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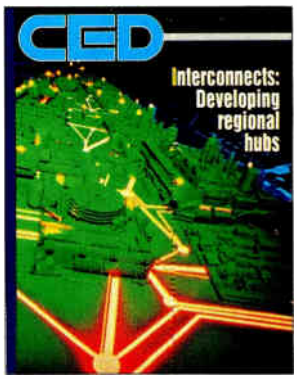

About the Cover
Who's interconnecting and where? Photo by Image Bank.

Departments

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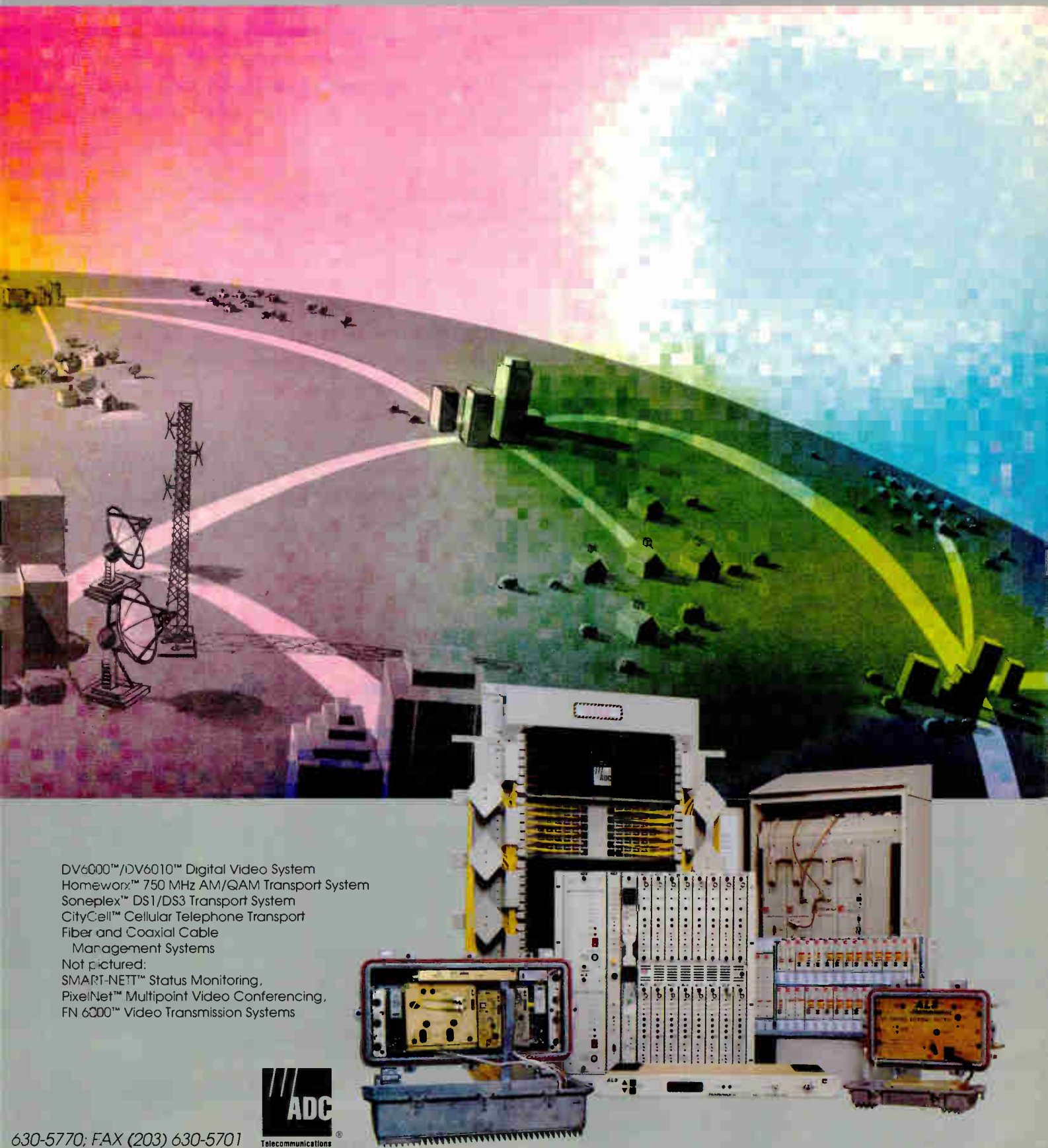

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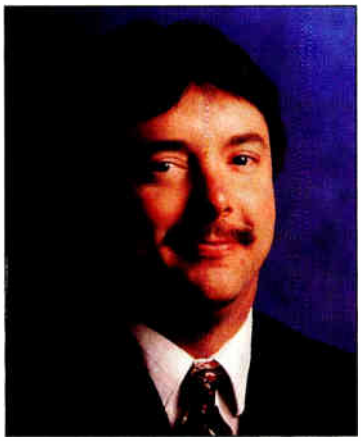

Building a house of cards

For the past several weeks, talks around the water cooler have been dominated by "what about" discussions related to the TCI/Bell Atlantic merger. "What about John Malone and Ray Smith–how will they get along?" "What about the network–what will it look like?" "What about industry leadership now that we've lost Malone?" and similar questions run rampant.

Those are all good questions, but the one I wonder most about relates to research and development. Say what you will about Cable Television Laboratories, but I don't think it's coincidence that since CableLabs was created in 1988, the cable industry has progressed from a national communications wannabe to the most compelling stories on Wall Street as well as Silicon Valley.

Remember when it was almost impossible to get consensus on a single subject from a group of engineers? The Labs, by serving as a melting pot of ideas, has been astoundingly successful at obtaining consensus and telling a cohesive story to regulators, technologists and even its rivals. The result has been new respect and the perception that cable television is presently best positioned to deliver more services faster to the American public.

Although it is prohibited from actually *establishing* standards for the industry, CableLabs essentially performs that function by seeking input and developing consensus on emerging technologies, which leads to de facto standards. Video compression, data protocols, digital ad insertion and the regional hub concept now very much in vogue–have all been or are currently subjects of major CableLabs projects. CableLabs has demonstrated its importance as a place where the cable industry's strategic directions are laid out.

What does all this have to do with the TCI merger?

One can't help but wonder whether the "new Bell Atlantic" will choose to support an entity like CableLabs. In reality, the financial commitment isn't a budget-breaker, but there are huge differences in the way the Labs functions vs. the way the telcos' R&D facility, Bellcore, does business. As I mentioned earlier, CableLabs is important because it helps develop strategic business plans. Bellcore, however, focuses on tactics, developing standards on reliability, functionality and other, arguably less significant subjects.

Will the new Bell Atlantic want to become part of an organization that spells out strategic thinking for all–including competitors–to see? Or will it choose to keep those thoughts buttoned up internally, holding its cards close to the vest? If Bell Atlantic ceases to support CableLabs, the whole house of cards may come crashing down.

I think that would be unforgivable. But if it does happen, the bulk of the R&D work will either be thrown back on the equipment manufacturers (and can they afford to take on a new level of research?) or it will gravitate back to each individual operator, who, for fear of letting out secrets, will revert to the past practice of developing *individual* solutions to technology problems. You could argue that it's that kind of thinking that put the telcos at the competitive disadvantage they hold today: imagine the weight they'd wield with a unified approach to video dialtone, for instance.

Roger J. Brown

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Jerrold, S-A focus on telephony applications during Western Show

You knew it had to happen.

Now that the nuclear fallout from the TCI/Bell Atlantic merger bombshell has settled, the cable equipment manufacturers are taking the wraps off telephony projects they've been quietly developing in their labs over the past several months.

The Western Cable Show in Anaheim will showcase a multitude of proposed hardware, architectures and systems designed to accommodate simultaneous carriage of voice and video signals over a fiber-based broadband network. Those who visit the General Instrument and Scientific-Atlanta booths wondering what's new will be inundated with answers.

S-A plans to introduce a functional prototype of its "CoAccess" family of products designed to allow delivery of switched telephony, video, data and interactive TV services over cable or telephony networks. The system will be integrated into the company's fiber to the serving area architecture. It is compatible with the public switched telephone network and would integrate telephony services in a multi-line, expandable architecture that requires no additional in-home hardware or wiring.

The announcement of the system follows an 18-month secret development project, says Ron Foster, vice president and general manager of Telecom Systems for S-A. "When you're designing a telephone system, you have to do it right technically," says Foster. "We're literally marrying two separate product lines."

Essentially, the system consists of products designed to reside in the headend and on the outside of the home. The headend equipment will be standard size hardware and interfaces directly to the RF broadband network. It is intended to perform the multiplexing and demultiplexing of digital signals, interfaces to a Class 5 or other switch, performs system and diagnostic functions and interfaces to the operations and provisioning controller.

The residential unit attaches the broadband network to the internal wiring into the house. Video is sent over coaxial cable while the voice signals are demultiplexed and sent over the copper twisted pair in the home. Although there is no in-home hardware for telephony, the system will still allow video to be controlled by set-tops, said Foster.

The digital telephone voice signals are bundled in 3 MHz wide slots and can be carried in areas of the spectrum that have been off-limits to video, including the FM band and the roll-off region, much like digital audio signals are carried over cable systems.

Importantly, powering of the system will be resident within the network, allowing telephone customers who have lost power to still use their telephones, said Foster.

S-A plans to announce a field test of the system that will occur in early January, followed by a more extensive test about 90 days later. Full volume deployment is slated for the third quarter of 1994.

General Instument will also focus on telephony as a main theme in Anaheim, using the event to announce an alliance with DSC Communications, a developer and manufacturer of digital switching, transmission, access and private networks for telecommunications.

The two companies intend to jointly develop and market an interactive broadband video, voice and data hybrid fiber/coax system that integrates all three services on a single platform. "The hybrid fiber/coax solution is a key element in making next-generation multimedia information services and video readily available," said Hensley West, DSC senior vice president of North American sales. DSC manufactures Sonet-based digital loop carrier products to telecom providers.

GI also will take the wraps off what it calls the Broadband Telecommunications Architecture (BTA), a hybrid fiber/coaxial network design that allows for a phase-in of new services by modularly upgrading electronic components (for a more detailed discussion, see page 22).

Predicated on a fiber-to-the-feeder platform employing 750 MHz electronics, the BTA allows six layers of progression so operators can take advantage of different levels of interactivity as determined by the marketplace.

"We envision this as the system architecture of the future that you can use today," said Bob Young, director of distribution marketing for GI's Broadband Communications Division.

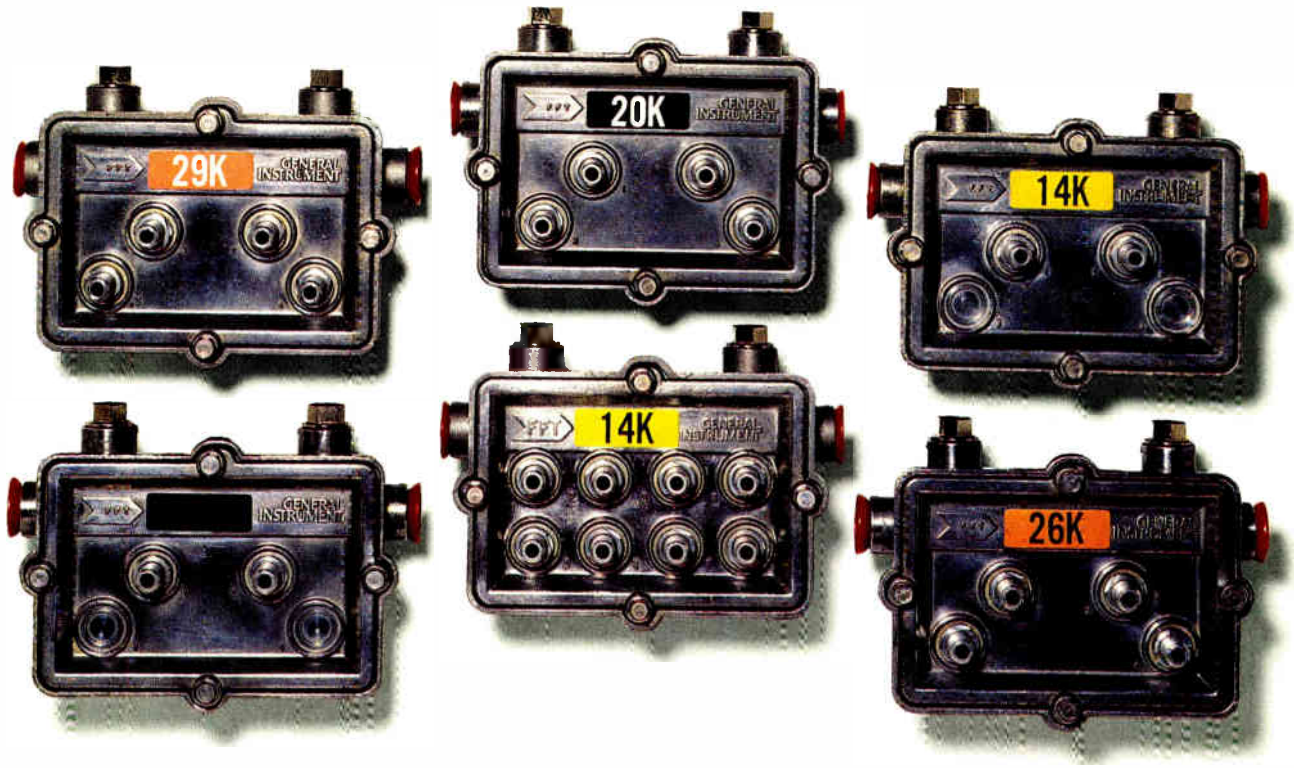
H-P to offer printing service over Time Warner's Fla. network

Time Warner and Hewlett-Packard are teaming up to bring a home printing service to customers residing in the Full Service Network in Orlando. With this home printing capability, viewers will be able to capture color images and related information from their televisions or other video sources and print them on plain paper. Applications include printing news and information, coupons, promotional material, maps, images, invoices, magazine articles and other information accessed via the digital interactive network.

The core technology for the new service was derived from HP's new product line for professional broadcast engineers. The product, called the VidJet Pro, is a professional version of the company's new imaging technology and is used to print storyboards of an entire production on plain paper that can be used for editing, indexing and cataloging.

In the Full Service Network, however, viewers could shop for an automobile, for instances, by using a remote control to choose a local auto dealer listed in the Shopping Mall

H-P's VidJet Pro enables FSN customers to capture and print video images.



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section of the network. A menu would allow customers to shop based on personal priorities, such as model or price. The network would then display several options from which subscribers would make a selection. The printer could be used to print a full brochure listing all the details of the car selected.

Apple integrates computer with TV, CD audio systems

Many have predicted that the computer and television industries are headed on a collision course, with many computer functions being placed into a TV. Apple Computer will find out if that's what consumers want now that it has debuted Macintosh TV, a new product that combines a computer, TV and CD-ROM stereo system into a single, compact unit.

The product provides the integrated functionality of a powerful personal computer with a cable-ready 14-inch color TV, and audio CD player for high-quality stereo sound. The device can be connected to a VCR, camcorder, laserdisc player or video game. It also comes with an infrared remote control.

"The computer industry and the consumer electronics market are converging," said Brodie Keast, director of product marketing for Apple Personal Computer Division. "With this special edition of Macintosh, Apple hopes to learn more about the needs of this market and apply that knowledge to future product development."

This product will probably also be closely watched by officials at Jerrold/General Instrument, which last summer announced a proposal to "modularize" TVs by separating the tuning and intelligent functions of a television from the display. GI dubbed its proposal "Joey" and downplayed the project because of harsh criticism from the Electronic Industries Association, which was involved in intense negotiations with the NCTA over compatibility. The EIA, which represents electronics manufacturers, does not support the modular TV concept for fear it would result in its members building "dumb" displays and little else.

Joey will once again be present in GI's booth in Anaheim, according to Dan Moloney, director of product management for Jerrold. Moloney believes that a modular approach will allow consumers to purchase the features and functions they need, much like they do with audio components. "Failure to modularize will ultimately kill the business," asserts Moloney.

GI has been shopping its idea around to existing TV manufacturers as well as other display companies and has seen "strong interest from some players," Moloney said. "It's very likely that over the next six months we'll have a deal to bring it to market in 1995," he concluded.

Grand Alliance makes key technology choices

The HDTV Grand Alliance has formally selected certain technologies that will be at the heart of the advanced television standard which will be adopted by the FCC later this decade.

The Grand Alliance chose to adopt:

- a compression system based on the emerging MPEG-2 parameters, including the use of "B" frames,
- a packetized data transport system to allow the transmission of virutally any combination of audio, video and data in packets,
- several scanning formats, including 24-, 30- and 60-frame per second progressive scan with a pixel format of 1280 x 720, and 24- and 30-frame per second progressive scan with a pixel format of 1920 x 1080. It will also accommodate 60-frame per second interlace wcan with a 1920 x 1080 pixel format,
- the Dolby AC-3 audio technology, with Musicam as a backup (pending additional tests).

The transmission technology is expected to be chosen in early 1994 following tests of 4-VSB, 6-VSB and 32 QAM broadcast modulation systems and even higher-rate cable modes.

VCR Plus+ upgraded for phone programming

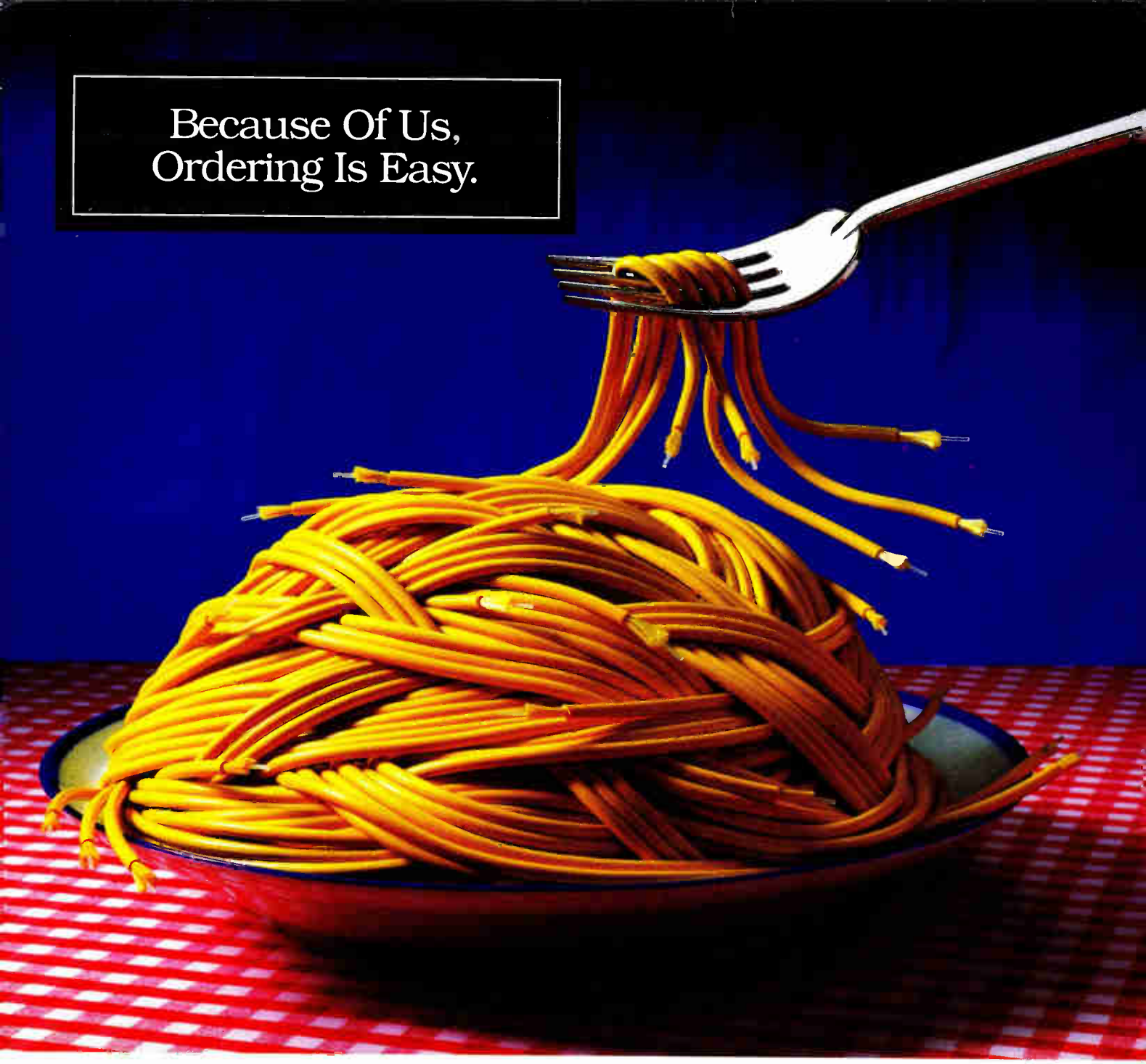
Cable operators ought to be aware that Gemstar Development Corp. has introduced a VCR Plus+ that allows consumers to accomplish initial product set-up in a matter of seconds over the telephone. The new device is called VCR Plus+ with CallSet.

The initial set-up is accomplished with one free phone call. Instead of using an instruction manual, customers call a toll-free number and identify their ZIP code, cable system, VCR brand/model and cable box. A special tone is then transmitted over the phone to the VCR Plus+ unit, setting it for the correct VCR and cable box model, the entire cable channel lineup and even the correct date and time. Consumers subsequently punch in the PlusCode numbers from program guides in order to tape their favorite programs.

Jottings

Century Communications is finally going addressable in Los Angeles and has committed to purchase 300,000 digital decompression terminals from **General Instrument**. Century will use the units to offer multiple channels of pay-per-view and to control premium services . . . The HDTV Grand Alliance has yet to select a modulation scheme for the system, but **Videoway Communications** of Canada recently completed a three-week field test of Zenith's 16 VSB digital transmission technology and pronounced it an "optimal approach to transmitting and receiving digital cable TV signals," said Michel Dufresne, president of Videoway. He hailed the approach for its ability to transmit data at 43 megabits per second, which compares favorably to 64 QAM methods. Videoway tested the system without error at more than 20 different sites . . . **Thomson Consumer Electronics** will purchase an additional $10.8 million worth of digital compression encoders from **Compression Labs** for the DirecTv DBS service, set to begin operating early in 1994. The contract follows an initial $5 million purchase by Thomson in 1992 for encoders. The additional encoding system will be used to expand the DBS system being built. The encoders are based on the emerging MPEG-2 worldwide standard . . . **TeleWest Communications**, an operator of integrated cable/telephony systems in the United Kingdom, has ordered addressable convertors from Jerrold/General Instrument. The units will be rolled out, starting immediately, in franchises operated by United Artists in North Thames Estuary, South Thames Estuary, Cotswolds and North East, areas passing about 859,000 homes . . . **American Lightwave Systems** has been selected by **Cox Cable Communications** to supply Cox's rebuild in Omaha, Neb. The $14 million, 1,300-mile project is slated to start this month and will include more than 120 optical transmitters and 300 receivers. The project will include status monitoring and two-way capability. It will take nearly two years to complete . . . **Adelphia Communications** has ordered single-port interdiction units from **Scientific-Atlanta** to launch an *a la carte* programming service in its cable systems. The home-powered units will enable Adelphia customers to pick and choose from a variety of channels and be billed only for what they select . . . **TCI** has purchased hardware from **AT&T** to automate the MSO's work processes in Pittsburgh. By purchasing the $2.6 million Field Access System, TCI will be able to assign and dispatch field technicians to work orders, give technicians access to customer information and track daily activities. Techs will no longer have to deal with paper work orders, instead, they'll use pen-based computers to manage the flow and completion of the work orders . . . . CED

Compiled by Roger Brown



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Birthing a childhood dream

By Leslie Ellis

Leo Hoarty grew up believing in interactive television–push a button, order a pizza. At the time, he was a teenager climbing poles, aligning amplifiers and tinkering with the electronics at Buckeye Cable, the system his father owned and operated. Now, after an impressive career in digital systems design, Hoarty is on the brink of making interactive TV a reality. As president and chief technical officer of Silicon Valley-based ICTV, Hoarty hopes to soon make his childhood belief in "the wired city" an end-to-end, compelling experience for the nation's cable subscribers.

Indeed, part of what makes ICTV interesting is Hoarty himself. The man is most definitely self-made, despite his obvious cable connections: he grew up with Toledo, Ohio-based Buckeye Cable as a training playground, not to mention the fact that Post Newsweek's droll Ted Hartson is Hoarty's brother-in-law. Clearly, Hoarty has carved a path of digital success for himself wherever he's gone, be it in medical electronics, human-interest work, or high-speed stock trading intelligence on Wall Street.

Hoarty's success can probably be attributed to a lot of chutzpah, tempered with intelligence and adaptability. In 1972, for example, Hoarty decided to transfer from Ohio State, where he was studying physics, to the University of California/Berkeley. While establishing residency, however, he took a job with a startup company as a design engineer, where he developed the first microprocessor-based medical instrumentation. He never did get to Berkeley.

Hoarty did his part for humanity in the mid-'70s, when a job as a digital design engineer for the United Nations sparked his interest and he headed east for the Big Apple. There, he designed voting systems and spearheaded a technology exchange program between developed nations and Third-World countries. On one such mission, Hoarty designed a graphics terminal for use in the 1980 census of China. He penned an article about the system and was subsequently snapped up by Wall Street to develop advanced communications systems for Goldman Sachs and Paine Webber.

It was that system that ultimately triggered Hoarty's active mind to start ICTV. Designed to assist stock traders before making large buys, the first-of-its-kind system mandated accuracy and speed. "That kind of information is so sensitive. It had to be there in a fraction of a second, or (the traders) would panic," Hoarty explains.

As Hoarty describes it, that experience led him to think that maybe the time was close to do something similar for the consumer market. Enter ICTV. "I put together a business plan in 1989, got funding, left Paine Webber, and started ICTV in a spare room in my apartment in New York in 1990," Hoarty recalls. "By the end of 1990, I moved to Santa Clara, where the computing hardware and software resources are far more abundant."

It's that kind of gumption that defines Hoarty. He talks fast, thinks fast and doesn't let go of details–all the while remaining courteous and thoughtful of others' time and interests.

What is ICTV?

Under Hoarty's direction, ICTV will soon bring to market a "headend to eyeball" interactive television system, modeled closely after the key design specifications needed by Wall Street traders: high speed, accuracy and, perhaps most importantly, low latency. "We've found through focus groups that if you take much more time than two to three tenths of a second to provide information, then subscribers will start to get impatient," Hoarty says. "Our system manages those latencies, so that when the user makes a choice, they'll get something in roughly the same amount of time it takes to change a channel, worst case."

The ICTV system is comprised of an intelligent hub located in the headend–Hoarty built his own 550 MHz "Leovision" system in the ICTV lab room–which serves up interactive content, movies on demand, games and information to users. A key point, Hoarty notes, is that the intelligence is in the headend, and not at the set-top. "You can only afford to put so much memory into a set-top. It's $25 for every million bytes. When you're talking about multimedia applications, each frame can take up a million bytes of information."

But what really intrigues Hoarty about interactive TV is the content itself. "That's been our biggest challenge," Hoarty says. "It has to be compelling to the user. We think that to be on TV, you have to look like TV, which means you're competing with extraordinary production values." Because of that, Hoarty also designed vertical applications for the system, including a home cinema preview channel, restaurant listing channel and classified ad service. "To the user, it looks like another TV channel. The user moves around in a full-motion video world. The alternative is basically a video game-like experience." Currently, Hoarty has snagged IBM, New Century Communications and Zenith as partners or potential partners in the system.

The 41-year-old Hoarty says he's down to 12-hour days now, citing potential counterproductivity as the reason. "I work half-days now: nine to nine," he laughs. In his off-time, he dabbles "at least two times a month" as a private pilot.

And, last year, he found time to court and marry Finland-born Satu, who is in the coffee roasting and coffeehouse industry (which probably explains why Hoarty talks so fast). "My friends kept telling me that women wouldn't come to the office to meet me," Hoarty explains. That advice prompted him to attend a summer party, where he met Satu. "When you meet the right person, it's remarkably obvious," Hoarty says.

And when the right person holds firm to a childhood dream, other things become remarkably obvious: like personal and professional success. CED

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Circle Reader Service No. 8

1993: The year in review

By Wendell Bailey, VP of Science and Technology, NCTA

Am I getting older, or is the world changing? Sometimes in those quiet, reflective moments that we all like to enjoy at special places, this question runs around and around in my brain, seeking a solution. If ever events were to conspire to make me wonder anew as to which it is, the events of 1993 would prove to be just such a time.

The year started off, of course, with a shock the entire industry felt by the passage of the 1992 Cable Act. Those of us in engineering and the technical side of the business were doubly shocked to find that all the issues which we thought dealt with other portions and disciplines of our business actually had components that would directly effect how we conducted our part of the business. From anti-buy through to rate regulation, we had much to consider.

While we were mulling over the ramifications of several hundred pages of information from the Commission, we found ourselves in mid-year in San Francisco at the National Show, listening to panel after panel and seeing display after display filled with optimism for our future. In fact, all of the numbers associated with this show, including attendance (which set records), looked to be a complete refutation of what the Congress and the FCC were trying to do to the cable industry.

The analysis of the show, after all was said and done, was that it was a show that focused world attention on the fact that cable has the technology, the platform and the know-how to succeed in this world (that is, of disseminating information to customers) and that more and better solutions would be forthcoming–soon.

Shortly after that meeting in San Francisco, another milestone in the cable industry's history took place when longtime president of the NCTA, James P. Mooney, announced that he was going to leave the NCTA to start a new career while he still had the time and interest to do so. Jim Mooney was my boss and sometimes my mentor, and always my friend. He taught me a lot about how to look at the issues that face us in the cable television industry. He possesses a truly superior intellect and an ability to grasp the big facts.

Consumer electronics compatibility

Overlaying all of this was the engineering effort to fashion workable details for a compromise in the cable consumer electronics compatibility. Meetings began at the first of the year in 1993 and have continued to this day, with managers and engineers from the consumer electronics side meeting with managers and engineers from the cable side. While this debate has sometimes been acrimonious and always difficult, in October the two industries nevertheless managed to forge a compromise agreement that the FCC followed substantially in its report to Congress.

Now the Notice of Proposed Rulemaking is out and the Commission will be seeking comment in its proposed rules for both cable television systems and consumer electronics manufacturers.

And if this weren't enough things to make 1993 an interesting year, Bell Atlantic, one of the seven regional Bell operating companies spun off in the 1984 divestiture of the Bell system, has agreed to a merger in which it essentially acquires TCI, the cable television industry's largest operator. The transaction is deemed to be the largest of its size in U.S. history, at $30+ billion.

The shock of such a move was quickly followed by questions in the minds of everyone who follows such things. Legal issues, regulatory issues and legislative issues all need to be resolved. What happens to the employees to both companies? What happens to the associations associated with TCI, such as NCTA, CableLabs, SCTE, CTAM–because there are similar associations involved with Bell Atlantic, such as USTA, Bellcore, etc.

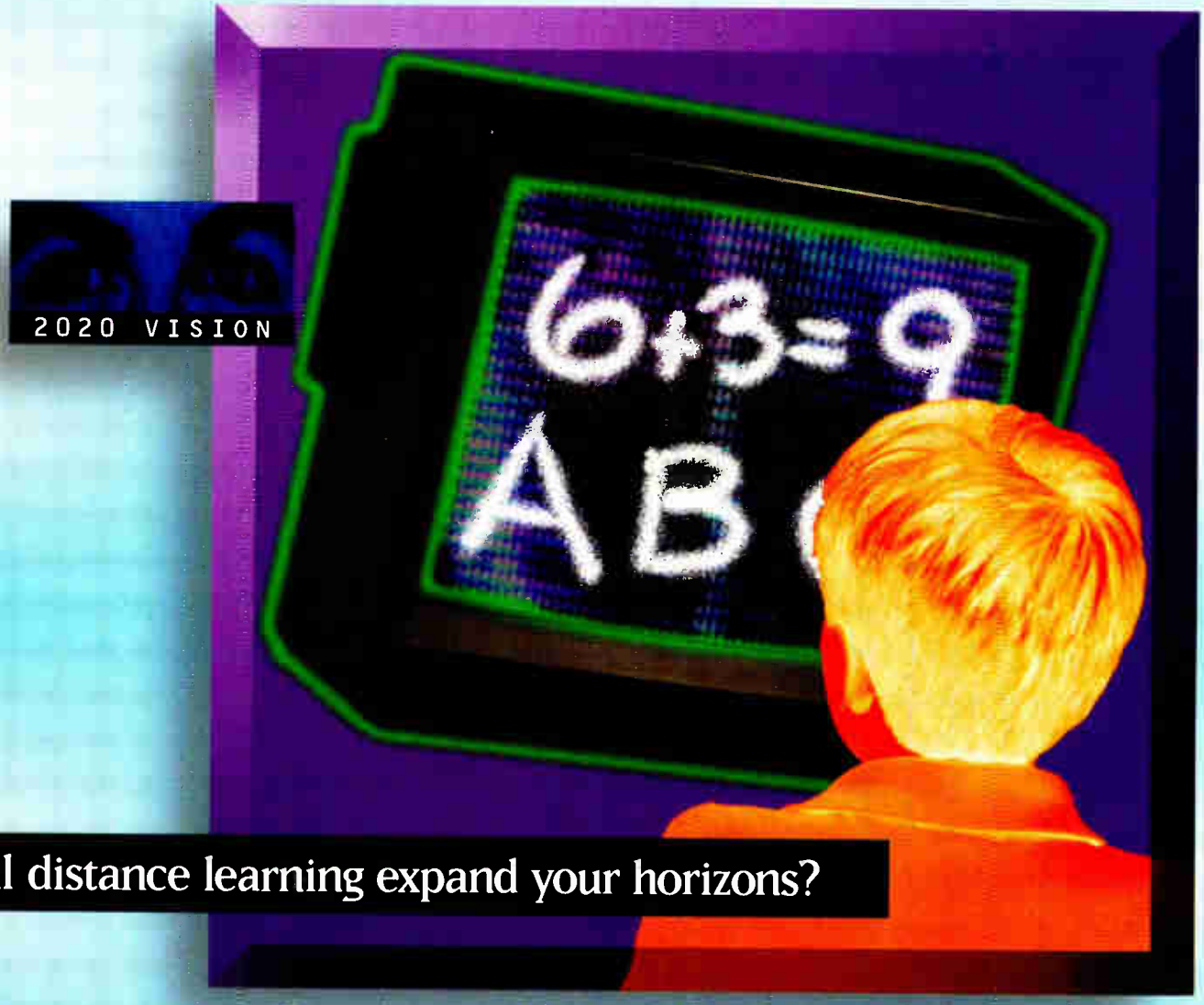
But many of us who gave thought to this when we first heard of it were also buoyed by the fact that it is a positive and persuasive statement about the abilities of the cable television architecture to deliver the services of the future. Bell Atlantic and, indeed, any other telephone company are likely to have an ability to begin building their version of the platform of the future.

Instead, this company as well as many other companies like it have looked around and seen that the best way to accomplish their goals for the future is to acquire a platform that is superior in virtually every way to the platforms used by other players. By combining the telecommunications platform with their aspirations and technologies, Bell Atlantic and TCI believe they can move rapidly into the service arena of the future.

What's next?

As the calendar pages continue to flip over and we approach 1994, which issues will confront us–and what new events will affect our path? Certainly, by next year NCTA will have a new president. Fairly early in the year, the FCC will finally issue its new rules for compatibility–after more than a year and a half of new effort by the FCC and all parties to fashion compatibility regulations that we can all live with. We no doubt will see additional mergers, deals, investments and partnerships between MSOs and other players such as RBOCs or independent telephone companies.

The National Show in May, in New Orleans, will be a perfect time to take the temperature of this unfolding scenario. I'm willing to bet that New Orleans will prove what we all began to feel back then: that we are in the right business; that we do have the right platforms; that our technologies will continue to grow and evolve; and that our understanding of our customers and our competitors have increased to apoint where we are capable in and of ourselves of making the right decisions and of moving forward with some certainly into the 21st century. CED



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Circle Reader Service No. 9

Networks: An integral part of the future

By Chris Bowick, Group Vice President/ Technology, Jones Intercable

No matter how "out of touch" you have been for the last several years, or no matter how deep your head has been "stuck in the sand" trying to ignore the vast changes that have been shaping our industry, there is simply no denying that the CATV industry, as predicted, is truly continuing its evolutionary migration into a major player in the international telecommunications infrastructure.

Let's explore why all of this is happening by briefly examining the respective strengths, weaknesses, and synergies of the converging industries.

The telephone industry

The telephone industry today is an international, digital, standards based, switched, regulated, ubiquitous, two-way interactive, life-line service, that has traditionally been without competition. Granted, competitive access providers, called CAPs (Jones is one), have provided some competition to the local exchange carriers for the carriage of long distance traffic in the local loop, but in the overall scheme of things to date, this has amounted to a "drop in the bucket" when compared to total industry revenues for telephony.

The switching fabric in the telephone industry is absolutely amazing, when you think about it, in that it allows point-to-point, two-way interactive interconnection to just about anywhere else in the world. But the industry certainly isn't perfect, and has some very important deficiencies. For example, even though the service is basically ubiquitous, and the telcos have been deploying fiber optics at an extremely rapid rate, they are still left with less "penetration" in overall fiber deployment than the CATV industry.

Most of their fiber deployment has been in the "trunk" portion of their plant, between central offices and inter-exchange carrier POPs, with very little in the local loop—between the central office and the home or business. In fact, the telephone companies' biggest capital asset, their twisted copper pair, has also been referred to as their biggest liability, because of its extremely narrow-band nature.

The cable industry

The CATV industry, on the other hand, has traditionally been a franchise oriented, analog, broadcast, unregulated (until recently), moderately penetrated, one-way, non-essential, entertainment-type service, that has also traditionally been without significant competition. We have significant strength as an industry, not only in our programming, but also in that our fiber/coaxial network infrastructure has been deployed in the "local loop" in such a manner as to provide an enormous bandwidth edge, by several orders of magnitude, to that of a single twisted pair into the home. With the advent of compression, we are moving very rapidly into the "digital", on-demand, two-way interactive, transaction-based, telecommunications world and are evolving our customer service and billing systems to meet this new challenge.

The computer industry

The computer industry also has evolved tremendously over the last several years from providing niche products to specialists for business-only applications, to a more consumer-oriented product with very broad and, arguably, a mass-market appeal. The consumer's thirst for entertainment, education, and information on-demand has forced the migration of the microprocessor from a little-used computer that sits on a desk in a back-office of the home, to a very active role in just about every major piece of consumer electronics equipment manufactured today.

As the microprocessor continues its immense gains in the power vs. cost arena, and as we continue to see improvements in the consumer friendliness area, we can only expect this trend to continue, with an interactive multimedia world available to us from the comfort of our easy-chair.

But as more and more people begin to effectively utilize the computer for entertainment, educational, and informational purposes, access to this "multimedia content" in an on-demand format will require significant amounts of on-demand bandwidth. *In essence then, in the future, "bandwidth" with be synonymous with "power".*

While the terms "convergence" and "information superhighway" have certainly been used quite extensively in recent months, there is simply no denying that it is really taking place. In addition to the highly publicized strategic mergers and alliances in these industries that are occurring on nearly a daily basis due to the synergies outlined in the above paragraphs, there are quite a few less publicized but important tactical moves taking place.

Recently, for example, Jones announced that we will be providing two-way high-speed interconnections to Internet for our customers in Alexandria, Virginia on a trial basis in early December of this year, with plans for further deployment in Alexandria, and in our other networks throughout the nation, in the very near future. As a result of this deployment, the Alexandria franchise will no-longer be an isolated "coaxial island", but will have high speed data communications and networking capabilities with the rest of the world. In less publicized trials Jones is also providing high-speed Wide Area Network (WAN) Ethernet services, and are gearing up very rapidly for telephony-on-cable trials and other very exciting data communications applications in several of our systems nationwide.

On the international front, we are currently providing switched telephony services (with our own switch) in the United Kingdom with a measure of success that goes well beyond our expectations. There is simply no doubt that the predicted convergence of these markets is truly happening—and very rapidly. CED

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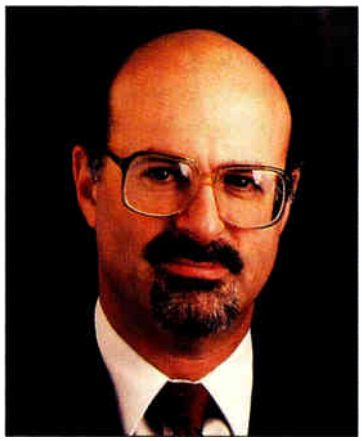
Circle Reader Service No. 10

The channel 19 problem



By Jeffrey Krauss, independent telecommunications policy consultant and President of Telecommunications and Technology Policy of Rockville, Md.

Interference into cable channel 19 is becoming more of a problem, because more consumers, dissatisfied with the limitations of a "plain vanilla" hookup, are connecting switches and other components to the cable system. The interference problem is caused by signals leaking in. But if signals are leaking in, signals are probably leaking out also. There are FCC rules that apply to this leakage by customer-owned components. And the new cable/consumer electronics compatibility policies provide a way to attack this leakage problem. Here's my experience.

Lots of switches

Initially, I hooked up my cable using a bunch of A/B switches I bought at Radio Shack and at hamfests. I have four signal sources: the CATV cable, output from the cable convertor/descrambler, an antenna in my attic, and a VCR. I want to be able to tape programs coming out of the convertor/descrambler box while watching a different channel. I want to be able to use the TV's handheld remote control. I want to use the attic antenna when the cable system goes down. My hookup worked fine, but it was very complicated, and usually I couldn't remember which A/B switch controlled which signal.

My first attempt to simplify this arrangement was to buy an A/B/C switch at a hamfest. This has three input ports and one output, and it replaced two A/B switches. I installed it, and noticed immediately a herringbone pattern of interference on cable channels 19 and 20. I also saw co-channel video interference on channels 4, 7 and 9, which are used by off-air broadcast stations. So I went looking for a more advanced solution.

I went to another hamfest, and found a "video control center," a device with a whole bunch of F-connector ports on the back and a bunch of push buttons on the front panel. This allowed me to get rid of all the A/B switches, and to connect any of the possible video sources with the VCR and TV. But I found that the interference remained on channel 19. In fact, it was even worse than before.

At the next hamfest, I found a Sony video control center that used relays instead of push buttons, and when I hooked it up, there was no interference on channel 19 or any of the off-air channels. Hooray. I now have a bunch of spare A/B switches, and the Sony unit works exactly as I wanted. By the way, it cost me $8 at the hamfest. The other unit, the one with all the push buttons and the interference, only cost $7.

Let me remind you that cable channel 19 and off-air channel 19 use different frequencies. Off-air channel 19 is 500 MHz to 506 MHz, while cable channel 19 is 150 MHz to 156 MHz. It turns out that 150 MHz to 156 MHz is used by a variety of land mobile communications systems. Paging transmitters, for example, are on the air almost continuously.

I was getting interference from land mobile and paging transmissions leaking into my TV set. The interference was probably coming down from the attic antenna and leaking through the switch. And I was probably "transmitting" cable TV signals out my antenna, because of leakage in the other direction.

The FCC recognizes that "cable input selector switches" are used with cable system hookups to allow a subscriber to switch between the cable and an outdoor antenna. As a result, the FCC rules (Section 15.115) impose isolation requirements to prevent the cable signal that comes in one leg from leaking out the other leg of the switch to the antenna.

A "standalone" input selector switch cannot be sold without satisfying the limits in Section 15.115. In fact, Section 15.101 of the FCC rules says these devices must be tested by the manufacturer, using a procedure called "Verification," and the manufacturer must affix a label saying that the equipment has been tested and found to comply with the isolation requirements. None of the products I bought had any such label.

Cable/consumer electronics compatibility

This column is partly about a technical issue–leakage–and partly about a political problem. The 1992 Cable Act requires the FCC to investigate and issue a report on compatibility between cable convertor/descramblers and consumer electronics. That has been completed. Next, the FCC has six months to adopt specific rules to implement the findings in its report. That process is now underway.

The reason I first installed a bunch of A/B switches, then tried an A/B/C switch, and finally installed a video control center, was that I was dissatisfied having limitations on hooking up my cable convertor, TV set and VCR. I wanted more flexibility, more functionality and more compatibility.

But I did not expect to encounter a leakage problem. I was "uneducated." The new FCC rules on cable/consumer electronics compatibility will require cable operators to educate subscribers about compatibility. Among other topics, this program should explain hookup options and describe commercially-available switches and their capabilities. It should mention the FCC requirements for Verification and labeling of these switches, and it should alert subscribers to potential interference problems to channel 19.

Cable operators have a specific obligation under the FCC rules to eliminate outgoing signal leakage, both from cable plant and from subscriber equipment. Subscribers hook up their own equipment to the cable, using poorly-installed F-connectors and other leaky items. They know nothing about outgoing leakage.

But incoming leakage can be a significant inconvenience. Cable operators can use the mandatory subscriber education program to explain leakage problems as part of the section on hookups, and start attacking leakage problems caused by customer-owned components. CED

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Circle Reader Service No. 11

Jerrold/GI develops Migration path unveiled architecture to support interactivity

By Roger Brown

General Instrument has introduced a system architecture that in many instances will allow cable operators to systematically upgrade their plants to a state-of-the-art interactive system by allowing them to migrate down to serving 1,000 homes per fiber transmitter and 125-home dedicated return areas.

Called the "Broadband Telecommunications Architecture," the system relies on a heavy use of fiber optic technology, coupled with 750 MHz active RF electronics to lay the initial platform for the new system. From there, up to six different "layers" can be implemented to take advantage of marketplace developments, according to Robert Young, director of distribution marketing for GI's Broadband Communications Division.

The first step is to build a hybrid fiber/coaxial plant with nodes serving 2,000 homes and transmitters serving four nodes (for a total of 8,000 homes), said Young. In this "star" topology, 2,500-foot-long fiber optic "express feeder" is used to deliver the signals from the optical receiver to four mini-bridgers.

From there, coaxial cable delivers the video to each subscribing home. Coax is also used to accommodate the tradtional return band spectrum of 5 MHz to 30 MHz.

This topology would obviously work well in moderate to high-density areas. However, in less dense systems, line extenders would still be used to service the homes located in the coaxial portion of the network, farthest from the mini-bridger location.

If revenue from a service such as video on demand is desirable and possible, it is important to reduce the number of homes served by each transmitter to effectively increase forward bandwidth throughout the system, said Young. If there are more nodes, the possibility of interactivity increases as well because the reverse bandwidth is increased.

The BTA accommodates this need by putting an optical receiver in the lid of the mini-bridger, transforming it into a node location that serves about 500 homes. The number of homes served by the optical transmitter is also reduced to 2,000 homes, which will significantly reduce the chances of viewers obtaining a "busy" signal when they attempt to interact with their TVs. These optical receivers/mini bridgers then serve RF mini-bridgers with coax, which then, in turn, serve the home.

Under this scenario, the optical receiver becomes a passive hub that contains both the fiber splice housing and the power supplies.

Extra return bandwidth

If additional return bandwidth is needed, as it would be if telephony is introduced or interactive multimedia becomes viable, the architecture can provide 500-home dedicated return by installing and utilizing a return laser transmitter at each optical receiver location. Dedicated return can be further reduced to 125 homes by utilizing a return upconverter between the coaxial RF portion of the plant and the return laser housed inside the optical receiver.

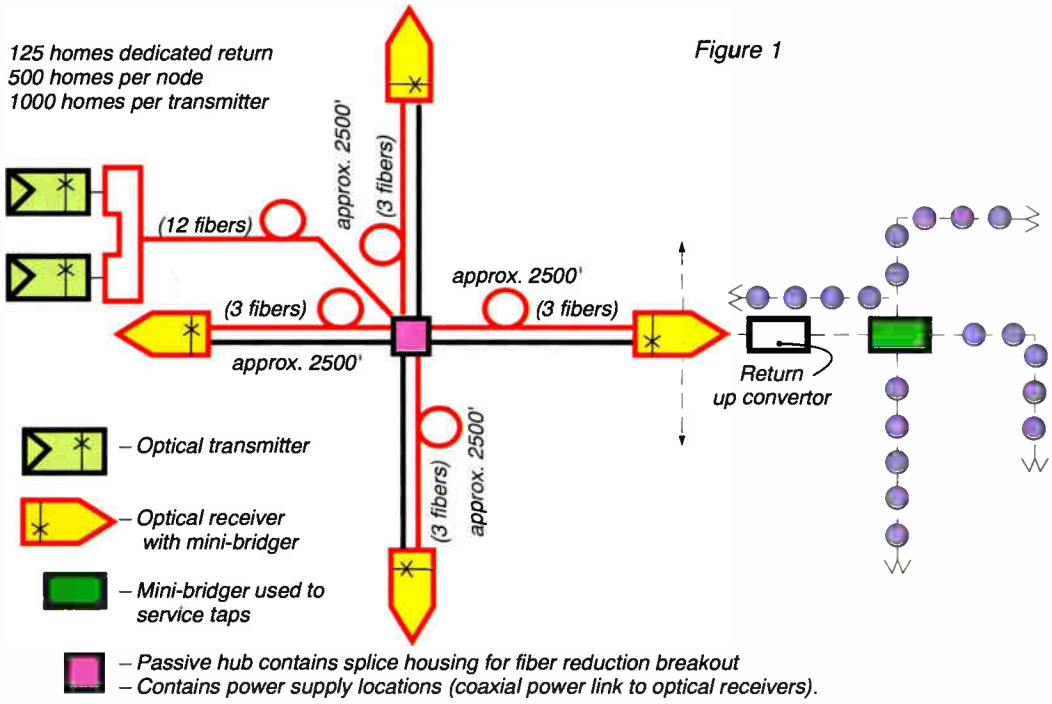
This return upconverter simply allows an operator to increase the amount of bandwidth used in the return fiber and provide a dedicated return path all the way back to the headend to avoid a "bottleneck" flow of information in the reverse direction.

For example, at each optical receiver site shown in Figure 1, there are four coaxial inputs. The first could use the standard 5 MHz to 30 MHz return band, while the three others could upconvert return signals to the following frequency plans: 60 MHz to 90 MHz; 110 MHz to 140 MHz; and 150 MHz to 180 MHz. As Young points out, today's return lasers effectively distribute signals up to 200 MHz.

To help support this architecture, GI plans to develop a modularly upgradable broadband communications amplifier that will be available in the middle of 1994. While not necessary to implement the architecture, this new amplifier will be developed with interactive applications in mind, said Young.

So far, NewChannels is using the BTA concept in the dense, urban portions of its build in Troy, N.Y., said Young. GI has shown the concept to several other MSOs that consider it "very promising" but have yet to actually implement it. CED

Figure 1



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PMD comment misguided?

George Sell's widesweeping indictment of AT&T (Feedback, October 1993, p. 22) demands a counterbalancing response and a correction of certain misinformation.

The quote that Mr. Sell attributes to Jim Refi was apparently taken from a paper that was written by four AT&T authors and published in the *1993 NCTA Technical Papers*. The quote was lifted out of context, as the original text clearly pertains to methods for making *polarization maintaining* (PM) fibers–not *standard* singlemode fiber.

The techniques for making PM fiber have little to do with the methods used by either AT&T or Corning to make standard singlemode fiber.

It is regrettable that Mr. Sell should suspect that AT&T's motivation for releasing information on PMD is because "AT&T has something to obscure."

As a leading supplier to the cable industry, AT&T recognizes an obligation to share new findings with the industry and has done so with presentations to CableLabs, cable operators and standards bodies, and by publishing technical papers.

The papers have appeared in refereed journals and at conferences that maintain high standards of excellence.

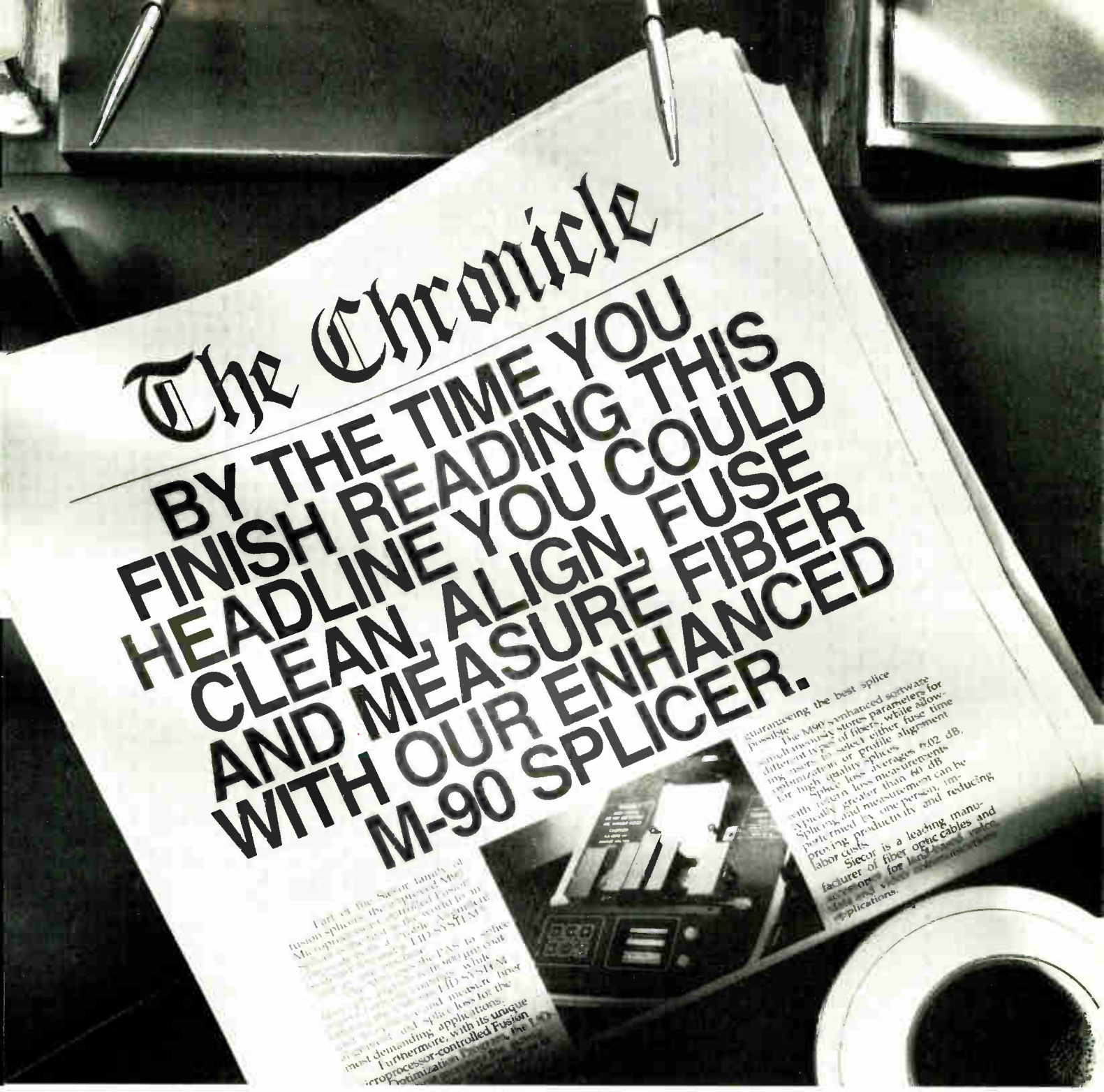
Users have long understood the effects of optical loss and chromatic dispersion on optical transmission systems, and have specified those parameters in their fiber/cable purchases.

AT&T's experience has caused us to identify PMD as another important parameter that should be added to customer and manufacturer specifications.

We recognize an obligation to share new findings with the industry.

Because all fibers have some level of PMD, AT&T and its joint ventures have imposed a maximum PMD specification on cabled fiber–the only fiber manufacturers to do so. The PMD of AT&T fiber is not only world class, but its PMD is the most stable–being consistent and predictable from factory spools to cable fiber to installed cable. It seems clear that Mr. Sell's prescriptions for avoiding PMD problems are misguided and self-serving.

Michael Michie
Product Manager, Optical Fiber
AT&T Network Systems



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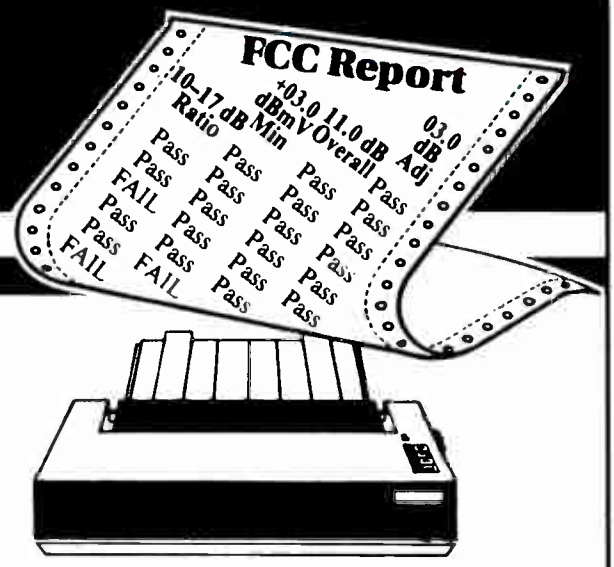

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A WHOLE NEW UNIVERSE OF CABLE NETWORKING.

Circle Reader Service No. 15

Inter MSOs learn to work together

Developing the regional hub concept

By Roger Brown

Spurred by political pressure and a perceived economic windfall, several individual state cable associations are studying the feasibility of developing a ubiquitous telecommunications network that can deliver voice, video and data. The trend is leading to an unprecedented level of interest in exploring regional and statewide interconnects that could tie existing plant owned by cable systems, alternate access providers, long distance companies and utilities that own both hardwired and wireless infrastructures to deliver a range of voice, video and data services.

The most mature efforts are in the Northeast, where FiberSpan Pennsylvania is perhaps the most developed, followed by similar efforts in New York state and in New Jersey, where several operators have joined together to blunt Opportunity New Jersey, a telco-led initiative to upgrade the state's telephone network.

But similar efforts are brewing in Michigan and Maryland and in Vermont, Massachusetts and New Hampshire, spearheaded by Continental Cablevision. Another successful regional interconnect exists in eastern Canada, where Rogers integrated voice (both hardwire and cellular) with video.

Pennsylvania's efforts

Just last month Probe Research officially kicked off

a $900,000 feasibility study and business plan for a proposed trans-Pennsylvania network. The six-month project is being funded by FiberSpan Pennsylvania, a non-profit corporation established by the Pennsylvania Cable Television Association.

The study was undertaken as a result of a "white paper" written by the PCTA, which outlined the technical viability of interconnecting regions–and then the entire state–via fiber, microwave and other signal transportation methods, based on research conducted by Cable Television Laboratories. Such a network could be used for distance education and improved health care in addition to increasing cable penetration and providing economies of scale for the state's operators.

Some would argue that the PCTA white paper simply called for an extension of the strategy already undertaken by some operators. For example, TCI has been interconnecting its systems in several areas, including Aurora, Colo., where it saved $908,000 annually by putting in a fiber system serving 600-home nodes that eliminated four headends and nine microwave receive sites, according to Richard Rexroat of TCI.

Adelphia has also been actively linking facilities via fiber to reduce the number of headends it operates throughout Pennsylvania. A system in Mt. Oliver, Pa. was recently linked to the larger Bethel Park system via fiber, resulting in an additional 24 channels being delivered to the 1,200-home community of Mt. Oliver–a development that would have been too expensive to consider without the interconnect.

"There is, of course, no reason why this interconnecting cannot be practiced by several companies serving larger, more urban communities on a cooperative basis," the PCTA paper asserts.

The white paper was initially written for political and economic reasons, according to Bill Cologie, PCTA's director of communications. Pennsylvania Bell has been lobbying regulators in that state to gain approval for a statewide fiber network that would be constructed by 2015 at a cost of approximately $30 billion. This paper was a response to that effort and noted that the same project could be built for about $300 million.

"For $300 million, financed by private industry, Pennsylvania could have its high-tech network of tomorrow," the paper argues. "If Pennsylvanians escape the proposed requirement that they finance the telephone companies' $30 billion fiber optic network, this $30 billion in disposable income will be available for other purposes."

To complete the study, Probe put together a team of seven companies that will be responsible for analyzing different segments of the proposed network. Engineering Technologies Group, headed by cable industry veteran Ron Cotten, will coordinate the network design and engineering, with assistance from Rochester Telephone for the telephony platform, switching and transmission interfaces, and IBM, which will offer expertise on multimedia and video servers.

Cincinnati Bell Information Services, which developed the software used to bill two-thirds of the nation's cellular subscribers, will design the billing and business support systems, while Daniels and Associates and the financial institution Lazard Freres & Co. will develop business and financial plans. The law firm of Swidler and Berlin will focus on regulatory issues, rights of way and other legal questions related to the project.

The study will determine the type and amount of signal transportation networks–not just cable TV facilities–currently in existence across the state and recom-

"There is no reason why this interconnecting cannot be practiced by several companies serving larger communities"

Figure 1: **The Rogers cable network topology**

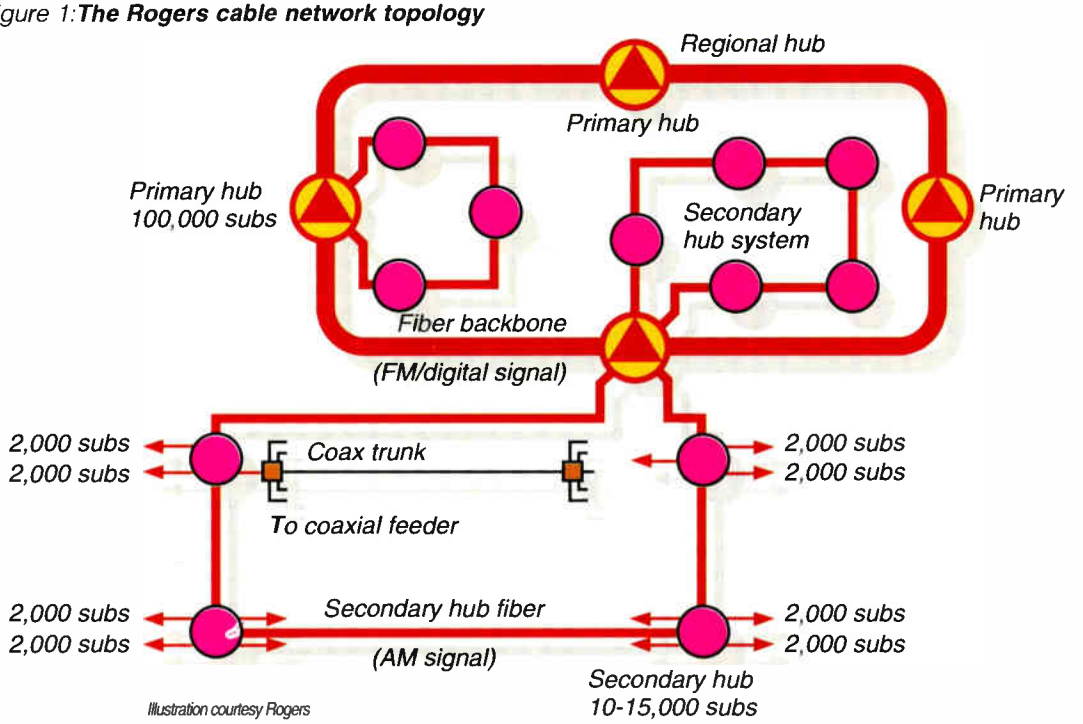

Illustration courtesy Rogers

The demonstration consisted of interactive links between hospitals located in New York City and Syracuse.

mend methods for tying them together. Although this is not a proposal to undertake a huge construction project, it is anticipated some facilities will need to be constructed, said Cologie.

Already, TCI is building a regional hub in Pittsburgh, several Suburban Cable systems are linked in eastern Pennsylvania and several microwave ad interconnects are in existence in the state, he added.

Once the study is completed, the FiberSpan board of directors will determine which strategy to pursue, but it is anticipated that the corporation will become a for-profit entity and offer the network to others.

Demonstrating tomorrow today

Over the summer, the Cable Television Association of New York contracted with Stern Telecommunications to inventory the state's existing communications facilities and develop a feasibility study of interconnecting those facilities, said Joe Stern, principal of the company. The study was started last June and was completed in August.

The CTANY already demonstrated the benefits of such a "network of networks" last July when it organized four cable systems, three alternate access providers, a programmer and a long distance carrier to provide teleconferencing between medical and educational facilities over existing fiber and coaxial networks.

The demonstration–believed to be the first of its kind–was undertaken to blunt arguments from New York Telephone, which is seeking approval for a major upgrade of its outside plant facilities in order to provide, among other services, links between medical and educational institutions. The demo by CTANY was designed to prove that alternative carriers can perform the same function without subsidy from governments or ratepayers.

The demonstration consisted of interactive links between hospitals located in New York City and Syracuse, where doctors at both facilities were able to consult with colleagues, including an on-line exam of a CAT scan. Also, two high schools on Long Island were linked with a school in Syracuse, allowing a music teacher to interactively instruct all three simultaneously.

A similar demonstration was organized by the New Jersey Cable Television Association in August that showed how today's cable systems can be linked to offer advanced interactive television services like distance learning, telemedicine and home banking. The hour-long telecast, called "Connecting the Future," highlighted:

✔ how local public schools in Princeton have been linked via C-TEC Cable plant;

✔ An inter-school fiber interconnect undertaken by Garden State Cablevision;

✔ A link between Suburban Cablevision (which serves communities in four counties) and the Liberty Science Center in Jersey City.

Since then, four operators have banded together to interconnect existing cable plant serving some 300,000 homes in 76 different communities located in Monmouth and Ocean counties, primarily to facilitate distance learning. The fiber link will create a seamless network stretching from Lower Barnegat Bay to Raritan Bay and from the Atlantic Ocean to Trenton's eastern suburbs.

Frank DeJoy, past president of the NJCTA, says this interconnection expands the geographic reach of the four local systems. And he hints that more is to come: "Further interconnections are being finalized on drawing boards of other systems in the state."

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"Further interconnections are being finalized on drawing boards of other systems in the state."

Interconnecting: It may not be easy

If the societal and economic benefits of interconnects are well understood, the technical details and logistics are much less so, according to those who have been through it. Some of the issues that must be contended with when interconnecting different MSOs include: incompatible scrambling schemes, lack of common channel lineups, revenue sharing formulas, service pricing issues and selling the idea to the other companies, says Tony Werner, vice president of engineering for Rogers Cable TV's Eastern Canada region.

Werner should know: Rogers has interconnected its cable systems located in Eastern Ontario via 700 kilometers of fiber. And because Rogers has a license to provide telephony service, the MSO even connected its plant to other MSOs in order to provide a seamless, reliable telephony network.

The Rogers approach relies on fiber "rings" that utilize, FM, AM and digital signals to provide reliable, "self-healing" service to customers. Additionally, Rogers installed parallel 128 x 128 switches that are monitored 24 per day. The switches are used both internally by Rogers and by other MSOs to feed programming into their networks.

What will it take to make a good interconnect? The answer depends on what the goal is, according to Stern. Immediate benefits include: the ability to deliver new services because they become more affordable if supported by more than one system; a reduction of redundant facilities; and a larger target for advertisers.

To help gather and disseminate information about interconnects and foster their growth, Stern was instrumental in establishing a Regional Interconnect Subcommittee that reports to the NCTA Engineering Committee. The group will attempt to develop broad specifications related to headend interconnections, regional signal distribution, alternate access services, consolidation of PCS and related services, interconnection to interexchange carriers, digital store-and-forwarding operations and gateway operations for statewide and national interconnection of systems.

As chairman of the subcommittee, Stern is actively seeking input from developing regional interconnects to submit non-proprietary information about their plans, topology and equipment choices.

The concept of cooperatively interconnecting with a neighboring system may come as a completely foreign thought to many established operators. But there are many potential benefits to be gained. As Joel Goldblatt, managing partner of Manmouth Cable in New Jersey, says: "Our Achille's Heel has been the perception that there's an unwillingness to cooperate. I think this (New Jersey) interconnect debunks that." CED

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B ☐ **Management** (Vice Presidents, General Managers, Business Managers System Directors, System Managers, Station Directors, Station Managers)

C ☐ **Programming** (Programming Vice Presidents, Directors, Managers or Programming Producers)

D ☐ **Pay Per View** (Pay Per View Vice Presidents, Directors, Managers, Producers)

E ☐ **News** (News Vice Presidents, Directors, Managers, Producers)

F ☐ **Marketing/Subscriber Sales** (Marketing/Subscriber Sales Vice Presidents, Directors, Managers, Customer Service Representatives, Subscriber Sales Reps)

G ☐ **Advertising Sales** (Advertising Sales Vice Presidents, Directors, Managers,Representatives)

H ☐ **Technical/Engineering** (Engineering Vice Presidents, Directors, Managers, Engineers, Technicians/Installers)

J ☐ **Other:** (please describe)_____

B3XSHW

Which of the following best describes your firm's primary business activity? (check only one)

Cable TV Operations

01A ☐ Independent Cable TV Systems
01B ☐ MSO Owned Cable TV Systems
01C ☐ MSO Regional/Headquarters Offices
01D ☐ Advertiser Supported/Basic Cable TV Networks
01E ☐ Pay Cable Television Networks
01F ☐ Pay Per View Cable Television Networks
01G ☐ Audio Cable TV Networks
01H ☐ Cable TV System Rep Firms
01J ☐ Cable TV Interconnect Firms

Broadcast TV Operations

02A ☐ Full Power TV Stations
02B ☐ Low Power TV Stations
02C ☐ TV Station Group Headquarters
02D ☐ Broadcast TV Networks
02E ☐ TV Station Rep Firms

Other Media Operations

03A ☐ MDS/MMDS Operations
03B ☐ SMATV Operations
03C ☐ DBS Operations
03D ☐ Local Telephone Companies
03E ☐ Regional Bell Operating Companies
03F ☐ Long Distance Telephone Companies
03K ☐ Cellular Telephone Companies
03G ☐ Newspapers
03H ☐ Magazines
03J ☐ Other Media

Others allied to the field

05 ☐ Cable TV Contractors
06 ☐ TV/Cable Component Mfg/Distributors
07 ☐ Satellite Communications Services/Common Carrier Firms
08 ☐ Telephone Equipment Mfg/Distributors
09 ☐ Electric/Gas Public Utilities
10 ☐ TV/Cable/Telco Research Labs
11 ☐ Computer Hardware/Software Manufacturers/Distributors
12 ☐ Computer Service Firms
13 ☐ Program Producers/Distributors/Syndicators
14 ☐ TV/Cable Production Facilities
15 ☐ Financial Institutions, Brokers or Investors
16 ☐ Law Firms/Lawyers
17 ☐ Advertising Agencies
18 ☐ Marketing/Promotion Service Firms
19 ☐ National Advertisers
20 ☐ Public Relations Firms
21 ☐ Talent Agencies
22 ☐ Market & Audience Research Firms
23 ☐ Elected Government Officials
24 ☐ Federal Government Agency Personnel
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28 ☐ Consultants
29 ☐ Other (please describe): _____

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History of the vestigial sideband

Group delay errors

By Archer S. Taylor, Director and Senior Engineering Consultant, Malarkey-Taylor Associates, Inc.

As early as 1936, five years before the first NTSC developed its monochrome television standards, the 6 MHz channel width had already been set in concrete by the Radio Manufacturers Association (RMA) television standards committees.[1]

At that time, 100 MHz was at the frontier of the electromagnetic spectrum considered useful for public purposes. You may laugh, but references even to 75 megacycles as "ultra-high frequency" were commonplace. Frequencies (wavelengths) were measured with Lecher wires (ask some old-timers about those); Barkhausen transit-time tubes and magnetrons were used for power oscillators. The RMA recommendation that seven 6-MHz channels be established between 42 MHz and 90 MHz was considered at the time to be both farsighted, and a little greedy. In hindsight, it is unfortunate they did not opt for 8 MHz channels, like the British did some 25 to 30 years later. Maybe this is the price of technological leadership.

In the 1936-37 RMA deliberations, there was general agreement on 441-line, 2.5-MHz video bandwidth, using double sideband amplitude modulation (see Figure 1). By 1938, however, the RMA committees recommended the recently developed vestigial sideband technology in order to increase the video bandwidth to 4 MHz without expanding the 6 MHz channel width.

It was only at the last meeting of the first NTSC, in March 1941, actually two months after its recommendation had been submitted to the FCC, and after stormy debate, that the number of scan lines was changed from 441 to 525, where it stands today

In January 1950, after the wartime freeze, the NTSC was reconvened to develop compatible color TV standards. By this time, it was politically impossible to expand the 6 MHz channel bandwidth. Therefore, the vestigial sideband, 525-line structure became literally immutable, and this standard was carried forward for NTSC color.

The Vestigial sideband

What is the vestigial sideband? Simply stated, it is what is left after filtering out most of the lower sidebands generated in normal double sideband (DSB) amplitude modulation (see Figure 2).

It is often useful to represent amplitude modulation as the sum of three vectors (see Figure 3).

The large vector represents the visual carrier, and rotates at the rate of 54 to 550 million revolutions per second (the carrier frequency). The two shorter vectors represent the sidebands, rotating in opposite directions at a much slower rate, less than about 4 million revolutions per second (the video baseband frequency).

When both sidebands exist, with equal amplitudes and opposite phase, the resultant always coincides with the carrier vector. But when one of the sidebands is missing (shown as a dashed line in Figure 3) the resultant swings back and forth, depending on the relative position of the carrier and modulation vectors, causing quadrature distortion. The smaller the modulating amplitude, however, the smaller the resultant swing back and forth.

The RMA committee realized, correctly,

Figure 1

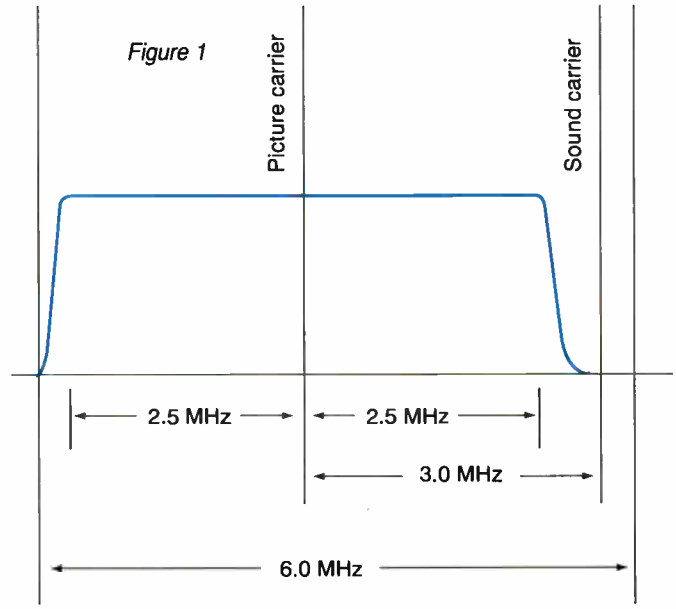
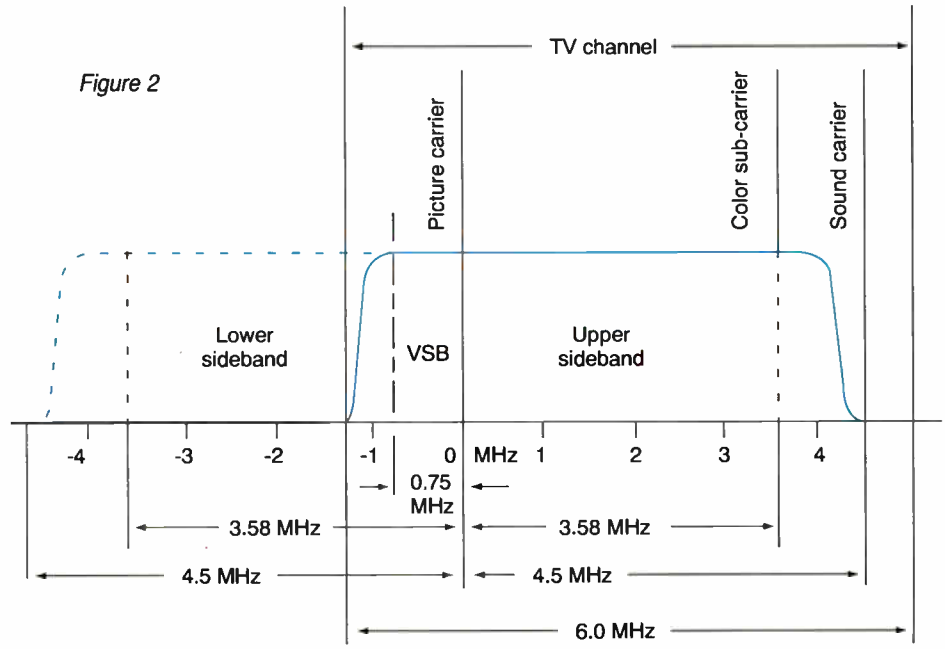


Figure 2



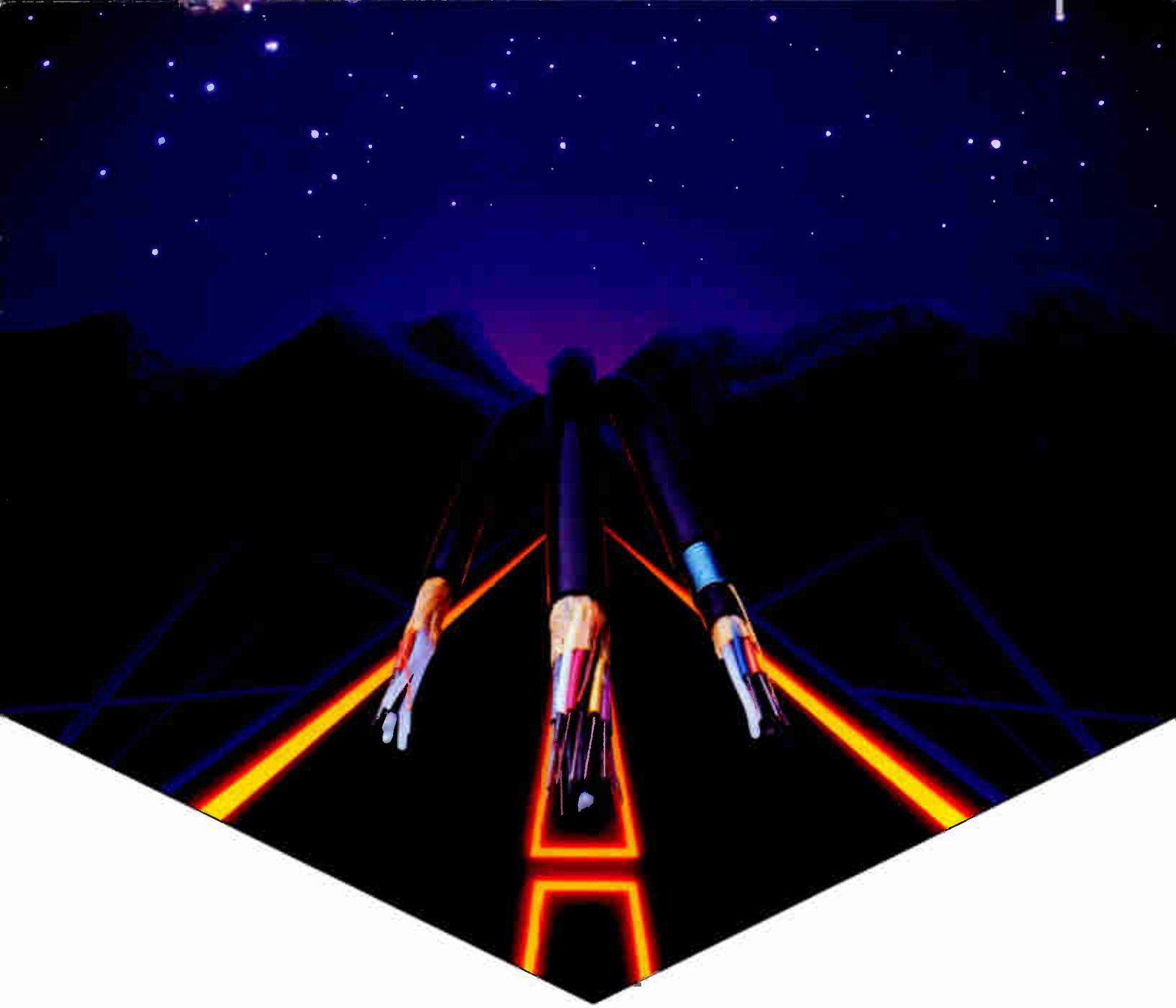


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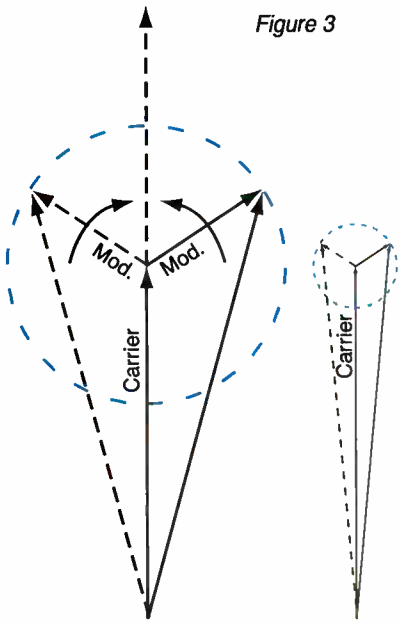
Figure 3



that the sidebands at more than about 0.75 MHz from the visual carrier would normally be so small that most of the lower sidebands could safely be eliminated.

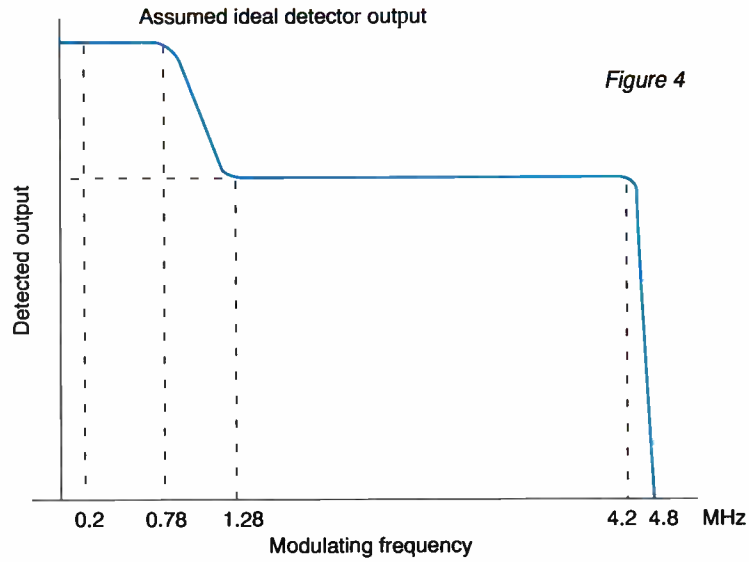
It was a good tradeoff at that time. With VSB, the RMA committees were able to squeeze 4 MHz video bandwidth into the 6 MHz straitjacket.

The Nyquist Slope

Both sidebands do exist in VSB television, up to about 0.75 or 1.0 MHz. In this region, therefore, the resultant signal voltage is twice as great as it would be with only one sideband.

An ideal detector would yield the response shown in Figure 4. To overcome this discrepancy, and to provide smooth transition from DSB to SSB, the receiver IF filter should have the shape shown in Figure 5.

Figure 4



The so-called "Nyquist slope" at ±0.75 MHz around the picture carrier, enables the combined amplitude of the upper and lower sidebands in the vestigial region to be the same as a single upper sideband in the single sideband region.[2] Ideally, the components of each sideband pair in the Nyquist region should have equal and opposite phase, like the DSB pair in Figure 3.

That is where the trouble arises. It is not easy to build a simple filter without phase shifts near the cut off frequency. Moreover, IF shaping filters designed to produce the Nyquist slope are likely to produce phase shifts above and below the picture carrier. The sharp corners at ±0.75 MHz in Figure 5 do not exist. The real world looks more like the dashed lines.

It is not easy to build a simple filter without phase shifts near the cut off frequency.

Group delay

Now look at Figure 6, which shows what can happen because of phase errors in the residual lower sidebands at more than 0.75 MHz below the picture carrier. This represents the situation where the lower (vestigial) sideband is delayed substantially.

At the instant when the upper sideband is in phase with the carrier, the lower sideband (dashed line) has not yet arrived. A little later, the two sidebands will come in phase, as indicated by the solid arrows. However, the resul-

It is not difficult to tell the difference between a true echo and the edge effect of vestigial sideband group delay.

tant envelope reaches its maximum substantially later than it should.

The lower sidebands, between roughly 0.5 and 1.0 MHz below the visual carrier, are susceptible to phase errors at both the VSB filter in the transmitter (or modulator) and at the IF shaping filter in the receiver (or demodulator).

Upper sidebands between 0.5 and 1.0 MHz above the visual carrier also are generally susceptible to phase errors, but only at the receiver (or demodulator).

Figure 7 is a computer plot of the Fourier series for a 100 kHz square wave, with linear (i.e. correct) phase and 4.1 MHz bandwidth The square wave, used for the calculation has zero rise time, with considerable energy remaining beyond the 4.1 MHz cutoff.[3] Had the sides of the square wave been 2T sine-squared, there would have been no ripple or ringing (this is why some character generators with steep rise times produce considerable ringing).

Time delay altered

The time delay (related to the phase) of the Fourier terms below 1 MHz was then altered, as shown at the top of Figure 8, and the Fourier series recalculated. The result of the non-linear delay is a pre-shoot at the leading edge, and an overshoot at the trailing edge. Real-world non-linear delays are more complex than was assumed for the computer plots. Nevertheless, Figure 8 shows how deviations in sideband delay cause the signal to come out of the second detector as a delayed low-level replica of the desired luminance pattern (picture)[4,5,6,7,8]

That is a euphemism for a "ghost", and because the delay is relatively short, the effect is seen as a "close ghost" (not really "ringing," which is a different .phenomenon).

It is possible for phase errors to produce "negative delay," that is, to produce a leading effect rather than trailing. This is sometimes seen as a leading undershoot outlining the left edge of a dark image in white, or a light image in black.

Perhaps the phenomenon can be better understood by considering a narrow group of sideband frequencies between 0.75 and 1.25 MHz below the visual carrier frequency, comprising part of the Fourier series for a T-step-function video waveform.

This group of frequencies is below the nominal "toe," or cutoff, of the Nyquist filter slope. This is precisely where large phase errors are most likely to occur. Whether demodulated synchronously or by envelope detectors, the vestigial sideband combines vectorially with the upper sideband, which is also subject to phase error near the inflection point.

Thus, when demodulated, this group of frequencies is typically delayed past the proper time for the step function transition. Although

the amplitude of the delayed group of frequencies is small, the vector sum of corresponding pairs of upper and lower sidebands is frequently enough to cause the characteristic edge effect.

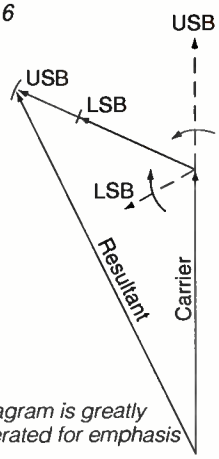
It is not difficult to tell the difference between a true echo or reflection and the edge effect of vestigial sideband group delay. In a true reflection, the entire image is replicated to the right of the main image, as in Figure 9.

The vestigial sideband edge effect, on the other hand, reproduces only the edge, with a blank space between the main edge and the delayed edge, as in Figure 10.

It is not always easy to pinpoint the defective component. Receiver IF filters have probably been one of the main causes in the past.[3] Broadcast transmitters and cable TV modulators have no doubt contributed.[4,5] Sideband filters (filterplexers), required to operate with high-power transmitters, were especially suspect.

There is almost no way the broadband parts of the cable TV distribution network can contribute to this effect.[8,9] However, any singlechannel equipment such as heterodyne processors, modulators, demodulators for microwave or fiber optic transmission, AML transmitters, and set-top converters–especially baseband units–may be contributing. VCR receivers are at least as likely as any TV receiver to introduce low frequency group delay; and the VCR modulator may be even more suspect, especially when cascaded with a demodulator.

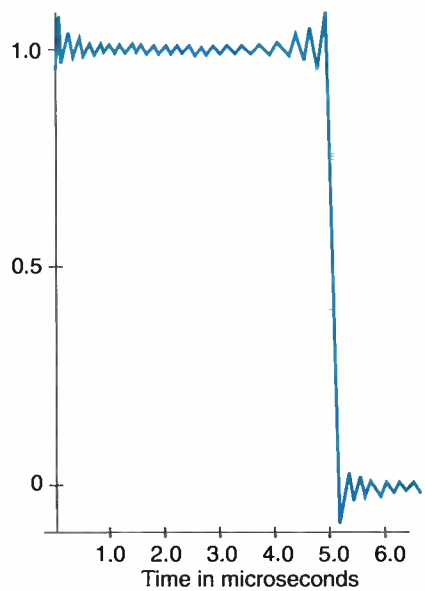
Figure 6



This diagram is greatly exaggerated for emphasis

Several photos were taken from the screen of a relatively new 20-inch home TV set, under highly adverse conditions, to demonstrate the "edge effect" at its worst (see Figures 11, 12).

All the pictures were taken during the same half-hour CBS News program, transmitted from the fullpower, channel 9 TV station located approximately 10 miles from the cable



Computer plot. 100 kHz square wave. Linear phase. 4.1 MHz bandwidth.
Source: Wilfred L. Hand 1970 (Ref. 3)

Figure 7

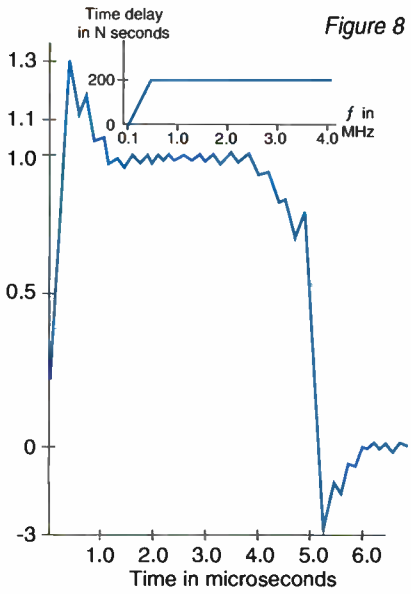


Figure 8

Computer plot. 100 kHz square wave. Time delay as above. 4.1 MHz bandwidth.
Source: Wilfred L. Hand 1970 (Ref. 3)

TV receiving site. After processing, the signal was relayed by AML, high power,single channel microwave to a broadband down converter for transmission by cable.

Zenith Z-TAC baseband

The channel 9 signal was selected by a Zenith Z-TAC baseband converter,demodulated to baseband, and remodulated to channel 3, which was received and demodulated again in a VCR for recording. The tape-recorded signal was then played back by modulating the channel 3 carrier to which the TV set was tuned, and demodulated again in the TV set, for display on the CRT.

These photos are unusually bad, because of the cascaded transmission through vestigial sideband filters. They represent a very severe case of accumulated low-frequency group delay. However, it must be recognized that, while such extreme cases may not be common, neither is the simple case of a transmitter and receiver with no intervening facilities.

Cable TV is now available to 98 percent of all TV households in the U.S., and more than half are already connected. Moreover, there are nearly 60 million VCRs in use, most of which are equipped with receivers and channel 3 or 4 modulators.

The television industry has never been able to come to grips with the allocation of tolerances.[10]

Each segment of the distribution chain, from camera to CRT, independently seeks its own level of technical performance. Tempered by practical considerations of cost and available technology, some segments by themselves succeed only in barely reaching the threshold of tolerance, with no safety factor for accumulated degradation.

Considering the diversity of independent entities involved in the television chain, it is probably unrealistic to expect otherwise. Obviously, however, only one threshold per-

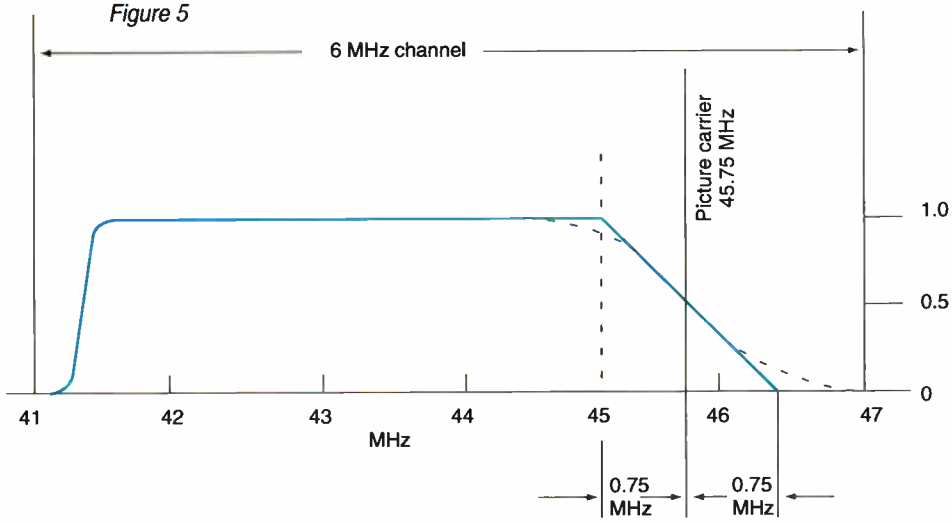
Figure 9

Vestigial sideband group delay error

Figure 10

Reflections and chroma delay

Figure 5



former can be accepted in the chain without adverse results.

Conclusion

Vestigial sideband group delay errors produce a type of subjective degradation variously called "close ghost," "trailing edge," or "halo." These effects may, or may not be observed on subscriber TV sets, depending on the net phase errors accumulated in filters all along the way .

Clearly, however, these effects attributable to group delay errors should not be ignored, nor automatically dismissed as faults of the TV set. Analog TV will be with us for many more years, competing with digital compression and HDTV. The industry needs to pay more attention to the finer points of signal quality affected by vestigial sideband group delay errors.

Parts of three previously published papers on the Vestigial Sideband have been combined in this article:

1. "The Vestigial Sideband and Other Tribulations", 1988 *NCTA Technical Papers*; page 203.
2. "HDTV & The Vestigial Sideband Syndrome"; *IEEE Trans. on Broadcasting*, March 1990; p.8.
3. "HDTV and the Vestigial Sideband Syndrome"; preprinted in *Communication Technology*; December 1988; p.100 CED

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3. Wilfred L. Hand; Measurement of Receiver Phase Characteristics; *IEEE Transactions on Consumer Electronics*; November 1970.

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8. G.L. Fredendall; Delay Equalization in Color Television; Proc IRE; January, 1954; pp. 258-262.

9. Fred J. Shulz; Envelope Delay, Phase Delay, Group Delay, Chroma Delay;...What does it Mean? How is it Measured? NCTA official Transcript; July, 1971; Annual NCTA Convention.

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Notice the edge effect in Figures 11, 12, above.

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Over the summer months, many *CED* readers participated in our annual salary survey. The results were published in our August issue. What we found interesting was the dire need for management training: how to delegate, how to deal with "problem" employees, how to manage time and stress, and similar topics. These concerns and more came forth in the survey as a weak spot for many of cable's engineers and technical supervisors.

To address those needs, *CED* Managing Editor Leslie Ellis hit the books to encapsulate today's thinking on management-related issues. As a result, we've compiled this special management training section to help industry managers deal with issues not normally covered in technical training seminars or other in-house resources.

What follows on these pages are summaries of "self-help" management publications. All of the topics selected came directly from our readers' requests in the salary survey. Wherever possible, specific and cable-related scenarios are included.

We hope you find this to be a quick and painless way to familiarize yourself with current management techniques: how to act and not react; how to plan and organize.

Managing turbulent staffers in turbulent times

How to manage difficult employees

By Leslie Ellis

Scenario: You're an engineering manager for a medium-sized MSO. You arrive at work on a Monday in fine spirits: the car started despite the sub-freezing weather, and your family has all recovered from the flu. You peg the day's schedule on the ride in, arriving at work ready to tackle the details of a 1,200-mile rebuild now half completed.

Once at work, however, things go downhill–fast. Eric, the construction manager with a very hot temper, is pacing angrily back and forth in front of your desk, obviously furious about something. While you're pouring a cup of coffee and wondering what lit his fuse *this* time, the company's ad sales manager strides menacingly toward you, screaming bloody murder about how much money went down the tubes over the weekend because ESPN's ad schedule went dark on Saturday morning. She wants to know why, and more importantly, wants it fixed *yesterday*.

Slinking nearby is Brian, one of your service technicians. When you greet him, he immediately launches into an explanation as to why the mayor's cable problem over the weekend wasn't his fault.

You walk to your desk already in a haze, wondering if there's any Tylenol left from last week. To ice the Monday morning cake, you find a report on your desk from your plant manager about a weekend outage. The cause, you discover, was not only preventable but entirely attributable to Chris, a problem field staffer whose negligence often causes problems.

It's not going to be a golden day. But, before you start checking the employment ads or practicing saying "paper or plastic?," take heart: all of the personality types causing this Monday morning headache are both recognizable and manageable, according to Muriel Solomon, author of the book "Dealing with Difficult People." This article will summarize Solomon's assessment of the four personality types described in the Monday morning scenario: Eric, the "hothead;" Pete, the "slipshod" who caused the ESPN problem;" Brian, the "tattletale" service tech and Chris, the "silent screwup" whose negligence caused the weekend outage.

The hothead

Hotheads are scrappers who start arguments with workers and outsiders

Solomon describes a "hothead" as a scrapper who unnecessarily starts arguments among workers and outsiders. In your case, it's Eric, the construction manager. Admittedly, he's a tough and highly effective employee who just happens to love a fight. Today, for example, he's in a rage at the construction turnkey company handling a portion of your 1,200 mile rebuild. Red-faced and cursing a blue streak, Eric informs you of missing documentation on the project, and how much it's slowing progress. You can't help but wonder how much of Eric's outburst is exaggeration.

According to Solomon, hotheads become belligerent when the pressures become too great. But, as you well know, Eric's belligerence is disruptive and unnecessary. Your objective is to keep your team focused and generally harmonious, so action is needed.

What to do. According to Solomon, several approaches work with this type of personality. First, review your management style. It could be that Eric–or any other hothead–feels that you reward nonperformance, like taking problem employees out to lunch to smooth problems. "So-and-so causes a problem and gets taken to

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lunch; I do my job as well as I can and get nothing," is what he may be thinking. Establish rules for yourself and ensure all staffers are treated the same.

Next, wait for him to calm down before working together to resolve the problem. When he's rational, listen carefully to the problem, without interrupting. If you disagree, ask more questions. Ask what he thinks should be done to solve the problem.

The slipshod

In this case, the "slipshod" is Pete, a headend tech who wandered into the headend on Saturday to fix a problem. While there, he accidentally bumped the "programmed operation" toggle switch on the ESPN pod deck, and carelessly forgot to set it in the "off" position before leaving. This, you think, is typical of Pete lately. While he used to be one of your best workers, these days he seems inattentive and negligent. You know he can do better–he's proven it many times–but you can't figure out his recent behavior.

Chances are, Solomon explains, Pete is feeling disillusioned: he's been working long and hard, and for what? In his mind, nobody cares about his average performance, let alone any extra effort.

What to do. First of all, some motivation is definitely in order. Take some time to ensure Pete understands his worth. You may also want to review your incentive system with all of your staffers. Are there paid educational leave opportunities, or overtime bonuses, or other spiffs? Make sure all employees are aware of company policy on spiffs and bonuses.

Also, you may want to design a system for idea exchange. Let people like Pete voice their concerns, and follow up with written notification of which ideas will be incorporated.

But most importantly, make sure Pete is informed. Let him know what is expected of him and how well he's doing. Deliver praise frequently.

The tattletale

Tattletales, Solomon explains, are snitches who tattle on their peers in an effort to make themselves look better. They feed on the gossip grapevine so as to gain a managerial advantage when some higher position opens up. In this case, it's Brian, who pulls you aside and explains that if another worker hadn't been having problems with his wife (she wanted him home and not out on a ser-

Tattletales snitch on their peers to make themselves look good.

EDITORIAL INDEX

November 1992 through October 1993

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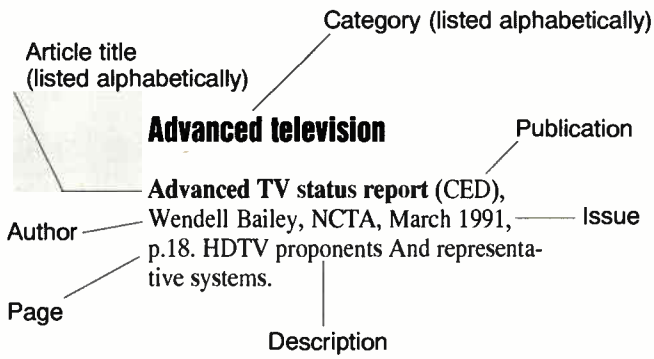
1993 Editorial index – Table of Contents

How to use this editorial index



Welcome to the only Editorial Index listing the technology articles that have appeared in the broadband industry's leading periodicals: *CED*, *Multichannel News* and *Cablevision*. The editors of *CED* have compiled the list for the benefit of its readers and others in the industry who need to reference the technology advances made over this past tumultuous year.

The index is divided into broad areas of interest, with articles that pertain to that subject listed alphabetically below the heading. As shown in the diagram, the article title is printed in bold type, followed by the publication in which it appeared, the author of the article, the issue date and page number on which it starts. That is followed by a short description of the article's contents or theme.

Articles that encompass multiple subjects are listed in more than one subject area. However, space limitations prohibited this practice in all cases. Therefore, stories are listed under the category that best describes the main theme or topic of the article. This index covers articles that were published between Nov. 1, 1992 and Oct. 31, 1993. For more information or to obtain copies of the articles listed, please call, write or fax your request to the editor of the publication in which the story was published:

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1-GHz developments and technologies

500 channels awe advertisers (MCN), Linda Moss, April 19, 1993, p.1A. Are 1-GHz environments an advertisers dream, or nightmare?
The Bailey Channel (CED), Wendell Bailey, NCTA, Jan. 1993, p.16. On filling 500 channels.
Death of a bandwidth (CV);. Chris Nolan, June 7, 1993, p.48. The focus on 1 GHz has dimmed, but it doesn't mean there aren't plans for it.
Six 1-GHz serving areas ready in Castro Valley (MCN), Peter Lambert, Sept. 13, 1993, p.35. Compressed digital home terminals, video storage and retrieval systems over 1-GHz of bandwidth will be ready by March 1994.
Time Warner sets voice, other tests in NYC system (MCN), Fred Dawson, Nov. 23, 1992, p.39. Time Warner's 1 GHz Queens system will be testbed for voice, data trials.

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Ad execs weight new technology's impact on sales (MCN), Linda Moss, April 26, 1993, p.29. CAB conference panelists debate effects of fiber, digital compression and interactivity on cable ad sales.
Ad insertion in the digital age (CED), Roger Brown, May 1993, p.58. CableLabs' involvement in the future of cable ad sales.
Boston operators creating fiber ad "super zone" (MCN), Linda Moss, May 31, 1993, p.10. Continental Cablevision, Time Warner Cable to link suburban Boston systems to form 500,000-sub zone for regional ad sales.
The commercial insertion renaissance (CED), Leslie Ellis, Nov. 1992, p.56. Cable ad technology moves from analog tape players to digital storage devices; description of technology, participants.
DEC unveils ad gear in Boston (MCN), Linda Moss, April 19, 1993, p.1A. DEC to pilot test its digital ad insertion gear within Continental's suburban Boston system.
Digital dilemma (CV); Chris Nolan, April 19, 1993, p.52. A profile of the various digital hardware approaches to ad insertion.
Interconnects test advertising insertion gear (MCN), Peter Lambert, Oct. 4, 1993, p.62. Regional cable interconnects in Albany, N.Y. and Atlanta will begin off-line tests of DEC's digital ad insertion system.
Lineup will be like a video magazine rack (MCN), Linda Moss, April 19, 1993, p.16A. 500-channel universe to include specialized niche networks.
MultiVail ad platform nears $50K (MCN), Peter Lambert, July 12, 1993, p.54. MultiVail Engineering selects Duck Corp.'s digital video compression technology for local ad insertion which may drive cost of headend equipment below $50,000.
No requiem for tapes yet (CV); Chris Nolan, April 19, 1993, p.56. Analog videotape isn't dead, yet.
Reaching for the stars (CV); Jane Weaver, April 19, 1993, p.48. Alan McGlade of AdStar has ambitious pot delivery plans. Can he make them fly?
Several operators test interactive advertising (MCN), Linda Moss, Sept. 13, 1993, p.10. Apollo Cablevision, Paragon, KBL-TV and others test interactive ad systems.
Speedy spot system (CV); Jane Weaver, Oct. 4, 1993, p.26. Digital ad insertion can make things move quickly--once they're set up.
StarNet, NCA pioneer electronic invoicing (MCN), Linda Moss, April 19, 1993, p.10A. StarNet, NCA and Donovan Data Systems team to invoice spot cable buys electronically.
Skyconnect setting its test-site lineup (MCN), Linda Moss, March 15, 1993, p.3. Digital ad delivery provider Skyconnect signs four MSOs.

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'93 field trial seen for addressable security system (MCN), Gary Kim, Nov. 9, 1992, p.39. Multichannel Communication Sciences aims to test its joint positive and negative addressable security system.
And the winner is . . . interdiction (CV); Chris Nolan, August 9, 1993, p.18. Interdiction technology gains from re-regulation.
Brother, can you spare a converter? (CV); Chris Nolan, Oct. 18, 1993, p.26. Demand exceeds supply as addressable convertors get more popular.
Compression beat goes on: CVI latest to enlist (MCN), Peter Lambert, March 15, 1993, p.24. Cablevision industries commits to 125,000 DigiCipher set-tops.
A different box in every home (CV), Chris Nolan, Jan. 25, 1993, p.24. Cable operators are asking for several different flavors of set-tops, depending upon their functionality.
Jones interdiction test nets subs, security & cuts costs (MCN), Peter Lambert, Feb. 22, 1993, p.48. Discussion of Jones' Elgin, Ill. interdiction test.
Macrovision makes anti-copying deal (MCN), April 26, 1993, p.35. Macrovision makes color encoder ICs to prevent copying of PPV programming in future digitally compressed video set-top encoders.
Malone: Digital age will be here in '94 (MCN), Fred Dawson and Gary Kim, Dec. 7, 1992, p.1. TCI announces plans to purchase $200 million in digital set-tops from General Instrument, AT&T.
Newhouse makes commitment to 250K digital boxes (MCN), Fred Dawson, March 1, 1993, p.27. Newchannels buys 250,000 GI DigiCipher set-tops.
Sammons joins DigiCable parade, orders 70K boxes (MCN), Peter Lambert, March 8, 1993, p.20. Sammons is fourth cable op to commit to GI's DigiCipher boxes.
Set-tops: Gateways to interactivity (CED), Roger Brown, Aug. 1993, p.56. Set-tops become enabler of digital, interactive future.
Set-top transition (CV); Chris Nolan, June 21, 1993, p.34. New technology is making demands on operators as well as vendors.
Set-tops will lead Western Show technology offerings (MCN), Gary Kim, Nov. 30, 1992. Innovations in descrambler technology top list of hardware offerings in Anaheim.
TeleCable Corp. to order DigiCable decoders (MCN), Peter Lambert, March 29, 1993, p.35. TeleCable announces intent to purchase 50,000 GI convertors.
What's in the box? (CV); Chris Nolan, Sept. 6, 1993, p.38. A lot is expected of the new generation of super boxes.

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Audio showdown dogs MPEG 2, HDTV (MCN), Peter Lambert, Sept. 13, 1993, p.3. MPEG 2 standard, HDTV Grand Alliance stymied by audio coding standards.
'B-frame debate hovers over MPEG standards (MCN), Fred Dawson, Nov. 16, 1992, p.42. Advanced TV experts spar over inclusion of B-frame technology in MPEG 2 standard.
Building the HDTV elephant (CED), Wendell Bailey, NCTA, April 1993, p.20. How the HDTV "grand alliance" came to be.
C-Cube, TV/Com deliver satellite MPEG 2 at Show (MCN), Peter Lambert, June 14, 1993, p.52. C-Cube, TV/Com display real-time transmission of 10 multiplexed MPEG 2 signals and one SCPC signal on a single satellite transponder.
Cable considers Zenith scheme for NTSC delivery (MCN), Peter Lambert, May 17, 1993, p.28. Four remaining HDTV proponents continue to negotiate an alliance; seek ways to lay down modulation scheme for digital compressed video.

Cable ponders HDTV's role in digital era (MCN), Peter Lambert, Feb. 15, 1993, p.27. Delays plague HDTV's 1994 implementation schedule.
Canadian MSO Shaw buys DigiCable set-tops (MCN), Peter Lambert, July 19, 1993, p.72. Shaw Communications, worried about DirecTv competition, buys 200,000 of GI's DigiCable boxes in strategic defense.
Diamond's surface seems flawless in flat-screen wars (MCN), Fred Dawson, Oct. 4, 1993, p.64. Obscure, diamond-based technology leads commercialized flat-panel video display systems.
FCC committee calls for merger of HDTV systems (MCN), Jeannine Aversa, March 1, 1993, p.10. FCC calls for "grand alliance" between remaining four HDTV proponent systems.
GI makes room for MPEG 2 compression (MCN), Fred Dawson, May 17, 1993, p.1. GI introduces DigiCipher II system for optional conversion to MPEG 2 digital video compression standard.
GI, S-A pack additional computing power into set-top boxes for TCI (MCN), Peter Lambert, July 5, 1993, p.3. TCI to purchase two levels of DigiCipher II/MPEG 2 home terminals from GI and Scientific Atlanta.
HDTV group mixes computer TV standards (MCN), Peter Lambert, May 31, 1993, p.3. HDTV "Grand Alliance" participants agree on creating a HDTV business alliance and on key technological elements of the system.
HDTV: The grand alliance (CED), Jeffrey Krauss, Telecommunications and Technology Policy, Sept. 1993, p.20. Proponents of four digital HDTV systems merge; ramifications of agreement.
HDTV warnings (CED), Archer S. Taylor, Malarkey Taylor Assoc., Nov. 1992, p.78. Speculation regarding likely success of HDTV.
HDTV: Where does it stand? (CED), Jeffrey Krauss, Telecommunications and Technology Policy, Jan. 1993, p.94. HDTV tests, test results, improvements and FCC action.
Higher definition (CV); Chris Nolan, June 21, 1993, p.22. The remaining HDTV proponents join together to form the Grand Alliance.
Is hi-def dead? (CV); Chris Nolan, Feb. 22, 1993, p.34. With the advent of digital compression, does America need HDTV?
Jerrold agrees to interactive set-top port (MCN), Peter Lambert, May 24, 1993, p.48. Jerrold to make future set-top convertors compatible with United Video Satellite Group's outboard interactive video services module.
Jerrold to build modular TVs (MCN), Peter Lambert, May 24, 1993, p.1. Jerrold announces development of TV with replaceable tuners, other elements in an attempt to ease consumer compatibility.
MIT's Negroponte: Cable is a "bully" (MCN), Peter Lambert, March 1, 1993, p.1. Q&A with Nicholas Negroponte about advanced television.
MPEG and video compression Q&A (CED), Jeffrey Krauss, Telecommunications and Technology Policy, June 1993, p.20. Q&A of commonly asked MPEG, video compression questions.
MPEG freezes coding for video (MCN), Peter Lambert, April 12, 1993, p.2. Motion Pictures Experts Group announces freezes critical digital video coding main profile; Philips Consumer Electronics and LSI Logic announce plans to deliver MPEG 2 decoders by mid-1994.
MPEG puts finishing touches on new video standard (MCN), Peter Lambert, p.4. MPEG 2 video compression standard finalized, signaling start of compression equipment rush.
Personal TV advances continue to leap forward (MCN), Gary Kim, Dec. 21, 1992, p.20. Television of future will be largely customized.
Philips, LSI set to produce MPEG 2 decoders (MCN), Peter Lambert, April 12, 1993, p.34. The race begins for vendors to start making compressed digital video ICs.
Reich enters HDTV fray as talks continue (MCN), Peter Lambert, March 15, 1993, p.25. U.S. labor secretary Robert Reich challenges U.S. HDTV proponents.
TV/Com, LSI join MPEG 2 decoder bandwagon (MCN), Peter Lambert, April 19, 1993, p.10. TV/Com, LSI will co-develop compressed digital video ICs.
TV's two-way street (CV); Chris Nolan, Sept. 6, 1993, p.36. You've heard the multimedia hype. What's real and what isn't?
What's in the box? (CV); Chris Nolan, Sept. 6, 1993, p.38. A lot is expected of the new generation of super boxes.
Wide-screen NTSC (CED), April 1993, p.136. Explanation of HDTV aspect ratios vs. HDTV.

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Alternate access heats up in Tenn. (MCN), Rachel W. Thompson, Feb. 22, 1993, p. 3. Adelphia's Hyperion Comm. in Nashville scramble to prevent City Signal from moving in.
Cable ops go after access rings (CED), Leslie Ellis, March 1993, p.80. Ops are interested but not active in alternate access.
Cablevision expands alt-access business (MCN), Fred Dawson, March 8, 1993. Cablevision Systems' telecomm subsidiary, Cablevision Lightpath, poises to increase Long Island alternate access coverage.
Cencom alums will challenge TCI, Cox CAP companies (MCN), Fred Dawson, April 5, 1993, p.4. Brooks Telecommunications forms alternate access firm to go head-to-head against Teleport.
Comcast, Continental take 20% stakes in Teleport Communications (MCN), Fred Dawson, Dec. 21, 1993, p.2. Comcast and Continental join Cox, TCI in cable operator ownership of PCS firm.
Determining CAP potential (CED), Chris Bowick, Jones Intercable, March 1993, p.18. How to determine if there's really a need for competitive access provisioning.
Teleport adds seven partners (MCN), Rachel W. Thompson, June 14, 1992, p. 1. Teleport adds Cablevision Industries, Crown Media, Adelphia Communication's Hyperion Telecommunications, InterMedia Partners, Maclean Hunter Cable TV, Times Mirror Cable Television and Viacom Cable.

Back to Basics

Coaxial signal splitters: A look inside (CED), Michael David Maahs, Evolutionary Thermo Dynamics, June 1993, p.86. In-depth analysis of splitters and taps.

Cable Poll

(A monthly *CED* survey. Data provided by Midwest CATV, *CED*, and *Cablevision* ; responses compiled by Leslie Ellis. Discontinued after May, 1993.)

Cable ops go after access rings (CED), Leslie Ellis, March 1993, p.80. Poll: Ops are interested but not active in alternate access.
Most ops advertise on just three to five channels, May 1993, p.61. Digital ads are still a long way off; most ops advertise on few channels.
Ops say they'll rebuild to handle compression (CED), Leslie Ellis, Jan. 1993, p.85. Ops cite no real need for video compression.
Outages remain an operational headache (CED), Leslie Ellis, Dec. 1992, p.77. Most ops cite cable outages as biggest customer service problem.

Set-top convertors here to stay (CED), Leslie Ellis, April 1993, p.125. Most ops use convertors and intend to do so for quite a while.
The @#!%# broke–now what? (CED), Leslie Ellis, Feb. 1993, p.70. How cable operators handle equipment repair.

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Ad insertion in the digital age (CED), Roger Brown, May 1993, p.58. CableLabs' involvement in the future of cable ad sales.
Bandwidth management: a new role for cable operators (CED), CableLabs staff, May 1993, p.22. Building networks to manage large amounts of upstream information.
Benchmarking cable system performance (CED), CableLabs staff, Jan. 1993, p.24. How to break a business up into its individual work processes for performance measurement.
CableLabs hits the digital road (CED), Leslie Ellis, June 1993, p.78. A look into CableLabs traveling test to clarify the effects of the in-home wiring environment on future digital signals.
CableLabs may try to clear up set-top morass (MCN), Peter Lambert, July 5, 1993, p.21. CableLabs enters interactive, digital standards discussions.
CableLabs sets 1993 budget, announces appointments (MCN), Gary Kim, Dec. 21, 1992, p.22. CableLabs board of directors approve $12.4 million budget for 1993.
CableLabs: Same problems plaguing ad sales (MCN), Linda Moss, Jan. 4, 1993, p.12. Discussion of Labs' report on cable ad sales.
CableLabs adds new staffers in reorganization (MCN), Oct. 4, 1993, p.68. Mario Vecchi joins Labs as VP, advanced network development; Richard Prodan named director of engineering.
Extending ring topology to hubs creates reliability breakthrough (CED), CableLabs staff, Sept. 1993, p.34. Discussion of the reliability benefits of ring-type fiber optic topologies.
FSN to make trip to Western Show (MCN), Peter Lambert, Oct. 18, 1993, p.3. CableLabs, vendors to host multimedia display at Western Show.
New neighbors CableLabs, Knight-Ridder talk turkey (MCN), Peter Lambert, May 19, 1993, p.28. Knight Ridder, CableLabs discuss joint venture on cable, computer and publishing trial.
Outages: A CableLabs update, part 1 (CED), CableLabs staff, Nov. 1992, p.44. Update on CableLabs' outage reduction task force efforts.
Outages: A CableLabs update, part II (CED), CableLabs staff, Dec. 1992, p.66. Update on CableLabs' outage reduction task force.

Capital Currents

(A monthly *CED* column written by Jeffrey Krauss, independent telecommunications policy consultant and president of Telecommunications and Technology Policy of Rockville, Md.)

Aftermath of the Cable Act–What's next, Dec. 1992, p.86. FCC rules and regulations, filings, decisions following 1992 Cable Act.
Consumer electronics/cable, May 1993, p.20. How cable should handle the consumer interface conundrum.
Dialing for dollars, Feb. 1993, p. 18. Details of the North American Numbering Plan for telephone numbers.
HDTV: The grand alliance, Sept. 1993, p.20. Proponents of four digital HDTV systems merge; ramifications of agreement.
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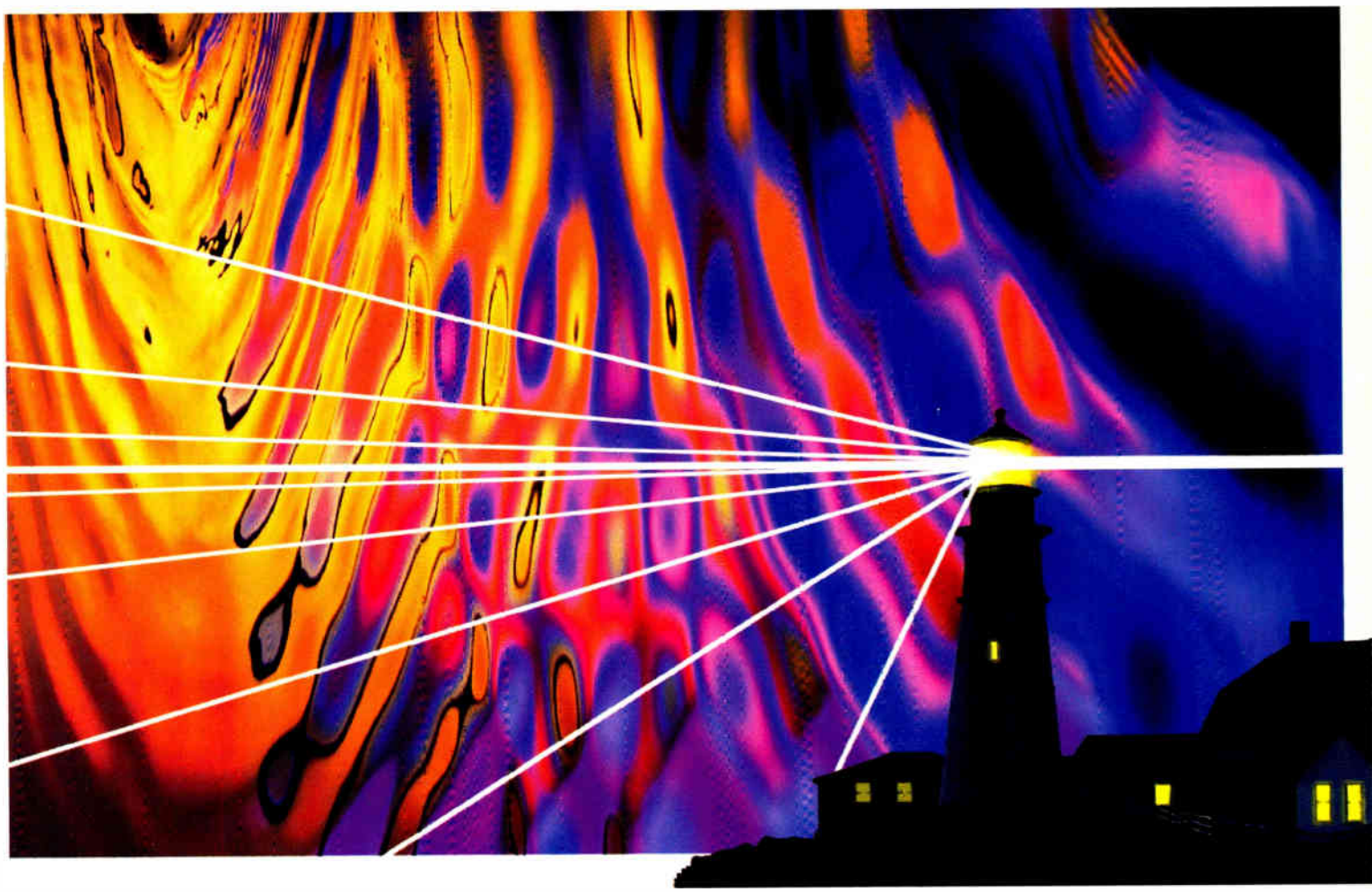

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EBS costs still big question to ops (MCN), Peter Lambert, July 5, 1993, p.23. EBS technologies demonstrated in Denver raise significant cost questions.
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Hospitals, schools first target for DEC (MCN), Peter Lambert, May 24, 1993, p.51. Digital Equipment Corp., LANCity Corp. to develop high-end user terminal, headend switcher for industrial applications.
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ICTV unveils new interactive cable service (MCN), Fred Dawson, May 24, 1993, p.49. Startup Silicon Valley company ICTV joins with IBM, New Century Communications to develop interactive cable system.
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TCI sets $50M for Pa. "superheadend" (MCN), Rachel W. Thompson, Feb. 8, 1993, p.1. TCI will tie together western Pa.-based headends with fiber optic loop.

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ICTV unveils new interactive cable service (MCN), Fred Dawson, May 24, 1993, p.49. Startup Silicon Valley company ICTV joins with IBM, New Century Communications to develop interactive cable system.
Is interactive an uphill fight for cable? (MCN), Linda Haugsted, March 15, 19923, p.26. Home Media Expo panelists say interactivity is less than a year away, but doubt cable's ability to lead the rush.
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My View

(A monthly *CED* column written by Archer S. Taylor, director and senior engineering consultant, Malarkey Taylor Associates)

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(A monthly *CED* fax-in poll on cable television and communications related issues)

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The SCTE (CED), compiled by Roger Brown, August 1993, p.70. SCTE members are universally satisfied with the organization, but want to attend more local chapter meetings.
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One on one with Tom Elliot (CED), Roger

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Britons lead European design revolution (MCN), Fred Dawson, Nov. 23, 1992, p.40. TeleWest, other European MSOs deploy broadband integrated services digital networks (B-ISDN).
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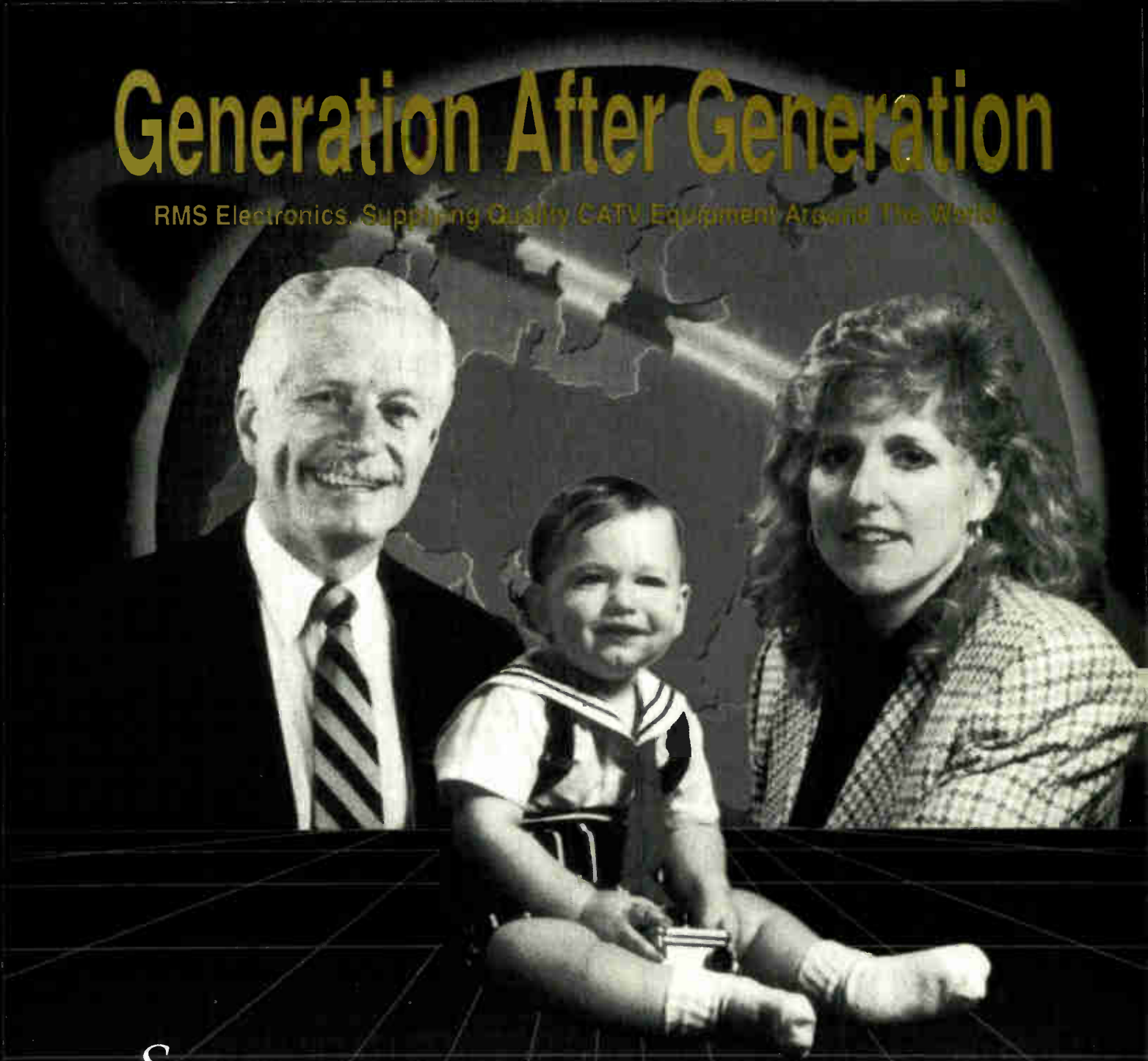

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Cable considers Zenith scheme for NTSC delivery (MCN), Peter Lambert, May 17, 1993, p.28. Four remaining HDTV proponents continue to negotiate an alliance; seek ways to lay down modulation scheme for digital compressed video.
Cable's digital era is underway (CED), Roger Brown, Jan. 1993, p.60. TCI plans to roll out compression to 1 million subs; ramifications of announcement.
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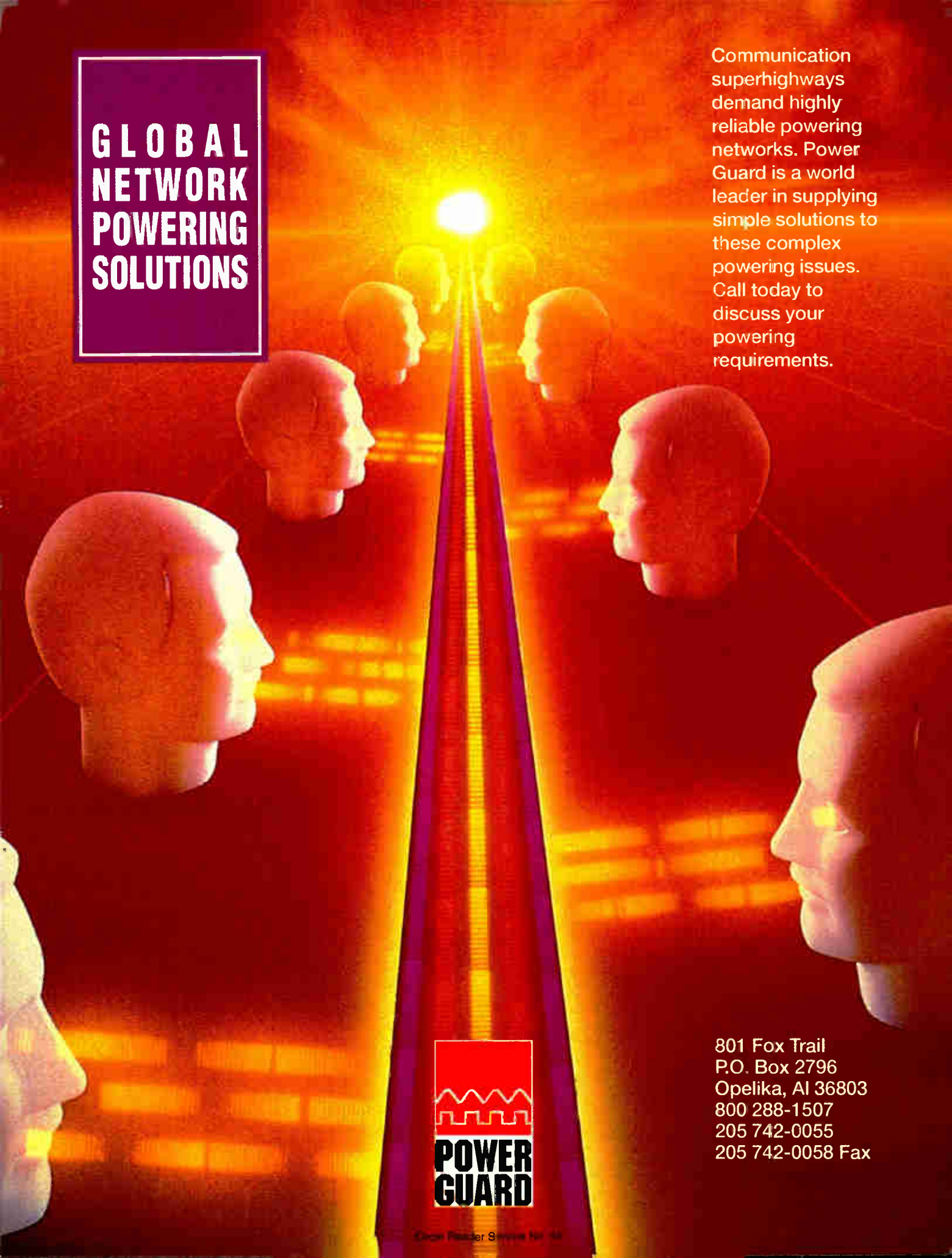
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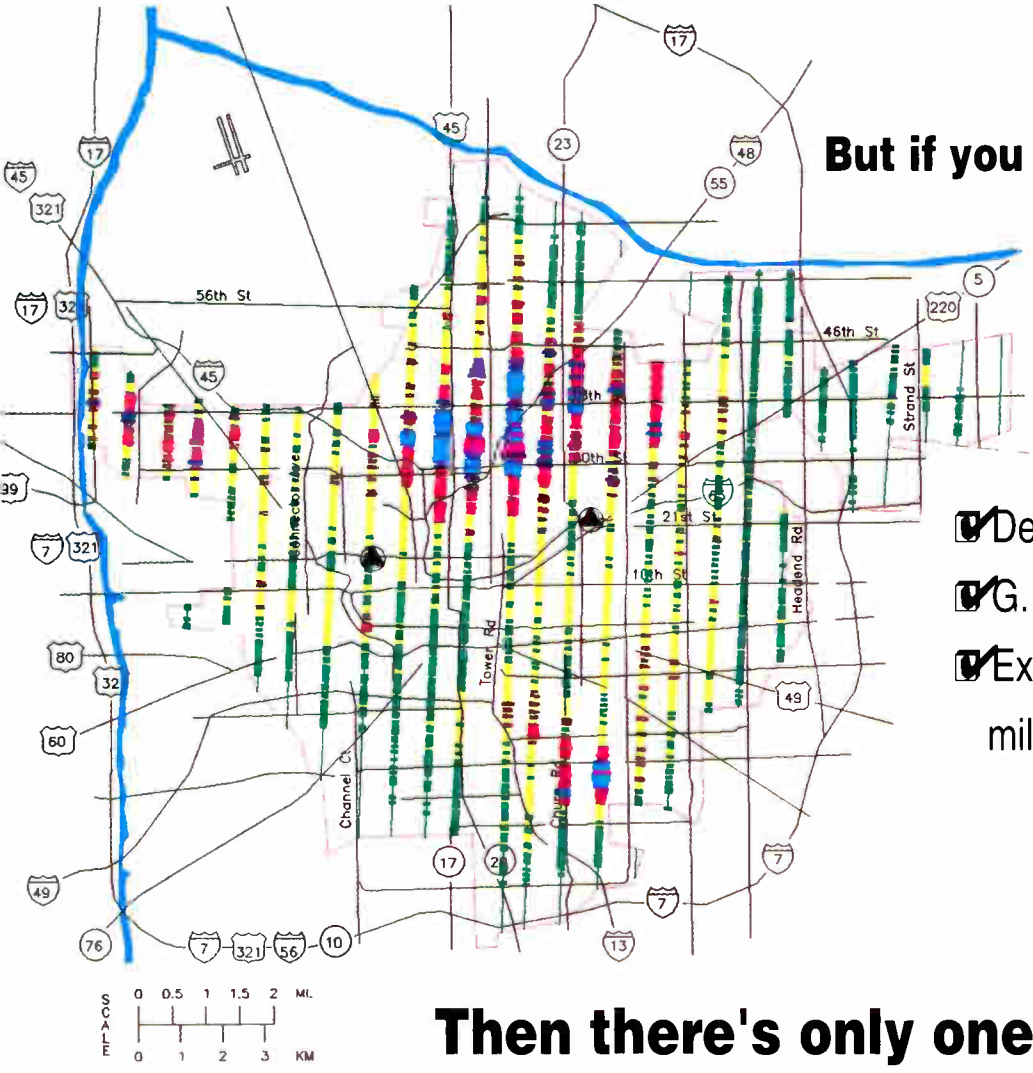

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vice call) the problem with the mayor's cable would have been resolved properly.

On the one hand, you're tempted to find Brian's information useful. If the other worker is having problems at home, maybe he's not the best one to pick for an upcoming project that requires overtime. On the other hand, maybe it's best to get that information first-hand.

What to do. First, make an effort to stay in touch with your workers. Even a casual interest in their non-professional lives goes a long way in becoming bait for the tattletale. By staying tuned, you'll know what's *really* going on in the organizatione.

Secondly, Solomon relates, teach the tattletale to solve his own problems. Have you become an indirect means for problems the tattletale won't solve directly?

The silent screwup

Silent screwups are too proud and stubborn to ask for help.

Silent screwups are those all-too-familiar proud and stubborn types who need help–but won't ask for it. They have false pride, Solomon explains, and are afraid to ask for assistance because they think it might jeopardize their jobs. As a result, they chronically botch assignments and exhibit unnecessarily inept performance. In this case, it's Chris, who failed to properly install batteries in a series of power supplies, opting instead to hope that the devices wouldn't fail over the weekend. If he had only asked you how to do it, you would have had an outage-free weekend.

What to do. Always try to bolster the self-confidence of people like Chris. Make him feel secure enough to ask for help as soon as he needs it. Because until a silent screw-up feels less vulnerable, he won't open up.

Be clear about your expectations. Demonstrate patience in their ability to grow within the company. Always be ready, willing and able to help. Assign tasks that can develop their weak skills; suggest outside resources. Increase the frequency of your feedback.

Supplement verbal orders with written instructions. In those written instructions, Solomon suggests, include *everything*: deadlines, exceptions to rules, where to turn for help, what equipment to use and how to report progress.

Lastly, help the screwup to accept responsibility. Instead of telling him *what* to do, ask for his ideas on how to solve problems.

Overall, Solomon recommends remembering that no matter how bright you are, acting out of hurt, disappointment or anger blocks good judgment. By learning the tools of logical action instead of emotional reaction when dealing with difficult employees, bad situations can be turned to your advantage.

Source: *Working with Difficult People*, Muriel Solomon, Prentice-Hall, 1990. CED

Delegation: How to do it and why it's important

Delegation–or the ability to entrust work assignments to others–is a key parameter in managerial success. After all, in most cases, a manager's role is to maximize departmental efficiency; that in itself means the manager can't *do* everything. One of the best tools for the manager is delegation.

Delegation doesn't mean abdicating responsibility or sloughing "dirty work" off onto someone else, according to Andrew E. Schwartz in his book *Delegating Authority*. Instead, he says, delegation is a "temporary procedure aimed at entrusting a project to another individual."

There are many traps to successful delegation, Schwartz notes, including:

✔ distrust of employees
✔ reluctance to share power
✔ misunderstanding of delegation
✔ "my way or no way" attitudes
✔ perfectionism.

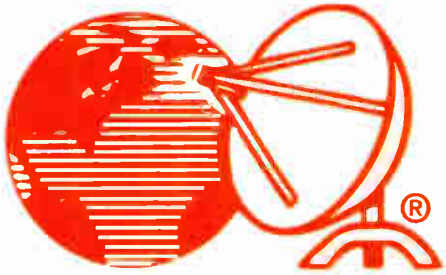
However, overcoming these barriers leads to a management style which saves money for the organization, promotes well-trained employees and builds teamwork, cohesion and spirit.

How does one become a good delegator?

1. Decide what to delegate. Examine the reasons why delegation is warranted: is it to reduce workload, develop an employee, or complete a project early? Typically, Schwartz says, the following tasks should be delegated: fact gathering, departmental routines, such as filling out time cards, and clerical procedures. Tasks that definitely should *not* be delegated, Schwartz adds, are discipline, tasks for which no employee is qualified, morale and complex situations.

2. Try to delegate a whole task. Instead of parceling projects out between staffers, assign a task to one person whenever possible. Doing so raises employee motivation, encourages greater attention to detail and minimizes confusion.

3. Select the right person. Notably, Schwartz says, the best person for the job is not necessarily the most skillful or experienced.



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Selecting the right person is an evaluative process, dependent largely on the needs of the situation: is the employee available for the job? Do the employee's skills match the demands of the task?

Goal setting

A manager without departmental goals is much like a race without a finish line, Schwartz says. Goals should be clearly defined and communicated to employees such that they answer three key questions: what, when and how. Goal-setting aids the delegation process because it narrows the manager/employee gap, provides a realistic assessment of expectations and ensures goal achievement.

According to Schwartz, goal-setting can be divided into five basic steps:

1. Specifying the task: what exactly needs to be done?
2. Describe and communicate goals: make them quantifiable, challenging and attainable.
3. Determine performance criteria: what criteria will be used to measure results?
4. Construct an action plan.
5. Introduce and implement the goal.

Motivating employees

Employee motivation also plays a key role in the success–or failure–of delegated projects. Because delegated work can sometimes seem dull, employees can become disinterested or resentful. Because of this, good communication and clear, cohesive goals are paramount.

Schwartz cites several organizational psychologists regarding what actually motivates people. One theory he notes is a need for meaning, in that people must feel their work is important, valuable and worthwhile. Secondly, most humans have a need to feel personally responsible for their work. Feedback is another key employee need. If an employee exerts considerable time and effort on a project, then hears nothing, he or she gains no satisfaction for the process. And, while some employees will openly seek feedback, most do not.

Motivation, Schwartz explains, "depends on getting people to see the link between their job goals and their needs." When they understand how the two are connected, they'll recognize the importance of meeting departmental goals.

To motivate the employees within a department, the manager must examine individuals and their environment, as follows:

1. Identify each employee's goals, needs and desires. Simply ask them, or note their actions in varying situations. Bear in mind, Schwartz adds, that while it is nearly impossible to change what a person wants, it's relatively easy to find out what they want.
2. Determine desired performance and behavior targets–and make performance targets attainable. Link desired performance to employee goals.

Evaluate

Even the most experienced delegators should frequently evaluate the success or failure of delegated projects. Delegation is not an easy task, Schwartz writes, and requires planning and practice. CED

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Negotiation: How to get what you want

It's budget time and you want that extra fusion splicer so bad you can taste it. You're tired of sharing one with three other systems in your region, and think one more would really ease the burden. But the one you want is on the pricey side. How do you get what you want? It's a matter of negotiation.

Negotiation, says Herb Cohen, author of the book *You Can Negotiate Anything*, is the use of power and information within a web of tension. Negotiation isn't about chiseling or intimidation, but is a matter of analyzing information, time and power to affect behavior.

There are several facets to successful negotiation, Cohen says, but all winning negotiations contain three primary elements: information, time and power.

Information, Cohen notes, is really the heart of the matter when it comes to the negotiation process. He recommends starting early in the information-gathering process, because information is typically easier to obtain before an acknowledged and formal confrontation.

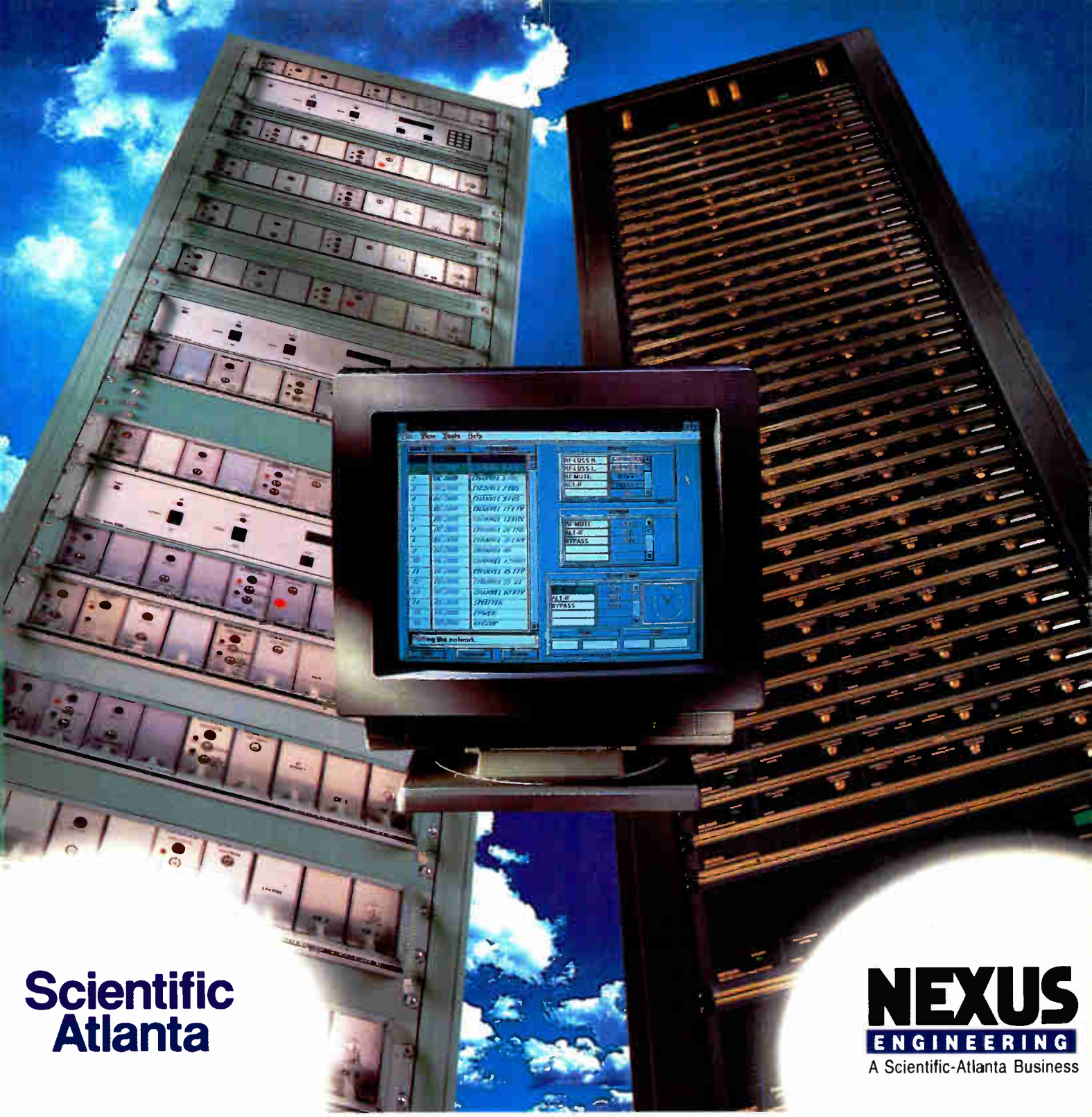
During the information-gathering process, quietly and consistently probe–in this case, for information on your company's budget process. Ask secretaries, clerks, co-workers and whoever else knows anything about the budget process. How much is allotted for capital expenditures?

Another reason to start the information-gathering process early concerns the age-old concept of "planting the seed." If you were to spring your proposal on your boss too close to deadline, his or her reaction might be a flat-out "no." But, Cohen notes, the word "no" is a reaction, not a position. Planting the seed of thought about the need for a new fusion splicer early on–while you're discerning how the budget process works–keeps the idea on the forefront of your boss's mind.

Time

Recognize early on that in the negotiation process, most concessions occur inches before the actual deadline. A case in point, Cohen notes, is typical human behavior: When do most people file their tax returns? Chances are, the answer is right before the deadline.

And, Cohen says, because most concession behavior occurs at or even beyond deadline, be patient. Remain calm, but alert for the favorable moment to act. Generally speaking, Cohen says, you cannot achieve the best outcome



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quickly, but rather slowly and perseveringly.

Power

Power, Cohen explains, is the mechanism with which to get from "A" to "B." Or, in this case, it's the transport vehicle to take you from where you are–wanting a new fusion splicer–to actually having it.

Unfortunately, the word "power" typically has ugly connotations, because it implies a "master/slave" relationship.

In most cases, though, power is neutral, like electricity or wind. And, it's based on perception. All people, Cohen notes, have power. If one firmly believes that he or she has power, that self-confident perception will be conveyed to others. "Within reason, you can get whatever you want if you're aware of your options, if you test your assumptions, if you take shrewdly calculated risks based on solid information, and if you believe you have power," Cohen emphasizes in his book.

One way to enhance negotiating success is to get the commitment of others. For example, while it's probably obvious that all three regions agree on the need for more fusion splicers, make sure everyone shares your view of the specifics.

Also, prepare to discuss at length the reasons why you want this particular splicer–or, as Cohen puts it, use the power of expertise. If the negotiation is important enough for you to win, it ought to be worth some of your time in boning up. Call the manufacturer and ask for supporting literature.

Finally, Cohen notes, use the power of persistence. Most people, he says, just aren't persistent enough when negotiating. They present their ideas, and when the ideas are shot down, they shrug and walk away. Be tenacious, Cohen says, and learn to hang in there.

Getting the splicer

In your case, let's assume you have the information and time factors necessary for successful negotiation. You know how much the splicer is and why you want it; you know when the budget deadline is. You know you can make the time to develop a compelling argument for the equipment.

As for power, Cohen suggests using the "you" force. In other words, always build your proposal with the company's goals, and hence your boss's goals, in mind. Building a case based on "me" can backfire, simply because a realistic assessment of the other side's position hasn't been made.

Make your idea valuable and desirable: a win-win situation for both sides. Have other options: is there a secondary splicer which will do the job for a lesser price, assuming price is the objection? A good negotiator always gives the other side more than one choice to resolve a problem.

But most importantly, Cohen says in closing, bear in mind that each individual determines his own destiny through his own efforts. "Don't back away from the exercise of negotiation and wait for someone else to act," Cohen says. "It's up to you to find your part and direct your future." CED

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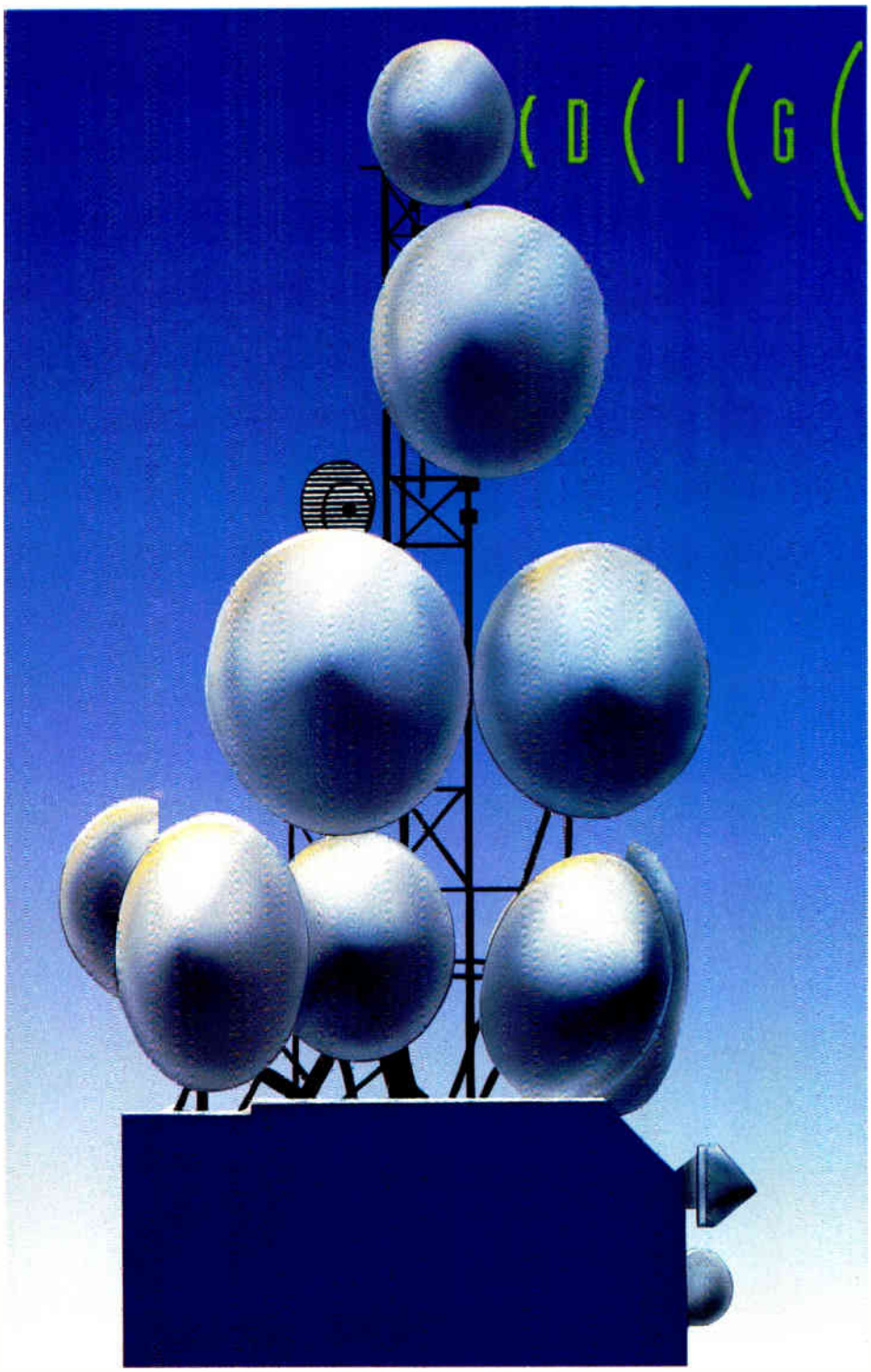

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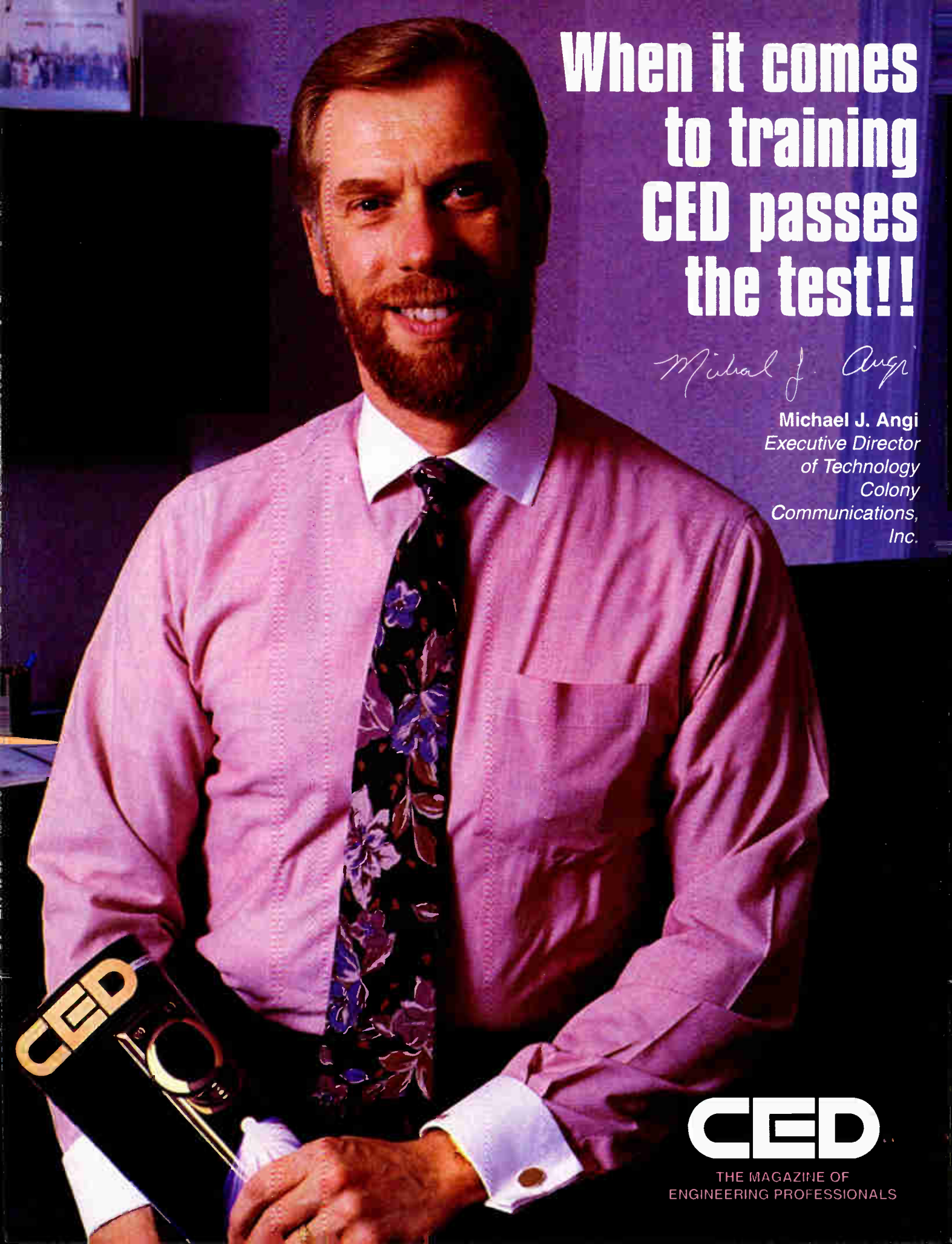
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Managing stress at work: How to make it work for you

Stress. Rarely a day goes by that we don't hear the word.

Stress, though, doesn't have to be the Grim Reaper of heart attacks, fatigue and even death. Indeed, when properly channeled, stress can be a tremendous motivator, according to Peter G. Hanson, a physician and author of the books *Joy of Stress* and *Stress for Success*.

In fact, Hanson offers these 10 tools for stress at work:

1. Manage priorities. That doesn't mean making a list of things to do. It means making a *prioritized* list.

2. Manage your time. Hanson suggests taking 10 minutes each evening to estimate the time it will take to finish each item on the next day's priority list. Then, sum all the times, being sure to include travel and documentation times. If the total list of top-priority tasks adds up to more than a day's work, look for shortcuts.

3. Manage details. This means keeping a day planner and using it as an extension of your brain. If an idea pops, write it down. Log all key phone numbers, personal and professional. Keep everything in one place.

4. Commit to exercise. Scheduling regular exercise–Hanson's rule of thumb is three hours per week–significantly reduces the physical effects of stress.

5. Commit to relaxation.

6. Use only the best "fuels." Commit to a healthy diet.

7. Set goals for left brain stimulation (to stimulate intellect and memory). Some methods include learning to play a musical instrument and memorizing something each day.

8. Set goals for right brain stimulation (to stimulate creativity and imagination). To strengthen the right side of the brain, Hanson suggests becoming a storyteller to children; or, for musicians, improvising with a musical instrument.

9. Make a standing date with family. If you travel, and have children take along their favorite books and schedule five minutes of bedtime reading for them, over the phone. It's not as good as being there, but it shows your commitment.

10. Make a standing date with your spouse, confidant or best friend.

According to Hanson, the average couple spends only 12 minutes a day speaking to each other in private. CED

Source: *Stress for Success*, Peter G. Hanson, M.D., Ballentine Books, 1989.

Time management: Making good use of a day

"I use my morning commute time to plan my day," a *CED* reader wrote recently during the magazine's annual salary survey. "Invariably, though, things go to hell by 10 a.m. The whole plan is out the window and I'm off in a completely different direction."

Sound familiar? If so, you're not alone, according to Charles R. Hobbs, author of Time Power and an expert at helping managers control events–not visa versa. "If there's anything that really describes us as employees, managers or as living people, it's that we are often out of control of events," Hobbs writes.

A good starting point is to determine your role within your company. For example, ask yourself: "What does the company pay me to do?" Write down the four or five critical areas that shape your role. Doing so, Hobbs says, will help keep your focus clear while spawning ideas for future growth both within the organization and personally.

Use a day planner

The *CED* reader who wrote in about his morning planning period was on the right track. Hobbs recommends a 15- to 20-minute planning period every morning. "If you wait until mid-afternoon or evening," Hobbs says, "urgencies will prevent you from achieving consistency in your commitments."

To put the fruit of the planning session in motion, purchase a day planner with sufficient room to write in daily events, monthly separators, and an address/telephone directory. Once you've invested in a day planner, however, do not stray from it. "Keep it with you at all times," Hobbs encourages. "You never know where or when a flash of inspiration will occur or a useful idea will be presented. With your datebook at hand, you have once place for immediate entry of ideas and information."'

Being effective at work

Hobbs notes that effective time management often begins with an analysis of time spent. As an example, he cites a product manager in a Lincoln, Neb.-based earth moving equipment firm who analyzed his time for two weeks. He found with surprise that he lost an average of 90 minutes per day to passersby. Computing his salary by the hour, he was spending $6,125 of his company's money on idle time.

He notes that interruptions are often a very necessary part of doing business. "A way to test this is to ask yourself: If I did not have a single interruption for 30 days, where would my job be?" Because of that, Hobbs recommends anticipating necessary interruptions during that early morning planning period, then scheduling brief meetings with those

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B ☐ **Management** (Vice Presidents, General Managers, Business Managers System Directors, System Managers, Station Directors, Station Managers)

C ☐ **Programming** (Programming Vice Presidents, Directors, Managers or Programming Producers)

D ☐ **Pay Per View** (Pay Per View Vice Presidents, Directors, Managers, Producers)

E ☐ **News** (News Vice Presidents, Directors, Managers, Producers)

F ☐ **Marketing/Subscriber Sales** (Marketing/Subscriber Sales Vice Presidents, Directors, Managers, Customer Service Representatives, Subscriber Sales Reps)

G ☐ **Advertising Sales** (Advertising Sales Vice Presidents, Directors, Managers, Representatives)

H ☐ **Technical/Engineering** (Engineering Vice Presidents, Directors, Managers, Engineers, Technicians/Installers)

J ☐ **Other:** (please describe)

Which of the following best describes your firm's primary business activity? (check only one)

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01A ☐ Independent Cable TV Systems
01B ☐ MSO Owned Cable TV Systems
01C ☐ MSO Regional/Headquarters Offices
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01E ☐ Pay Cable Television Networks
01F ☐ Pay Per View Cable Television Networks
01G ☐ Audio Cable TV Networks
01H ☐ Cable TV System Rep Firms
01J ☐ Cable TV Interconnect Firms

Broadcast TV Operations

02A ☐ Full Power TV Stations
02B ☐ Low Power TV Stations
02C ☐ TV Station Group Headquarters
02D ☐ Broadcast TV Networks
02E ☐ TV Station Rep Firms

Other Media Operations

03A ☐ MDS/MMDS Operations
03B ☐ SMATV Operations
03C ☐ DBS Operations
03D ☐ Local Telephone Companies
03E ☐ Regional Bell Operating Companies
03F ☐ Long Distance Telephone Companies
03K ☐ Cellular Telephone Companies
03G ☐ Newspapers
03H ☐ Magazines
03J ☐ Other Media

Others allied to the field

05 ☐ Cable TV Contractors
06 ☐ TV/Cable Component Mfg/Distributors
07 ☐ Satellite Communications Services/Common Carrier Firms
08 ☐ Telephone Equipment Mfg/Distributors
09 ☐ Electric/Gas Public Utilities
10 ☐ TV/Cable/Telco Research Labs
11 ☐ Computer Hardware/Software Manufacturers/Distributors
12 ☐ Computer Service Firms
13 ☐ Program Producers/Distributors/Syndicators
14 ☐ TV/Cable Production Facilities
15 ☐ Financial Institutions, Brokers or Investors
16 ☐ Law Firms/Lawyers
17 ☐ Advertising Agencies
18 ☐ Marketing/Promotion Service Firms
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20 ☐ Public Relations Firms
21 ☐ Talent Agencies
22 ☐ Market & Audience Research Firms
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☐ 1b. MSO (two or more Cable TV Systems)
☐ 2. Cable TV Contractor
☐ 3. Cable TV Program Network
☐ 4. SMATV or DBS Operator
☐ 5. MDS, STV, or LPTV Operator
☐ 6a. Microwave Company
☐ 6b. Local Telephone Co.
☐ 6c. Regional Bell Operating Co.
☐ 6d. Long Distance Telephone Co.
☐ 6e. Cellular Telephone Co.
☐ 7. Commercial Television Broadcaster
☐ 8. Cable TV Component Mfg
☐ 9. Cable TV Investor
☐ 10. Financial Institution, Broker or Consultant
☐ 11. Law Firm or Government Agy
☐ 12. Program Producer, Distributor, Syndicator
☐ 13. Advertising agency
☐ 14. Educational TV Station, School or Library
☐ 15. Telecommunications Consulting Firm
☐ 16. Local Area Network End-User
☐ 17. Local Area Network Equipment/ Services Supplier
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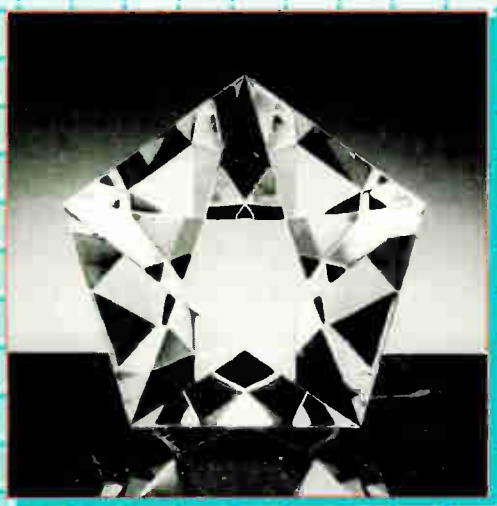

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Where: The Pointe Hilton Resort on South Mountain, Phoenix.

When: Wednesday, January 5th, 6-8:00 p.m., South Mountain Ballroom.

"interrupters" early in the day. Middle managers, Hobbs notes, get interrupted on average every eight minutes; senior managers are interrupted every five minutes.

Common, self-imposed time wasters include:

- ✔ insufficient planning
- ✔ unrealistic time estimates
- ✔ too much involvement in details
- ✔ excessive socializing
- ✔ inability to say no
- ✔ arguing

Time savers include standing while making telephone calls and while taking interruptions, instead of sitting. Doing so will subtly lessen the inherent "comfort factor" associated with being seated, while imparting a degree of urgency.

Meetings, visiters and telephones

More than 11 million meetings are conducted in the U.S. everyday; most are unnecessary or poorly conducted. Hobbs offers these tips for an effective meeting:

1. Doubling preparation time will cut meeting time in half. Most people arrive at meetings unprepared.

2. Use a written agenda with firm start and end times. Distribute agendas before the meeting, then write the agenda on a blackboard or washable wallboard. And, stick to starting and ending meeting times. Never reward latecomers by waiting or regurgitating information once they arrive. Hobbs notes that one company enforced this policy by placing the meeting chairman by the door at the scheduled starting time. Everyone who arrived by the scheduled start time were invited to sit; then any extra chairs were removed from the room. Latecomers were punished by having to stand for the duration of the meeting.

3. Limit verbosity. Request conciseness before the meeting, or limit the "windy" individual by gently interrupting and summarizing his response: "So Joe, am I correct in saying that your point is....?" Joe's answer can be one of two: yes or no.

Because humans are gregarious and social by nature, we have an inherent psychological inclination to visit rather than to end a visit. Hobbs cites a few simple ways to curb extended conversation:

1. Maintain a businesslike stance. Give your visitor your complete attention (that includes ignoring the ringing telephone.) Sit on the edge of your seat. Be quick and alert.

2. Set a time limit your visitor is not used to hearing. For example, say "I have four minutes," instead of five minutes. This focuses attention on time; creates a sense of urgency.

3. Stand when it's time for the visit to end. When it is your turn to speak and the meeting is at a concluding point, stand and walk toward your visitor. If the visitor is from outside the company (a vendor, for example), take the liberty to walk them to the elevator or to their car.

Many of these guidelines can also be applied to telephone calls. Standing and pacing, for example, during an extended call can create within you a sense of urgency.

Developing a time management system that works for you is an ongoing project. It takes time, dedication and energy. Relapses occur. But, Hobbs says, accept any setbacks and correct for them. CED

Source: Hobbs, Charles R. "Time Power," Harper and Row Publishers, 1987.

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In 1992, TeleCable launched its Total Quality Management program in order to reduce waste and re-work. To date, company officials estimate the program has saved the MSO about $1 million.

TKR Cable decided a few years ago to build a total employee training program from the ground up. Since then, it has developed a broad training and safety program that is the envy of many.

Intermedia Partners is developing a computer-based training program from the ground up for all its employees. Meanwhile, Cox Cable San Diego recently completed construction of a training center, complete with classrooms and fitness center.

These are just some of the programs that are serving as models for the cable industry. About 100 persons responsible for training cable system employees recently gathered in Anaheim, Calif. to attend Training '93, a conference sponsored by Multichannel CommPerspectives, a unit of The Cable Publishing Group (which also publishes this magazine).

The goal of the two-day event was to share ideas and tips for developing an effective training program at either the system or MSO headquarters level. Topics included building a program from the ground up, how to measure training effectiveness, developing curriculum, customer service training for field personnel, getting the most for your available resources, legal aspects, getting support from top managers and taking a program to the next level.

Why should a company develop a total training program? If the goal is to offer customer service, become profitable, provide employee satisfaction and improve community relations, a total training program is mandated, said L. Primrose Reeves, director of training at TKR. Training provides these things by reducing employee turnover and ensuring that the public sees the best side of every front-line employee.

Program construction

Actually creating such a program is impossible without complete commitment from the top (a term known as "management buy-in"); even with that buy-in, getting employees to commit can be difficult because people often rebel from such programs.

Once the buy-in is obtained, a training program has to start with a philosophy that is built into every facet of the program. Other key components include a mission statement and a series of goals or objectives that will be evaluated periodically. From there, needs must be assessed. Next, courses must be developed and methods of evaluating the courses should be identified.

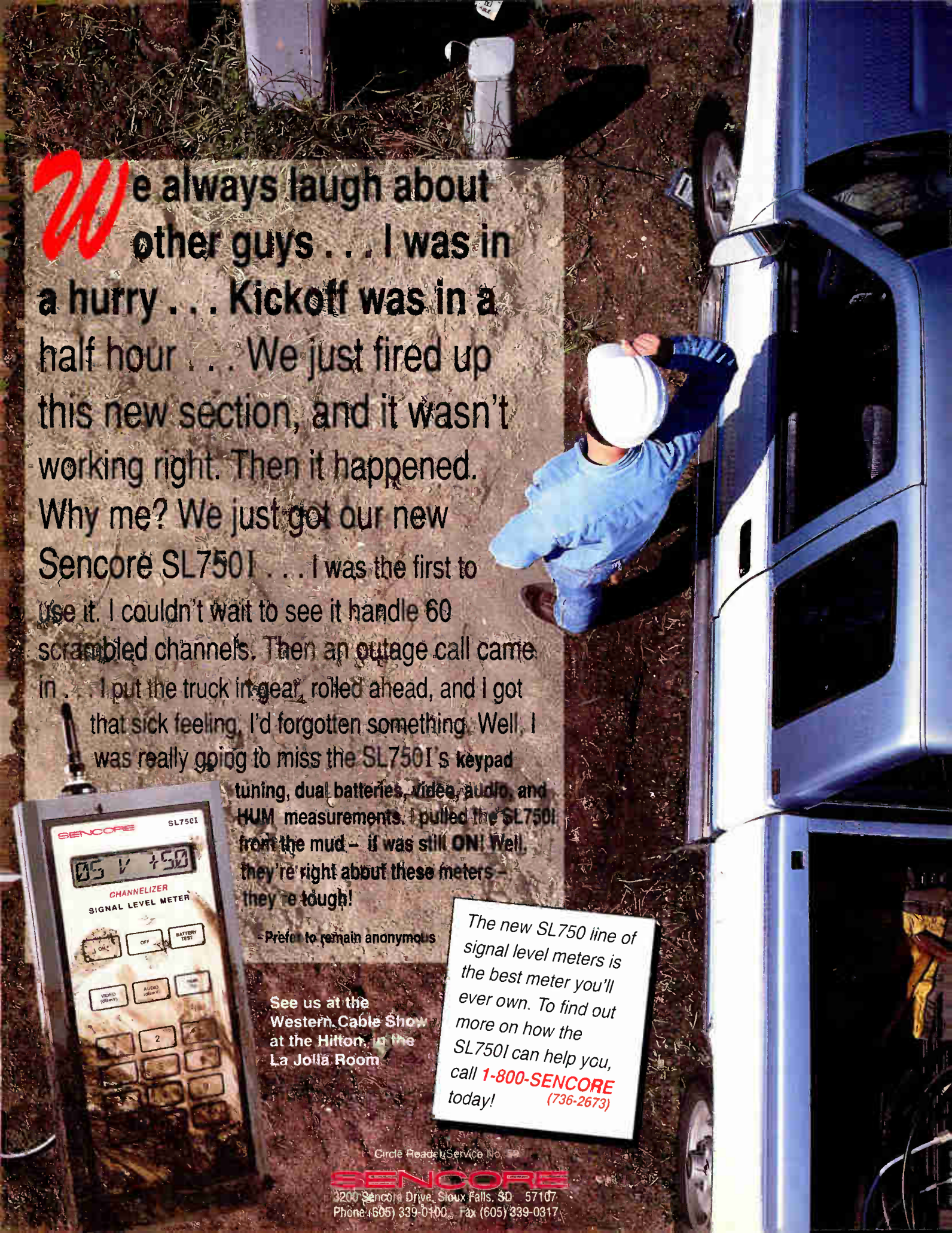
A truly effective training program integrates sales, technical and customer service training in every course, which results in a higher level of customer satisfaction.

By setting meaningful objectives, a training program can be properly evaluated, said Keith Howes, director of training for Continental Cablevision's Sierra Region. Specifically, four things should be evaluated: the program, the presenter, the trainees and on-the-job results. Evaluation methods can vary and may include tests, attitude surveys, observation, productivity reports, evaluation forms, professional opinion, etc.

The training process

In order to effectively train others, the presenter must be motivated to train others, well-prepared and consistent, according to Toni Kanakaris, national training director at Century Communications. The basic rules of thumb regarding training are as follows:

- ✔ Establish a training schedule and stick to it.
- ✔ Be prepared with a "multimedia" presentation of flip charts, hand-outs, video tapes, overheads, role-plays, etc.
- ✔ Formally announce to everyone the training and schedule.
- ✔ Perform the training.
- ✔ Monitor and track employee performance.
- ✔ Inform the management of training results and progress.
- ✔ Develop plans, schedule and secure buy-in for follow-up training.
- ✔ Announce training results.
- ✔ Implement follow-up training. CED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Video disks in cable television

Why they're so good for PPV

By Jon Hazell, Video Engineering Supervisor, Paragon Cable

There is an interesting sculpture hanging from the ceiling of the engineering shop at Paragon Cable, where I work. Spiralling down a wire is a four-foot-long, metal, rubber and plastic helix consisting entirely of used pinch rollers.

Aside from its value as a unique conversation piece, this sculpture represents nearly $7,000 worth of worn out videotape recorder parts. As cable companies look to augment revenues with pay-per-view, ad insertion, and other local programming, the drawbacks and limitations of VTRs become more and more unacceptable.

Paragon is an industry leader using local playback sources to generate revenue and promotion. In Portland (Ore.), we insert local spots on 16 cable networks and reserve a channel for paid programming playback. We program two local origination channels, four locally-programmed pay-per-view channels and a pay-per-view barker channel.

As operators look to augment revenues with PPV, the drawbacks of VTRs become unacceptable.

And, we even do local insertions on the Prevue Guide. All this activity requires more than 100 VTRs.

A very rigorous and very costly maintenance program is what keeps everything going as it should.

In addition to maintenance expenses, there are some other well-known problems with VTRs.

The first is the tape itself. It wears out, shreds, gets easily damaged, and doesn't store well. The cost of videotape is a significant expense. The tape format can also be a source of headaches.

When operating a large number of VTRs in a cable environment, for example, there are only a few economically practical tape formats, and all of them suffer from serious signal degradation problems when dubbed down several generations.

Optical no-brainer

It's easy to see why we're interested in less expensive and more reliable alternatives to VTRs. There are several high technology solutions looming on the horizon, including digital storage and opto-magnetic disk recording.

Digital storage systems using computer hard disk drives and data compression look promising for ad insertion, but there are several drawbacks.

The only systems currently available are in development or in beta testing stages and still have a lot of bugs to be ironed out. Manufacturers are not yet in total agreement about a compression standard, though most are leaning toward MPEG-2. Storage capacity in these systems is at a premium and it doesn't seem practical yet to use them for full length programs.

OMDRs, or opto-magnetic disk recorders, also have some drawbacks as VTR replacement devices. The technology is proven and reliable, but the recorders are expensive for mass applications, with prices on the order of those for broadcast-quality type C one-inch VTRs.

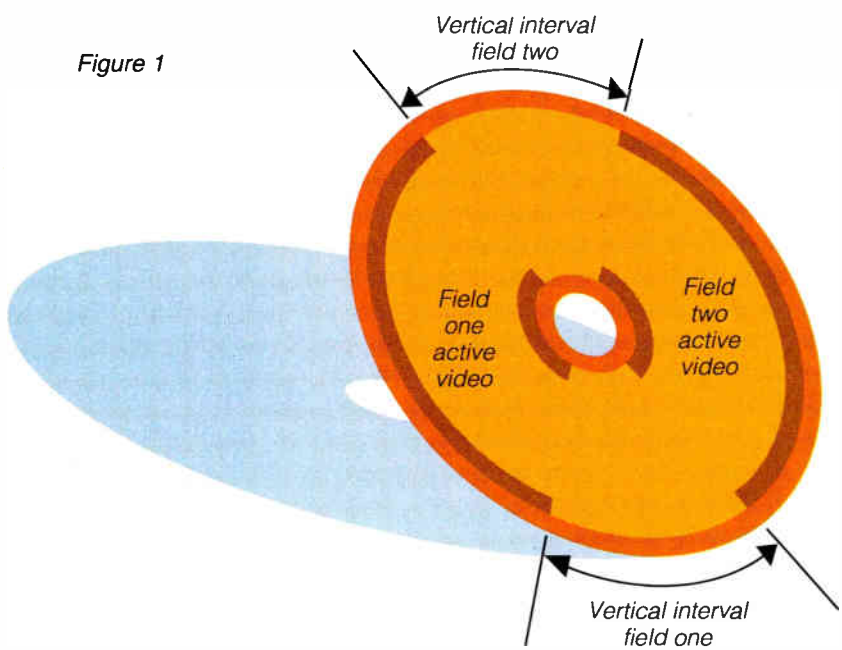
The record/playback media is also expensive, though it can be used many times over without degradation. Still, the cost of blank OMDR disks limits their usefulness for the storage of more than a few programs. Like digital storage systems, OMDR systems are more suitable for ad insertion than program playback.

Plan C: video disks

While these high technology systems still have some drawbacks for program playback, there is currently a viable option to VTRs in some program applications: video disks. Video disks were introduced in the early '80s to compete with the Beta and VHS tape formats in the home video market. They promised better video and audio quality, and a more robust storage medium.

Video disk players are mechanically simple and require little routine maintenance. The disks themselves are hardy and, unlike tape,

Figure 1



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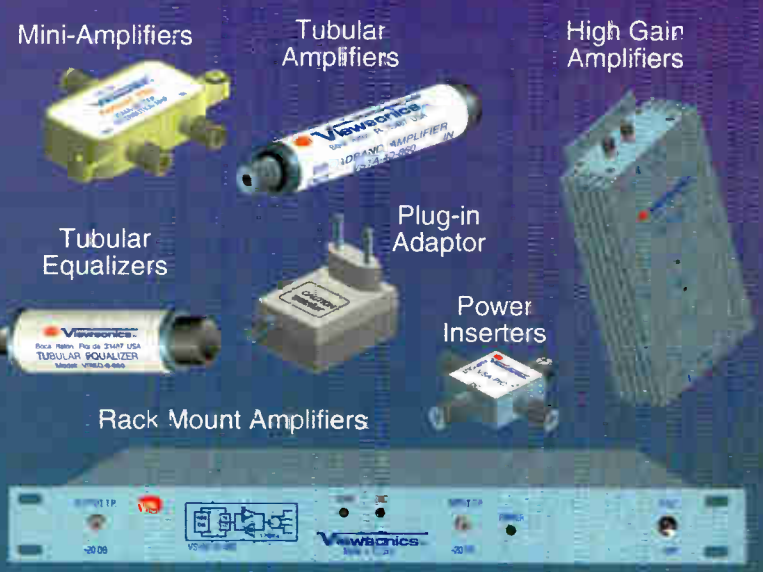

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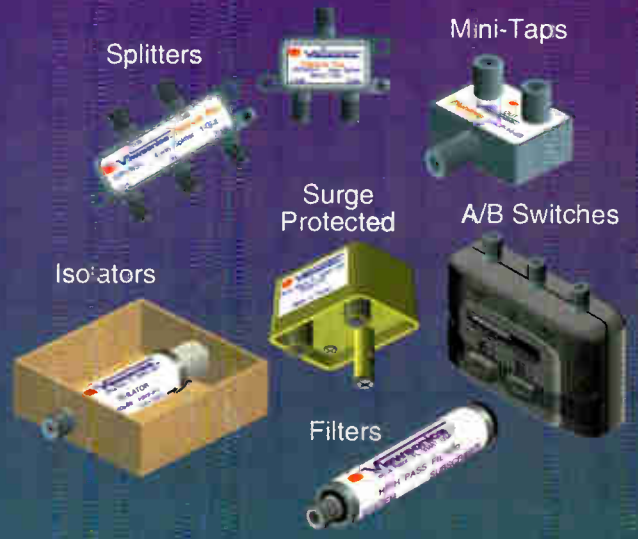

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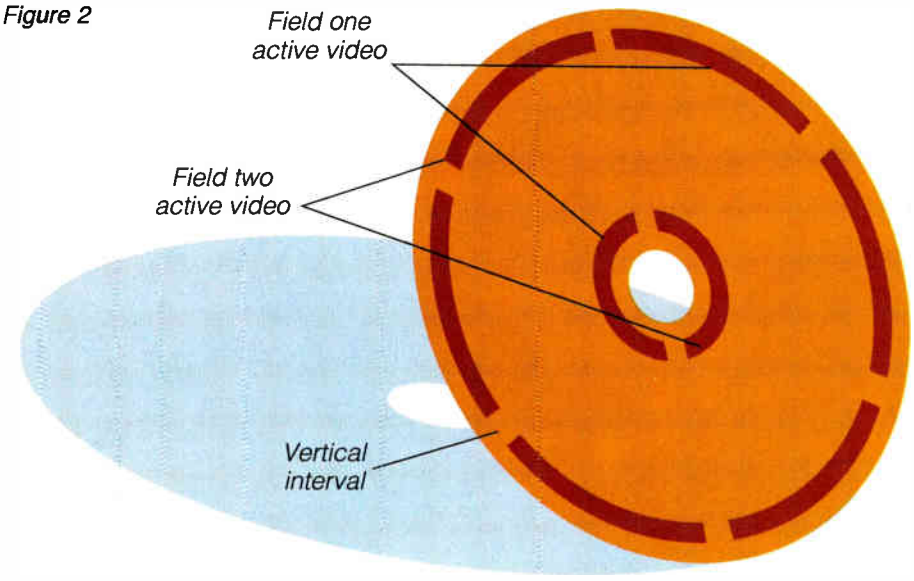
don't wear out because there is no friction generated from moving past fixed guides, rollers and heads.

Unfortunately for proponents, video disks failed to catch on because, unlike tape, they can't be easily recorded and they can't be erased.

Creative uses

The format remained alive through a variety of industrial uses and is now making a solid comeback in the home video rental market. Cable systems doing stand-alone pay-per-view (as opposed to using satellite services like Request and Action) can reduce tape and VTR problems by taking advantage of the fact that many popular movie titles are now being released on video disk. A little creative thinking will uncover a number of other ways laser disks can solve cable system playback prob-

Figure 2



Ad Index

Video disks, in the real world, are ideal for situations where multiple plays are required.

lems.

What is a laser video disk? Basically, a video disk is similar to an audio compact disc, only larger. It's about the size of a long-playing record, if you can remember what they were like!

Like the needle tracking an LP record, the laser tracks a video disk in a spiral pattern, but instead of working from the outside in, the first tracks are located on the inside of a laser disk.

CAV and CLV formats

Video disks come in two formats, constant angular velocity (CAV) and constant linear velocity (CLV). A CAV disk has a constant rotational speed of 1,800 RPM. The components of the video signal are recorded in specific sectors of the disk, which is divided like a pie (see Figure 1).

CAV is not perfectly efficient because the outermost and widest part of each pie slice contains the same amount of information as the innermost and narrowest portion of the slice. A CAV disk can hold up to 30 minutes of video on each side.

By using a more efficient layout, CLV disks are capable of storing 60 minutes of video on each side. On a CLV disk video information is recorded in equal length linear sections, with three frames recorded on the outermost track of the disk and one frame recorded on the innermost track (see Figure 2).

The disk player changes its rotational speed so that video frames are output at a constant rate. When scanning the outside tracks on a CAV disk, the speed is 600 RPM. When scanning the inside tracks, the speed is 1,800 RPM.

Traditionally, the trade-off for the extra length of CLV disks has been the inability to do slow motion and single frame viewing, which are possible with CAV. Industrial disk players have built-in full-frame timebase correctors and are capable of slow motion and still frames with either format.

An industrial video disk player has control inputs and video and audio outputs, so it can be substituted directly for a VTR in most playback situations. Because there is a built-in TBC (timebase corrector), a disk player can be connected directly to a cable system modulator and won't cause the glitching, hiccuppy, instability problems seen with uncorrected VTRs.

How video disks work

How do video disks work in the real world? Considering their limitations, they work very well. They are ideal for situations where multiple plays are required.

For example, video disks can play and recue over and over again without wear and tear on the machine or the playback medium. Repeatedly running a spot on a barker channel or a program guide will destroy a VTR and the tape playing in it in short order–and will require a lot of tender, loving care.

If a 30-second spot airs once every five minutes it will air 12 times an hour, 288 times a day, 2,016 times a week. Most tape manufacturers suggest that a tape can endure around 100 passes before becoming too worn for use. Are you changing that tape twice a day?

As for the VTR, the number of thread/unthread cycles is tremendous. There are ways to get around some of these problems using tape (recording multiple copies of the spot on the tape, for example) but all have serious operational drawbacks. A neat solution to this quandary is to use video disks instead of tape.

A disk with a 30-second spot on it can air repeatedly, back to back (with about a one-second cue-up time) with no degradation and virtually no wear and tear on the player.

Recording

At this point, the question of how to record video disks arises. The cost of a video disk player is in the same ball park as that for an industrial grade video tape player. A video disk recorder is quite a different story. These machines have high accuracy and stability requirements.

They come built into a solid desk-like structure that, in this day of miniaturization, harkens back to an earlier time. The cost is closer to that of a new Rolls Royce than that of a used Ford Escort.

The high cost of video disk recording

equipment dictates that a company make a business of disk duplication in order to afford one. That is out of the question for most cable systems. Fortunately, several companies are in the video duplication business. A list of them is shown in Table 1.

Costs for recording

The cost for recording a single disk is approximately $250. This figure is usually flexible, based on the number of disks you want made, how often you want disks recorded, and all sorts of other creative negotiating tactics. Most of these companies feature a short turn-around time of a day or two for video disk recordings.

A bean-counter may balk at the $250 per disk recording cost, but compared to the cost of VTR wear, the cost of tape, the operations cost to dub and re-dub the tape, and the all-important image of quality that is presented to the customer, the cost of laser disks isn't so high after all.

Where laser video disks really shine is pay-per-view. Most major film titles are available on video disk. The video quality is generally quite good and the audio quality is excellent. Maintenance costs are low and reliability is high. Many automation systems can be configured to control laser disk players. In the approaching world of near video-on-demand, laser disk players are very attractive as VTR alternatives.

Video disk caveats

There are some caveats about using laser disk players in pay-per-view scenarios, however. Not all movies are available on video disk, particularly adult titles, so for now any playback system will still have to include VTRs. The industrial-grade TBCs included with video disk players are not the highest quality. They do put out a stable signal, but many parameters do not have adjustments.

Video disks make an excellent alternative to videotape for program-length playback.

For example, all of our players have low chroma burst at the output with no way to correct it. This isn't really a problem for us, because each pay-per-view channel is run through an additional TBC/frame sync, but it is annoying.

Also, the video and audio quality of disks from some sources is marginal. There frequently seems to be a quality difference between dubs made for the consumer market and those made for professional uses such as pay-per-view.

The laser disks we air are standard consumer disks. Sometimes it appears that levels weren't as carefully matched during the duplication process as they might have been.

Another issue that is yet to be decided when it comes to video disks is pan 'n' scan vs. windowbox. Most feature films are shot in 35 mm, which has a wider aspect ratio than the 4-to-3 of standard television. Historically, when features are dubbed to tape for air on television, the action is centered on the screen with the edges cut off. Sometimes, when action is at one side of the picture, the image is panned to follow the action and then back

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List courtesy Pioneer New Media Technologies

to the center again. This is called pan 'n' scan. It's what most television viewers are used to.

Many video disks use windowbox, the other method of dubbing wide-screen film to narrow-screen video. In a windowbox film, the video frame is cropped to leave the entire wide-screen image in the center with a black bar at the top and bottom.

This allows the viewer's eye to roam across the entire filmed image. Our experience has been that viewers don't like windowbox very much.

On a consumer's television, the windowbox image is much smaller and a large amount of the screen appears to be wasted. Responsive studios are now making disks available in both formats.

Not a ubiquitous solution

Clearly, video disks are not the solution for all of the playback problems facing a cable system that wants to expand its local presence and local revenues.

Ad insertion and video production probably need different solutions. Still, laser disks make an excellent alternative to video tape for program-length playback and in circumstances requiring repeated plays.

In those areas, video disks offer a substantial cost savings over VTRs. Maybe in the future, the sculpture in our shop will be made of something else! CED

Whither 3/4-inch tapes and players?

New ad systems look like PCs

By Leslie Ellis

Scientific-Atlanta's announcement last month that it would OEM its digital compression boards to leading computer supplier Digital Equipment Corp. for use in its digital ad insertion system comes as proof positive that, with technology as the enabler, the ad insertion business has become a big boy's game.

Clearly, the 3/4-inch magnetic tape-based systems of yesteryear are quickly becoming a thing of the past. Replacing the vast stores of traditionally unwieldy VTRs are the new kids in town: digital storage and retrieval systems based on a combination of MPEG compression and standard, off-the-shelf personal computers.

In S-A's case, for example, it will provide DEC with its real-time MPEG encoder and a two-card MPEG decompression set. Each two-card set controls one advertising channel; the cards themselves are variations of standard PC expansion boards. It's this plug-and-play mentality that is shaping up to define digital ad insertion.

"When considering the future of digital ad insertion, it's useful to consider it this way: the decompression cards are like the tape deck, the SCSI hard drive is the tape itself and the CPU is like the controller," relates Don Rice, VP of engineering for Telecommunication Products Corp.

Growth potential huge

Why such a heavy emphasis by big players like Scientific-Atlanta and DEC on an already saturated equipment marketplace? Technological innovation, mostly. Compression technology makes 30-second video spots storable in roughly 10 mbytes to 30 mbytes, depending on the compression algorithm used. And, with the almost unlimited storage capacity of today's hard disk drives, operators are no longer tied to a maximum of four VTR players each handling 100 or so spots each.

As Bob Luff, VP/GM of new digital technologies for Scientific-Atlanta explains, this unlimited spot inventory can only help an industry that has experienced double-digit growth over the past five years. "Cable ad sales is one of the few totally unregulated revenue streams in the cable industry," Luff says. "None of these revenue streams come out of the pockets of the subscribers. That's what has cable operators interested in the acceleration of insertion material development."

The new, digital ad realm works something like this: Video ads are played into an MPEG encoder, which compresses and encodes the ads. The digitized ads are stored on a video server (usually, a standard but high capacity hard disk drive). A CPU-like controller loaded with a traffic list stores the day's play schedule, and readies the digitized spots prior to play. When the network cue tones come down, the ads are decompressed, decoded and switched out onto the air.

Of course, specific air methods vary widely by manufacturer. S-A, for example, loads each channel's next play load into a smaller hard disk drive–a sort of data buffer–prior to play. Channelmatic, on the other hand, eschews single-channel integrity, opting not to use a data buffer. It's control unit readies spots and retrieves digital copies from other channels' hard drives prior to playback, then switches the decompressed and decoded ads directly from each channel's storage drive.

Meeting of the minds

The new digital age, despite the obvious payoffs in reliability and performance, doesn't come without some headaches, however–particularly for traffic and billing software providers.

Last month, in fact, 11 companies representing ad insertion hardware and software met in Denver at the behest of software providers CompuLink and CCMS. The reason? To sort out a data exchange interface protocol for use in uploading and downloading traffic schedules and verification play data to and from insertion hardware.

"Currently, we maintain about 20 different interfaces to different pieces of equipment. It's a huge pain," says Pete Czornohus, director of operations for CompuLink. "We're getting more and more requests from MSOs to write new interfaces to some of the digital equipment that's coming onto the market. It's pretty costly for us to sit down and write a new interface for every piece of equipment that comes out."

In attendance at the meeting were Arvis, Ad Systems, CCMS, Channelmatic, DEC, MultiVail Engineering, Optimedia, Perfect Sync, SkyConnect, Starnet and Texscan.

"Our basic objective is to define a data set that we're going to pass back and forth," Czornohus says. "I think it'll be an ongoing process: it's not going to be a one meeting thing."

Also in the digital mix is CableLabs, which over a year ago initiated an ad hoc committee to examine the interconnectivity of the ad sales business. Last month, it released the fruits of its work in a 281-page draft document chock full of information flow charts, transaction sets and data elements. "The goal here was to develop a blueprint of all the business data elements and how they interact with each other, so that ultimately we can get to a completely electronic interchange of business information," says Scott Bachman, VP of operations technologies for CableLabs.

So that ad sales participants don't have to re-invent the wheel, CableLabs has described an American National Standards Institute standard, X.12, already in wide use by "thousands of companies" in the U.S. and worldwide, Bachman says.

The standard, not in use currently by cable operators, embodies a vast well of electronically-formatted business documents, including invoices, purchase orders, affidavits and contracts, for example. The idea, Bachman says, is for the ad insertion business to adopt these existing electronic documents for data exchange.

The next step in the process, Bachman says, is vendor and operator feedback and a multiple vendor test of the actual information flow–between advertising agencies, cable networks, information providers, cable ad sales offices and all associated hardware and software. "The place to do that is with a real agency to a real entity," Bachman says, noting that the tests won't happen at CableLabs.

"We're hearing very strong positive comments from the industry that they would like to see a common hardware platform," Luff says. "They don't want another Beta vs. VHS scenario." CED

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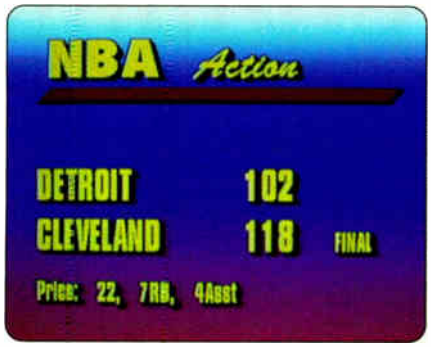

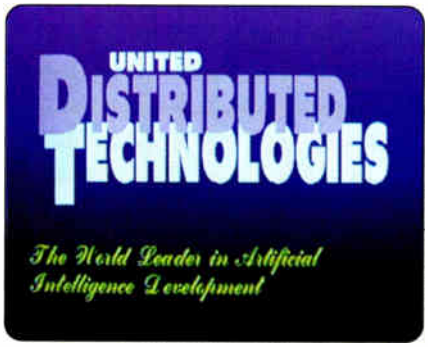

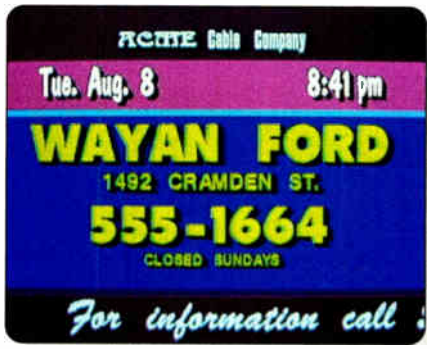

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14 Chattahoochee SCTE Chapter Social Event: Annual Christmas party. Call Hugh McCarley, (404) 843-5517.

14 Desert SCTE Chapter Technical Seminar. "Construction Safety and OSHA." Location: San Gorgonio Inn, Banning, Calif. Call Greg Williams, (619) 340-1312, ext. 277.

14 New England SCTE Chapter Technical Seminar and Testing Session. BCT/E and installer certification tutoring with Odule Breau, Greater Media Cable. Location: Greater Media Cable, Worcester, Mass. Call Brian Bedard, (508) 853-2525.

14 Southeast Texas SCTE Chapter Technical Seminar. "Proof of performance testing" with Ray Searcy of Prime Cable/Houston and "Supervision III" with Kelly Watson of Lakewood Cablevision. BCT/E and installer exams will be administered. Location: Warner Cable, Houston, Texas. Call Rosa Rosas, (409) 646-5227.

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16-18 Inter-American Link '94. Location: Mexico City, Mexico. Call (305) 929-6657.

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20-25 Optical Fiber Conference. Location: San Jose, Calif. Call (202) 416-1980.

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ANTENNAS

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- 3 Meter 10'
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- 3.7 Meter 12'
- 3.9 Meter 13'
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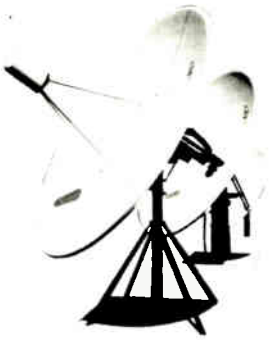

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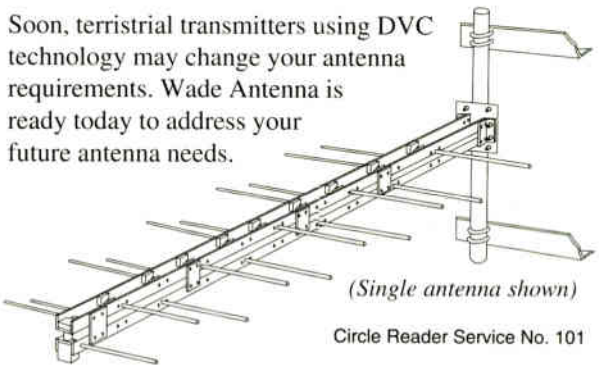

(Single antenna shown)

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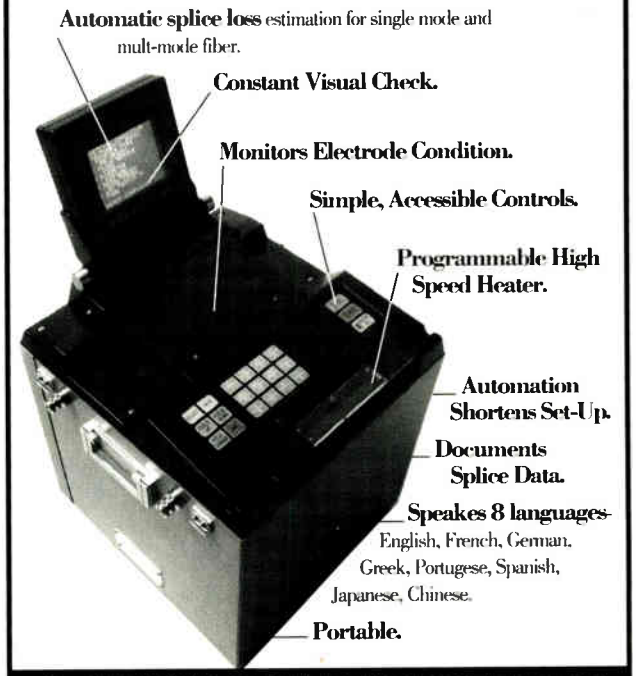

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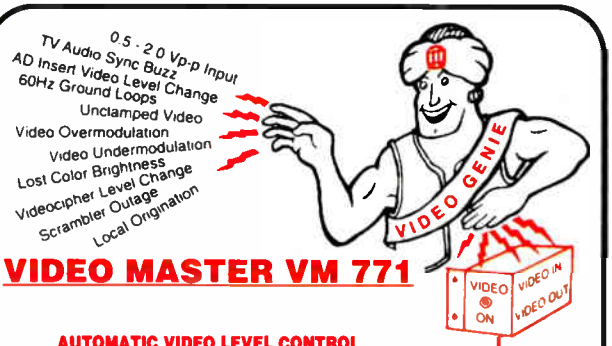

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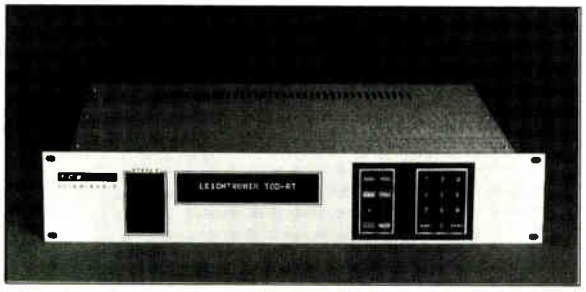

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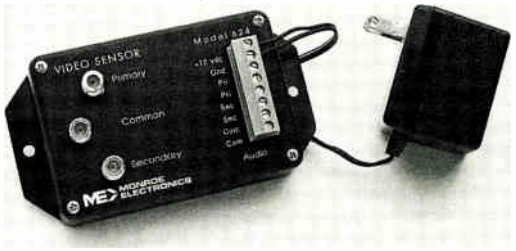
Circle Reader Service No. 112

Model 624
VIDEO SENSOR



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Monroe Electronics is happy to introduce the new Model 624 VIDEO SENSOR which provides automatic 2X1 audio-follow-video switching by monitoring the loss of horizontal sync pulses. When video is lost on the primary source the 624 will automatically switch to the secondary video source until the primary source returns. With the 624's small size; easy installation; and low price the Model 624 VIDEO SENSOR is cheap insurance against lost video. So call Monroe today and we'll be happy to help eliminate your loss of video problems!

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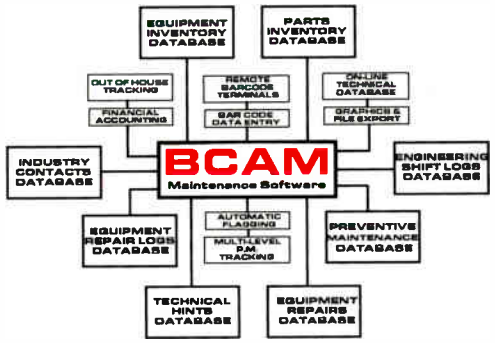
BCAM

MAINTENANCE MANAGEMENT SOFTWARE



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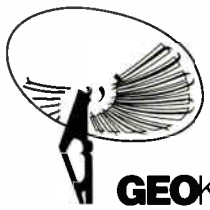

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Circle Reader Service No. 117

The issue: Convergence

Bell Atlantic's acquisition of Tele-Communications Inc. was a watershed event that promises to have profound effects on national telecommunications policy. Since then, other telcos have invested in MSOs and others are rumored to join in shortly. But there remain dozens of unanswered questions about how these mergers might affect everyone else in the old "cable TV" business. This month, we'd like your thoughts on what the whole thing means to you.

The questions:

1. Do you think your system will ultimately be taken over by a telco?

❑ Yes ❑ No ❑ Don't know

2. Given the choice, would you personally prefer to work for a telco or a cable company?

❑ Telco ❑ Cable company ❑ No preference

3. Why?

4. Do you think telephone technical personnel are better compensated (salary and benefits) than cable personnel?

❑ Yes ❑ No ❑ Don't know

5. The telephone companies today are heavily unionized. Do you think technical employees who build, service and maintain broadband networks ought to be unionized?

❑ Yes ❑ No ❑ Don't know

6. Do you think acquisition of cable companies by telcos will actually result in more local competition or less local competition?

❑ More ❑ Less ❑ Don't know

7. Do you personally fear the day your system is taken over by a telco?

❑ Yes ❑ No ❑ Don't know

8. Do you think basic skill training (digital technology, telephony basics, etc.) will take on new significance for you personally?

❑ Yes ❑ No ❑ Don't know

9. Do you think your company's training programs should be reworked to include more information about competition and new networks?

❑ Yes ❑ No ❑ Don't know

10. Do you think governmental restrictions related to telcos being banned from offering video freely and MSOs being banned from telephony should be removed?

❑ Yes ❑ No ❑ Don't know

11. Do you believe they actually will be anytime soon?

❑ Yes ❑ No ❑ Don't know

12. Do you believe CableLabs will continue to be funded by telephone companies that purchase MSOs, or will those companies choose instead to fund Bellcore (the telcos' R&D facility)?

❑ CableLabs ❑ Bellcore ❑ Don't know

Your comments:

FAX US

303-393-6654

Make a copy of this page and fax it back to us at the number above or mail it to CED, 600 South Cherry Street, Suite 400, Denver, Colo. 80222.

We will tally the results and print it in a future issue. Your suggestions for future questions are always welcome.

We also want some written comments from you on this subject. Names won't be published if you request your name to be withheld, but please fill out the name and job information to ensure that only one response per person is tabulated.

Your name and title

_____

_____

_____

System name:

_____

Your MSO:

_____

Location:

_____

Your job function:

_____

RESULTS

Cable operators appear quite willing to become active participants in a revamped national emergency alerting system, but balk at having to install expensive equipment that won't help them generate any revenue.

Seventy percent of those responding said they are interested in becoming more active in the program, but not a single respondent said the system in which they work would be willing to spend $500 per channel (considered a low-end figure) for the equipment in the headend.

Operators were split over whether they have plans to add emergency equipment next year, with most saying they would add new gear only if forced by franchise stipulations. Perhaps this is because less than half who responded said their systems are located in geographic areas that are prone to numerous national emergencies.

Half of those responding to the survey said they already have override equipment in place. Of those, fully 60 percent have gear that overrides with both audio and video signals. According to the survey, most of the equipment in place is tested and/or activated on a regular basis.

The issue: Emergency alerting

Another FCC rulemaking currently underway that stands to have a major impact on the cable industry is one related to the old Emergency Broadcasting System. The FCC would like to modernize the system and bring more cable operators into the program as active participants. Operators want to be good citizens, but the industry has said it cannot afford expensive hardware because of the number of channels a system distributes.

The results:

1. Is your system active in the current EBS locally?

Yes	No	Don't know
30	**70**	**0**

2. Is your system interested in becoming more active in a modern emergency alerting program?

Yes	No	Don't know
70	**10**	**20**

3. Is your local geographic area prone to numerous emergencies on an annual basis?

Yes	No	Don't know
30	**60**	**10**

4. Are you aware of the FCC proceedings to include cable in the new national alerting system.?

Yes	No	Don't know
80	**20**	**0**

5. Does your franchise agreement require emergency alerting capability?

Yes	No	Don't know
40	**60**	**0**

6. Do you have plans to add emergency alerting equipment to your headend in the next year?

Yes	No	Don't know
40	**40**	**10**

7. If a new alerting system cost $500 per channel, would your system buy it?

Yes	No	Don't know
0	**70**	**30**

8. If a new alerting system cost $1,000 per channel would your system buy it?

Yes	No	Don't know
0	**80**	**20**

9. Does your system presently have programming override equipment in place in the headend?

Yes	No	Don't know
50	**50**	**0**

10. If so, does it override audio only, or audio and video signals?

Audio	Audio & video	Don't know
40	**60**	**0**

11. If your system has such equipment, does it override all channels, including broadcast?

Yes	No	Don't know
80	**20**	**0**

12. If you have emergency alerting equipment, is it activated and/or tested often?

Yes	No	Don't know
80	**20**	**0**

Comments:

The new system needs to be fair and affordable. $50,000 per headend is not affordable.
– Name withheld by request

We are a city-owned cable company. Adding an EBS system would cause us to raise our rates.
– Michael Monsrud, Bagley Public Utilities, Bagley, Minn.

We use a number of alert devices and we have a problem phaselocking them, so we are in violation of tolerance standards every time the alert is used.
– Ray Fournier, Continental Cablevision, Dover, N.H.

Cable operators, vendors announce personnel moves

Daniel F Akerson, formerly president and CEO of **MCI Communications,** has been named chairman and CEO of General Instrument Corp, succeeding outgoing Donald Rumsfeld. Also at GI, **John Seely Brown**, chief scientist and corporate VP of **Xerox Corp.**; and **Morton H. Meyerson**, chairman and CEO of **Perot Systems** have been added to its 12-member board of directors.

The three replace former GI chairman Frank G. Hickey, who retired; Brian LIttle, a general partner of Forstmann Little and Co.; and James M. Denny, vice chairman of Sears, Roebuck and Co.

Albin F. Moschner has been elected president and COO of **Zenith Electronics Corp.** Moschner was previously senior VP of operations. As president and COO, he will continue his focus on cost-reduction and operating improvements for Zenith, as well as leading the company's cable equipment business.

David Nicholas

David Nicholas has been named VP and general manager of **Texscan MSI.** In his new role, Nicholas will lead the company's digital ad insertion ventures. He joins Texscan from Pioneer New Media Technologies, where he was senior VP of its business systems division.

Connie Buffalo

Connie Buffalo has been named VP of **Mind Extension Institute.** Buffalo has been ME/I's director of educational product development.

Whit Jackson has been promoted to VP, video encryption technologies for **Macrovision Corp.** Jackson will oversee sales, marketing and product development of the company's video scrambling products and technologies.

Tom Potosnak has been named product manager/cable television for **Reliance Comm/Tec Corp.**'s Reliable Electric Division. In his new assignment, Potosnak will be responsible for all marketing issues related to traditional CATV enclosures, as well as for the company's recent focus on advanced CATV enclosures, fiber optic products and electronic equipment cabinets. Potosnak was formerly senior product specialist for the company.

Mike Braun has been named president and CEO of **Kaleida Labs Inc.** Braun, a 20-year IBM veteran, will succeed Nat Goldhaber, who has been named co-chairman of the board. Braun's most recent position at IBM was VP and managing partner of IBM's "firework partners" division, a group responsible for the formation of businesses that use multimedia technologies. Kaleida Labs is a joint venture between Apple Computer and IBM. Its mission is to develop standards and license technology for cross-platform multimedia products spanning the PC, consumer electronics and communications industries.

Bernie Czarnecki, president of **Cablemasters Corp.**, has been named **Region 11 director for the SCTE.** Czarnecki succeeds **Diana Riley**, senior account manager for **Jerry Conn Associates**, who relinquished her regional director seat earlier this summer when she was transferred to Denver, Colo. Riley will, however, remain on the board as chairman of the operations committee.

James F. McDonald has been named president and CEO of **Scientific-Atlanta**, succeeding **James V. Napier**, who will continue to serve as the company's chairman. McDonald was formerly a general partner with J.H. Whitney and Co., a private investment firm in New York.

William A. Geist has been named VP, information technology and services for **Scientific-Atlanta.** Geist had formerly been VP of information services for Reichhold Chemicals. In his new role, Geist will be responsible for the development and maintenance of data, voice and video information strategies for S-A.

Michael T. Hayashi has been appointed VP of advanced engineering for **Time Warner Cable** In his new position, Hayashi will lead the hardware and operations software development effort for the company's full service network project underway in Orlando, Fla. He will also be responsible for development of next-generation subscriber services. Hayashi joined Time Warner Cable last year as VP of international development.

Dan Dougherty has been named outside sales representative for **Jerry Conn Associates.** He was formerly with Diamond Communication Products. In his new role, Dougherty will oversee the New York and New England Region.

Also at JCA, **Glen Langley** has been named outside sales representative for the southeastern portion of the U.S. Langley had formerly been with Trilogy Communications and Stormwatcher Inc.

Stephen B. Adler has been named VP of systems integration for **Bull HN Information Systems.** In his new role, Adler will establish partnering relationships and provide Bull products to systems integrators throughout North America.

David P. Beddow has been named VP of **TCI Technology Inc.**, a subsidiary of Tele-Communications Inc. In his new role, Beddow is responsible for overseeing the construction and operation of TCI's digital compression uplink and playback center, which is scheduled for completion in 1994. Beddow joins TCI from Primestar Partners.

Thomas E. Dooley, senior VP of corporate development for Viacom Internatyional Inc. has been named president of the company's Interactive Television division. Dooley will coordinate the company's initiatives in interactive TV and multimedia, as well as strategic planning.

Steve Youtsey has joined **Trilogy Communications** as VP, international operations. Youtsey was formerly with Pyramid/CableCon Connectors.

Dario Santana has been promoted to product manager, addressable systems for **Jerrold/General Instrument.** In his new position, Santana will be responsible for overseeing all of Jerrold's addressable cable product marketing efforts, including computer-controlled convertors, addressable controllers and standard analog terminals. Santana was previously wireless product manager for the company. **Mike Pulli** will take up the reins in Jerrold's wireless operations as its new wireless product manager. Pull joined Jerrold in 1992 as its manager of business planning. CED

Dario Santana

Mike Pulli

Dish de-icer

BOULDER, Colo.–New from Geoklein Industries is its Steadystate anti-icing system, which prevents the accumulation of ice and snow on satellite dish reflectors. The key to the product, Geoklein officials say, is its unique heating strip construction. Unlike conventional heat tapes with resistance wire construction, Steadystate uses a heating element that is a continuous core of semiconductive polymer, company officials submit. The polymer regulates its own heat output as the ambient temperature changes. Heat is thus distributed evenly and hot spots are eliminated, company officials say.

Steadystate starts to work when the temperature drops. Carbon particles in the conductive core of the heater create a network of electrical paths with heat output; when the heat rises, as it does with the ambient temperature increases, the heater core expands and the network of electrical paths begin to disconnect.

The heater strip is supplied on reels ready to be cut to length and installed. The heating strip can be "easily installed" even around antenna ribs and supports, using pressure sensitive adhesives supplied with the Steadystate kit.

Circle Reader Service No. 70

Sweep with hand-held receiver

INDIANAPOLIS, Ind.–New from Wavetek is its "Stealth Sweep System," pictured here, designed with a hand-held receiver for convenient field use and a non-interfering transmitter for the headend. The system offers extremely fast sweep updates–to the tune of 200 points of response data updated in roughly a second–and a simple user interface that Wavetek officials say significantly shortens learning curves and set-up time.

A continuously referenced sweep method eliminates headend drift errors, company officials submit, and a propri-

Fiber transmitter/receiver

ENGLEWOOD, Colo.–New from ABC Cable Products is its CBLinX-1 line of RF-to-fiber optic transmitters and receivers, which were designed as a cost effective solution to intermixed copper and optical fiber facilities, ABC officials say. As such, the CBLinX family permits transmission of video, data, analog or digital signals where the use of fiber optics is cost prohibitive.

Specifically, ABC officials say, the products are aimed at applications where DFB and Nd:YAG lasers transmitters aren't cost effective–such as in return path, institutional feed and redundancy applications for the cable TV and closed circuit TV industries. Initial product offerings, as an example, transmit up to four or more video channels in the 10 MHz to 550 MHz frequency range, with a C/N figure of greater than 50 dB, CSO of less than -60 dB and CTB of less than -55 dB. Input connections are of a common F-type connector; output to the fiber is via a FC/PC connector. The unit has been tested, ABC officials say, using fiber lengths of up to 12 km.

CBLinX-1

CBLinX-1 consists of a transmitter and receiver pair housed in a desktop or rack-mounted configuration.

Circle Reader Service No. 71

Handheld fusion splicer

PRINCETON, N.J.–Aurora Instruments has announced availability of its new FASE II handheld, programmable fiber optic fusion splicer, designed to provide quick and high quality field splices on singlemode or multimode fiber optic cable.

The splicer uses a proprietary fusion technique known as "axial reciprocation," Aurora officials say, which increases the surface tension effect on fiber ends as they are fused. An internal, rechargeable battery within the unit can facilitate roughly 100 splices, but an AC power cord and charger is included with the splicer.

Microprocessor-based programs built into the splicer enable a full range of programmable settings, including arc current range of 4.5 mA to 22.0 mA, arc time range from zero to 9.9 seconds, and overtravel, reciprocating amplitude and gap ranges from zero to 30 µm.

To use the handheld splicer, fiber ends are inserted into a fixed V-groove; ends can be viewed with a built-in, 75X microscope. Fine adjustments can be made with a thumb wheel. A piezo-electric positioner enhances fiber alignment during the arcing process, Aurora officials say. And, a 16-character, two line LCD indicates step-by-step splicing instructions as well as displaying the programming mode. Internal software counts and records the number of splices performed.

Designed for field use, the FASE II operates in temperatures from -10° Celsius to +40° Celsius. It weighs just over four pounds, and is available with a wide variety of accessories including a portable tube heater and splice sleeve protection tubes.

Circle Reader Service No. 72

Digital video transportation system

MERIDEN, Conn.–New from American Lightwave Systems is its DV6010 digital fiber

Stealth Sweep System

etary DSP technique is included to make hum and carrier-to-noise measurements on modulated carriers. The Stealth tests to 1 GHz, is compatible with scrambled and digital signals and includes frequency agile telemetry.

The Stealth 3SR also features a high resolution display for viewing of multiple measurements simultaneously. The 3SR receiver features a full spectrum display and an analog representation of single channel measurement data. When tuned to a specific channel, for example, the following information is provided:

- tuned channel,
- video frequency and level,
- audio frequency and level,
- the difference between video and audio carrier levels
- a battery charge condition.

The Stealth 3ST transmitter transmits a sweep that "steps around" channels so as not to interfere,, and the accompanying 3SR receiver references existing carriers when possible.

Circle Reader Service No. 79

transmission system, design to transport up to eight video channels in either one or two directions simultaneously. The system uses 10-bit uncompressed video technology, which ALS officials say far surpasses the performance capabilities of RS-250c short haul transmission. The use of uncompressed video avoids artifact generation which might affect video performance, ALS officials say. Because of that, the DV6010 transmits all digital and audio information in an uncompressed form.

The system is available (optionally) in a fully redundant version which includes hot standby switching capability. If the redundancy option is selected, the system protects against signal loss caused by the loss of a fiber or the loss of any individual system component, such as an optical transmitter, receiver, multiplexor, demultiplexor or power supply.

Circle Reader Service No. 73

The fastest optical power meter?

QUEBEC, Canada–Exfo E.O. Engineering has

FOT-910

introduced its FOT-910 attenuation/ORL test set, which it describes as "the fastest power meter in the industry." To support this claim, Exfo officials submit that the unit can test one fiber at two wavelengths and in two directions–all within 33 seconds. Further, Exfo officials say, all of the testing mentioned above is performed from a single fiber and a single output port, thus reducing errors and testing time.

All attenuation measurements are automatically stored in the unit's non-volatile memory, and can be sent to a portable, on-site thermal printer for instant performance documentation.

Other features of the FOT-910 include dynamic range of +10 dBm to -68 dBm, 0.01 dB resolution, 2 kHz tone detection and transmission and an easy-to-read, alphanumeric and backlit LCD. Also included is downloading software, which enables data transfer to a PC via an RS-232 port and bi-directional loss averaging. An optical return loss option enables back reflection measurements from 0 dB to -55 dB at both 1310 nm and 1550 nm.

Circle Reader Service No. 74

OTDR with Windows interface

HICKORY, N.C.–Siecor Corp has announced its 2001-PCw, an OTDR emulation software package that operates within Microsoft's Windows version 3.1 environment. The software is designed for use with Siecor's 2001 high-resolution OTDR.

The package enables OTDR users mouse-style analysis, comparison and batch printing capabilities, as well as compatibility with multiple networks and printers. Further, a global edit feature enable users to update cable/identification labels for a group of traces all at once, instead of one-by-one.

Circle Reader Service No. 75

Fiber optic overlash block

TREVOSE, Pa.–New from GMP is a fiber optic overlash block suited for lashing to new messenger strands from 1/4-inch to 3/8-inch in diameter, or when overlashing to existing lashed cable bundles up to 2 inches in diameter.

The overlash block is easy to raise and attach with the company's wire raising tool, and securely retains the cable and messenger strand for lashing. It weighs 1.5 pounds and is constructed of electro-galvanized steel.

GMP officials say that the block's economical price enables users to affordably employ additional blocks in each span to improve cable support.

Circle Reader Service No. 76

Briefcase-sized earth station

ATLANTA–Scientific-Atlanta has announced availability of a new, portable land satellite communications terminal, dubbed the Model 9826 TerraStar-M, which provides international travelers with global, two-way communications and optional fax and data capabilities.

The earth station weighs under 30 pounds and fits under airline seats and in overhead compartments. A unique feature of the TerraStar, S-A officials say, is its flat-plane antenna, which can be remotely located from the terminal–an important feature when establishing line-of-sight communication with a satellite in inclement weather. For example, sometimes a satellite cannot be accessed from an interior office; rather than carrying the entire unit outdoors, the antenna can be placed on the roof or on a balcony.

The terminal functions as an interconnect to the Inmarsat-M digital satellite communications service. In addition to two-way voice capabilities, the unit will be available with optional fax, date (at 2400 b/s) and voice encryption (at 4800 b/s) ports. (Although Inmarsat doesn't yet offer data and encryption services, the unit is equipped to accommodate these services when available.)

The basic TerraStar-M system, priced at "less than $25,000," S-A officials say, comes with a remotable antenna, terminal electronics with a protective aluminum housing, a telephone and a soft, nylon case.

Circle Reader Service No. 77

Singlemode cable assemblies

ATLANTA–New from GCT Technologies is a high performance line of singlemode cable assembly products for the telephone, cable television and local area network industries. The line includes GCT's S^2PC (for "super-smooth physical contact) singlemode assemblies with FC, SC, D4 and ST-type connectors. Typical insertion loss on the assemblies is less than 0.1 dB; return loss is typically less than -55 dB, GCT officials say. Biconic singlemode cable assemblies are also available.

All GCT jumpers are tested to Bellcore TR-NWT-000326 specifications , according to company officials.

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Compiled by Leslie Ellis

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The Gordian Knot revisited

By Archer S. Taylor, Director and Senior Engineering Consultant, Malarkey-Taylor Associates

That mushroom cloud generated by the critical mass convergence of TCI and Bell Atlantic on October 13 marks the opening of a new era in telecommunications as surely as Hiroshima marked the new era in international relations.

The impact on cable television is likely to develop over time, spreading from ground zero (TCI and Bell Atlantic) to all corners of both industries. No one, probably not even John Malone nor Raymond Smith, can predict reliably the shape of the future. That it will be dramatically different is incontestable, whether or not this particular deal is consummated.

For starters, Fred Dawson was right, back in 1989, when he warned the cable TV industry that it had better become familiar with switching technology because it will soon be a part of the future.

It has been obvious for some time that near-video-on-demand (NVOD) could not compete effectively with true video-on-demand (VOD), especially if VCR-like features, such as pause and fast forward/reverse, were to be provided. And, it is generally recognized that central switching is a more realistic way to provide true VOD, especially in large systems, than with dedicated channels, even with compression.

Not TRACS, Mini-Hub, or Discade

Switched architecture, such as Time Warner's full service network (FSN) and others, differs importantly from TRACS, Mini-Hub, Cabletime, or the older Rediffusion Dial-A-Program or Ameco's Discade (TM). In most of these older switched versions, all channels were multiplexed in the clear on conventional broadband trunk lines. Feeder lines were connected to a series of street cabinets, each of which contained 16 to 32 (more or less) dedicated switches (actually convertors), for every subscriber TV outlet.

In the FSN architecture, on the other hand, a control computer at the headend, known as a "session manager" interprets the message from the user terminal to determine which program the user has selected. After first checking the user's credit, the session manager then instructs the server to assemble the desired program into ATM (asynchronous transfer mode) digital packets, with the user's address imbedded in the packet headers.

The packets are then assigned to a slot in an available DS-3 (45 Mbs) channel to be transmitted by 16 VSB (or 64 QAM) modulated RF carriers in an assigned 12-MHz channel (e.g. in the band 450 MHz or 550 MHz to 750 MHz).

The session manager advises the intelligent set-top interface which channel to tune for the requested program. This highly intelligent box (much smarter than mere humans!) then demodulates the 12 MHz signal, demultiplexes the 10 to 15 compressed video signals and enables the properly addressed program to be displayed.

Statistically, not all of the households in the serving area would require the use of a transmission path at the same time. The particular DS-3 bandwidth carrying the packets with the desired program information would be available only to the user with the matching address. Depending on the traffic loading, therefore, the fiber trunks would need to provide, simultaneously on the 450 MHz to 750 MHz band, transmission paths for only 25 percent to 40 percent of the households in each nodal serving area. All premium programs, including PPV and VOD, would be accessed in this way. basic and extended basic would be carried normally as broadband VSB/AM in the clear at 54 MHz to 450 MHz.

No freedom of choice for pirates

Without access to the switching center, an unauthorized tap of either the fiber or coaxial cables would permit viewing only the particular program someone else had selected. This kind of random peep show, without access control, could hardly engender a financially rewarding piracy venture.

The key to program security, then, would clearly be focused on unauthorized access to the switching facility, whether attempted by means of physically breaking and entering, insider perfidy, unscrupulous hackers, or sophisticated piracy. While security always requires constant vigilance, it could be controlled at the switching center before the product is distributed to the network.

Because the FCC appears likely to prohibit scrambling of basic and extended basic programs, there would be no need for descrambling facilities with the hybrid switched and broadband network architecture such as is planned for the FSN.

Agony over compatibility

Thus, the current agony over compatibility of the descrambling interface could fade away as the ripples from the cable-telco convergence lead to centrally switched architectures. The noteworthy fact is that, except for the sophisticated central switching technology, the present trend to smaller serving areas of 500 or fewer households per node at 750 MHz bandwidth already is quite consistent with the centrally switched configuration.

Moreover, the supposed need for 500 channel capacity (or even more) would become obsolete. The capacity of the program storage files would be virtually unlimited.

Think about it. The impact of TCI/Bell Atlantic is almost certain to accelerate the trend to headend packet switching technology.

Wherever that occurs, the need for scrambling will no longer exist. There may well be other compatibility problems, but this particular Gordian Knot is likely to move into history. CED

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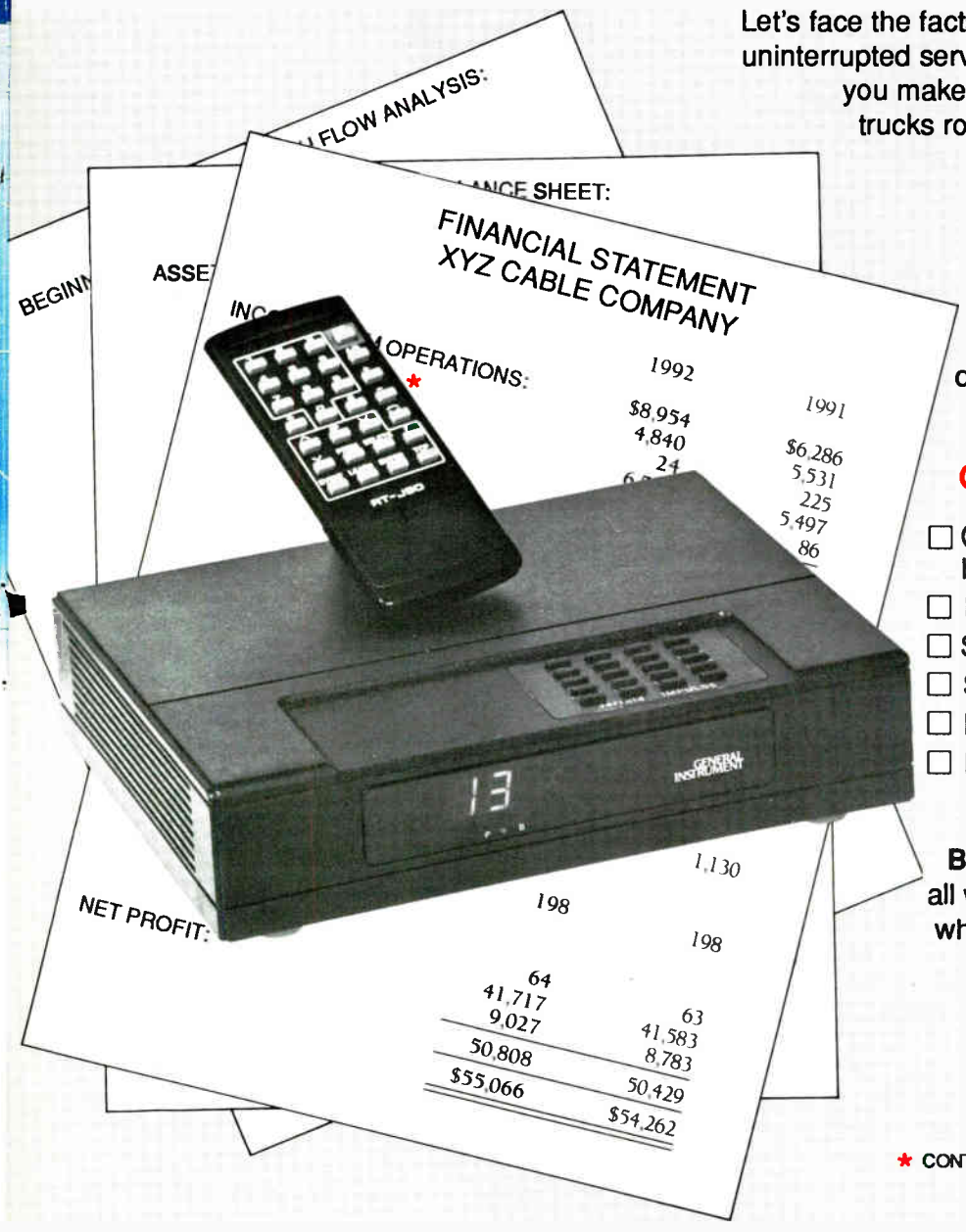

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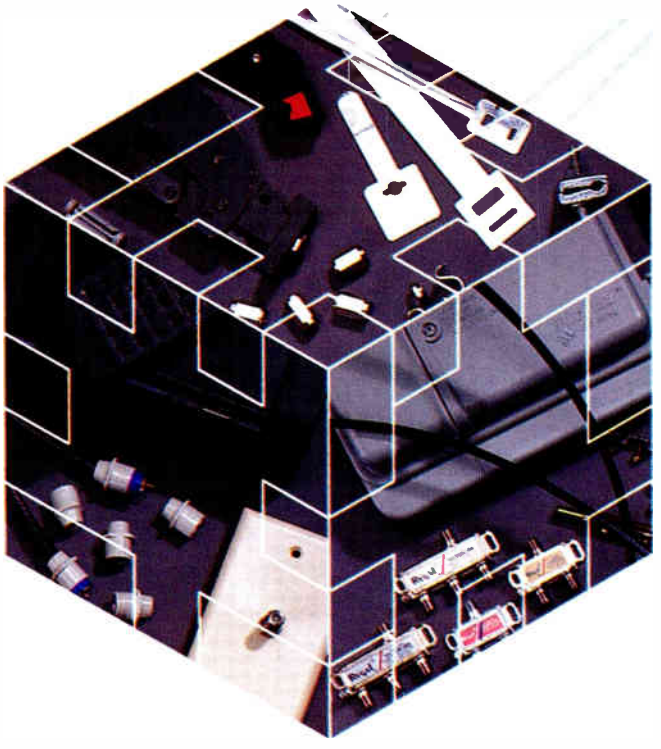

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