marketing a paging service as well. Its definition of telephony continues to emphasize alternate network access.

Technology plays a supporting role

Consumer needs, rather than technology, are driving operator implementation of telephony solutions. For example, Internet protocol (IP) telephony often is presented

Comcast trial configuration—Phase I



Source: Lucent Technologies

The code strikes home.

NEC
Article 830C

"Primary electrical protection shall be provided on all network-powered broadband communications conductors ..."

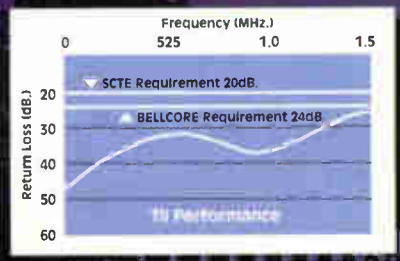
COAX PROTECTION NOW MANDATED FOR CABLE TELEPHONY.

What's the best possible way to avoid shocks from non-compliance with the new NEC code? Provide the coax protection they mandate with TII surge protectors. They optimize shielding of cable telephony services from lightning as well as provide protection for other expensive home equipment.

TII PROTECTORS BRING YOUR COAX UP TO CODE.

TII surge protectors fully satisfy NEC requirements. They ground the outer coax shield while protecting the center conductor from the damaging effects of lightning. With over 30 years of experience and a wealth of patents, TII provides protection you can count on.

TII'S UNPARALLELED RF PARAMETERS.



TII can handle high energy surges with very low capacitance and low arc voltage. Our coaxial protectors easily exceed both SCTE and Bellcore requirements. For more information, call **1-888-844-4720**. Visit us at www.tii-industries.com.

TII INDUSTRIES, INC.

as a necessary ingredient for telephony's growth in cable. Although IP technology is a platform for many enhanced, converged services, in the residential access arena, the reliable solution that is available at less cost than the telco offering is what customers buy.

Right now, that solution is available only with circuit-switched technology. Even Mark Coblitz, vice president of strategic planning at Comcast and who is very active in CableLabs' PacketCable initiative, agrees: "It's very complicated for a customer to figure out why IP telephony is better or not better. Where our company offers primary and secondary local telephone service, 10 to 20 percent of our customers take the service. They don't care about technology. They are concerned about whether the quality is as good, and is the price less."

That doesn't mean that new packet-switched technology won't eventually displace the current circuit-switched implementations. It's just that many operators agree with MediaOne's Lang: "IP telephony just isn't ready for prime time. Anyone serious about telephony will not wait for IP."

> "Telephony is not just local phone service, but the entire spectrum of connecting a call between subscribers."

Still, Comcast is bullish on the long-term potential of IP telephony and is conducting a technical trial of the service with 25 employees in Union, N.J. Comcast is using Lucent Technology's PathStar Access Server coupled to Motorola's Cable Router CMTS (cable modem termination system). A pair of workstations for administrative and routing functions rounds out the trial system. (See the accompanying figure on page 76.) Coblitz expects the trial to develop into a full market trial, with hundreds of users, and eventually lead to full deployment with thousands of customers.

In the meantime, using circuit-switched technology is another way to build from strength. Revenues come in, and experience builds. As Sheri Sharp, Cox vice president of new product operations in San Diego, put it: "The nice thing about circuit-switched technology is that we gain basic customers and can move them to IP when it makes sense."

The concept seems to be working. In San Diego, Cox has a penetration rate of about 9 percent of homes passed and is doing even better in areas where it has been established longer as a telephony service provider.

Even AT&T seems to agree. Although the company has said it will be trialing IP telephony in selected markets this year, it also is evaluating circuit-switched telephony access solutions from ADC, Arris Interactive and Tellabs and continuing with that technology for service implementations in the markets it has gained with its acquisitions.

With flexibility, the future is bright

Most predictions indicate that cable telephony subscribers will increase exponentially over the next five years. Other projections indicate that the number of minutes of calls processed by IP telephony switching also will increase rapidly during the same period.

With multiple ways to approach the telephony market, cable can realize at least part of its growth by riding the IP technology curve, even if it's not all in the residential access market.

On the other hand, by providing reliable, feature-rich service independent of the underlying technology, at prices below the incumbent provider, cable has the potential to reach Forrester Research's predicted 20 percent penetration of U.S. households by 2005. CT

Justin Junkus is president of KnowledgeLink, a consulting and training firm specializing in the cable telecommunications industry, and applications engineering director for Antec. To discuss this topic further, you may e-mail him at jjunkus@knowledgelinkinc.com.

Perfecting Our Leakage Meters Meant Moving One Important Part—You.

Now you know exactly where to go. Because finding and fixing cable leaks just got a whole lot easier, faster, more accurate – even more fun. We've completely redesigned our leakage antenna system to provide unparalleled sensitivity and direction finding, so you can follow that elusive leak into any nook and/or cranny to get your job done more efficiently than ever. This new HD-1 antenna, combined with our new Find and Fix firmware and advanced tagging capability, provides the most comprehensive leakage test system available. Did we mention we're giving the newly designed HD-1 antenna away with every unit we sell until March 1? It's true. Just call your local sales rep or visit ***www.wwgsolutions.com.*** You can also call **1-800-851-1202** for a free leakage system information packet.

WAVETEK WANDEL GOLTERMANN
Communications Test Solutions

Avoid the Pitfalls of High-Speed Modem Hookups

Six Steps to Hassle-Free Modem Hookups

By Bruce Bahlmann

Installing an Internet information service (also known as high-speed data service) has become one of highest priorities of today's multiple system operators (MSOs). Unfortunately, installation of these services also involves considerable install times and complexity. It requires individuals with a combination of cabling, software, hardware, basic computer networking, RF or broadband, and interpersonal skills.

Although efforts are underway to augment MSO employee-driven efforts with customer self-service options, installing high-speed data will for some time remain a long manual process.

The personal touch

Regardless of the improvements in technology, self-service options and increasing standardization, providing personal in-home installation and support of broadband services is the cornerstone of the cable TV industry. This personal touch differentiates broadband-based Internet service from dialup Internet service. The installation also is the time to demonstrate product superiority and establish customer loyalty.

What it involves

Installing high-speed data services is an expansion of a traditional video install with the following added requirements:

- Customer agreement to a different installation, service contract
- Qualification of customer premise equipment (CPE)—that is, the customer's computer
- Installation of a network interface card (NIC) in the CPE, if applicable
- Configuration of NIC and network software on the CPE
- Use of remote access software along with a laptop computer to access the subscriber management system (SMS)
- Provisioning and troubleshooting remotely from the customer's house

Pitfalls Installs

Most of these differences involve personal computer (PC)-related tasks that each installer must accomplish to complete the installation successfully. Let's examine these in more detail.

1. Service contracts

Each installation represents an attempt that the MSO makes to bring aboard a new customer. The installation truly is an "attempt" because several risks could adversely affect its outcome. These risks could range from obvious reasons (the customer is not home) to ones less obvious (the CPE cannot support high-speed data service).

Consequences of attempting to install high-speed data services are covered by a contract. The contract contains similar items to that of a normal video contract, but with an Internet focus. The high-speed data contract ensures that CPE works properly both prior to the installation (noting any discrepancies) and after the installation to ensure that nothing done by the installer adversely affected the previous operating condition of the CPE.

The contract also defines the scope of intended use for the high-speed data service, which is much more diverse than video use contracts. It is best to send a copy of the contract for the customer to read, and ideally sign, prior to the date of the installation.

Be sure to include customer service contact information with the contract so the customer can get contract questions answered before the install. However, when the installer arrives, the customer still could have questions about the contract; thus, it's best that the installers have a basic understanding of the various contract sections.

When the installation is complete, the installer should leave a copy of the contract with the customer or include a copy in the welcome kit. Note that these contracts often cover only one service—in this case, high-speed data service.

When the installer is connecting multiple services (video, high-speed data, telephony), some consolidation may be necessary to prevent overwhelming the customer with multiple contracts. ➤

Preparing for a high-speed data install, an installer with MediaOne's St. Paul, Minn., system has moved the customer's computer onto the floor, where he has plenty of room to work, and is performing a visual qualification inspection of the unit to find an open expansion slot for the network interface card (NIC). All photos courtesy of MediaOne

The installer removes the case from the customer's computer preparatory to installing the NIC. Before this stage, all cabling for computer peripherals (printer and so forth) should be removed and marked, and the computer should be plugged into a grounded outlet to protect against static shock.

The installers inserts the NIC into an open expansion slot in the customer's computer. Note the grounding cord on the installer's left wrist, used to prevent damage to the equipment from static shock.

2. CPE qualification

The extent that a given CPE is receptive to installing high-speed data services and how well the service performs on given CPE directly depends on its hardware and software qualifications. Establishing and enforcing minimum qualifications for CPE can significantly improve high-speed data installation success rates, as well as customer perceptions of the service.

Qualification also eliminates the need to perform costly software and hardware updates on outdated CPE. Don't try to install high-speed data service on CPE that doesn't meet minimum qualifications. And not all qualification can be done remotely or over the phone; be sure to include a visual inspection of the CPE for an available expansion slot.

Qualification is becoming more automated for installers; more and more tools are being developed that will sense required resources and provide feedback as to CPE readiness and capability. Installers use qualification tools to quickly determine whether to proceed with the install.

If the CPE does not meet minimum qualifications, the installer can provide a list of discrepancies, in the form of a printout, that the customer must correct before an install can be rescheduled. Be sure that this activity is be part of the normal checks for service performed at every customer residence near the beginning of the installation.

3. NIC install

The NIC installation phase is the source of most risks associated with high-speed data installations. During this critical phase, it is often necessary to open the CPE enclosure and install the NIC into an available expansion slot.

Before opening the CPE, be sure to completely disconnected it from all peripherals and move it to a location convenient for service. Disconnection of cables must be done with care to avoid damaging the connectors or their sockets. It's also helpful to label the peripheral cables when there are multiple cables of similar type.

The location where the CPE is serviced is closely related to the quality of service performed. In other words, an installer who has enough room to work tends to be more conscious about what screw goes where and installing the NIC in a professional manner.

Once the CPE is open, the installer must attach a wrist-ground to the enclosure and plug the CPE into a grounded wall outlet to ensure the work performed is protected against static shock. The installer can then prepare the desired location (usually an expansion slot) to receive the NIC. This includes removing the expansion slot cover and shoring up any wires that may get in the way.

To install the NIC, the technician will need to remove it from its protective cover and gently seat it into the correct expansion slot. Always follow the manufacturer's instructions for handling and seating for the highest degree of success. Lastly, the technician will secure the NIC with the screw from the expansion slot cover and re-attach the removed enclosure portion.

Note that some installers prefer to leave the cover off until they're certain that they have successfully configured the NIC. The

If we don't have exactly what you need...

we'll make it for you!

Telecrafter Products

Direct merchants to the telecommunications industry

800-257-2448 • fax: 303-986-1042 • e-mail: mail@dropsupplies.com

The installer uses his laptop computer and a provisioned modem to log onto the subscriber management system (SMS) provisioning account for a trial run.

After successfully completing the install, the installer runs a demonstration of the high-speed data service's features for the customer. Note that the installer hasn't yet replaced the case on the customer's computer; generally, it's best to replace the case prior to firing up the machine.

The installer walks the customer through the frequently asked question (FAQ) section of MediaOne's site after a successful installation.

only problem with this is that you run the risk of further damage to the connectors and increase the possibility of breakage. Keeping down the number of times you touch any one piece of equipment will greatly reduce the possibility for breakage or failure. This, combined with the fact that very few NICs fail right out of the package, provides a solid reason to seal up the enclosure after the NIC installation.

4. NIC configuration

Configuring the NIC in the CPE can be one of the most time-consuming steps in the installation. Here is where the qualification process proves its worth. Without proper qualification, the installer may need to manually edit automatic driver or operating system (OS) configurations, swap out existing hardware, or back out of all changes (cancel the install), which can be time consuming and may affect the operation of other software and hardware on the CPE.

The manual configurations necessary to complete these installs depend on the type of OS and NIC in use. Installers always must follow manufacturer's instructions on NIC configurations. If the customer provides the NIC, the installer needs to write down the configuration steps for the customer. If the NIC is provided by the MSO, be sure to leave the customer with the manufacturer's instructions and a driver diskette to avoid future truck rolls if the customer has to re-install the OS.

5. Remote access

Giving the installer a laptop computer and remote access to the SMS closes the loop between the call center and field operations. Installers can then obtain their work from home, close out jobs on-site and receive updates on work throughout the day.

During the high-speed data install, this capability is useful because it allows the installer to provision active components (the NIC and cable modem) from the customer's home by submitting their Ethernet addresses to the SMS. Virtual private networking (VPN) software allows this to happen quickly, efficiently and securely over a cable modem while at the same time providing customers with an example of the capability of service they are about to receive. This activity also ensures that once provisioned, the customer's NIC and cable modem ought to work.

Once provisioned, the customer's cable modem is powered up and connected to the broadband network, and the NIC is attached

The happy ending: With the customer's computer reassembled and service running correctly, the customer checks his new high-speed service out for himself.

COMING SOON.

BOTTOM • LINE

Six Steps to High-Speed Data

Although installing a high-speed cable modem may seem foreign to the uninitiated, it's not rocket science. An experienced video installer with a basic user-level understanding of computers can be quickly trained to install high-speed data service.

Essentially, installing high-speed data service is an expansion of a traditional video install with the some added requirements. By focusing on the following six tasks, technicians can increase the success rate of their cable modem installs:

- Customer agreement to a different installation, service contract
- Qualification of customer premise equipment (CPE)—the customer's computer
- Installation of a network interface card (NIC) in the CPE, if applicable
- Configuration of NIC and network software on the CPE
- Use of remote access software along with a laptop computer to access the subscriber management system (SMS)
- Provision and troubleshoot remotely from the customer's house

Multiple system operators (MSOs) seeking to further expand their installation capability can seek efficiencies within the field operations organization and leverage current advancements in technology. Providing tools such as laptops, remote access software, and qualification and troubleshooting tools will make each technician more self-sufficient and increase his or her capacity to perform more installs.

to the cable modem via a standard Category 5 (CAT-5) cable. After the installation is complete (that is, both cable modem and NIC are able to access the customer network), the installer writes notes within the install ticket, closes out the install ticket and logs out of the VPN session. This provides customer care with immediate access to the install notes in case the customer later has any questions or problems.

Before this capability, either a dispatcher would update the install ticket as time permitted or a check-in person would transfer notes scribbled on the work order to the install ticket at the end of the day. Use of remote access also prevents delays in translating information over a radio. If this method were used to activate other services such as video and telephony, it would be like cross-selling high-speed data during installation.

6. Troubleshooting

With the laptop in hand, the installer becomes an extremely capable high-speed

A PARTNER YOU CAN TRUST FOR PROFESSIONAL HEADEND SOLUTIONS...

DRAKE

*Drake offers a full line of professional headend equipment for those who demand **quality** and **value.***

*Every Drake product is supported by a **tradition** of unmatched service and expert advice, so you can feel **confident** about your headend choice.*

Call us today to find out how we can help you match the right products or system to your specific requirements.

The Industry Leader for Professional Headend Equipment and Accessories

Coming Soon - Digital Headend Products.
See our website for details.

DRAKE DIGITAL

R.L. Drake Company
230 Industrial Dr.
Franklin, OH 45005-4496 U.S.A.

PHONE: 513-746-4556 **FAX:** 513-743-4510
WORLD WIDE WEB SITE: www.rldrake.com

DRAKE

data troubleshooter. Combining this with a test cable modem that is provisioned on the customer network enables the installer to access any number of tools that can easily be made available online. Simply accessing the customer network via a laptop and provisioned test modem can tell the installer whether the provisioning system, cable modem termination system (CMTS) and the network are all in working order.

However, the hard part of troubleshooting is getting the customer's CPE and cable modem operational. Once the installer confirms that the problem is not with the network, he or she must figure out what the problem is.

Troubleshooting from this point on requires access to the provisioning system (to confirm activation) and access to a working system (the installer's laptop and test cable modem). The most basic troubleshooting tool merely gives a "provisioned status" back to the installer, confirming whether the customer's CPE or cable modem is successfully provisioned.

More sophisticated troubleshooting tools provide details of the transactions between the provisioning system and the customer's CPE and modem. Using this level of support, the installer can determine whether the customer's CPE or cable modem needs reconfiguration or reprovisioning. Without this level of support, the install must be escalated to someone with access to these systems.

> "Don't try to install high-speed data service on (customer premise equipment) that does not meet minimum qualifications."

Train your techs

By following these six steps, you can greatly increase the success of your cable modem installations. But, what do you do about the shortage of PC technicians? The answer may be in your own backyard.

Although there are differences between normal video installs and high-speed data installs, technicians with 70 percent RF and 30 percent data skills seem to be the best suited for high-speed data installations. In fact, it is much easier to train RF people to perform the data portion of the high-speed data install than it is to train data people to perform the RF portion of the install.

So train your people and get your high-speed data program rolling. CT

Bruce Bahlmann is senior systems engineer for MediaOne's Internet Services Group. He can be reached via e-mail at bbahlmann@mediaone.com.

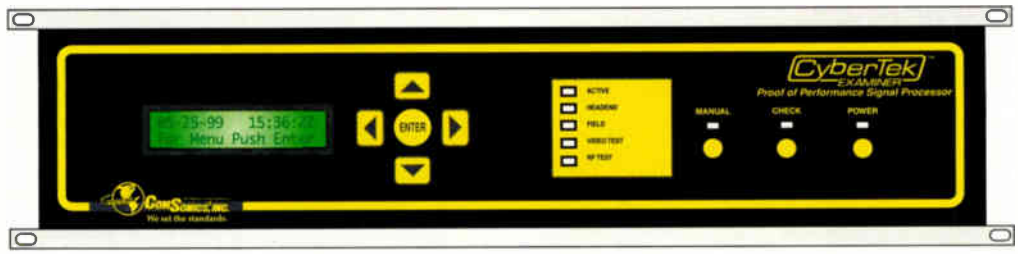
ComSonics Inc.

We've set another Test Equipment Standard!

Introducing

CyberTek™ EXAMINER

Proof of Performance Signal Processor



- Allows Proof of Performance (POP) FCC required tests any time, day or night.
- Tests are performed without viewer interruption.
- Signals provided for the following tests: Carrier to Noise, Composite Triple Beat, Composite Second Order, in-band flatness, and spurious signals.
- Also, provides signals for FCC required Head End video tests.
- Automatic, unattended sequencing of the required test functions without standby Head End personnel.
- Eliminates the need for communication between Field Technicians and the Head End while making measurements.
- Capable of providing test signals on 12 channels.
- Rack mountable for convenient, permanent installation in the Head End.

Use it as a routine maintenance tool... and guarantee quality system performance.

...Another Innovation from the Cable Industry's Test Equipment Leader

P.O. Box 1106 • Harrisonburg, VA 22801 USA
(540) 434-5965, In USA: (800) 336-9681 Fax: (540) 432-9794
or visit our web site at http://www.comsonics.com
email: marketing@comsonics.com

COMSONICS

An Employee Owned Corporation

COMSONICS, INC.®

We set the standards.

"Calling All

Stephen Jones, network operations manager at Comcast of Baltimore, used to watch his technical crews grab their work orders each morning and head out the door. Aside from an occasional conversation over two-way radio, there was little he could do to cancel a job, change it, or add another quick stop at a house down the street.

Cars . . . . "

Mobile Dispatching Goes Wireless, Paperless

By Arthur Cole

That was in the days (barely six months ago) when orders were printed from the company's CableData billing system, and stacks of paper were handed out to Comcast's more than 100 technicians. But now that the company has installed an automated, wireless dispatching system, the mornings seem to fly by, dispatchers are in constant contact with crews all day, and last-minute cancellations or changes are a snap.

Change ain't bad

"It's great," Jones says. "It saves money in efficiency and routing. We get more productivity from our technicians, and we can run tighter routes."

Mobile Data Solutions Inc. (MDSI), based in Richmond, British Columbia, devised the new Comcast dispatch system. MDSI is one of a handful of companies targeting the cable industry with automated, wireless dispatching systems.

Using specialized software, a third-party wireless data network and laptop computers, these systems are set to revolutionize the way cable operators maintain and troubleshoot their systems and handle customer service calls.

"As cable has moved from its rapid

buildup phase to a more mature business, the profits are starting to come more from enhanced services and reliability," says Mike Richard, president of Brazen Software, an Austin, Texas-based system provider. "In the old days, it almost didn't matter how well you maintained your system because there was little competition, and the emphasis was on growth and getting new subscribers. Now, it's time to pay more attention to the management of the system."

How it works

In a new wireless system, customer service representatives (CSRs) field calls by phone and input the requests to the billing system, same as always. Now, however, the billing system uploads work orders to a workstation running the automated dispatch software. The same computer is linked to a wireless network through which it feeds work orders directly to the techs' laptops.

So instead of hanging around the office waiting for work to be printed out, the tech grabs a laptop and hits the road. It's the difference between getting to the first call at 8 a.m. or 9:30. Should an order be canceled or a new one come up, the system automatically updates the tech's laptop on the fly. Imagine your customers' surprise and delight when they get service calls the same day of the complaints.

Costs and benefits

Costs will vary widely depending on the size of your fleet, the types of computers you use and a host of other factors. As well, it's difficult to put a dollar amount on the benefits of automated dispatching, but system operators who have adopted the technology say that one of the greatest intangible assets is customer satisfaction.

"What we really found out was that it enhanced the customer experience," says Eugene Bohan, director of consumer services support at Cablevision of New York, which also uses a system by MDSI. "It allows the technician to spend more time in the customer's home doing everything that customer wants, instead of having to make another truck trip a few days later."

The system also is a two-way street. Not only can the central office update the work schedule, but the tech can update a customer's account automatically, either by a wireless back channel if so equipped, or by dumping data back into the billing system at the end of the day.

The cable industry, and telecommunications in general, are on the tail end of this technology. Wireless data networks and wireless modem-equipped laptops have been in existence a good 10 years now. Electric and gas utilities were among the first to adopt the technology, largely because customer service is a crucial component of those industries—customers who've lost power or heat tend to become unhappy very quickly. As cable moves toward more sophisticated services, it must

BOTTOM • LINE

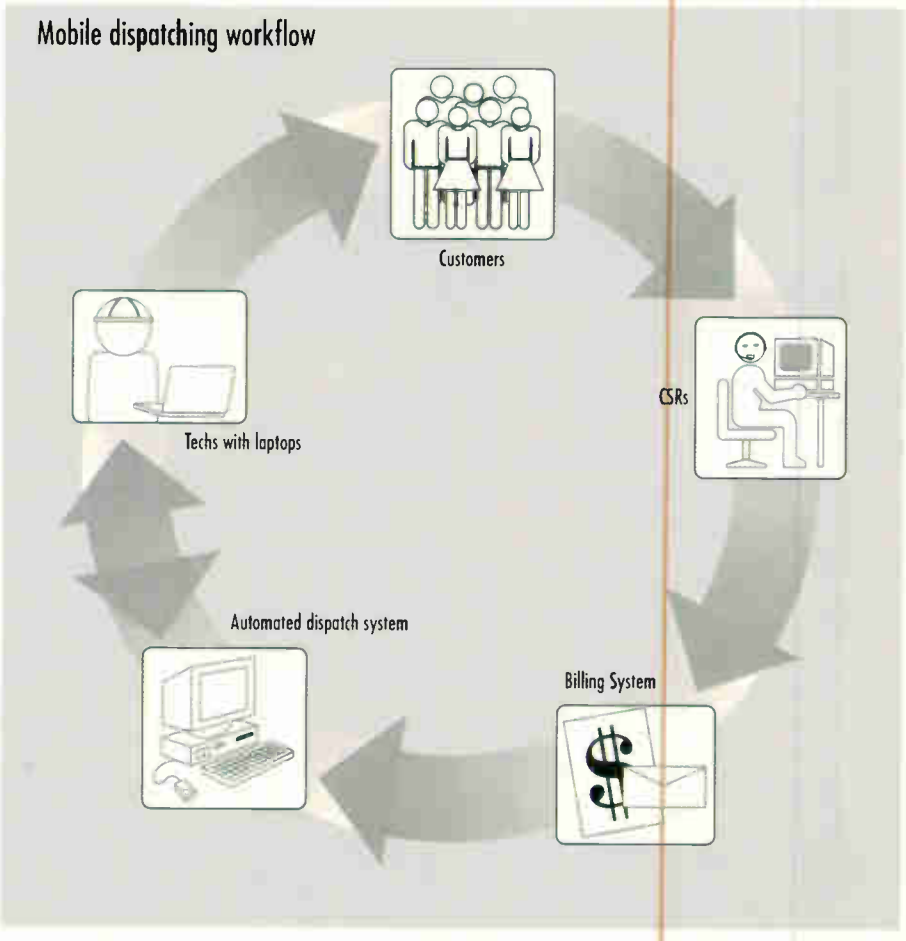
Work Orders to Go

Automation software providers and wireless data networks are teaming up to streamline the dispatch operations of the modern cable facility. In place of stacks of paper tickets, work orders will be tied to a wireless dispatch workstation that updates technicians' laptops wherever they might be.

The benefits of such a system include improved efficiency, better customer service and a more streamlined operation. But it's wise to do your homework before you jump in. Make sure the wireless network is reliable throughout your territory. And be sure your existing dispatch procedures are the best they can be. Automation can improve a well-run operation, but it can make a poor one even worse.

The systems in place today also can provide data on your customers and your technical operations. Computerized customer repair histories can be easily downloaded into a master computer at the end of the day, allowing you to analyze the strengths and weakness of your own crews.

Automated dispatch is likely to sweep the industry. In these days of heady competition between cable and telco operators, it's worth looking into any system that promotes customer satisfaction.



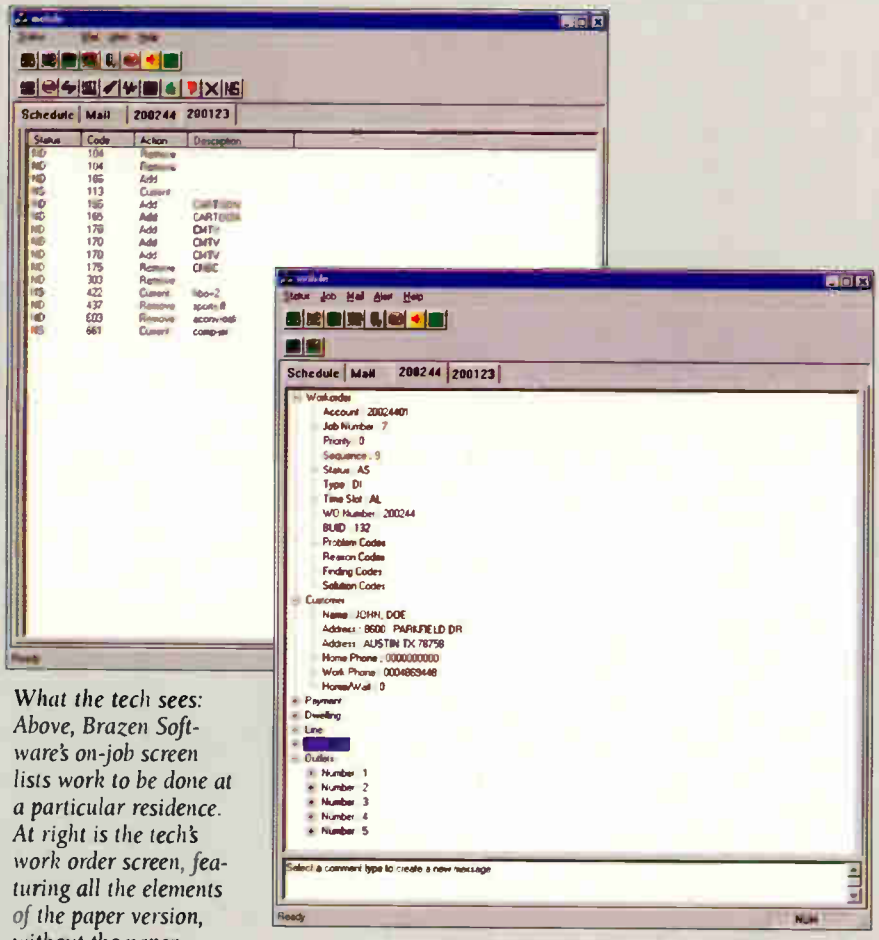
Innovation At All The Right Times.

TFC 2000

Times Fiber Communications, Inc.

A Division of Amphenol Corporation

358 Hall Avenue • P.O. Box 384 • Wallingford, CT 06492
(203) 265-8500 1-800-677-2288 FAX (203) 265-8422
www.timesfiber.com



What the tech sees: Above, Brazen Software's on-job screen lists work to be done at a particular residence. At right is the tech's work order screen, featuring all the elements of the paper version, without the paper.

take the same approach; a sub who misses the big game will be angry, but not nearly so angry as one who loses phone service.

Challenges to conquer

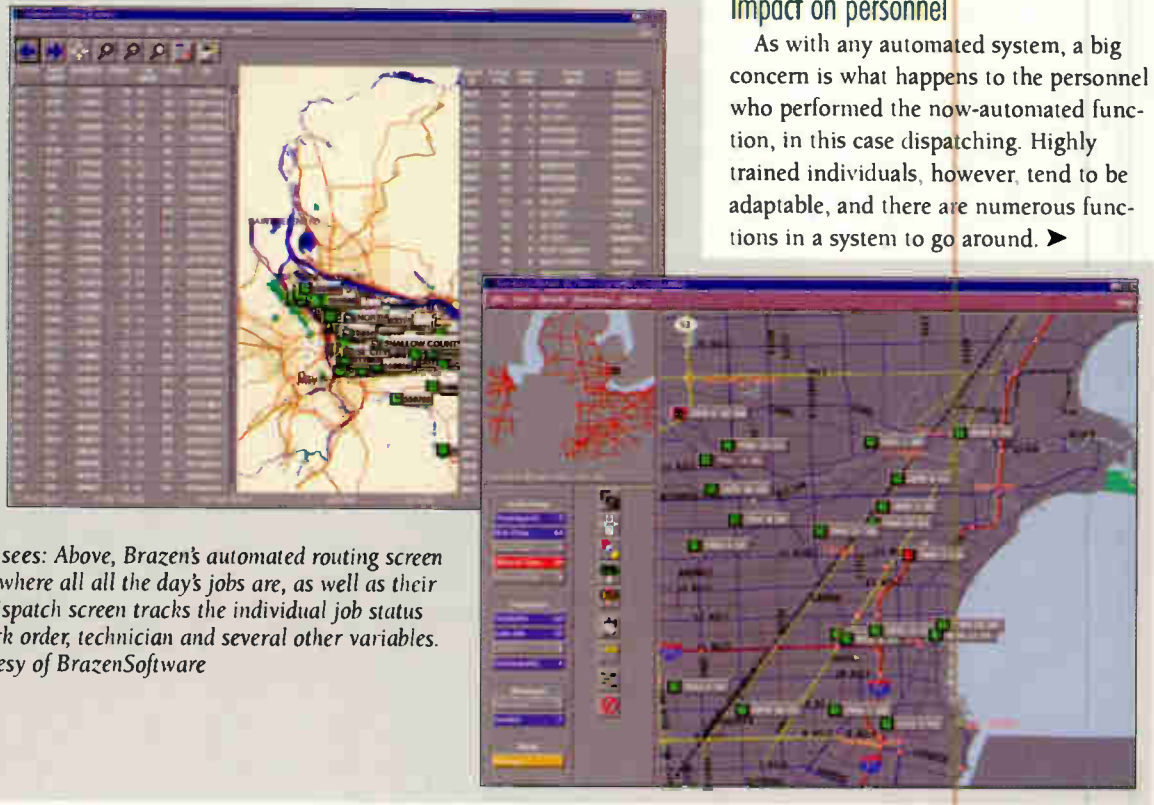
Still, the technology has not been without problems. Chief among them has been coverage. A number of cable companies investigated but then rejected mobile dispatching earlier this decade because the wireless connection could not be maintained throughout the cable system's geographic area. Even those who have adopted it recently say it really pays to do your homework before launching.

"It took a while to get to the point where we felt comfortable taking the risk," says Brien Kelley, director of technical operations at Time Warner of New York. "We were concerned about coverage and reliability. It's a pretty complex process where there isn't just one vendor or system. You have to manage a complete project and get everyone (cable system, mobile dispatch vendor and wireless provider) on the same page."

Time Warner of New York has installed the FleetCon system from Brazen Software for use with service calls. Kelley says it likely will be expanded to include installations, sales and collections.

Impact on personnel

As with any automated system, a big concern is what happens to the personnel who performed the now-automated function, in this case dispatching. Highly trained individuals, however, tend to be adaptable, and there are numerous functions in a system to go around. ➤



What the dispatcher sees: Above, Brazen's automated routing screen shows the dispatcher where all all the day's jobs are, as well as their status. At right, the dispatch screen tracks the individual job status by time, location, work order, technician and several other variables. Screen captures courtesy of BrazenSoftware

gotta get a Gator

Cable **Gator™** *Center Conductor Cleaner*

As a manufacturer of cable installation tools, Ben Hughes/Cable Prep was approached by technicians and linemen throughout the industry to produce a center conductor cleaner. The prevailing factor was the need to eliminate cleaning the bonded dielectric from center conductors with knives or other scraping methods without causing installation problems. By listening carefully to the comments and suggestions offered, Cable Prep has responded with the Cable Gator.™

There is a beveler that performs the pyramid cut to remove the burrs. If the center conductor burrs aren't removed, damage to the seizing mechanism of the connector can occur. Scoring of the copper-clad coating on the center conductor results in signal loss. In two easy steps the Gator bevels the center conductor and removes the bonded dielectric, leaving the cable perfectly prepared and ready for the connector. A perfect prep means no signal loss and no down time.

FEATURES

- Lifetime Warranty on Body
- Produces pyramid cut on center conductor
- Multiple blade surfaces
- Enhanced ergonomic handle

A Ben Hughes Communication Products Company

207 Middlesex Ave., P.O. Box 373
Chester, Connecticut 06412 USA
Phone: 800-394-4046
Int'l: (01) 860-526-4337
Fax: (01) 860-526-2291

CablePrep®
Tools You Trust.™


Pocket TerminX


Hex Crimp


Armor Removal


Strip/Core

How Wireless Nets Work for You

The new generation of mobile dispatching systems has a variety of wireless network configurations to choose from. System vendors say the choice of networks will vary from region to region and according to terrain.

Most operators use the wireless services of the major telephone providers in their area, but there are a number of smaller players in most major markets, ranging from cell phone operators to networks specialized for data transmission.

Vendors of mobile data systems will have a pretty good handle on the wireless providers in your area. But be sure you conduct a rigorous test of the service throughout your plant to make sure there are no significant dead spots. The last thing you want is a tech out in the field with no "paperwork."

Here are a few of the wireless networks that mobile data network providers rely on:

- American Mobile (ARDIS)
- CDPD
- Circuit Switched Cellular
- DataTAC
- DataRadio
- Ericsson Private Networks
- GSM
- Metricom
- Mobitex (Bell South)
- Modacom
- Motorola
- Norcom/Direct
- Norcom/Bell South
- Paging
- Qualcom
- Spread Spectrum
- TETRA

"The people we used to have working on dispatch are now doing things like status monitoring," says Comcast's Jones. "The automated dispatcher responds to calls much quicker, and our former dispatchers prevent outages from happening in the first place."

In fact, integrating the dispatch system with operational support systems (OSSs) such as status monitoring and billing will be essential as cable operators seek to improve the reliability and efficiency of their networks. Toward that end, MDSI and Lucent Technologies are working together to integrate MDSI's system with Lucent's CableConnect OSS.

And how has it improved life for the field tech? Well, that depends on work habits. The days of blowing through the first few service calls lickety-split and then settling in for a long lunch are over. Being linked to the home office means the boss knows where you are and what you're doing every second of the day.

"No one will admit why productivity picks up, but this is one of the reasons," says Bob Campbell, senior vice president of telecommunications at MDSI.

Full-time monitoring also provides all sorts of data on how to improve technical operations.

"You get all kinds of statistics on how the fleet is operating," Campbell says. "If Joe takes three times as long to do a service as anyone else, maybe he should be assigned to another type of call."

Or, such data can help cable operators pinpoint where additional training may be needed for technicians.

Future directions

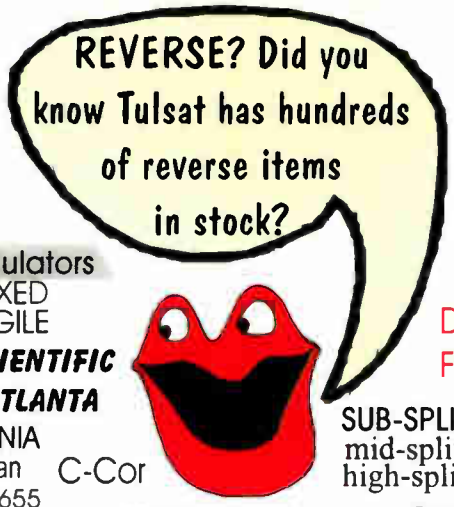
Because customer service is crucial to modern cable operations, it probably will take some time before an automated system can be totally trusted. But once the kinks have been worked out, the benefits can be tremendous.

"We're paperless now," says Comcast's Jones. "It's a big step to go paperless. If you send techs out with no paper and the system is not reliable, you can have 100 technicians with no work."

Now that both the automation software and the wireless networks have come of age, it's a good bet that paperless will soon become standard operating procedure throughout the industry. CT

Art Cole is a contributing editor to "Communications Technology."

800-331-5997



Modulators
FIXED
AGILE
SCIENTIFIC ATLANTA
SYLVIANIA
texscan
1654-1655
C-Cor
DIPLEX FILTERS
SUB-SPLIT
mid-split
high-split
REVERSE
AMPLIFIERS
30 & 40 mhz
Processors
FIXED
AGILE
Jerrold
DEMODS
FIXED
AGILE
Equalizers
Pads
Magnavox
TEST EQUIPMENT

800-331-5997
1605 E. Iola Broken Arrow, Ok 74012
TULSAT

450-550 MHZ

FEED FORWARD
&
POWER DOUBLING

Scientific Atlanta
Sylvania / Texscan
C-Cor
Magnavox
Jerrold

800-331-5997
1605 E. Iola Broken Arrow, Ok 74012
TULSAT

NEW **TRAPS** USED

Over 1,000,000 traps in our warehouses
ALL TRAPS SWEPT BEFORE SHIPMENT
TIERING-NEGATIVE-POSITIVE-LOW PASS

800-331-5997
1605 E. Iola Broken Arrow, Ok 74012
TULSAT

New & Refurbished
Fiber Optics

Nodes
550 Mhz from $449

LAZERS
450, 550 & 750 mhz

550-750 MHZ

SCIENTIFIC ATLANTA
SYSTEM II

Triples
Duals
Singles
Quads

System Amp II's
550 Mhz
Singles w/ housing
refurb $199
new $299

800-331-5997
1605 E. Iola Broken Arrow, Ok 74012
TULSAT

Using Powers of Numbers, Part 2

This month's installment continues a mathematics refresher series. The material is adapted from a lesson in NCTI's Installer Technician Course. © NCTI.

Last month's installment on using powers of numbers covered squaring numbers. This installment continues with determining square roots.

Determining square roots

Square root and square are opposite operations. With a square root, you might ask, "What number multiplied by itself would give this square as a product?" The square root of 4 is 2, because 2^2 equals 4. The symbol for square root is $\sqrt{\ }$ and is used in the power formulas $I = \sqrt{P/R}$ and $E = \sqrt{P \times R}$.

Determine the square root of the following numbers. (The answers are upside down at the end of the text.)

(a) $\sqrt{9}$ (b) $\sqrt{16}$ (c) $\sqrt{25}$
(d) $\sqrt{0.25}$ (e) $\sqrt{256}$ (f) $E = \sqrt{400}$ E = ? volts

Calculating or extracting square roots by hand tends to be a rather lengthy and time-consuming effort if you do not have a calculator (or one with square and square root functions).

Even if you do have a proper calculator, you still may find it helpful to use the accompanying square and square root table as a reference when you begin to work problems that require these calculations.

This table will work for many numbers beyond the limits of the table itself. To find the square root of a number not listed on the table, break down the original number for which the square root is sought into its smaller multiplication products that can be found on the table.

Then, locate the square root for each of the smaller multiplication products and multiply these square roots to find the square root of the original number.

For example, note from the table that the $\sqrt{36} = 6$. You can determine this by using the following:

$36 = 9 \times 4$

Thus, $\sqrt{36} = \sqrt{9} \times \sqrt{4}$

$\sqrt{9} = 3$ and $\sqrt{4} = 2$

$3 \times 2 = 6 = \sqrt{36}$

So, $\sqrt{120} = \sqrt{20} \times \sqrt{6}$ and so on.

Next month's installment will continue with using powers of 10.

Answers:
(a) 3 (b) 4 (c) 5 (d) 0.5
(e) 16 (f) 20 volts

Determining squares and square roots

No.	Square (x^2)	Square root ($\sqrt{x}$)	No.	Square (x^2)	Square root ($\sqrt{x}$)	No.	Square (x^2)	Square root ($\sqrt{x}$)	No. No.	Square (x^2)	Square root ($\sqrt{x}$)	No.	Square (x^2)	Square root ($\sqrt{x}$)
1	1	1.000	21	441	4.583	41	1,681	6.403	61	3,721	7.810	81	6,561	9.000
2	4	1.414	22	484	4.690	42	1,764	6.481	62	3,844	7.874	82	6,724	9.055
3	9	1.732	23	529	4.796	43	1,849	6.557	63	3,969	7.937	83	6,889	9.110
4	16	2.000	24	576	4.899	44	1,936	6.633	64	4,096	8.000	84	7,056	9.165
5	25	2.236	25	625	5.000	45	2,025	6.708	65	4,225	8.062	85	7,225	9.220
6	36	2.449	26	676	5.099	46	2,116	6.782	66	4,356	8.124	86	7,396	9.274
7	49	2.646	27	729	5.196	47	2,209	6.856	67	4,489	8.185	87	7,569	9.327
8	64	2.828	28	784	5.292	48	2,304	6.928	68	4,624	8.246	88	7,744	9.381
9	81	3.000	29	841	5.385	49	2,401	7.000	69	4,761	8.307	89	7,921	9.434
10	100	3.162	30	900	5.477	50	2,500	7.071	70	4,900	8.367	90	8,100	9.487
11	121	3.317	31	961	5.568	51	2,601	7.141	71	5,041	8.426	91	8,281	9.539
12	144	3.464	32	1,024	5.657	52	2,704	7.211	72	5,184	8.485	92	8,464	9.592
13	169	3.606	33	1,089	5.745	53	2,809	7.280	73	5,329	8.544	93	8,649	9.644
14	196	3.742	34	1,156	5.831	54	2,916	7.348	74	5,476	8.602	94	8,836	9.695
15	225	3.873	35	1,225	5.916	55	3,025	7.416	75	5,625	8.660	95	9,025	9.747
16	256	4.000	36	1,296	6.000	56	3,136	7.483	76	5,776	8.718	96	9,216	9.798
17	289	4.123	37	1,369	6.083	57	3,249	7.550	77	5,929	8.775	97	9,409	9.849
18	324	4.243	38	1,444	6.164	58	3,364	7.616	78	6,084	8.832	98	9,604	9.899
19	361	4.359	39	1,521	6.245	59	3,481	7.681	79	6,241	8.888	99	9,801	9.950
20	400	4.472	40	1,600	6.325	60	3,600	7.746	80	6,400	8.944	100	10,000	10.000

MEGA HERTZ®
ESTABLISHED 1975

DENVER, CO
800-922-9200
303-779-1749 FAX

ST. LOUIS, MO
800-922-9200
314-429-2401 FAX

SAVANNAH, GA
800-922-9200
770-594-8566FAX

OCALA, FL
800-922-9200
904-351-4403 FAX

PHOENIX, AZ
800-922-9200
602-857-1114 FAX

HURST, TX
800-922-9200
817-354-8445 FAX

PORTLAND, OR
800-922-9200
503-582-8350 FAX

BUTLER, PA
800-922-9200
724-586-2486 FAX

"UNIQUE" PRODUCTS FOR THE 21st CENTURY!

www.megahz.com

videoGIZMO

Feature-Rich Graphic Billboard System

by VIDEO DATA SYSTEMS

Beautiful background images, dazzling page transitions, its own independent Logo, and remote access via Windows software.

* modem & network card included (TCP/IP access) *

- simple to use FROM/TO date/time scheduling
- hundreds of supplied background images
- sound playback and Leightronix control options
- weather instrument option……plus more !

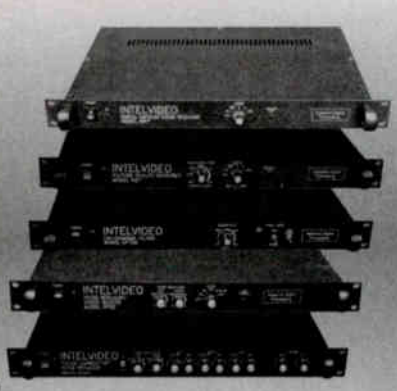
MEGA HERTZ® ESTABLISHED 1975

☐ Please send me information

www.megahz.com "Unique" Products For the 21st Century! CT 02/00

Let NTSC Be All It Can Be!

- ELIMINATE ELECTRICAL NOISE (INR-ES),
- ELIMINATE RANDOM NOISE (HQ),
- ELIMINATE CO-CHANNEL INTERFERENCE (CF),
- ELIMINATE GHOSTING PROBLEMS (Vector/VP50),
- ELIMINATE SOFT VIDEO FROM POSITIVE SCRAMBLING WITH THE COLOR CORRECTOR (VP900)
- AND USE YOUR EXISTING PROCESSOR WITH THE IFDM



MEGA HERTZ® ESTABLISHED 1975

☐ Please send me information

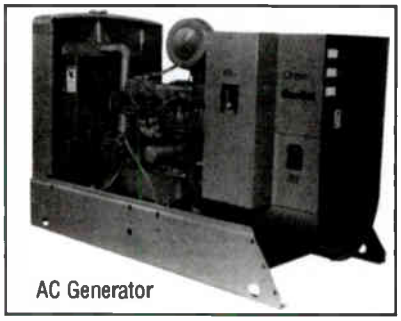
STOCKS Intelvideo INC.

www.megahz.com "Unique" Products For the 21st Century! CT 02/00

Onan KOHLER GENERAC WINCO

STANDBY GENERATORS & TRANSFER SWITCHES

MEGA HERTZ HAS SUPPLIED CABLE TELEVISION OPERATORS WITH STANDBY GENERATOR SYSTEMS SINCE 1980


AC Generator

MEGA HERTZ® ESTABLISHED 1975

☐ Please send me information

www.megahz.com "Unique" Products For the 21st Century! CT 02/00

Name ______________________________

Company ______________________________

Address ______________________________

City ________________ State ______ Zip ________

Phone ______________________________

Fax ______________________________

PLACE
STAMP
HERE

MEGA HERTZ
6940 South Holly, Suite 200
Englewood, CO 80112

Name ______________________________

Company ______________________________

Address ______________________________

City ________________ State ______ Zip ________

Phone ______________________________

Fax ______________________________

PLACE
STAMP
HERE

MEGA HERTZ
6940 South Holly, Suite 200
Englewood, CO 80112

Name ______________________________

Company ______________________________

Address ______________________________

City ________________ State ______ Zip ________

Phone ______________________________

Fax ______________________________

PLACE
STAMP
HERE

MEGA HERTZ
6940 South Holly, Suite 200
Englewood, CO 80112

Amplifiers
Antennas (Off Air), (Satellite)
Cable
Character Generators
Commercial Insertion
Connectors
Converters/Batteries
Distribution Passives
Demodulators
Emergency Alert Systems
Enclosures/Racks
Fiber Products
Generators/Inverters
Headend Products
LNA/LNB/Block Converters
Modulators
Molding
Pedestals/Apartment Boxes
Power Supplies/UPS/Batteries
Processors
Satellite Receivers
Stereo BTSC/FM Processors
Switching
Televisions/Monitors
Test Equipment
Traps/Filters (Specialized)
Video Products

MEGA HERTZ®

DENVER
800-922-9200

ST. LOUIS
800-922-9200

SAVANNAH, GA
800-922-9200

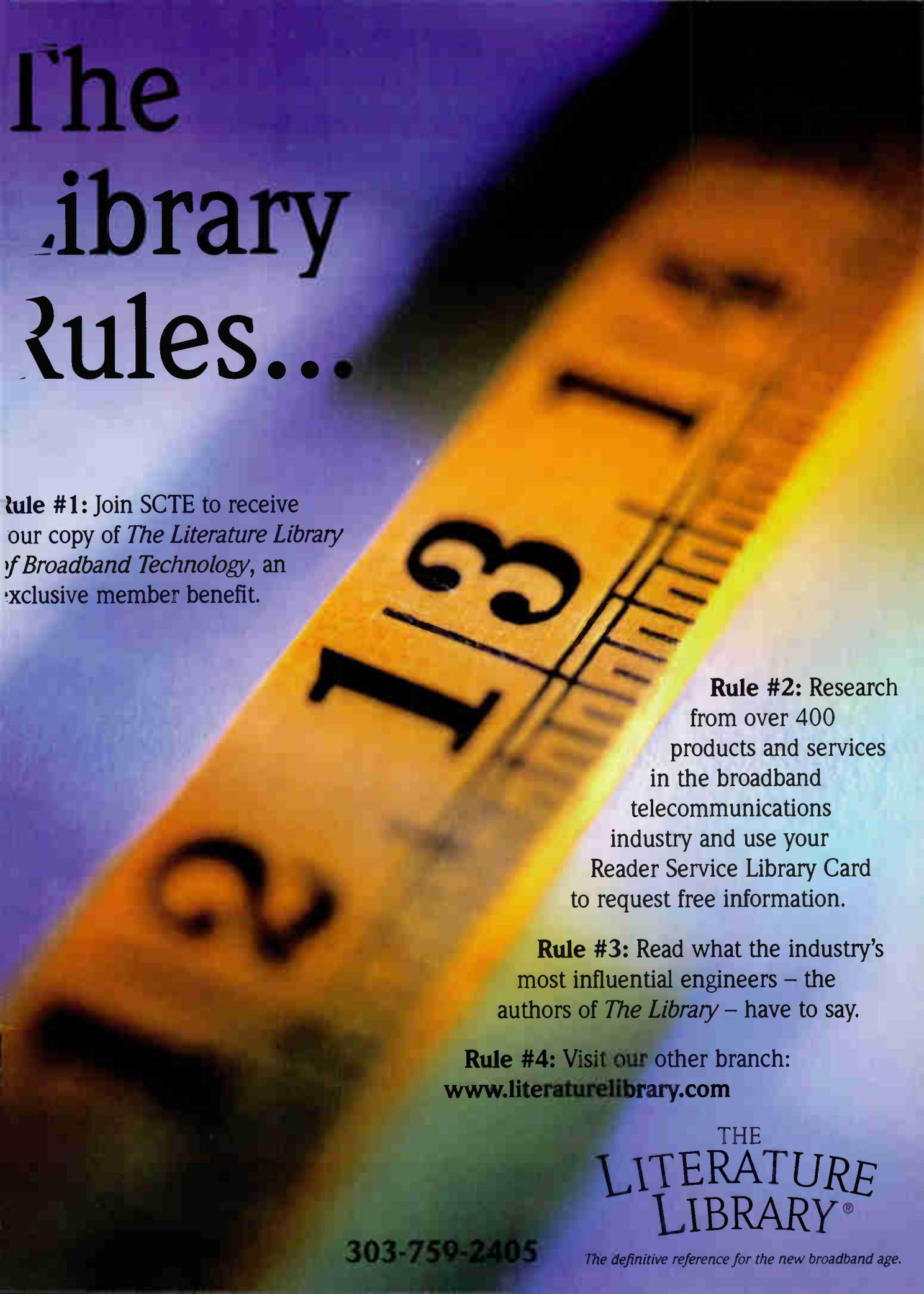
OCALA, FL
800-922-9200

PHOENIX, AZ
800-922-9200

HURST, TX
800-922-9200

PORTLAND, OR
800-922-9200

BUTLER, PA
800-922-9200


The
Library
Rules...
Rule #1: Join SCTE to receive our copy of The Literature Library of Broadband Technology, an exclusive member benefit.
Rule #2: Research from over 400 products and services in the broadband telecommunications industry and use your Reader Service Library Card to request free information.
Rule #3: Read what the industry's most influential engineers – the authors of The Library – have to say.
Rule #4: Visit our other branch:
www.literaturelibrary.com
THE LITERATURE LIBRARY®
303-759-2405
The definitive reference for the new broadband age.

Hand-held TDR

Riser-Bond Instruments' hand-held time domain reflectometer (TDR) locates faults in short- or long-range applications on all types of metallic cable.

The Model 1550 features automatic attenuation compensation and can locate faults from 3 feet to more than 9,000 feet, with an accuracy of +/- 0.9 percent of range. Intended for technicians, linemen and construction personnel, Model 1550 has a backlit liquid crystal display (LCD) and is designed to work in all weather.

For more information, contact Riser-Bond at (800) 688-8377 or on the Web at www.riserbond.com.

Signal Protection Switch

ADC's RDS-2 two-way signal protection switch is designed to protect driver amplifiers, optical/electrical (O/E) amplifiers, O/E receivers and other critical network elements against service outages.

The RDS-2 is intended to protect the forward path (50 MHz-1 GHz) and features a graphical user interface (GUI) for remote control.

Positioned at the headend or enclosed hub, the RDS-2 monitors the RF signal path's total power and reroutes signals to a redundant signal path if established thresholds are exceeded. The switch offers a -48 VDC power option for telephony deployment, plus hot and cold standby.

For more information, contact ADC at (800) 366-3891 or on the Web at www.adc.com.

Goodies From the Western Show

The 31,208 attendees at the 1999 Western Show had plenty to look at—more than 400 exhibitors in the Los Angeles Convention Center dazzled them with countless new products and prototype technology displays. We'll never know how exactly how many new products debuted, and we'd never be able to cover them all. Still, here's sampling of products on parade.

Noise Control

Technical Solutions Inc.'s WaveGear is a turnkey network maintenance system that preemptively identifies abnormal, elevating noise levels.

WaveGear scans each node through a high-speed switch and characterizes the return spectrum. It stores noise and ingress data and regularly compares them. It integrates monitoring with field testing by sending the spectrum to any portable-computing device. Technicians have full control over headend parameters allowing node selection, changes to test parameters and fault library search, and they can store "as found" and "as left" traces in WaveGear's fault library.

For more information, contact TSi at (800) 646-8289 or on the Web at www.tsisolutions.com.

3D Media Processor

iGS Technologies' CyberPro 5300 is an integrated streaming media processor for advanced digital TV set-top boxes.

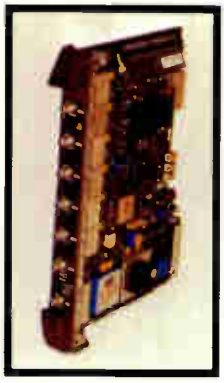
The CyberPro5300 features high-speed 3D graphics, broadcast-quality video and hardware support for advanced set-top box transparency. It is fully upward-compatible with its 2D counterpart, the CyberPro 5000, both of which are used in numerous set-top boxes and information appliances.

The CyberPro 5300 combines a 3D hardware graphics accelerator with a fully programmable NTSC/PAL (phase alteration line) TV encoder, a video processor that provides integrated scaling, de-interlacing and time-based correction, and an AC97 audio processor.

For more information, contact iGS Technologies at (408) 982-8588 or on the Web at www.igst.com.

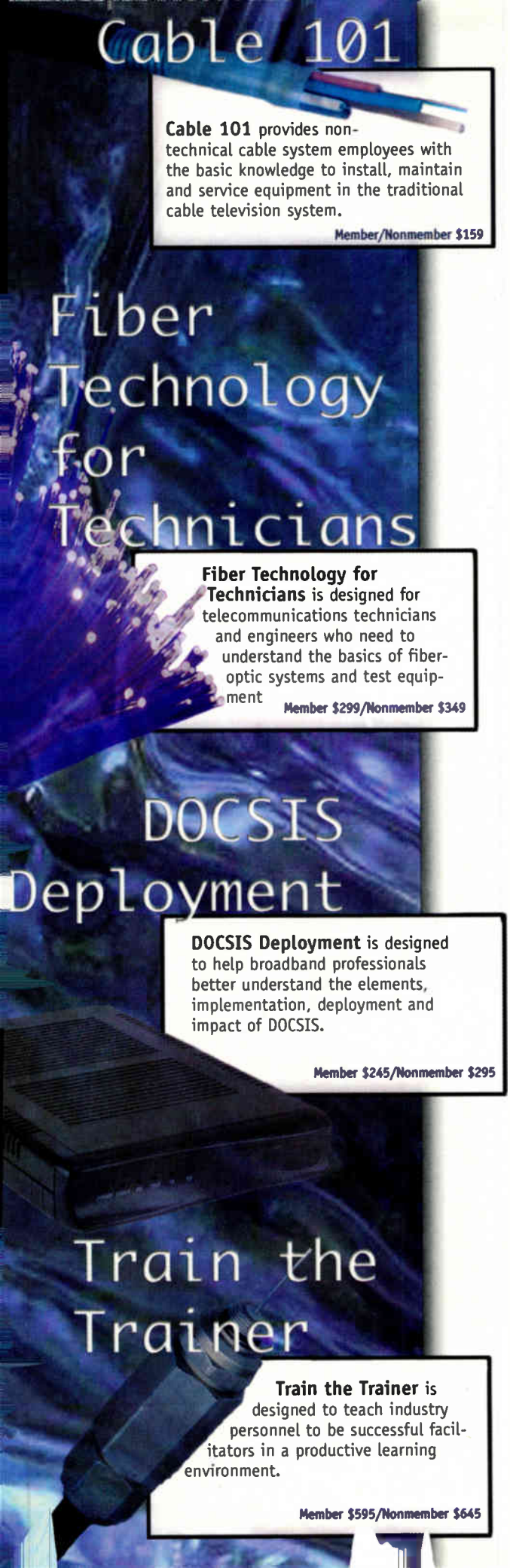
Cable Modem Termination System

Ericsson's Tigris AXC 711 Cable Modem Termination System (CMTS) combines Cable Modem Line Card with MultiService Access Platform to deliver Data Over Cable Service Interface Specification (DOCSIS)-compliant headend solutions.



The AXC 711 CMTS enables operators to offer DOCSIS 1.1 high-speed data and PacketCable 1.0 telephony. The system supports full simple network management protocol (SNMP) management, performance monitoring, remote configuration and software downloads to cable modems. Self-diagnostic capabilities and hot-swappable architecture reduce system downtime. The system's modular, scalable design allows for quick capacity growth.

For more information, contact Ericsson at (804) 592-7849 or on the Web at www.ericsson.com.



SCTE®

Regional Seminars

Feb. 2-4	Fiber Technology for Technicians Salt Lake City, UT
Feb. 8	Cable 101 Dallas, TX
Feb. 15	DOCSIS Deployment Nashville, TN
Feb. 17	DOCSIS Deployment Portland, OR
March 14	DOCSIS Deployment Minneapolis, MN
March 16	DOCSIS Deployment Kansas City, MO
March 28-30	Fiber Technology for Technicians Phoenix, AZ
April 3-5	Train the Trainer Los Angeles, CA
April 11	DOCSIS Deployment San Diego, CA
April 25	Cable 101 Philadelphia, PA

For more information, or to register by phone, please contact the SCTE National Conferences Department at 800-542-5040, ext. 239 or e-mail to info@scte.org.

Contributions or gifts to SCTE are not deductible as charitable contributions for Federal income tax purposes.

Upconverter Module

Broadband Innovations' Model SCM-137 is a commercial transmitter upconverter module for cable TV applications.

The Model SCM-137 is Data Over Cable Service Interface Specification (DOCSIS)-compliant and intended for video-on-demand (VOD) and high-speed data over cable applications. It accepts modulated intermediate frequency (IF) signals centered at 44 MHz and converts them to any one of 137 RF channels in the 57-873 MHz range. Up to 20 SCM-137 modules can be installed in a single rack-mounted 2U chassis for multiple channel processing functions such as VOD downstream transmission.

For more information, contact Broadband Innovations (formerly MCSI) at (888) 713-8500 or on the Web at www.broadbandinnovations.com.

Fiber-Optic Microscope

EXFO's Fiber-Optic Microscope enables network installers to view the endface of connector ferrules to evaluate polish quality and cleanliness.

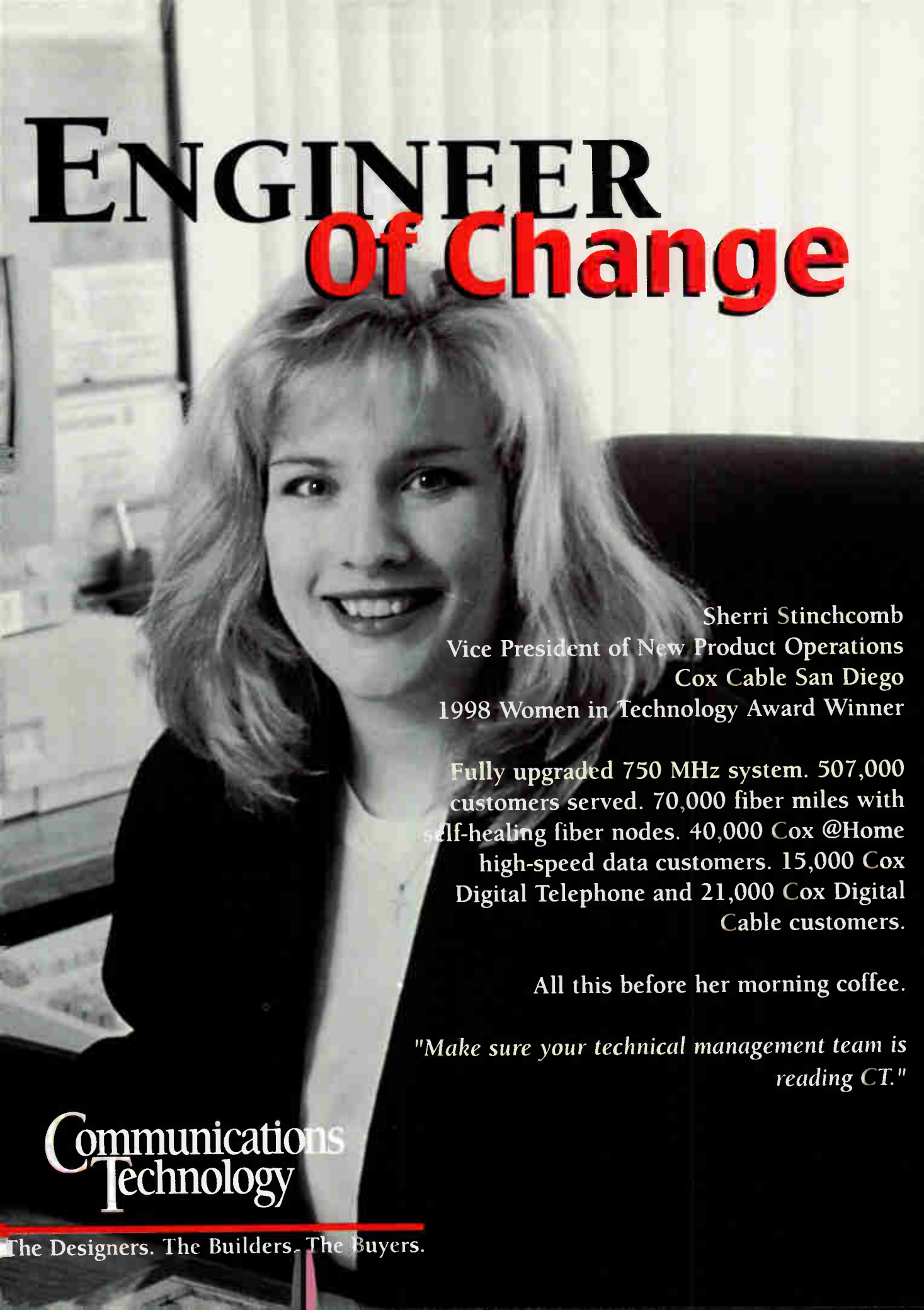
Delivering 400X magnification, the Fiber-Optic Microscope also detects flaws from factory non-specification errors, shipping and handling problems, and other situations prior to connectorization. EXFO offers the 'scope for use as a self-contained handheld as well as a component in several test kits for outside plant use. The instrument comes in a casing intended for field use.

For more information, contact EXFO at (418) 683-0211 or on the Web at www.exfo.com.

Digital Analyzers

Wavetek Wandel Goltermann's SDA-4040D and SDA-5000 Stealth Digital Analyzers offer noninterfering sweep for 64- and 256-QAM (quadrature amplitude modulated) digital channels, user-friendly digital channel setup and digiCheck. Other features include 64- and 256-QAM constellation display with zoom, average digital power level, bit error rate (BER) 21-35 dB modulation error rate (MER) and noise margin ("cliff effect"), an equalizer display showing equalizer stress and distance to faults, and a 50-1,000 MHz frequency range.

For more information, contact WWG at (317) 788-9351 or on the Web at www.wwgsolutions.com.


ENGINEER
Of Change
Sherri Stinchcomb
Vice President of New Product Operations
Cox Cable San Diego
1998 Women in Technology Award Winner
Fully upgraded 750 MHz system. 507,000 customers served. 70,000 fiber miles with self-healing fiber nodes. 40,000 Cox @Home high-speed data customers. 15,000 Cox Digital Telephone and 21,000 Cox Digital Cable customers.
All this before her morning coffee.
"Make sure your technical management team is reading CT."
Communications Technology
The Designers. The Builders. The Buyers.

Pedestal Family

Marconi's Dura-Ped pedestal family features 360-degree access, a secure metal top and a nonmetallic base, which the company claims exceeds industry standards for security, durability and corrosion resistance.

The Dura-Ped family is designed for tap applications, tap and splitter/directional coupler applications, and line extenders and amplifier applications. The Dura-Ped dome is made of heavy gauge mill-galvanized steel, and the high-density polyethylene (HDPE) base provides a noncorrosive, heavy duty material for mounting in any type of terrain. The Dura-Ped features a self-locking mechanism and comes pre-assembled with stake and bracket.

For more information, contact Marconi at (630) 579-5521 or on the Web at www.marconi.com.

Modem Test Suite

Ixia Communications' Cable Modem Automated Test Suite (CMATS) tests upstream and downstream throughput, back-to-back, jitter and rate limit.

CMATS uses dynamic host control protocol (DHCP) to assign Internet protocol (IP) addresses to cable modems. Depending on the test, CMATS can be run on any of Ixia's three traffic generators with a variety of load modules. For most purposes, Ixia recommends 10/100 Ethernet and Gigabit Ethernet Load Modules. Ixia's Packet over synchronous optical network (SONET) Load Module works on a wide area network (WAN) backbone.

For more information, contact Ixia Communications at (818) 871-1800 or on the Web at www.ixiacom.com.

Interactive Remote Control

Interlink Electronics' Interactive Remote enables remote control of electronic devices, keyboard-less text entry and wireless telephony.

Regular TV remote functions work by touching the remote's finger pad in the same relative location as the control appearing on the screen. Channel selection, volume level and media transport controls operate with a single-finger input pad. For services requiring text entry, the remote has finger-activated character recognition or an on-screen keyboard. For some telephony applications, the remote pairs an integrated microphone with a patented optical communications link.

For more information, contact Interlink Electronics at (805) 484-8855 or on the Web at www.interlinkelec.com.

Digital Spectrum Analyzer

Avantron Technologies' AT-2000RQ Quadrature Amplitude Modulation (QAM) Spectrum Analyzer is designed to demodulate and accurately measure the QAM signals carried through the cable system.

The AT-2000RQ equips field technicians for the latest 64/256 QAM digital technologies and allows for a simple transition from analog to digital testing. The built-in digital demodulator measures pre- and post bit error rate (BER) modulation error ratio (MER) and error vector magnitude (EVM).

Additional features include cable TV spectrum analyzer function, high-resolution 6.4-inch color liquid crystal display (LCD) and total weight (including battery) of 19 pounds.

For more information, contact Avantron at (800) 297-9726 or on the Web at www.avantron.com.

Ortel announces a dramatic boost in laser power with a broader operating temperature range.

At 31 mW, Mercury Laser goes the distance.

Our popular transmitter engine now features the new Mercury Laser Module

Broadband capabilities have just taken a major leap forward. Thanks to revolutionary coupling technology, Ortel's new 31mW Mercury Laser Module offers unprecedented output power, enabling transmission over far greater distances and more optical signal splits. The result is significant improvements in service and performance.

And that's just the beginning.

The powerful CATV laser has a much wider operating temperature range (-40°C to +85°C), which improves unit reliability in even the harshest environments and allows for more efficient transmitter packaging density. And with its industry standard OC-48 pin-out design, Mercury offers drop-in integration.

It's yet another example of the visionary thinking that has become an Ortel hallmark. For more information on Mercury or any of Ortel's high performance fiber optic products, contact us today.

800.362.3891 **www.ortel.com**

ORTEL® CORPORATION
harnessing the power of light ™

Telephony Upgrade

Tellabs' Feature Package 4.0 for its CABLESPAN 2300 Universal Telephony Access System is designed to increase network capacity by almost 30 percent.

CABLESPAN 4.0 enables broadband service providers to offer integrated services to more customers without taking up additional space at the headend. The enhancement allows for quick deployment within the CABLESPAN 2300 system. Nearly 8,000 voice lines can be installed in one standard 7-foot relay rack in the headend. Other features in the software release include multiple trunk groups and enhanced alarm and traffic monitoring capabilities.

For more information, contact Tellabs at (630) 512-8336 or on the Web at www.tellabs.com.

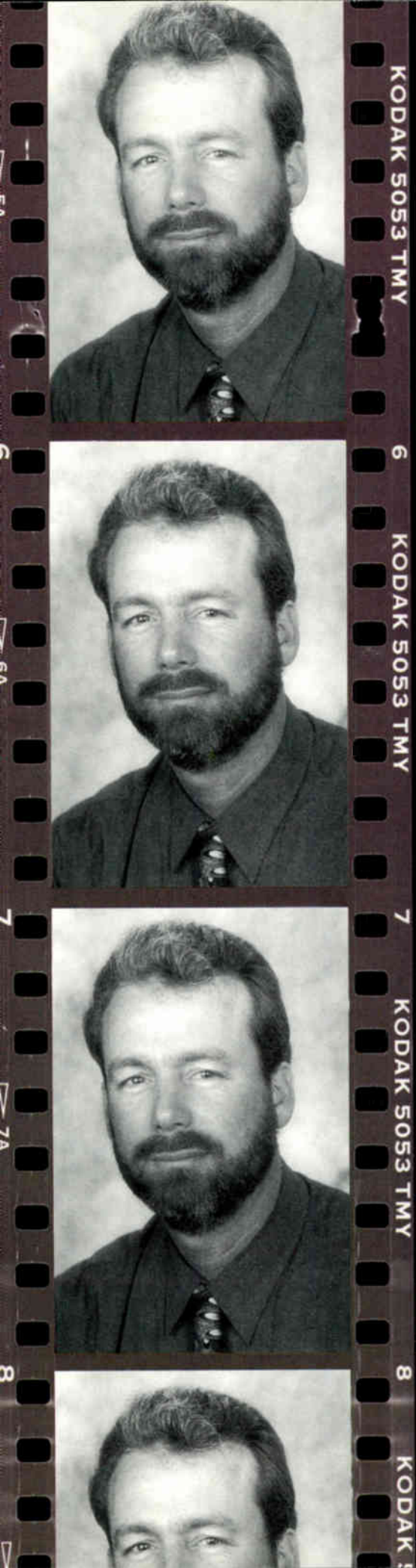
TV Controller

ATI Technologies' Rage DTV and Rage HDTV integrates 2D and 3D graphics, a transport demux, and either a standard-definition or high-definition Moving Picture Experts Group (MPEG)-2 video decoder.

Rage DTV/HDTV includes an International Standards Organization (ISO)-compliant transport demux and identical 2D and 3D engines. 3D graphics enable family-oriented 3D gaming, improved user interfaces, and fades and wipes between channels.

The controller employs unified memory graphics architecture. As many as three separate memories now use a single frame buffer. Simultaneous true-color (32 bit/pixel) graphics, transport demux, and HDTV MPEG-2 decode require 8 MB of memory.

For more information, contact ATI Technologies at (905) 882-2600 or on the Web at www.atitech.ca.



ENGINEER Of Change

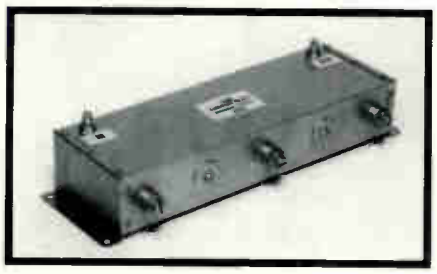
Mark Harrigan
Executive Director of Engineering
AT&T BIS West Division
SCTE member since 1979.

69 Locations in California served by the most extensive fiber optic ring in the industry. Approximately two million customers served. Launch market for AT&T telephony in Fremont, CA. 25,000 plant miles including 1,500 secondary and distribution fiber miles. 360 ring miles on a triple ring. Extensive fiber recovery systems in place.

Mark's biggest challenge? Finding enough workers to do the upgrade and continuing maintenance.

"Make sure your technical management team is reading CT."

Bandpass Filter



Microwave Filter's Model 13430 Bandpass Filter is designed to enhance test measurements by eliminating out-of-band (OOB) signals from the input of a spectrum analyzer, allowing cleaner measurement of the data portion of a transmit signal. The unit has a passband from 640-660 MHz and an insertion loss that typically is less than 1 dB. The group delay over the passband is less than 20 ns. A minimum of 40 dB rejection is achieved from 0.3-550 MHz and from 750-1000 MHz.

For more information, contact Microwave Filter at (800) 448-1666 or on the Web at www.microwavefilter.com.

Curbside Generator

Alpha Technologies' 5.0-kilowatt curbside generator system provides enhanced backup power for cable TV, telecommunications and broadband networks.

The new system nearly doubles the power of previous models, while retaining the same small size. The AlphaGen line incorporates low audible noise levels, high power density, both remote startup and monitoring, and high fuel compatibility. Alpha's generator systems also have been improved to allow installation further from the power supply location. AlphaGen systems are fueled by either natural gas or propane and use a universal regulator.

For more information, contact Alpha Technologies at (360) 647-2360 or on the Web at www.alpha.com.

Modem System Upgrade

GADline Ltd.'s Voice Over Internet protocol (VoIP) and Smart Card components now enhance its Data Over Cable Service Interface Specification (DOCSIS)-compliant cable modem system.

GADline's VIVID 1 network operates with a standard local exchange while allowing for a smooth migration to full end-to-end IP network telephony. The Smart Card Reader Add-on authorizes the connection between the applications running on the client's personal computer (PC) and the relevant server. It is geared toward financial transactions, home banking and e-commerce.

For more information, contact GADline at (303) 683-9005 or on the Web at www.gadline.com.

Experience the Power of Connection...

Introduce a peer to the Society of Cable Telecommunications Engineers!

SCTE membership is your link to essential technical resources
that drive your professional development and success.

Your Member Benefits

- ➢ Knowledge and news resources like *Interval, Communications Technology** and *Literature Library*
- ➢ Access to training opportunities, certification programs and educational materials
- ➢ On-line technical resources at www.scte.org
- ➢ Recognition and Awards programs
- ➢ Tuition assistance and scholarships
- ➢ $100 registration savings on industry events including Emerging Technologies℠ and Cable-Tec Expo

* Members residing outside of the U.S. and Canada receive the acclaimed *International Cable* rather than *Communications Technology*.

Name: _____

Title: _____ E-mail: _____

Company: _____ System: _____

Phone: _____ Fax: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Country: _____ Sponsor (if applicable): _____

If you reside in the U.S. or Canada, do you wish to receive *Communications Technology* magazine? ❑ Yes ❑ No

If you reside outside the U.S. or Canada, do you wish to receive *International Cable* magazine? ❑ Yes ❑ No

Fee:

❑ $48 annual dues for U.S. and North American members.

❑ $72 for international members residing outside North America.

Contributions or gifts to the Society of Cable Telecommunications Engineers Inc. are not tax deductible as charitable contributions. However, they may be tax deductible as ordinary and necessary business expenses.

Payment:

❒ Check, made payable to SCTE in U.S. dollars.

❒ Visa Account: _____

❒ MasterCard

❒ American Express Signature: _____ Exp. Date: _____ For Office Use: CT199

Three Easy Ways to Enroll:

Phone: 800-542-5040

Fax: 610-363-5898

Mail: 140 Philips Road, Exton, PA 19341-1318

SCTE®

Visit SCTE at
www.scte.org

BOOKSHELF

The following is a listing of some of the resources available by mail order through the Society of Cable Telecommunications Engineers. The prices listed are for SCTE members only. Nonmembers should contact the Society for additional pricing information.

- *Cable Television* (Third Edition) by William Grant—One of the Society's best sellers, this comprehensive guide to cable TV examines equipment, systems and methodology. It's a valuable tool for learning about the important working facets of cable TV. Hardcover, 598 pages, 1994. Order TR-5, $48.
- *Recommended Practices for Optical Fiber Construction and Testing*—Review, refine and expand your knowledge of fiber optics with this resource. This manual describes the recommended practices for successful management, construction, documentation and restoration of fiber systems. Notebook bound. 1996. Computer disk included. Order TR-13, $125.
- *Cable Television Proof of Performance*—This guide is packed with step-by-step advice, practical trouble-shooting methods and scores of diagrams designed to save time on every testing procedure. A useful resource to remedy subscriber complaints and avoid costly Federal Communications Commission penalties. 337 pages, 1995. Order TR-14, $55.
- *Recommended Practices for Coaxial Cable Construction and Testing*—This manual is a guide to help telecommunications professionals understand the management, construction, documentation and restoration of coaxial systems. Softcover, 260 pages, 1996. Order TR-22, $125.
- *Computer Networks* (Third Edition) by Andrew Tanenbaum—This book describes and illustrates principles of copper, fiber, radio and satellite communications; protocol principles, high-level data link control (HDLC), serial line Internet protocol (SLIP) and point-to-point protocol (PPP); Institute of Electrical and Electronics Engineers 802 local area networks (LANs), bridges, high-speed LANs; routing, congestion control, internetworking, IPv6; transport protocol principles, transmission control protocol (TCP), network performance; cryptology, e-mail, the Web, and Java multimedia. Hardcover, 814 pages, 1996. Order TR-29, $81. CT

Note: The videotapes are in color and available in the NTSC 1/2-inch VHS format only. They are available in stock and will be delivered approximately three weeks after receipt of order with full payment.

Shipping: Videotapes are shipped UPS. No P.O. boxes, please. SCTE pays surface shipping charges within the continental U.S. only. Orders to Canada or Mexico. Please add $5 (U.S.) for each videotape. Orders to Europe, Africa, Asia or South America: SCTE will invoice the recipient for additional air or surface shipping charges (please specify). "Rush" orders: a $15 surcharge will be collected on all such orders. The surcharge and air shipping cost can be charged to a Visa or MasterCard.

To order: All orders must be prepaid. Shipping and handling costs are included in the continental U.S. All prices are in U.S. dollars. SCTE accepts MasterCard and Visa. To qualify for SCTE member prices, a valid SCTE identification number is required, or a complete membership application with dues payment must accompany your order. Orders without full and proper payment will be returned. Send orders to: SCTE, 140 Philips Rd., Exton, PA 19341-1318 or fax with credit card information to (610) 363-5898.

CALENDAR

February

1-2: Cactus Society of Cable Telecommunications Engineers Chapter Vendor Show. Contact Brenda Hunt at brenda.hunt@cox.com.

7-8: SCTE standards meeting, Digital Video Subcommittee, Mon. 2—6 p.m., Tues. 8:30 a.m.- noon, Orlando, Fla. Contact Dr. Ted Woo, SCTE director of standards, at (610) 363-6888, e-mail twoo@scte.org or visit the SCTE Web site at www.scte.org.

8: SCTE regional seminar, "Cable 101," Holiday Inn Select, Dallas. Contact Jessica Dattis in the SCTE National Conferences Department at (800) 542-5040, ext. 239, or jdattis@scte.org.

12: Llano Estacado SCTE Chapter technical seminar and testing session, Cox Communications, Lubbock, Texas. Topic: Category IV Tutorial, Distribution Systems. Contact Bob Baker at (505) 763-4411.

14-17: IEC's Carrier IP World Forum 2000, Fontainebleu Hilton Resort, Miami. Call (312) 559-4100.

15: SCTE regional seminar, "DOCSIS Deployment," Wyndham Garden Hotel, Nashville, Tenn. Contact Jessica Dattis in the SCTE National Conferences Department at (800) 542-5040, ext. 239, or jdattis@scte.org.

16: Delaware Valley SCTE Chapter technical seminar. Williamson Restaurant, Horsham, Pa. Topic: Return Path—Theory, Setup and Troubleshooting. Contact Chuck Tolton at (215) 961-3882.

17: Wheat State SCTE Chapter technical seminar, Red Coach Inn, Wichita, Kan. Contact Joe Cvetnich at (316) 262-4270, ext. 139.

23: SCTE standards meeting, Test Procedures Working Group of IPS, 8:30 a.m.—4:30 p.m., Room 214 D, San Antonio Convention Center, San Antonio. Contact Dr. Ted Woo, SCTE director of standards, at (610) 363-6888, e-mail twoo@scte.org or visit the SCTE Web site at www.scte.org.

Feb. 23-25: 40th Anniversary Texas Show, San Antonio Convention Center, San Antonio. Call (512) 474-2082. CT

Planning Ahead

March 12-15: Eastern Cable Show, Atlanta. Call (404) 255-1608.

April 2-4: Canadian Cable Show, Toronto, Canada. Call (613) 232-2361.

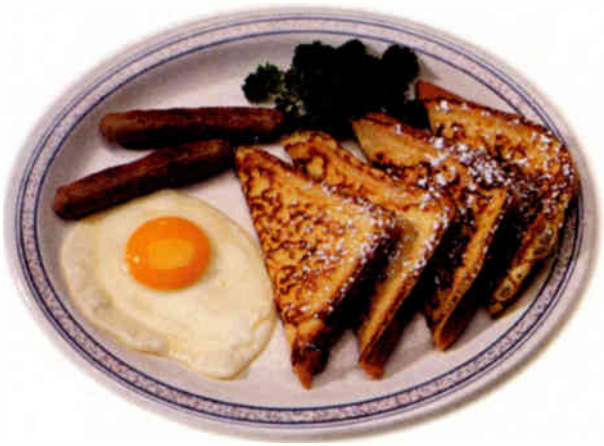
April 8-13: National Association of Broadcasters Show, Las Vegas. Call (202) 429-5300.

May 7-10: C2K, National Cable Television Association Cable 2000, New Orleans. Call (202) 755-3669.

June 5-8: SCTE Cable-Tec Expo 2000, Las Vegas. Call (610) 363-3822 or go to www.scte.org.

CableFAX Daily

+



=

what the industry reads first

www.cabletoday.com

AD INDEX

Communications Technology

To request and receive product and service information fast with LEADnet, log onto the Internet to www.leadnet.com, enter code AXCT, and you'll head for the Communications Technology link with further instructions. It's that simple.

To receive a free subscription to *Communications Technology* please answer all questions, sign and date the card. Incomplete forms CANNOT be processed.

Signature _____ Date _____
(Signature and date required by U.S. Postal Service)

Phone _____ Fax _____

E-mail Address _____

Occasionally, *Communications Technology* makes its lists available for special offers from qualified, relevant, businesses and organizations. If you would not like to receive this information via email, check this box. ❑

Please Print:

Name _____ Title _____

Company _____

Address _____

City _____ State/Province _____

ZIP/Postal Code _____ Country _____

A. Please check your company's primary business: (check only one)

04. ❑ Multiple System Operator (MSO) (operates more than one cable system)
03. ❑ Independent System Operator
9B. ❑ Telecom Network/Carrier (RBOC, LEC, CLEC, Long Distance Provider, Wireless/Satellite Carrier, ISP)
19. ❑ Public/Private Utility
20. ❑ Systems Contractor
21. ❑ Hardware/Component Manufacturer/Dist.
18. ❑ Other (Please specify)

_____

Do you hold a supervisory position?

22. ❑ Yes
23. ❑ No

B. Check the TITLE that most CLOSELY matches your current position: (check only one)

Corporate Management
31. ❑ CEO
32. ❑ President
33. ❑ Owner
34. ❑ Vice President
35. ❑ Partner

Operations Management
36. ❑ General Manager
37. ❑ Business Manager
38. ❑ Operations Manager
39. ❑ Product Manager
40. ❑ Purchasing Manager

Engineering Management
41. ❑ Engineering VP
42. ❑ Engineering Manager
43. ❑ Director of Engineering
44. ❑ Engineering Supervisor
45. ❑ Corporate Engineer
46. ❑ Senior Engineer
47. ❑ Regional Engineer
48. ❑ Divisional Engineer
49. ❑ Plant Manager
50. ❑ Installation Manager
51. ❑ Network Manager
52. ❑ Construction Manager
53. ❑ Field Services Manager
54. ❑ Technical Manager

Engineering
55. ❑ Engineer
56. ❑ Headend Engineer
57. ❑ Const. Engineer
58. ❑ OSP Engineer

Technical
59. ❑ Headend Technician
60. ❑ Line Technician
61. ❑ Bench Technician
62. ❑ Sweep Technician
63. ❑ Other Technical Title (Please specify)

_____

Installation
64. ❑ Installer
65. ❑ CSR
66. ❑ Other Installation Specialist (Please specify)

_____

30. ❑ **Other** (Please specify)

_____

C. Which of the following best describes your involvement in the decision to purchase a product/service?

31. ❑ Recommend
32. ❑ Specify
33. ❑ Evaluate
34. ❑ Approve
35. ❑ Not Involved

D. Are you a member of the SCTE (Society of Cable Telecommunications Engineers)?

01. ❑ Yes
02. ❑ No

E. Would you like to join the SCTE?

01. ❑ Yes
02. ❑ No

002743

CT0200
Q2B202

• For Free Reader Service mail or fax to 413-637-4343 • To subscribe via Internet, send e-mail to CT.Subs@Reply.Net •

February 2000 Issue

Communications Technology

To request and receive product and service information fast with LEADnet, log onto the Internet to www.leadnet.com, enter code AXCT, and you'll head for the Communications Technology link with further instructions. It's that simple.

To receive a free subscription to *Communications Technology* please answer all questions, sign and date the card. Incomplete forms CANNOT be processed.

Signature _____ Date _____
(Signature and date required by U.S. Postal Service)

Phone _____ Fax _____

E-mail Address _____

Occasionally, *Communications Technology* makes its lists available for special offers from qualified, relevant, businesses and organizations. If you would not like to receive this information via email, check this box. ❑

Please Print:

Name _____ Title _____

Company _____

Address _____

City _____ State/Province _____

ZIP/Postal Code _____ Country _____

A. Please check your company's primary business: (check only one)
04. ❑ Multiple System Operator (MSO) (operates more than one cable system)
03. ❑ Independent System Operator
9B. ❑ Telecom Network/Carrier (RBOC, LEC, CLEC, Long Distance Provider, Wireless/Satellite Carrier, ISP)
19. ❑ Public/Private Utility
20. ❑ Systems Contractor
21. ❑ Hardware/Component Manufacturer/Dist.
18. ❑ Other (Please specify)

_____

Do you hold a supervisory position?
22. ❑ Yes
23. ❑ No

B. Check the TITLE that most CLOSELY matches your current position: (check only one)

Corporate Management
31. ❑ CEO
32. ❑ President
33. ❑ Owner
34. ❑ Vice President
35. ❑ Partner

Operations Management
36. ❑ General Manager
37. ❑ Business Manager
38. ❑ Operations Manager
39. ❑ Product Manager
40. ❑ Purchasing Manager

Engineering Management
41. ❑ Engineering VP
42. ❑ Engineering Manager
43. ❑ Director of Engineering
44. ❑ Engineering Supervisor
45. ❑ Corporate Engineer
46. ❑ Senior Engineer
47. ❑ Regional Engineer
48. ❑ Divisional Engineer
49. ❑ Plant Manager
50. ❑ Installation Manager
51. ❑ Network Manager
52. ❑ Construction Manager
53. ❑ Field Services Manager
54. ❑ Technical Manager

Engineering
55. ❑ Engineer
56. ❑ Headend Engineer
57. ❑ Const. Engineer
58. ❑ OSP Engineer

Technical
59. ❑ Headend Technician
60. ❑ Line Technician
61. ❑ Bench Technician
62. ❑ Sweep Technician
63. ❑ Other Technical Title (Please specify)

_____

Installation
64. ❑ Installer
65. ❑ CSR
66. ❑ Other Installation Specialist (Please specify)

_____

30. ❑ Other (Please specify)

_____

C. Which of the following best describes your involvement in the decision to purchase a product/service?
31. ❑ Recommend
32. ❑ Specify
33. ❑ Evaluate
34. ❑ Approve
35. ❑ Not Involved

D. Are you a member of the SCTE (Society of Cable Telecommunications Engineers)?
01. ❑ Yes
02. ❑ No

E. Would you like to join the SCTE?
01. ❑ Yes
02. ❑ No

002743

CT0200
Q2B203

• For Free Reader Service mail or fax to 413-637-4343 • To subscribe via Internet, send e-mail to CT.Subs@Reply.Net •

Please send *Communications Technology* to the following individuals in my company:

Name _____ Title _____

Name _____ Title _____

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO.788 PITTSFIELD MA

POSTAGE WILL BE PAID BY ADDRESSEE

Communications Technology

PO BOX 5360

PITTSFIELD MA 01203-9190

Please send *Communications Technology* to the following individuals in my company:

Name _____ Title _____

Name _____ Title _____

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO.788 PITTSFIELD MA

POSTAGE WILL BE PAID BY ADDRESSEE

Communications Technology

PO BOX 5360

PITTSFIELD MA 01203-9190

Advertiser	Web Address	Page #
Molex Fiber Optics	www.molex.com	56
Monroe Electronics	www.monroe-electronics.com	96
Moore Diversified Products	www.MooreDP.com	40-41
Multilink	www.multilinkinc.com	124
Ortel	www.ortel.com	105
Passive Devices	www.pdi-eft.com	25
PBI Customer Service	www.cabletoday.com	108
PCI Technologies	www.pcitech.org	48-49
Quality RF Services	www.qrf.com	63
Rifocs Corporation	www.rifocs.com	106
Riser Bond Instruments	www.riserbond.com	61
R. L. Drake	www.rldrake.com	87
Sadelco	www.sadelco.com	30
SCTE	www.scte.org	57, 101, 109
Sprint North Supply	www.sprintnorthsupply.com	53
Standard Communications	www.standardcomm.com/satcom	11
Synchronous	www.syngroup.com	33
Telecom Web	www.cabletoday.com	111
Telecrafter Products	www.broadband-guide.com/company2/telecrafter.html	8, 12, 83
Tempo Research	www.temporesearch.com	64
Terayon Communication Systems	www.terayon.com	7
Tii Industries	www.tii-industries.com	77
Times Fiber Communications	www.timesfiber.com	93
Toshiba	www.internet.toshiba.com	21
Trilithic	www.trilithic.com	31, 47
Tulsat	www.tulsat.net	45, 97
TVC	www.tvcinc.com	62
Viewsonics	www.viewsonics.com	39
Wavetek Wandel Goltermann	www.wwgsolutions.com	15, 79

Reprints	(301) 340-7788, ext. 2009	Merchandise/Back Issues	(800) 877-5188
List Sales	(301) 340-7788, ext. 2026	Editorial	(303) 839-1565, ext. 43
Customer Service	(800) 777-5006	Advertising	(301) 340-7788, ext. 2004

CAREER OPPORTUNITIES

HiQ Communications Inc. Is seeking experienced CATV people to work on our many projects throughout the U.S.. We currently have openings in our CA, MI, FL, & GA locations. Positions to be filled are as follows:

- Sweeps/FCC Proof Technicians
- Ingress Technicians
- Power Supply/Status Monitoring Technicians
- Splicers/Activators

Send resume to Director of Operations
HiQ Communications Inc.
2619 Exposition Blvd.
Los Angeles, CA 90018
fax: (323) 735-1171,
vdeleon@hiqcommunications.com

Broadband CAREERS NETWORK
Full-Service Network Career Center™
www.BroadbandCareers.com

Reach For The Stars™

- Telecom Industry-Specific Career Site
- Web Brochures / Unlimited Job Postings
- Career Opportunities & SecureCandidate™
- Résumé Database & BroadSearch™ Agent
- Free Access to Emerging Talent™ Database
- Career & HR Industry Resources

www.BroadbandCareers.com

Broadband CAREERS NETWORK Full-Service Network Career Center™ www.BroadbandCareers.com
"Your On-line Career Center"

Peter Froehlich & Co.
executive search
SCTE Sustaining Member

P.O. Box 339 Weatherford, TX 76086
(800) 742-4947 FAX (817) 594-1337
email: pfsearch@flash.net
web: http://www.flash.net/~pfsearch

All levels of Technical Positions - Corporate to Hourly. Operators and Manufacturers Call or Write. Fees Paid.

Communications Technology
WHERE IT'S AT!!
CALL 1-800-325-0156, extension 23 for your Classified Advertising

Bigham
Cable Construction, Inc.

Performance Built Our Company Specializing In Rebuilds and Fiber Optic Installation, Splicing & Sweep

PERMANENT POSITIONS AVAILABLE! NATIONWIDE

- Line Foremen
- Subcontractors
- Construction Supervisors

Harold Bigham
800-441-0780, Fax 850-932-1755
P.O Box 903
Gulf Breeze, FL 32562

TECHNICIANS

CableAmerica has openings for experienced cable service and system technicians in our Mesa, Arizona operation. If you are an enthusiastic team player and possess strong trouble shooting and customer service skills you may be qualified to join the CableAmerica team. We offer an excellent benefits package including a 401k. Send resume with salary history to: CableAmerica, Att: Jerry Blount, 1755 S. Horne, Suite 1, Mesa, AZ 85204, EOE

CableAmerica

Wanted!

Experienced long term help for Southeast rebuilds/upgrades

Aerial Crews
Fiber Optic Crews
Underground Crews
Splicers
Installers
Field Engineers

CABLE MAN, INC.
Call (228) 374-5832
Fax: (228) 374-2198

Since 1975 Leader in the Placement of Cable TV Professionals

JOBS GALORE!!

Technical • Sales & Marketing • General Management

JY JIM YOUNG & ASSOCIATES
Holland Creek • 1424 Clear Lake Rd. • Weatherford, TX 76086
Call 817-599-7623 • FAX 817-599-4483 • E-Mail jyoung@staffing.net

Enhance your ad with
COLOR
For more information please call
Kelly Aarons at 1-800-325-0156, x23

By Melissa Hicks

Surveying and Serving Our Diverse Membership

Currently, more than 16,000 technical professionals benefit from membership in the Society of Coble Telecommunications Engineers, and the number is rising.

Data recently collected from more than half of our membership has allowed us to take a closer look at this group and to appreciate the different segments of the technical community served by SCTE.

Who employs SCTE members?

48 percent: Multiple system operators (MSOs)
18 percent: Manufacturers
9 percent: Independents
9 percent: Contractors
8 percent: Telecommunication carriers
5 percent: Other (programmers, broadcasters and such)
3 percent: Regulatory, financial or educational organizations

What are SCTE members' roles?

37 percent: Engineering/operations management
29 percent: Engineers and technical professionals
24 percent: Management
7 percent: Sales and marketing
2 percent: Installers
1 percent: Programmers

In the coming months, the Society will conduct a comprehensive needs-assessment among all of its varied constituencies. In turn, this knowledge will help to drive the creation of new professional development resources and benefits for our membership.

This continued evolution helps ensure that the Society remains a vital and valued partner to the industry and to each of its members.

Already in the works

Several key advances are already in motion, setting the tempo for a dynamic year of added value:

- A redesigned and enhanced Web site to provide cutting-edge technical information, SCTE news, an online bookstore and more. Members will enjoy exclusive access to reference materials and additional online resources at www.scte.org.
- The introduction of Data Over Cable Service Interface Specification (DOCSIS) Deployment seminars throughout the United States

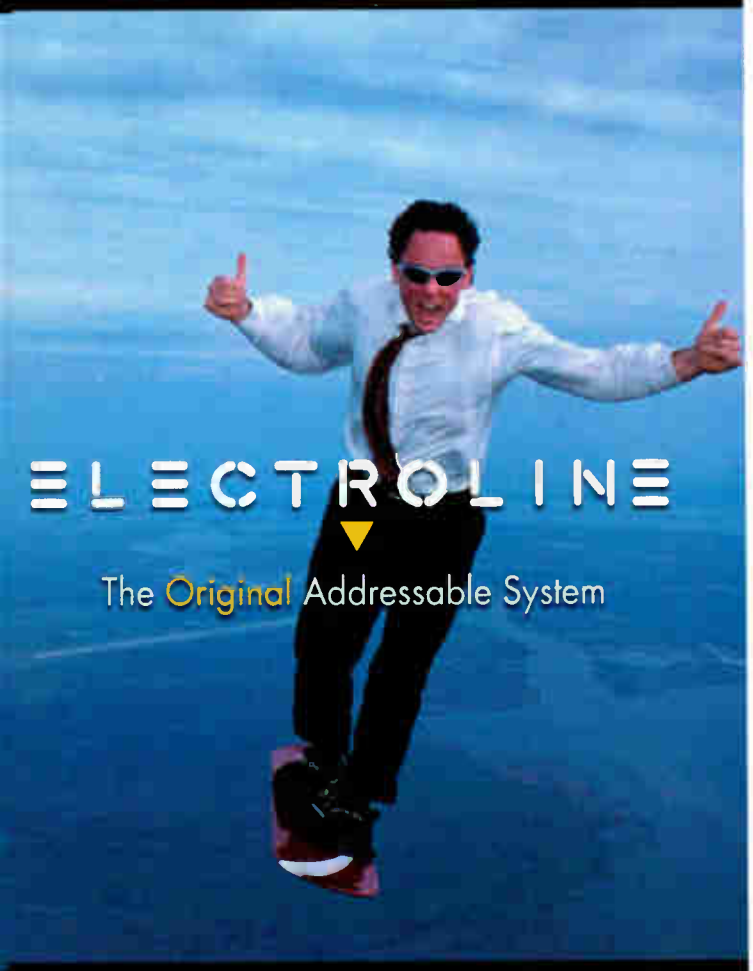
> "In the coming months, the Society will conduct a comprehensive needs-assessment among all of its varied constituencies."

- An expansion of SCTE's training program to include A+ certification training
- Publication of new educational materials, including *Making the Right Decisions* and *Effective Decision-Making and Problem Resolution*
- Development on standards such as DVS 267, Point-of-Deployment (POD) Module Emergency Recovery and Firmware Upgrade Resource; IPS TP 403, Test Procedure for Measuring Shielding Effectiveness of Coaxial Cable Using the GTEM Cell; and HMS 013, Power Supply Electro-mechanical Specification
- Increased availability of training in the workplace through corporate partnerships with SCTE
- The introduction of a Chapter Leadership Conference on March 17
- Enhanced communication with our members through increased use of e-mail, fax and Web site postings
- Expanded use of the SCTE headquarters facilities in Exton, Pa., including standards subcommittee sessions, board of directors meetings and the Chapter Leadership Conference
- Additional educational opportunities through partnerships with other professional societies

Share your ideas

SCTE looks forward to continuing to further the professional success of its members through training, certification and standards. But the headquarters staff can't do it alone—we need your help, and most importantly, your involvement and input to make this Society of ours really shine. The Society is always eager to listen to ideas and opportunities to further support our membership. Please contact membership@scte.org with your suggestions. CT

Melissa Hicks is director of membership services for the SCTE. She can be reached via e-mail at mhicks@scte.org.



Money Talks!

Electroline's Addressable Tap System means MONEY IN THE BANK!

- Money from dramatic reductions in truck rolls, overdue accounts, non-pay disconnects and cable piracy
- Money from increased market penetration and customer satisfaction

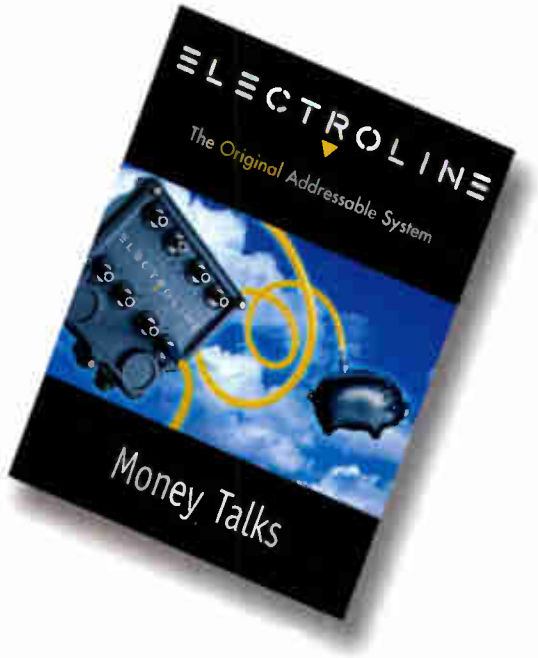
THE PROOF

Over four million ports shipped worldwide and thousands of satisfied customers since 1983

- By far, the only field-proven and most widely used addressable tap on earth

Make the Electroline Addressable Tap System

work for you.



CONTACT MONEY TALKS :

TOLL FREE • NORTH AMERICA (800) 461-3344
GENERAL INQUIRIES info@electrolinequip.com

ELECTROLINE EQUIPMENT INC.
8265 St-Michel Blvd.
Montréal, Québec Canada H1Z 3E4

ELECTROLINE

www.electrolinequip.com

The Industries Most Versatile Line Of Plastic Demarcation Enclosures

Satisfied Customers World Wide Since 1983

We Customize

Multilink™

Technologies Group

Phone (440)366-6966 **FAX** (440)366-6802
Internet: www.multilinkinc.com
E-mail: sales@multilinkinc.com
24 Hour Voice Messaging
Worldwide Distribution

Member SCTE BiCSI

www.multilinkinc.com