COMPLIANCE

CED

THE MAGAZINE OF BROADBAND TECHNOLOGY • APRIL 1999

Can LO produce profits?

—page 35

Measuring fiber optic systems

—page 52

Headend automation: Eliminating human intervention

—page 30

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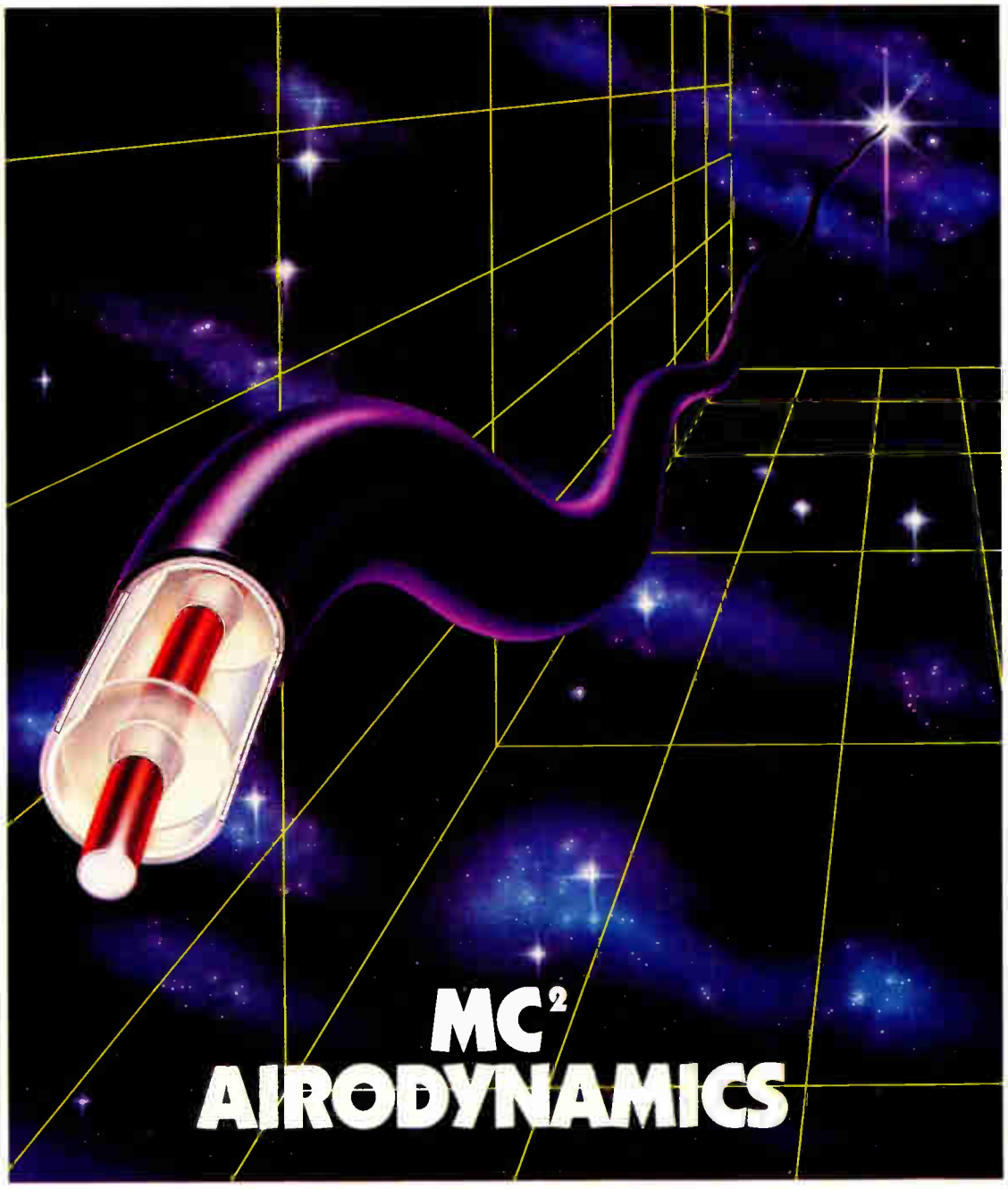

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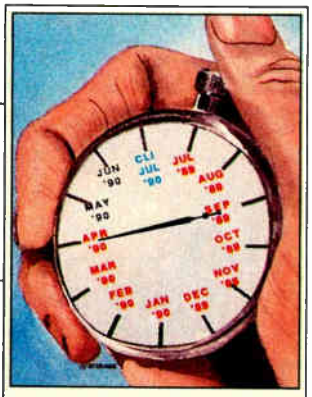
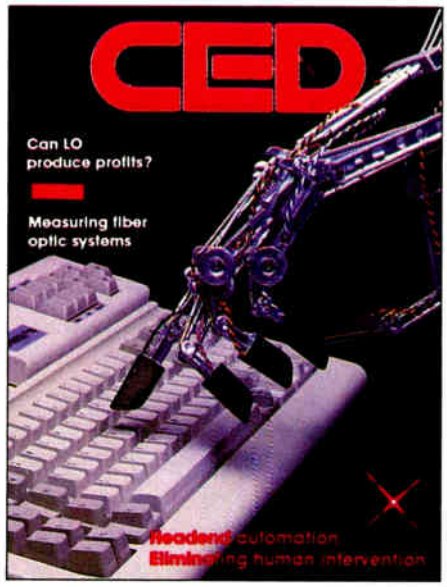


Choosing between flyovers and driveouts, pg. 78.

CED. (USPS 330-510) (ISSN 1044-2871) is published monthly except twice in May by Diversified Publishing Group, a Division of Capital Cities Media, Inc., 600 S. Cherry St., Denver, CO 80222. ©April 1990, Volume 16, Number 4. Subscriptions free to qualified industry readers. All other one-year subscriptions are $36, prepaid in U.S. funds only. Second-class postage paid at Denver, CO. and additional mailing offices. CED is published on behalf of the cable television and broadband communications industries. POSTMASTER: Please send address changes to CED Circulation, 600 S. Cherry St., Suite 400, Denver, CO 80222. MEMBERS OF THE BPA.



About the Cover:
System operators are looking for more benefits through automation in their headends.

DEPARTMENTS

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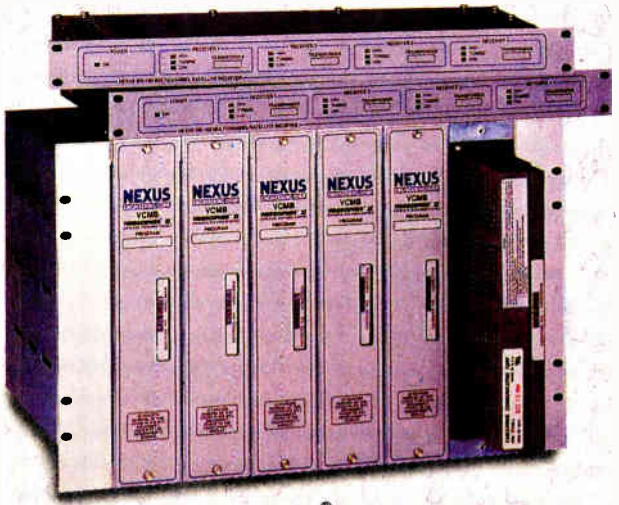

The Nexus VCMB packages six VC®II modules in less than 13 inches of rack space.

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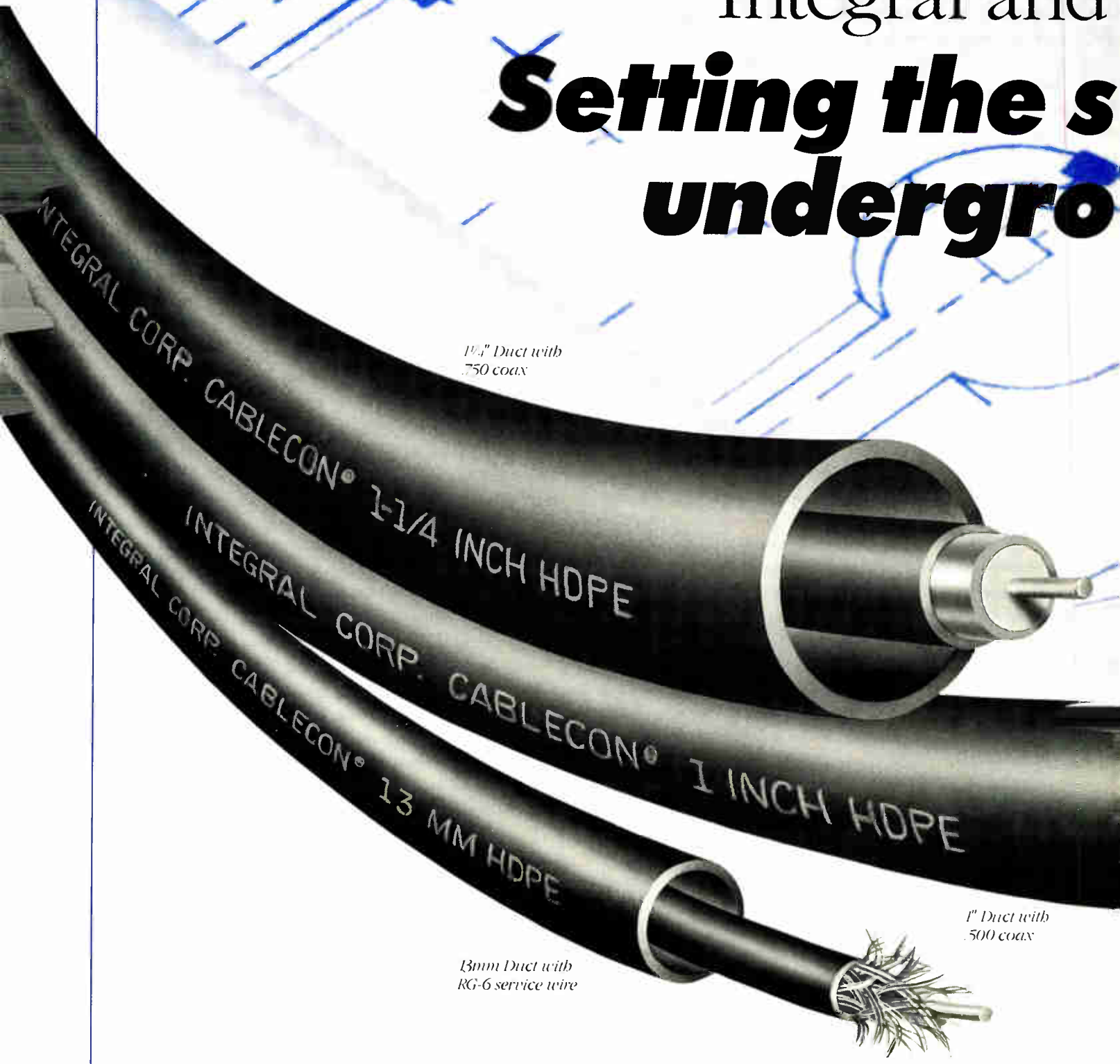

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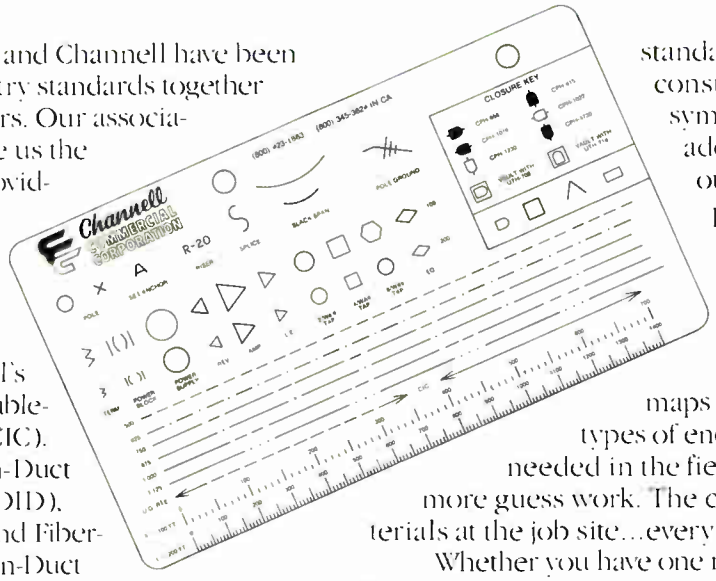

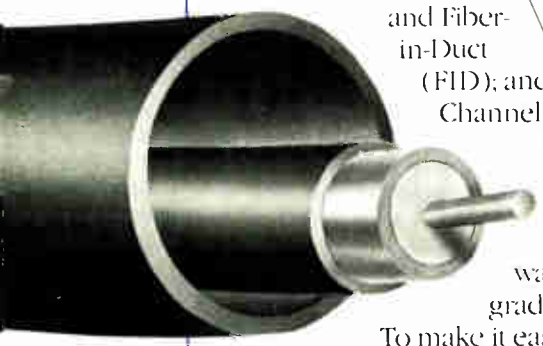

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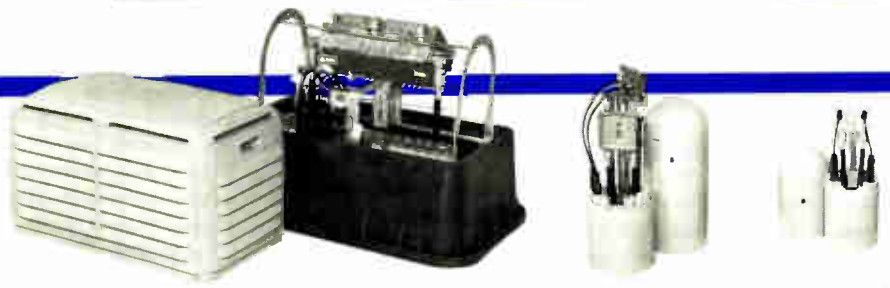


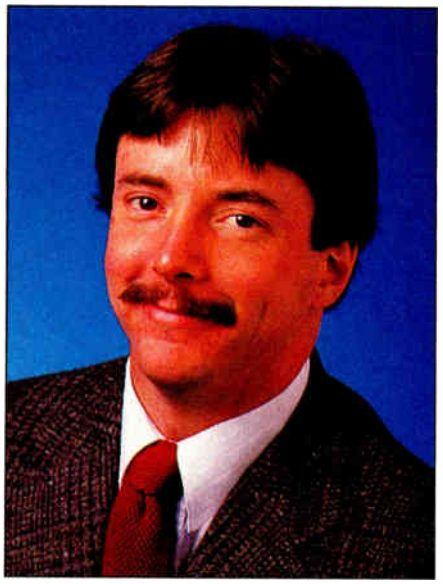
Channell COMMERCIAL CORPORATION

Reader Service Number 4

Political posturing or a real threat?

Ever since deregulation in 1986, the hardware side of CATV has experienced steady growth in revenues which resulted in a host of new product introductions designed to meet the challenges posed by fiber optics and advanced television.

However, that growth may grind to a halt in a hurry if Tele-Communications Inc. takes the hard line on capital spending it has promised in recent press reports. Publicly, TCI officials are saying they plan to scrutinize every cent they spend on capital improvements and one even speculated expenses could fall by as little as 25 percent and as much as 65 percent. Talking privately with a number of industry manufacturers at the Texas Show, I was left with the impression they believe TCI is simply throwing its considerable weight around, promising to halt growth is the industry is re-regulated in any heavy-handed way.



(One manufacturer doubted TCI would greatly reduce costs in 1990: "I know my market share with them and I've already got my orders for product," he said.) Political posturing it may be, but don't count on it.

John Malone, J.C. Sparkman and Tom Elliot—the three men who control the purse strings at TCI—are fed up with the bad press they and the industry at large have been suffering lately. Last year TCI launched a customer-service initiative called "The Customer First" which seemed to fall on mostly skeptical ears. And while it hasn't exactly led the industry in fiber optics deployment, a good portion of its annual rebuild budget falls in that category, yet few notice anything about TCI except its size and clout.

Perceptions of poor customer service, huge rate hikes, long outages and other problems have come to rest on TCI's doorstep probably because it is simply the biggest target out there. But TCI—and other operators—are tired of being compared to the telephone company, rightly pointing out that if consumers spent in excess of seven hours a day on the phone (like they do watching TV) they'd have a different perception of their telephone service and CSRs.

Instead of taking this latest round of cable-bashing quietly, TCI has decided to fight back where it will hurt the most. By cutting back on capital spending, some of the people employed by contractors who rebuilds and upgrade cable plant might possibly lose their jobs. TCI will make sure those newly unemployed people understand it's the lawmakers' fault that they're standing in the bread lines. That way, the vocal Congressmen who have joined in on the cable bashing might find re-election a little tougher next time.

Yes, TCI's move could be a political power play with lawmakers. After all, TCI is a huge machine with a voracious appetite. The hundreds of systems that make up the country's largest MSO face franchise renewals and signal leakage headaches that have to be fixed. Stopping the momentum cannot be accomplished overnight.

But who wants to find out? If TCI slows its machine, others are likely to follow suit and the impact will be felt throughout the industry. Manufacturers' sales orders will drop, research and development dollars will dry up and the products that do exist will cost more. TCI has the power to greatly impact the hardware side of this industry. Let's hope they don't have to wield it.

Roger J. Brown

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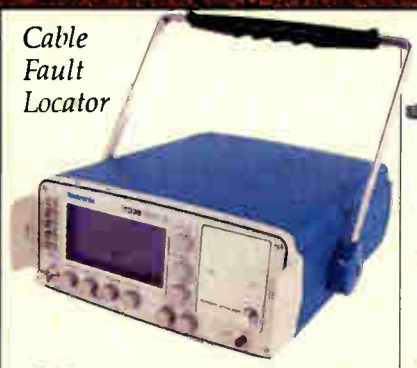

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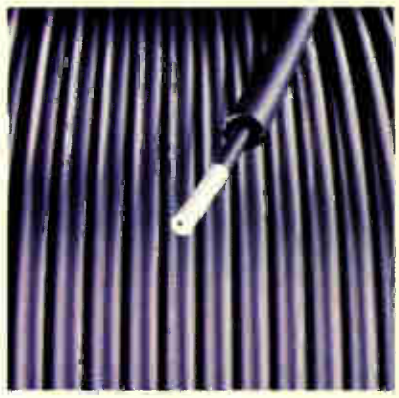

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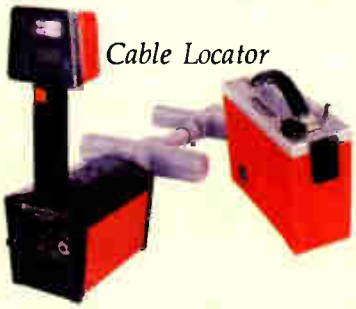

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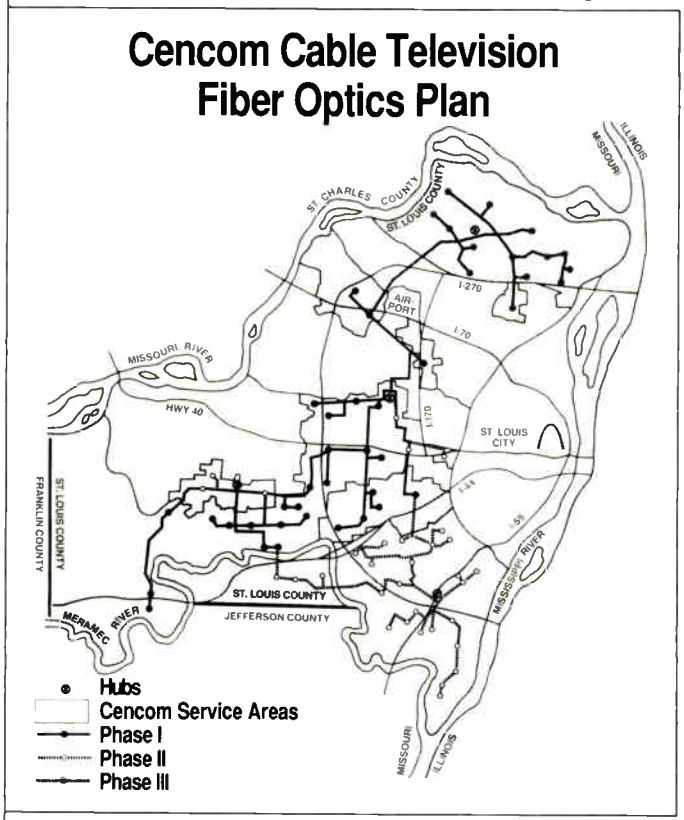
Cencom Cable begins build of 200-mile St. Louis fiber net

After a lengthy period of media attention and hype, announcements regarding the implementation of fiber optics in CATV networks has received little more than passing notice lately. It seems that nearly everyone is installing the technology in supertrunking applications and carefully studying its use deeper into the system.



Quietly, Cencom Cable Associates has joined the ranks of the leaders in implementation, with the construction of a $5 million fiber optic network that is based on ATC's "backbone" architecture and employing both FM and AM transmission schemes.

According to Larry Lehman, vice president of technology and planning at Cencom, the network, which will be built in three phases between now and the end of 1992, will ultimately consist of 200 sheath miles of fiber cable, 90 AM nodes and serve more than 105,000 subscribers throughout St. Louis County in Missouri.

The project was undertaken for two reasons, according to Lehman. The desire to improve service via better pictures and improved reliability was the driving factor, while the need to change out converters from an old Warner-Amex Qube system drove the timing of the endeavor.

The addition of the fiber network will integrate what was originally three separate systems. Cencom acquired the two-way interactive system serving the southern and central portions of St. Louis County from Warner-Amex as well as systems serving the central and northern portions of the county from Group W and Storer in the mid-1980s and has slowly integrated the functions of each into a single entity.

That wasn't an easy process. The 400-MHz Warner system utilized Pioneer's Qube converters, was real-time two-way interactive and consisted of one headend and three high-power AML receive sites. The Group W system was also 400 MHz but was one-way addressable with three headends and Zenith Z-Tac converters. The Storer system, meanwhile, was built to 330 MHz capacity, used just one headend and used Tocom set-tops.

Now, however, Cencom uses the main headend in Olivette for signal origination (including three pay-per-view channels, two of which are stand-alone services).

The architecture chosen by Cencom calls for Olivette to remain as the main headend, with FM supertrunks emanating from that location to three satellite hubs located in the west, south and northern portions of the county. From those locations, AM fiber will branch out to approximately 90 nodes where the signals will be converted back to RF and sent to subscribers' homes over traditional coaxial cable.

Cencom chose ATC's well-known architecture model for the network. That model calls for fibers to run to node locations serving various neighborhoods. From there, traditional coax and amplifiers are used to push the signals to the homes. In St. Louis, the system calls for no more than nine amplifiers to be cascaded between the fiber node and the subscriber, according to Lehman.

Construction of the system has already commenced. Six nodes are already on-line and serving subscribers. Anixter has been selected to supply its Laser Link for the first 12 AM nodes; a vendor for the next 17 nodes was to be selected in late March. The FM equipment, which is scheduled to be running by mid-May, is being supplied by Synchronous Communications. Qube converters will be replaced by Jerrold equipment and the fiber cable is being supplied by Comm/Scope.

Lehman said the fiber portion of the HRC system will load 54 channels on a single laser and expect a minimum performance of 49 dB carrier-to-noise at the last receive site (the longest run will be about 20 kilometers) and distortions greater than -60 dB.

CableLabs, EIA promise more co-ops

With the goal of further galvanizing the relationship between the cable television and consumer electronics industries, CableLabs recently hosted a seminar in which Peter McClosky, president of the Electronic Industries Association (EIA), was a key speaker.

The three-day seminar, held in early March in Boulder, Colo., was attended by about 75 people representing 30 MSOs and focused on case histories of innovative solutions to the consumer interface obstacles presented by addressable descrambling converters and "cable-ready" televisions and VCRs. (For a detailed examination of the problems and some of the solutions to the interface, please see *CED*'s "Consumer Interface Handbook" which supplements this month's issue.)

Although the seminar highlighted a number of approaches to solve the interface problem, most of the attention focused on the EIA-563 plug more commonly known as MultiPort.

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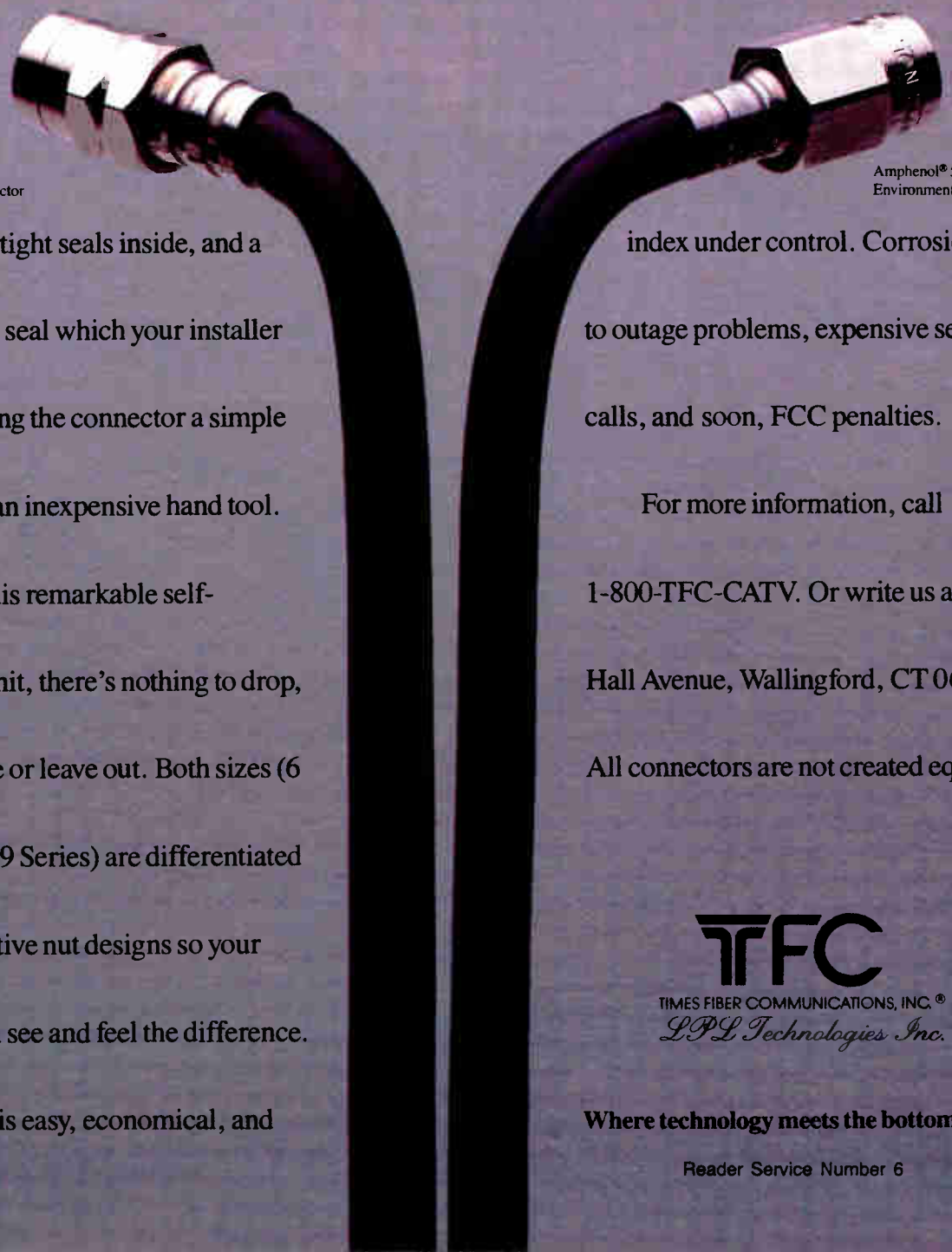

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MultiPort is a product created jointly by the EIA and NCTA. When built into cable converters and consumer gear, the device allows the descrambling functions to take place transparently; that is, consumers are allowed to fully use their remote controls and other features associated with their equipment.

The CableLabs seminar was aimed at provoking more operating managers into seeing the benefits of devices like MultiPort and prompt them into action. Speakers from cable operations included TeleCable President and CEO Richard Roberts, who called for more interaction with the EIA. TeleCable is a leader in the testing and implementation of MultiPort.

Sky Cable venture hangs on compression

Unless you've been hiding under a rock recently, you no doubt have heard that a new Direct Broadcast Satellite consortium was formed several weeks ago with the aim of providing homeowners access to video via a Hughes Communications high power, Ku-band satellite. The announcement caught the fancy of many because it promises to deliver, by digital means, as many as 108 channels of video (including HDTV) and digital quality audio that can be received by flat, napkin-sized dishes that will cost about $300.

The service, dubbed Sky Cable and funded (to the tune of about $1 billion) by Cablevision Systems, NBC and Rupert Murdoch's The News Corp., promises to offer a diverse mix of programming. Cable operators will be allowed to market the service, nevertheless, many view the venture as a direct competitor to cable TV, even though cable has a huge lead in penetration, which will grow between now and the 1993 launch of Sky Cable.

Industry observers believe two real questions remain regarding the venture: can it attract enough viewers to remain viable? and will video compression techniques become mature enough to squeeze 108 channels on 27 transponders?

Experts disagree on the outlook for a breakthrough in compression. While no one is willing to say it cannot be done, to date no one has been able to digitally compress video and have the outcome resemble a high quality NTSC picture (much less HDTV).

VideoCipher reports better turnaround

A VideoCipher II update: The VideoCipher division of General Instrument has successfully fulfilled its promise to reduce repair turnaround times of the much-maligned VCIIC (commercial CATV descrambler).

As mentioned in the cover story of February *CED* ("Can VideoCipher regain cable's trust?, page 26), operators were complaining of turnaround times that often stretched into several weeks. Marvin Blecker, vice president of engineering at VideoCipher, promised to reduce the turnaround time to 10 days or less.

According to a letter Blecker sent to *CED*, it appears he's been successful. "I am delighted to report that...the turnaround for 2/26/90 was at 7.4 days, and we have been comfortably under 10 for several prior days," wrote Blecker.

"This achievement has been accomplished through the hard work of many people under the direction of Dick Armstrong," continued Blecker's letter. "Not only has the turnaround time been reduced, but the ability of the repair center to determine faults and correct them has increased dramatically, resulting in a major reduction in the 'Cannot Duplicate (CND)' rate. This has been accomplished through more stringent control of procedures, improved test methods and new test equipment. In addition, reliability upgrade ECOs (Engineering Change Orders) have been introduced into the repair process."

VideoCipher also recently announced that its Access Control Module is now being installed in British home satellite receivers in anticipation of the launch of British Satellite Broadcasting, a DBS service targeting homes in the United Kingdom.

Telcos gaining video experience

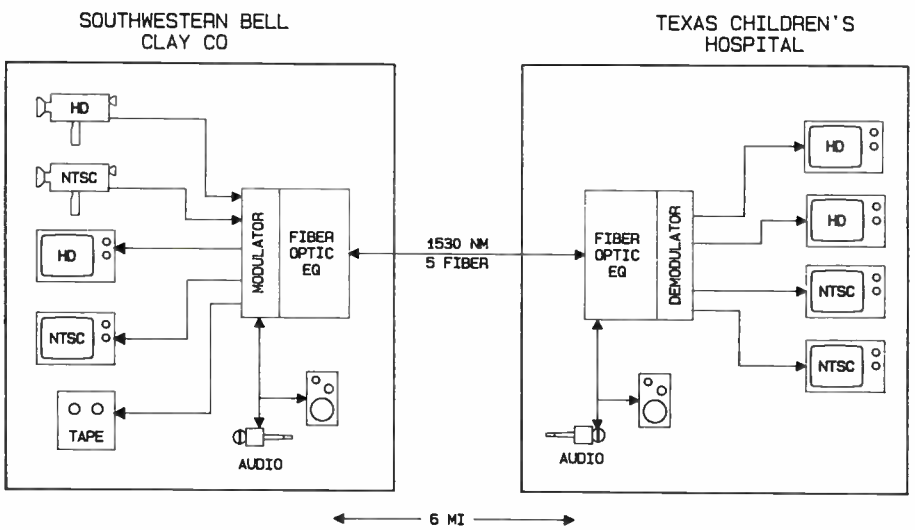
The telcos continue to gain experience in delivering video over fiber. Southwestern Bell recently announced two projects its undertaking; one relating to advanced television and the other regarding an interactive network serving a Kansas school district.

The advanced TV "study" is being undertaken with Texas Children's Hospital in Houston and promises to be one of the first commercial uses of the new technology. A demonstration allowed the transmission of sharp, full-color images of patients via fiber to a remote site (in this case a Bell switching office), and allowed for physicians to consult over the link. The study will be ongoing for some time.

Also, SW Bell will work with two Kansas telephone companies to develop and implement a 168-mile fiber network linking nine school districts. According to Gayle Gordon, manager of video services for SW Bell in Topeka, the network will utilize off-the-shelf analog equipment and employ both the 1300 nm and 1550 nm windows.

—Roger Brown

SW Bell's Advanced TV Demonstration



When it comes time to increase channel capacity, available headend space may be the first problem.

Enter the agile 40C/K or 32C/K IRD.

Additional free space can be created by using Standard Communications new Agile IRD VideoCipher® mainframe and one Agile 40C/K or 32C/K satellite receiver. Our packaging saves you 7 inches of rack space compared to older receiver descrambler designs. In a typical 24 satellite channel headend the total rack space savings is 14 feet. That's 2.3 empty 6 foot racks compared to older receiver descrambler designs. Now that's space available for additional channel capacity.

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The descrambler module mainframe can only be used by specifically approved SCC receivers.
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Reader Service Number 7

James W. Stilwell

Facing up to the challenges

After putting in 20 years of service with TeleSystems Corp., James W. Stilwell retired as corporate vice president for engineering research and development. He offers some simple advice for those entering the work force. "When you get out of college, take a job that you think will be interesting and challenging. Pick the one that offers the best opportunity and for two years, work hard. At the end of two years, analyze what your activities comprise and ask 'Am I being challenged? Am I being improved and am I happy?'

"If, at the end of two years, you feel you don't like the job and you're not growing—by the end of the third year you should have found another job. If you haven't, quit."

Considering Stilwell retired and received a pension based on 20 years of service, this may sound like crazy advice. However, upon reviewing his past, you find five-year cycles throughout Stilwell's career.

The first cycle started after he obtained a degree in mechanical engineering from Stevens Institute of Technology in Hoboken, Pa. in 1942. Working for Linde Air Products, Stilwell designed industrial gas welding, cutting and heat treating apparatus.

Based on his five-year evaluation, Stilwell changed careers in 1949 and opened an appliance store which sold television sets. At the time, Stilwell's shop was one of just two that offered in-home demonstrations of television, which was still in its infancy. The plan was to leave the set for two or three days, longer if the customer wanted. "If the TV stayed for a week, you could bet your money the set never left the house," chuckles Stilwell.

A Jerrold veteran

In 1952, Stilwell closed down the TV service business and went to work for Jerrold as a field engineer in Kentucky, West Virginia, Ohio and western Pennsylvania. "One of my strongest reactions personally at the time," states Stilwell, "was I thought we were doing things that were tremendously altruistic in principle; to open people's eyes up to the rest of the world."

During this era, the number of cable systems multiplied—which also prompted growth in equipment manufacturers. Stilwell was transferred in 1956 to a Jerrold regional office in Dallas. However, in 1959, Stilwell decided to reduce his travel in order to spend time with his family. He resigned his position and spent the next year doing local consulting work. In late 1959, he accepted a position with the Ampex Videotape Division at Redwood City, Calif.

In 1961, Stilwell accepted an opportunity to return East to Philadelphia to serve as Vice President of Engineering for TeleSystems Corp., a multiple system operator and consultant group offering turnkey system construction. "It was a very interesting experience compared with working for a manufacturer," says Stilwell. "I found system operators more willing to discuss their operational problems without concern."

In the late '60s, Cox Broadcasting Corp. purchased a group of TeleSystem's cable properties and the cash infusion allowed the company to build additional systems. Stilwell became vice president for engineering research and development for TeleSystems with greater emphasis on integrating new technologies in CATV. In 1978, Times Mirror Cable Television acquired all the assets, yet Stilwell continued on as corporate vice president for engineering research and development.

"I really feel fortunate that I have a very high intellectual curiosity," Stilwell says of his past and future. "I always want to know what makes things tick, where things go, how things run. So I'm always looking, smelling, touching, trying to find something that maybe we (the cable industry) haven't looked at and maybe that I'd be interested in, too."

This is also Stilwell's rationale for his involvement in so many committees throughout his career and even now, after his retirement. Stilwell is one of three long-standing members of the NCTA Engineering Committee, having served since the '60s with Archer Taylor and Hub Schlafly.

He continues to represent the NCTA on the National Electrical Code (NEC), Panel 16, which deals with the review of industry suggestions for revision to the NEC on a three-year cycle. Past committee work includes the Society of Cable Television Engineers, the Electronic Industries Association, the Federal Communications Commission, the NEC and the National Electric Safety Code.

"I think the biggest problem we're having nowadays," he continues, "is there is such a serious curtailment of ability to get approval to spend the money to attend technical meetings. As a result, we are finding more and more difficulties finding volunteers. At a NCTA engineering meeting, we'd call for a subcommittee chairman report and he'd say, 'Well, I didn't have a meeting, I couldn't get everybody together.' That's a terrible reason," says Stilwell.

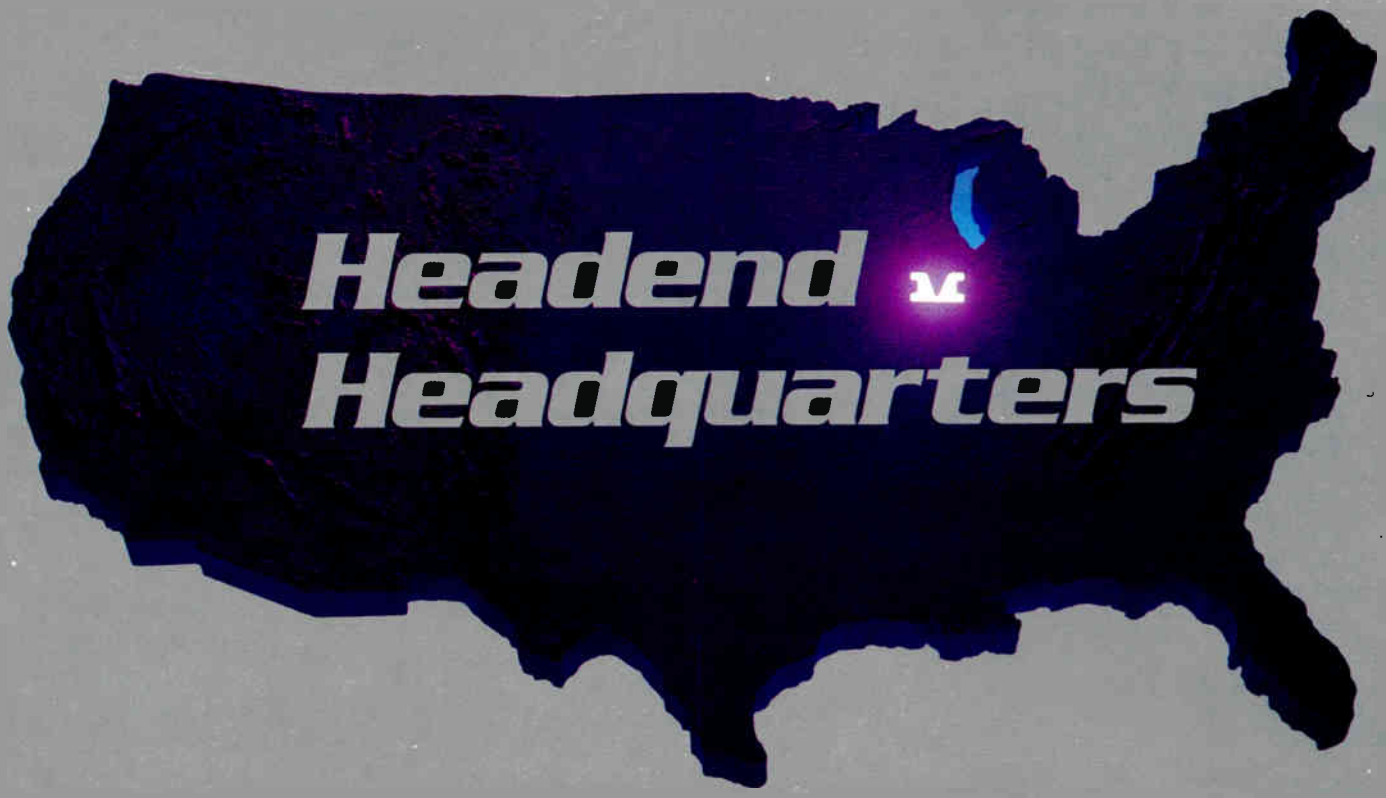
One of the lucky

Stilwell considers himself to be one of the lucky ones. "I'm one of many who have had the desire, the interest, and were fortunately supported corporate-wise to meet, to discuss, to teach and to pry. But in finding corporate support for time and expenses—whatever we can do to close that loop electronically (as in a proposed NCTA electronic bulletin board) will open the door for those who cannot travel."

Regardless, Stilwell is pleased to see the CATV industry addressing the need for higher technical performance through the integration of fiber optics. He is also pleased with the level of technical competence in the younger technical representatives.

As for Stilwell, why hasn't he followed his own advice? Why did he stay in the industry for more than 20 years? "I guess the best answer is because I want to, I have the time, I have the money to do it and I really enjoy it," says Stilwell. ■

—Kathy Berlin



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Reader Service Number 8

Meeting the new service standards

Previous columns I have written have detailed (to some degree) the acrimonious comments, verbal and political abuse that the cable industry has found itself the subject of in recent times. As I and other authors in other publications have said before, most of this abuse is related to two facts: That rates have risen in recent years for basic cable service and a perception exists (and *persists*), that the cable industry does not answer its telephones. The bad thing about this type of criticism is that it is relatively formless. It is nonspecific. It is anecdotal. Those who fault our industry often speak in generalities or refer only to isolated personal experiences.

Creating performance standards

Many of our cable colleagues and many of the companies that are members of NCTA work very hard at providing good customer service and many of them have creative methods for providing top-notch service to their customers. This has not stopped Congress and the FCC from being swayed by individual complaints from one region or complaints directed at one specific company. It also has not stopped those who would like to see us do poorly from dragging up page after page of alleged abuses and distributing same to the legislators and regulators in Washington.

Several weeks ago, after many months of hard work, a committee of the NCTA Board of Directors gave final approval to a set of customer service standards which was then approved by the full Board itself. This set of standards contains several key provisions which are important for our industry's continued health. These standards are directed toward several cable system activities that are perceived by our critics to be places where improvement is warranted.

In particular, they address: The amount of time in which a cable operator should handle an incoming telephone call (in 30 seconds, including answering, transferring, and holding; and furthermore, customers shall not receive a busy signal more than three percent of the total time the cable office is open for business); the time a cable subscriber shall receive a standard installation (within seven days); the time taken to respond to service interruptions (24 hours); supplemental operating hours for customer service centers; and issues dealing with communications, bills and refunds.

> This set of standards contains several key provisions important for our industry's health.

The committee that worked on this project wrestled long and hard with a lot of these points, and in fact a lot of other particular numbers and issues were proposed and eventually abandoned. Some issues were controversial; some, it was felt, were currently being handled so well by the industry that it was not necessary to include them.

A good set of criteria

The point I would like to make about these standards is this: They are good standards and they are useful standards. Their primary use is to lay out a system of goals which will allow us to be measured by something specific as opposed to being picked and nagged to death by people who say, in general, that we provide bad service but can only prove it with anecdotal incidents. There are many cable systems that can claim that in some respects they perform better than these standards. Unfortunately, there are some who do not do as well as these standards.

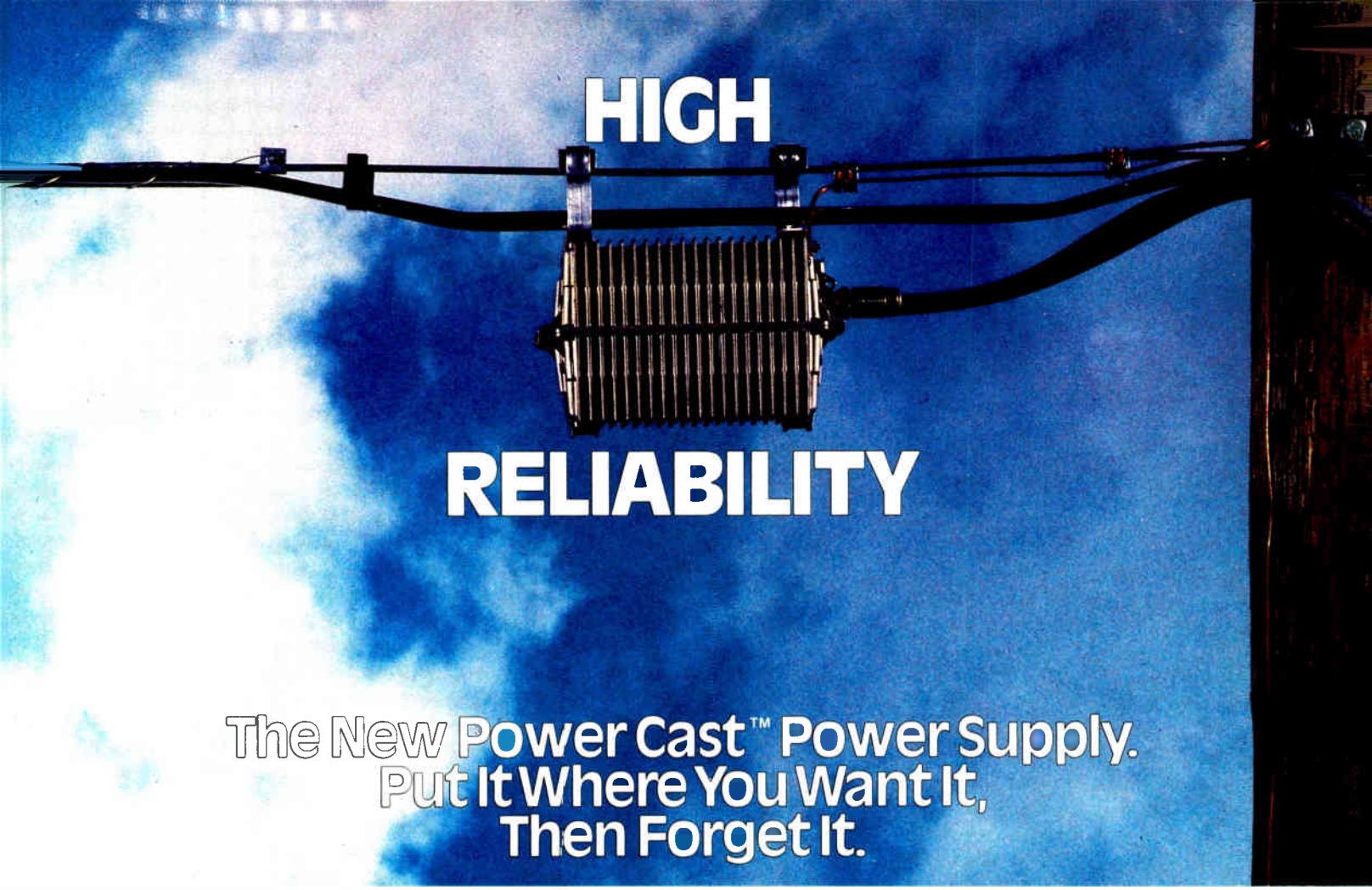
It is the desire of the NCTA and of the people who worked hard on this document to see all cable companies meet or implement these voluntary standards by July 1, 1991. And I am confident that can be done. I am also confident that as soon as the companies begin working on meeting these standards and putting in place mechanisms and procedures necessary to measure their compliance with these guidelines, many of the industry professionals will find ways to do better. Nothing challenges the cable industry more than having goals to reach, and nothing generates creative effort like reaching those goals and wanting to prove that we can do better. I fully expect that the cable industry will be doing at least this well by July 1991, and in all likelihood will be doing better by that time.

No longer nebulous

A great debt of gratitude goes to the 30-plus cable professionals who met many times over long days to hammer out these particular words. Each one represented companies with much to gain and potential expense to be borne, yet all entered into the negotiations with one thought in mind: helping to define the correct way to show that we can and do provide good service to our customers. Our critics can still criticize and our enemies can still attempt to do us ill, but they will no longer be able to do so by vague reference. If it turns out in the future that these standards are not tough enough or are too lenient, we can make specific reference to those problems as they arise.

But from here forth, we can say that the cable operator that meets or exceeds these recommended cable industry customer service standards is operating properly and adequately. Let our critics find other reasons to criticize us. In the meantime, we will do what we can to provide customer that we can be proud of. ■

By Wendell Bailey, Vice President Science and Technology, NCTA



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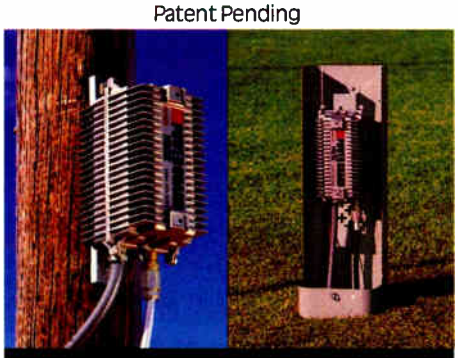

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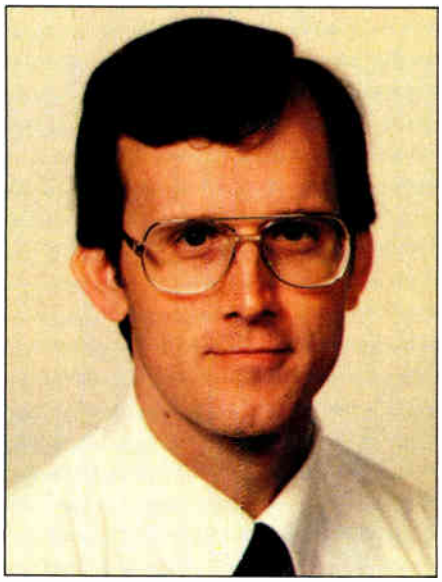
Reader Service Number 9



Pre-emphasis and de-emphasis

The International Radio Consultative Committee (whose initials for the French language translation are CCIR) is a permanent Committee of the International Telecommunication Union. According to the charter specified in each of its published documents, the committee's purpose, on a multinational basis, is to ensure efficient utilization of RF spectrum, recommend international performance standards and disseminate information for the planning and operation of radio systems.

The definitive document

Many years ago, it was out of this committee that recommendation 405-1 was published. CCIR Recommendation 405-1 is now *the* document that has become the satellite video-emphasis standard for our industry. The equations, specifications and graphs of emphasis transfer functions are given for both 525-line (NTSC) and 625-line (PAL) systems.

For those without access to the document, I have reproduced the equations and the graphs of the pre-emphasis and de-emphasis functions in Figure 1.

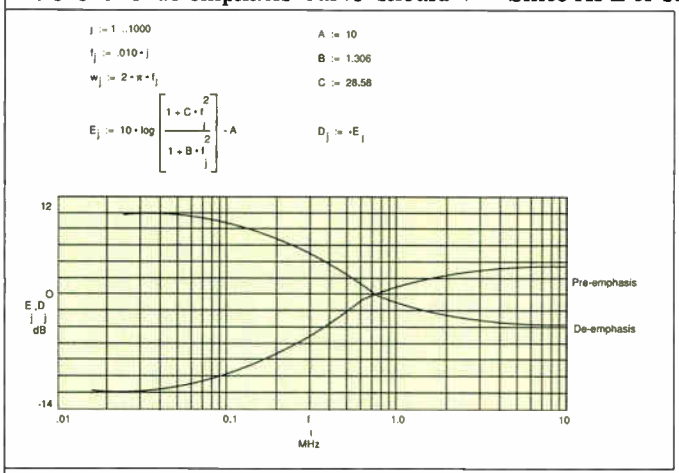
Note that the pre-emphasis network actually attenuates the low-frequency components (less than 100 kHz) of the video waveform by 9 dB to 10 dB prior to transmission over the satellite. It then gradually decreases the amount of attenuation, until at 761.6 kHz, the so-called crossover point, the network provides 0 dB of insertion loss. Above 761.6 kHz, the pre-emphasis network provides some actual *emphasis* or gain to the signal, achieving about 3.2 dB at the color subcarrier frequency before reaching a plateau very quickly thereafter.

The de-emphasis network, of course, provides the inverse function at the receive end of the transmission link. It provides about 9 dB to 10 dB of *gain* for the low-frequency (less than 100 kHz) video components and 3.2 dB of *loss* at the color subcarrier frequency. Again, the crossover frequency for the de-emphasis network is 761.6 kHz.

RS-250B graph in error

Those who have a copy of EIA Standard RS-250B will find a similar set of graphs at the end of that document.

Note however, that the de-emphasis graph shown in RS-250B is in error. The entire de-emphasis curve should be shifted up on the graph by about 6.6 dB in order to place its 0 dB cross-over point at 761.6 kHz.



According to 405-1, the emphasis network chosen was a compromise based on a number of factors—only one being the contribution that the emphasis networks provide to the overall video S/N performance of the link. In fact, according to another report published by the CCIR, 637-1, the S/N improvement provided by the emphasis networks in this case is only about 2.9 dB. Other factors were also considered.

A potential reduction in differential phase and differential gain errors through the transmission link is possible with pre-emphasis due to a couple of reasons. The fact that much of the high-level, low-frequency video information, as well as the Average Picture Level (APL) information, has been significantly reduced in amplitude prior to transmission, helps to protect any baseband amplifier in the chain (prior to de-emphasis) from potential saturation or compression with changes in the brightness of the scene. (Remember, differential gain and differential phase are defined as *changes* in the amplitude or phase of the color subcarrier [high frequency] with changes in the instantaneous brightness of the scene—which is APL sensitive).

Gaining headroom

Therefore, reducing the amplitude of the low-frequency information prior to transmission gives the baseband amplifiers in the chain *some* "headroom." But more importantly, as we shall see, it also helps to keep the carrier frequency of the FM signal centered within the FM links pass band response.

Since APL or scene brightness information is a very slow, time-varying component of the video information, the amount of brightness or APL in the signal will determine the center frequency, or offset, of the FM carrier being transmitted over the satellite. The objective is to center the carrier, as much as possible, within the transponder or other filter networks in the transmission path (i.e. receiver IF filter) so as not to encroach on the skirts of the filter where group delay and amplitude distortion could cause a problem with differential phase and gain.

By using pre-emphasis to significantly reduce (by 10 dB) the amplitude of the APL information being used to modulate the uplink's FM modulator, the "wandering" of the center frequency of the FM carrier with changes in the brightness of the scene is kept to a minimum, giving further headroom to the transmission system (keyed AFC also helps). ■

By Chris Bowick, Vice President of Engineering, Headend and Earthstation Systems, Scientific-Atlanta, Inc.

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Reader Service Number 10

'Video dial tone'

A new bit of jargon is working its way into debates over communications policy. In its recent Notice of Inquiry on cable television, the FCC asked for comments on whether the "video dial tone" would be a good solution to the alleged shortage of competition in the local television marketplace. Nobody quite knows what a video dial tone is, but policy makers and communications lawyers are throwing the term around these days as if everybody understood it.

The genesis of the concept

The concept of a video dial tone was introduced a couple of years ago in a National Telecommunications and Information Administration (NTIA) report on cable television and the video marketplace. That report, like the current FCC inquiry, addressed the whole range of issues involving competition in the cable industry. One such issue, of course, is whether the law prohibiting telephone companies from owning cable television systems in their telephone service areas should be retained or repealed.

NTIA concluded that, although it might be desirable to have more competition in the local video marketplace, letting the local telcos in as cable operators was not a good solution. The risks of anticompetitive behavior by the telcos were just too great. But NTIA believed that telco facilities might be used to provide a more competitive television marketplace. If telcos were allowed to provide their facilities on a common carrier basis to competing providers of video programming, consumers might be able to choose from among several providers instead of from a single cable operator.

Telcos, however, are already allowed to lease broadband facilities to cable operators and video programmers on a common carrier basis. And such leasebacks, which usually look just like traditional cable systems, are fairly common. Is this what NTIA meant by "video dial tone"? And, if so, what's the big deal?

It's pretty clear that traditional leasebacks by telcos to cable operators are not what NTIA had in mind. But what NTIA did mean—and what others mean today when they use the term—is not so clear. There are several ideas that may be embodied in the notion of a video dial tone.

One is premised on the belief that fiber optics will some day provide virtually unlimited capacity on a single facility that brings cable television to consumers. In this scenario, the owner of that facility could lease capacity to a large number of competing cable operators, each of which would offer its own packages of programming to consumers.

A leased access medium

Presumably, consumers could subscribe to the program offerings of one or more of these packagers. Another scenario for the video dial tone essentially turns cable television into a leased access medium, with no cable operators or packagers at all. Under this approach, cable programmers could simply lease capacity on the broadband facility, and subscribers could order programming on an *a la carte* basis.

Assuming the technological feasibility of these approaches, the only legal impediments to the provision of such facilities by telcos are (1) that they have to convince regulators that common carrier broadband facilities will be economically viable and (2) that the providers of video programming over such facilities obtain franchises from local franchising authorities. Nobody quarrels much about the first requirement, but the second—the requirement in the Cable Act that all cable operators obtain franchises—is viewed by some as the only impediment to the wonderfully competitive world of video dial tone.

Eliminating the franchise requirement, however, would undermine the policy objectives and the comprehensive regulatory framework embodied in the Cable Communications Policy Act of 1984.

While the Act largely deregulated cable rates, franchising authorities retained significant regulatory authority. They're entitled, for example, to impose public, educational and governmental access channels, to define service areas, to establish franchise fees and to impose equipment, facilities and customer service requirements. They're entitled to select franchisees—and limit the number of franchises—in order to ensure that these regulatory requirements, which Congress authorized, can be achieved.

Effect on programming

Moreover, to the extent that the video dial tone simply transformed cable systems into a leased access system, it would have drastic effects on the nature of cable programming. The number and types of services currently provided by cable systems reflect the fact that cable operators have incentives to maximize their subscriber base by offering a diverse array of programming. If every programmer—including local broadcasters—had to pay the identical, nondiscriminatory rate to lease a channel on a system, some services that are less profitable but add to the diversity of available programming would inevitably disappear from systems.

That's why Congress specifically refused to impose a common carrier, leased access model on cable television and refused to require nondiscriminatory rates even on the several leased access channels mandated by the Cable Act. As the Congressional committee that wrote the Act explained, "a cable operator who would have to provide access to all programmers at the same price would inevitably be forced to set an average price which was lower than the fair market price for certain uses of the cable system by certain sources, while being much higher than the fair market price for other services."

These are the sorts of things that policy makers are going to have to think about as they attempt, before deciding whether a video dial tone is a good idea, to determine just what is meant by that still illusory notion. ■

By Michael Schooler, Deputy General Counsel, NCTA

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Reader Service Number 11

Reregulation pressure rises

The February meeting of the NCTA Engineering Committee was held in Washington, D.C. with Walter Ciciora chairman. The first order of business was a description of customer service busy phone studies available from Orbital Technologies. This service can be used to determine requirements for additional lines or CSRs. This was followed by subcommittee reports.

Allocating spectrum

ATSC—Jud Hoffman. The technology groups of the ATSC met February 13 at NAB. Technology group 3 reviewed an FCC Notice of Inquiry regarding allocation of spectrum above 1 GHz for Broadcast Satellite Service. The recommendation was 10 transponders occuyping 500 MHz and cross polarized using a digitally compressed video signal. The NOI is in preparation for WARC '92.

Specialist groups 2 and 3 are investigating the interoperability of the various alternative media with terrestrial transmission and requirements for the digital transmission of audio, encryption, access denial and other auxiliary services.

Consumer Electronics Bus—Jud Hoffman. The majority of the power bus standard was distributed in January. General Instrument has taken over the development of the coaxial bus specifications from Scientific-Atlanta. The committee is considering the distribution of digital audio services below channel 2. The committee needs cable industry input to help ensure the proposed coaxial system does not interfere with cable operators' future plans.

I.E.C.—Ike Blonder. The European Common Market is expected to require imported goods to meet the government mandated standards. This could pose hardships for U.S. manufacturers if the U.S. government is seen to be not developing standards. A meeting by the N.I.S.T. in April is to discuss the possibility of the current voluntary standards organizations being put under the control of the government.

In-home Wiring—Larry Nelson. The purpose of the subcommittee is to help the cable industry deal with consumer self home wiring. CableLabs is investigating the preparation of a manual for the new building construction industry.

The primary purpose is to provide builders with a guide of proper installation procedures. This will help ensure that the wiring installed at the time of construction is acceptable to the local cable company. The current situation often results in substandard wiring which the cable company cannot use.

HDTV—Tony Werner. Analysis of the wideband channel characteristics data is continuing at the Canadian Communications Research Council. This characterization will help determine the effect of the cable plant on a TV channel wider than 6 MHz. The advanced TV test procedures for cable have been revised with the tests for cross modulation and compatibility with cable AGC systems deleted. It was felt that there are other distortions which limit cable system operations before cross-modulation.

VideoCipher improvements

Satellite Practices—Paul Resch. The introduction of modifications to VideoCipher II to improve reliability are continuing on schedule. GI is looking for a couple of systems to be beta test sites to ensure the instructions and modifications are correct and field installation is practical. The VideoCipher II system was tested to ensure video with Faroudja improvements would pass without degradation. The tests were successful.

Standards—Mike Jeffers. Mike resigned as chairman of the subcommittee and Bert Henscheid and Dick Shimp have agreed to co-chair the subcommittee. The second edition of the recommended practices is available for purchase. The next task for the subcommittee will be to develop practices for fiber optic plant.

Signal Leakage—Ted Hartson. The subcommittee met with John Wong of the FCC. Wong answered a number of questions on the interpretation of the rules, filing requirements and proper completion of the new Form 320. One form must be completed for each community identifier but only one ground or airspace test needs to be done. If parts of the system are separate from the main system (i.e. a development remote from the city) and fed by microwave, fiber or low-level supertrunk, then it can be considered a separate test area. Large systems split up with hubs but with the boundaries of the various hub areas touching each other have to be reported as one test area.

Making cable compatible

Multichannel Sound—Alex Best. It was decided to reform the committee to address audio quality on cable with Ned Mountain as the chairman.

ARRL/NCTA—Bob Dickinson. The major concern of the league is leakage from SMATV systems. At the present time these operations must only comply with the leakage requirements of Part 15 of the FCC regulations. Pressure is increasing for the Commission to review these requirements and place SMATV systems under the same leakage requirements as cable systems.

NEC—Jim Stillwell. Work is beginning on the next revision to the Code. Ground lugs installed on the base of meter housings are still a manufacturing option. The manufacturers association is blocking making them mandatory due to the cost. In the meantime the cable and phone industries are having a difficult time, in some instances, locating a good bonding point for ground wires.

Washington Update—Wendell Bailey and Jeoff Krauss. The pressure to move a cable reregulation bill through the Senate is increasing and there may be something passed before the summer break. The House is not expected to pass a bill this session but will probably move something next year. The industry must work to improve its image with congress and, thereby, minimize the effects of new regulations.

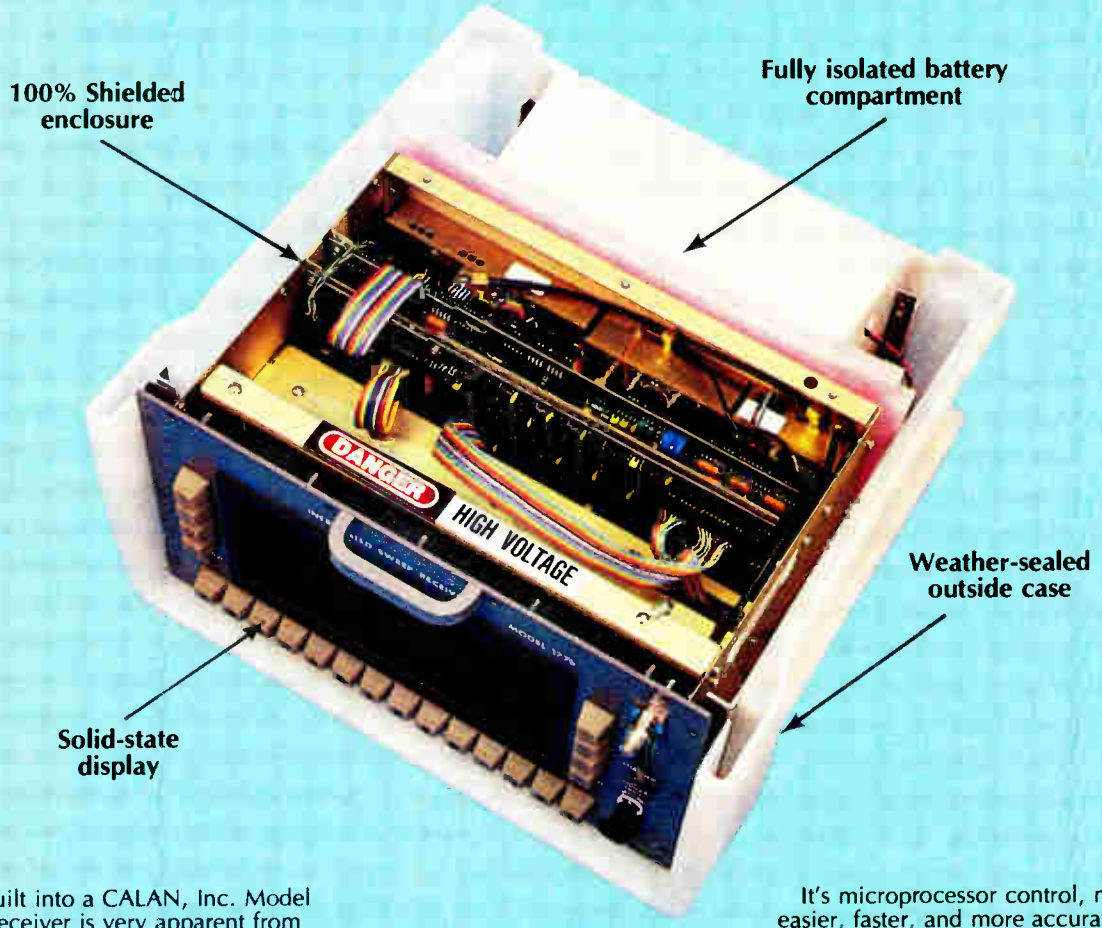
The National League of Cities wants to work with the industry to adopt minimum technical standards which could be applied by the cities and would be consistent across the country. The NCTA board adopted customer service standards which did not include any specific technical standards. Operators have 18 months to bring their systems into compliance with the voluntary standards.

The FCC is proposing to allow SMATV operators access to the 18 GHz band for multichannel microwave links between buildings. This is part of their effort to increase cable's competition.

The FCC is also reviewing the effective competition rules to determine if three local channels can still be considered sufficient to provide competition or if new criteria are necessary. ■

By Brian James, Director, Advanced TV Testing, CableLabs

The Inside Story on Reliability



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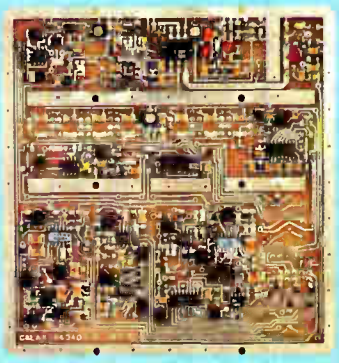

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Reader Service Number 12

Design considerations for headend switching

Recent regulatory decisions have imposed some new and somewhat difficult technical problems on the cable engineer. These decisions may obligate the operator to switch sources of cable programming to protect the local broadcaster's syndication rights or for non-duplication of network affiliates. Other switching needs, such as sports blackouts and regional services switching, are also increasing and can further complicate the overall problem. Combining these with multiple system responsibilities, the incorrect solution could be quite costly and extremely inflexible if pre-planning is not involved.

Understanding the problem

Before any solution can be implemented, the engineer must have a thorough understanding of the problem to be addressed. This should direct the operator to the most logical and cost-effective technique to cover current and expected future needs of the switching system to be installed. As with any complex problem, the best solution is usually derived by breaking the problem down into simpler questions and combining the answers. The switching problem is a good example. Let's consider a series of questions that can help in conceptualizing the desired switching system.

By Terry Bush, VP Instrument Div., Trilithic Inc.

Design Table

Channel	Sources	Format	Stimulus	Comments
2	Local (P) Char. Gen. (S)	I.F.	Time	Syndex
7	Local (P) News (S)	I.F.	Drop-Out	Replace
A	Shopping (P) News (S) Char. Gen. (S) Return Video (S)	Video	Time	Multi-Source
13	Local (P) Char. Gen (S)	I.F.	Time	Non-Dup.
R	Sports (P) Sports (S)	Video	Tones	Blackout
W	Sports (P) Sports (S) Sports (S)	CBB & Sat Tune	Time	Regional Services

Figure 1

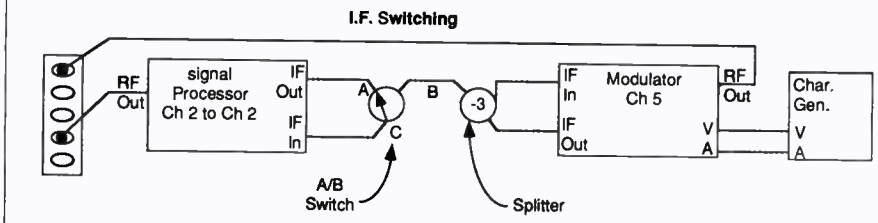

Figure 2

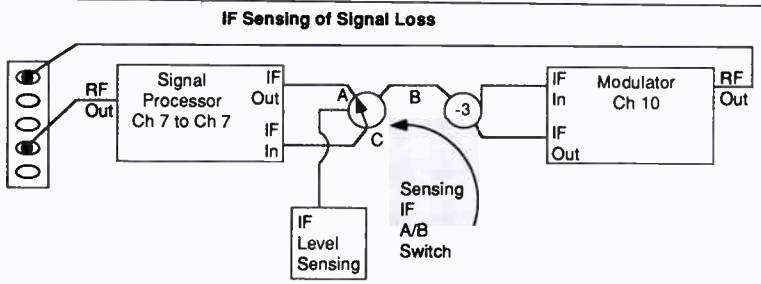

Figure 3

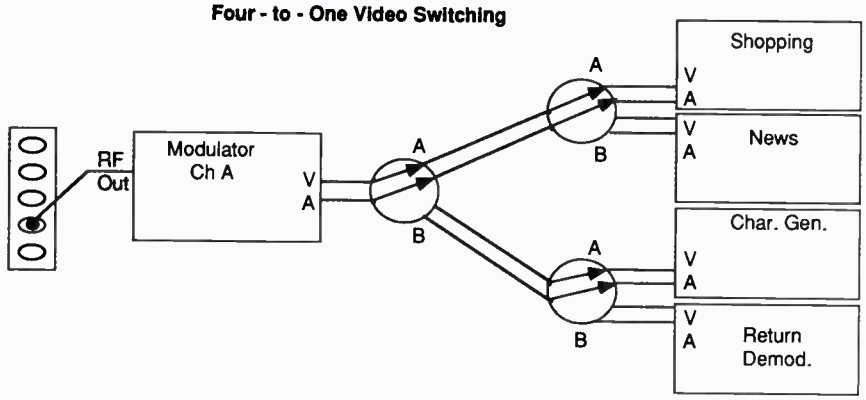

Figure 4

What do you need to switch?

If the answer to this question is nothing, contratulations, you just solved the problem. You may now continue reading or proceed to other interesting articles within this magazine. But if one or more services must be switched, further considerations are needed. With pen and paper in hand, examine the system channel plan. Log down the channels which have conflicts or may need source switching. Remember, non-dupe or syndex conflicts require the switching of other channels as defined by the requesting station. Suspect sports channels, broadcast blackouts and local switching needs should also be in-

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vestigated. Once the target channels are defined, we are ready for the next question.

What is to be substituted?

Now that we have defined the system channels that need some form of switching, we must create another column on the paper identifying the sources of alternate programming. Depending on the channel, one or more sources may be desirable and should be logged next to the channel under consideration. Because of inconvenient or expensive switching approaches, some of these sources may be ruled out, but for now, make out your wish list.

What stimulates the substitution?

Now, next to each substitution source, we must indicate the main criteria used to switch the service. For instance, a syndex violation will probably be resolved by time switching. For other switching, other prompts are available, dependent on the channel and substitution source. These may include tone transmission, V.I.T.S. data, subcarrier data, loss of carrier, and other circumstances which must be considered. Remember, in the case of sporting events, you may not know when to switch back, so proper planning is really needed to avoid customer aggravation.

> Before any solution can be implemented, the engineer must have a thorough understanding of the problem to be addressed.

What format is available?

Many different formats of the same video information are generally available to the engineer. These include baseband video, composite video, I.F. carriers, processor retuning and satellite receiver retuning. Any one, or a mix of these, may be used, depending on the complexity of the switching problem. Look at I.F. switching first. I.F. loops are generally provided as standard features on most commercial equipment and some options include internal switching. And, because I.F. frequencies are normally a standard, vendor-to-vendor compatibility is usually not a problem. But, beware of levels. Multi-tapping or differences in I.F. levels can reduce the signal quality or overload the output converter, creating new problems.

Baseband and composite video is probably the next best consideration. These sources are available from tape decks, demodulators, character generators, satellite receivers and de-scramblers and are generally compatible with all channel origination equipment. Remember, more than one source of replacement information may be desired per channel and a common format should be selected when feasible.

Pulling it all together

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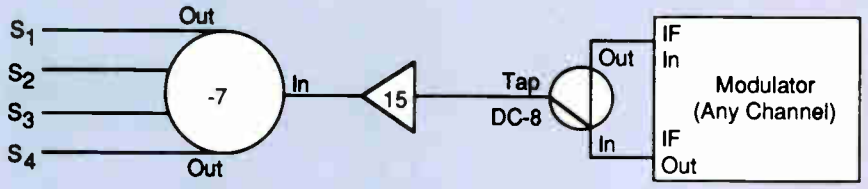
Multi-tapping a common IF source



Note: Amplifier Gain = Tap Loss + Splitter Loss

Figure 5

Tone Sensing Switch Logic

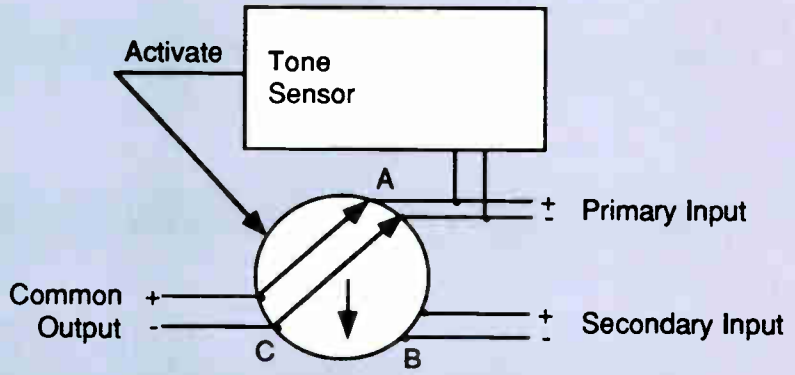


Figure 6

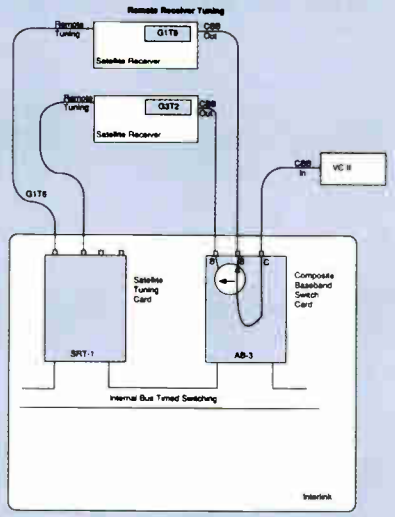


Figure 7

design for source switching (see Figure 1). Each channel for switching should be assigned a primary and secondary source. The desired information format and the method of switch stimulus should also be identified, as with any other pertinent information.

In this example, channel 2 is a syndex violation which is to be switched at certain times. The format of the signal to be switched is I.F. and the second source is a character generator connected to a modulator with an I.F. loop (see Figure 2). Channel 7 requires a replacement source due to off-the-air conditions. A simple tuned receiver switch or smart processor contact closure will initiate this switching (see Figure 3). Channel A requires the time related switching of four sources of video. A logical combination of three switches will allow four-to-one switching (see Figure 4). In most cases, I.F. switching would be easier, but video signals may be switched with the correct hardware.

Channel 13 would be switched similar to Channel 2 and possibly using the same source, if I.F. levels permit further tapping. An I.F. amplifier could be used if multi-tapping a common source is desirable (see Figure 5).

Tones, if available, may also be used to stimulate a source change. In the example, Channel 7 requires tone switching from a primary source to a secondary source. The operator should investigate the multi-tone sequence for switch and switch back commands supplied by the carrier. This information will be needed to properly program the switch prior to activation (see Figure 6).

Other less direct techniques are also available to the engineer, if warranted in the design. Products are available that allow remote programming of satellite receivers (see Figure 7). In this example, a primary sports feed on Galaxy I, transponder 9 has alternate programming available on Galaxy I, transponder 6 and Galaxy III, Transponder 2. A combination of remote receiver tuning and composite baseband switching will allow the desired sourcing to the descrambler.

Typical switching applications

When the switching network is to be constructed from simple switching modules (A/B), the engineer will find it very easy to create complex switching subsystems. For instance, as seen earlier, three basic switch blocks may be utilized as a programmable four-to-one routing switcher (see Figure 7). This configuration will route either A or B or C or D to the common port. Another configuration which might prove useful is the parallel routing switcher (see Figure 8). This circuit may be used to switch in scramblers, filters, attenuators or other serially fed devices. Again, multiple switches can increase the parallel routing capacity.

"Ganged" Switch Activity
Parallel Routing Switch

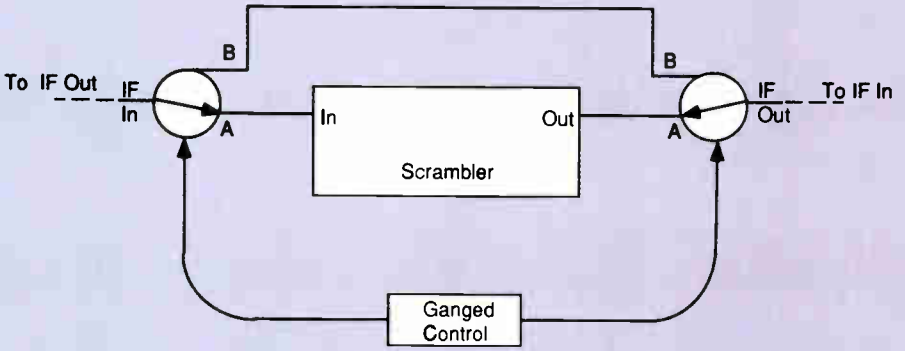


Figure 8

Matrix switching

One of the most convenient but costly switching systems is the programmable RF matrix. These devices, usually defined by two numbers indicating the number of input and output ports (example: 2x4), are a very powerful tool when used as routing switchers. The non-blocking matrix switch allows numerous inputs to be connected to any or all outputs.

A simple non-blocking matrix switch may be constructed from splitters and A/B switching modules (see Figure 9). In this diagram, splitters have been used to impedance match different sources to different RF loads. A terminator has been connected to all primary ports to assure good backmatch and isolation. Also, the switches have autotermination of the unused port, allowing the source to see a valid load termination when disconnected.

To operate the switch, activate switch one (SW #1) to position B. The sources of RF at port 1 is now connected to port A. We may also activate switch three (SW #3) to position B and connect the load on port B to the source at port 1. In any position, the sources and loads always see a valid termination, whether connected to a I.F. input or resistive load. It should also be noted that the signal routing, although constant, will always see a loss relative to twice the number of splits. This may dictate pre-amplification of the source signals if the matrix is large.

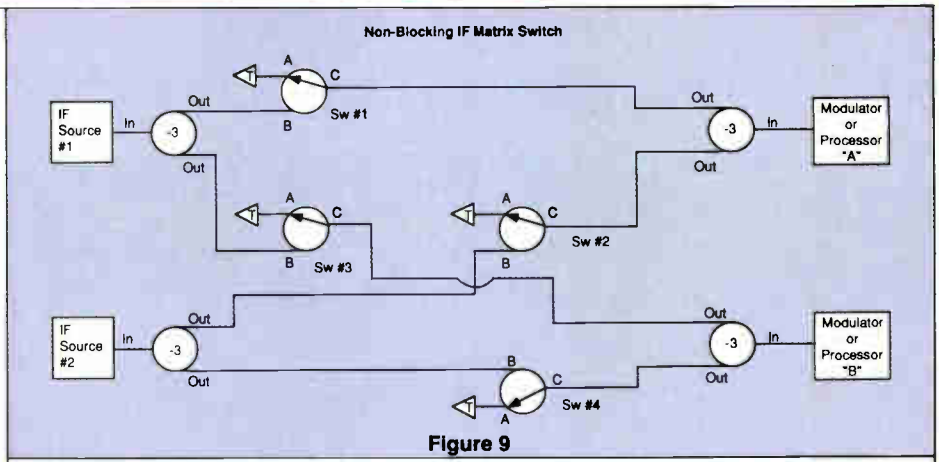


Figure 9

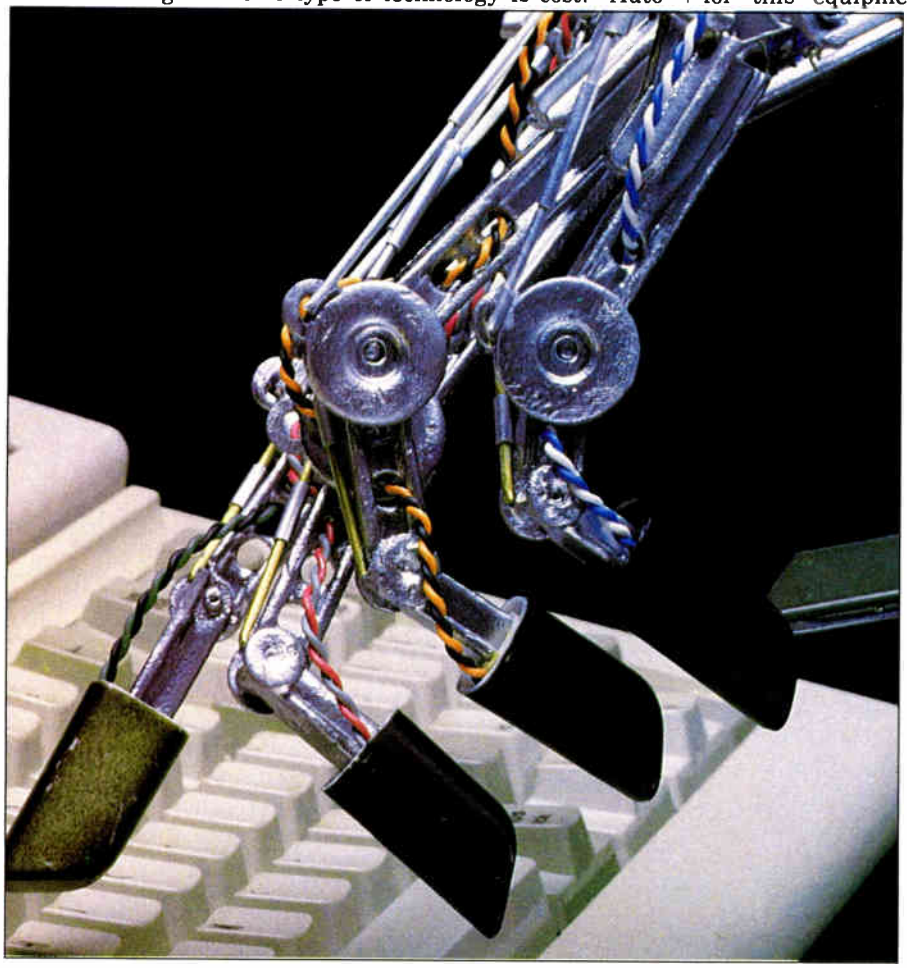
A similar switch may be constructed at video levels by substituting video distribution amplifiers for the splitters, but you better buy four or five sets of screwdrivers for all the aural connections you'll need to make. In any case, be sure the program logic does not allow two different sources if feeding the same receive unit at the same time.

Summary

Remember, pre-planning can save many hours of aggravation and delay in getting your switching system "on-line." You'll possess a better understanding of the task to be performed and of the software and hardware requirements to do it. And consider future needs, if for no more of a reason than they told you that this would be "the last time" you would have to do this. ■

Headend automation and its benefits

Ask any oldtimer and he'll tell you life used to be much simpler than it is today. Similarly, cable techs and engineers with more than a little experience can remember when a headend consisted of a few receivers and some modulators. Now, however, the number of "boxes" in the headend must accommodate for modulating an ever-growing number of channels, satellite reception and descrambling of signals, stereo generation, pay-per-view and switching/routing of signals.



A new focus on machines

The advent of the new syndex and non-dupe rules have cast a new focus on the need for efficient, accurate switching of program material from a variety of sources between a multitude of channels. For some operators it has become the impetus to automate their headends to a level only contemplated before; many engineering directors are beginning to see that for just a few dollars more, things like telemetry become possible.

For example, why not place "dumb" computer terminals or an inexpensive portable laptop PC in the hands of lead technicians who can then monitor the cable system remotely during non-business hours? Add some analytical software and you can begin forecasting when frequencies might drift or levels get out of whack.

The benefits of this approach are many: a reduction in manhours spent in a reactionary mode (and more time available for preventive maintenance), fewer personnel needed overnight, ability to respond better to outages or fluctuations in specifications that may adversely affect pictures (which will improve customer service).

Presently, according to Scott Bachman, director of engineering for Scripps-Howard Cable, the biggest thing holding back extensive implementation of this type of technology is cost. "Automated gear is just now becoming cost-effective," he says. "It has cost us $8,500 for a box that monitors just the frequency and level of the signal."

Terry Bush, vice president of Trilithic's instrument division agrees that cost is a big factor right now. "Anyone considering automation should examine the cost of implementation and the trade-offs involved. For someone who employs people specifically to monitor and check levels and other things, automation may help. Others who go out and do that as a normal function of their jobs may not see an immediate benefit."

Prices will fall

But as more operators see the need for this equipment and make purchases, prices will fall rapidly and the devices will get better. Operators like Bachman are already miles ahead of the manufacturers, but understands the automation process will take time.

"Headend automation, especially telemetry, is a natural," says Bachman. "I want to know what's going on in my headends and hub sites, even when no one is there. As our networks get more sophisticated and begin dealing with switching, data and voice, we'll *have* to know what's going on in the remote sites. With fiber, they'll be even more need."

As Bachman points out, the desire for telemetry is not new. In fact, status monitoring equipment offered by all the amplifier manufacturers was an important step in that direction. But increasingly, operators want to do more than monitor a problem—they want to be able to tell *why* the problem occurred, remotely correct or bypass the problem and get input on how to prevent future problems.

Presently, Bachman has devices in place that automatically monitor the

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frequencies and signal levels in five or six of the 100 or so headends Scripps-Howard operates. Although limited in scope, frequency monitoring (especially the aeronautical band) is important. With the monitoring devices, Bachman can tell the computer to perform the time-consuming frequency tests overnight and print out the results first thing in the morning.

Finding other uses

In addition to Trilithic, companies like J.D. McKay, CableCom Specialists and Telecommunication Products Corp. offer PC-based control and switching devices that were initially designed for syndex needs but offer broader applications.

"Interest (in automation) is growing daily," says Arthur Leisey, president of CableCom. Leisey, who says he has more than 100 systems (consisting of an IBM PC, interface cards and software) installed, says most operators "realize it can be used for other things than just syndex switching." For example, it can be used to link and network a number of headends via standard telephone lines.

Kevin Mackenzie, president of J.D. MaKay, says operators are looking toward automation to reduce costs, enhance customer service, derive new revenue via direct production of infomercials and local ads for insertion and because of franchise requirements calling for local origination, which almost always means character generation.

Mackenzie's product also offers voice response capability (similar to an ARU) to allow system operators to automatically remain in communication with the subscriber base and inform them of such difficulties as audio problems and the like.

Switching devices may one day also be set up in a matrix mode to allow spare, frequency agile modulators and receivers to be switched into place when the primary device fails. "That's extremely challenging, but the idea came from an MSO," says Mackenzie, which demonstrates some of the advanced thinking that is occurring. "Ultimately, we want the headend to repair itself as much as possible" and even call the customer to let him know there is a problem and steps are being taken to correct it. "I think you'll begin to see this in headends of the future."

Commercial insertion gear

As local cable ad sales have heated up over the years, the commercial insertion hardware manufacturers have spent millions to automate their equipment. "The most common requests (from operators) are for automated status monitoring—knowing instantaneously what failures are occurring and why," says Leslie Miller, marketing and sales representative for Telecommunication Products Corp. "Also, as interconnect activity picks up, a big concern is for more efficient video distribution. Right now, most interconnects are faced with the time-consuming job of 'bicycling' tapes to the individual cable systems."

Some operators have the answer to both switching and insertion in their systems already and may not know it, according to Bill Dawson, vice president and general manager of Texscan MSI. He says many character generators have line-level outputs with timers built in that can drive external switches.

Most insertion equipment suppliers have concentrated on making it easier for systems to build and mark videotapes automatically. For example, tape markers and tape compilers make it easier to build the tapes and locate individual spots with little or no human intervention. "There is a definite desire (by the operators) to make the process less labor intensive," says Dawson.

Mike Watson, vice president of sales at Channelmatic, believes operators want to get past the point where they're just "patching" gaps that exist in their insertion and switching needs. "We think people want to take the seamless solution to ROS and local origination," says Watson, "instead of taking the cheap way out and adding another box. Right now we have a mish-mash of vendors and (hardware), capability, which is making headends (a nightmare)."

Filling the needs

In Watson's mind, the industry still has several "needs," including: More remote control, advance scheduling and verification; multi-source (RF, IF and composite video, as well as component switching in the future) switching capability; and more system diagnostics because system hardware tends to be neglected for long periods of time in this day and age of system sales.

Getting to that point without obsoleting all previous products is tough, however. "We're trying to meet operators' new needs without forsaking our past products," Watson says. "Our approach is to evolve the 'old' technologies to provide new products that reduce the number of inputs, phone modem connections, etc. We'd like to stop building more 'things' and concentrate on integration."

In fact, Channelmatic introduced a new programmable clock unit at the National Association of Broadcasters convention earlier this month and will be bringing some new devices to the NCTA convention in May, Watson says. "They'll address new issues and evolve old technologies," he promises. "They'll improve operations by reducing labor and improving accuracy. If we can save six hours (of work) a week and do it for $5,000, what's it worth?"

Miller at TPC also sees some solutions through the introduction of networks in the headend. Somewhat unique in that it sells Novell PC networks, TPC believes that "the next step is to put the Novell and/or networking technology in the headend," says Miller. "Installed upstream of the actual commercial insertion controllers, a networked controller offers the instantaneous status monitoring our customers desire.

New stuff in the works

"This networking step is not far off," continues Miller. "Currently, we are in prototype development of a 1- to 15-deck controller that is a simple modular expansion" to the medium-level of insertion gear TPC sells. "If you can imagine an interconnect 'hub' office with four or five personal computers networked together to share workloads, and one terminal dedicated to keeping an active, real-time eye on the status of each headend's commercial insertion activity, then you are seeing our vision for ad insertion in the early '90s. Beyond that, we envision of the power of fiber optics technology assisting in solving the video distribution puzzle."

Clearly then, the technological march toward automation has already consisted of several major steps. But there is a lot of ground yet to be covered. The increasing complexity of headends, coupled with new demands placed upon the hardware that resides in those headends, will demand innovation in both hardware and operations. It's a safe bet that the signal origination points of cable television networks in the coming years may resemble those you see today, but will be capable of so much more. ■

—Roger Brown

Local production: Making it pay

If you were to spin through the channels of many of today's cable systems trying to spot programming produced by the local cable system, you just might find it difficult to tell them apart from local broadcast channels. Not only are the production values better than ever before but the subject matter, by design in many systems, is indistinguishable from an independent broadcast station's programs.

In many ADIs, cable operators are beginning to compete head-to-head with local TV stations for news programming, studio production and commercial production. Few have yet to turn a good profit but some are nearly paying for themselves. And if the local broadcaster drops the ball in one area of local programming, cable is there to quickly pick it up. And, because of this, many cable systems are attracting strong video production talent away from the broadcasters.

But talent and aggressiveness are not enough. The trick seems to be confident and savvy analysis of the local market, some wise risk-taking, and, most importantly, a financial commitment to meaningful upgrading of technical quality.

If an operator can justify the capital outlay in terms of community service, higher visibility, perceived value for the cable system and a demonstration of what cable can do, then he may find that the expense is not such a hard pill to swallow.

There is no universal formula for success in local production. Some systems may be the only game in town. More often than not, however, cable systems find themselves amid a mixed competitive situation with several broadcast stations and other cable operators in the same ADI.

But even in a tight environment, a creative operator can deliver targeted demographics or special programming or, through a cable interconnect, deliver numbers that mimic those of broadcast stations.

To get some sense of what's happening on the local cable video production scene, and some things to try, what follows is a quick look at a representative sampling of six local cable systems that are involved in various levels of activity ranging from the new beginnings exemplified by Southwestern Cable TV in San Diego to the high level of commitment at Greater Rochester Cable.

By George Sell, Contributing Editor

Council Bluffs' News 17

American Heritage Cablevision in Council Bluffs, Iowa, launched "News 17" in 1987. Up to that time, the system was investing about $50,000 a year in capital equipment for production. With the launch of the news project, the system added about $130,000 worth of new equipment. Since then the annual budget has returned to the $50,000 level.

> Cable operators are beginning to compete head-to-head with local TV stations for news programming.

"We moved into the (JVC) MII format," says Dan Cupak, production manager, "which gives us one-inch quality. It gets us out of the 3/4-inch quagmire. It's competitive, technically, with Betacam SP, the same specs as far as quality is concerned."

Council Bluffs also recently installed a Dubner 5K character generator. Along with the MII format change, the meat of the upgrade included a couple of time base correctors, three mainframe edit machines and one field recorder. This added up to $53,000. The Dubner ran about $10,000.

"We are trying to jump up a little bit here in '91 and '92," Cupak explains, "to about $80,000 in '91 and $60,000 in '92, but that's all to be reviewed, approved or denied." The increase of funds over what's needed for normal equipment replacement will be used for upgrading the switcher and DVE (digital video effects) system.

How will American Heritage Cablevision recoup this investment? "Primarily, it can be justified a couple of ways: One being always trying to improve the quality of the news, which hopefully can increase revenues from advertising," Cupak proposes. It's also justified by the need to stay competitive with the broadcasters and other production houses in the marketplace, even though as yet it cannot stand on its own financially.

Cupak doesn't see local news production as a trend in cable. "If anything, I think the trend is maybe to shy away from that a little bit because of the cost involved." But the Council Bluffs system is not getting out of the news business. "Well, not at this time but that's always a possibility. If there is a trend at all, it is to emphasize revenue generating lines of business which would be advertising production," Cupak suggests.

St. Louis County

Continental Cablevision of St. Louis County, Missouri, finds itself in a situation not atypical of systems across the country. "Our communities are scattered," says Phil Rock, program manager, "so it's really hard to say just one type of programming will cover all communities. So, I might be doing something for one of our systems in the middle part of town and one in the North. Those are two different personalities, demographically."

Rock's system does about 40 hours a week of programming of which three hours is new material. Much of the subject matter is targeted toward the ethnic diversity of the communities served.

The system has no news operation. "We find that that's a difficult situation. We've attempted that, particularly on the East side of the river, and there really isn't that much material in the smaller communities. Now, if we were doing countywide news, we'd have more of a chance to do visuals," Rock surmises.

One of the problems is the cost. "The expense to do the job correctly is fantastic," says Rock. "Some people find it very profitable, they have a sales

staff and they go out and do it. We don't have anyone selling our local origination stuff."

With a cable news operation, Rock suggests, "It better damn well look like the local stations or we're labeled 'those amateurish cable companies.' "

While Rock admits he is used to a different quality level, having come from a long career in broadcasting, he is satisfied with the production values his equipment generates. "We do a lot of commercials here, a lot of post-production. Those commercials play on broadcast (stations) and I have not been ashamed of any that I've seen. But still it is not the peak quality."

Rock's system invested about $200,000 over a three-year period recently to upgrade quality. "We added an (Commodore) Amiga PC. We just put in a Pinnacle special effects unit on one channel. We just got capital approval to get an A/B switch on that thing that will give us at least more bells and whistles." The system also added a Sony 800-series 3/4-inch editor and a Sony DXC-M7 camera.

Rock reports, "About one-third of our operating budget is covered by income. The other two-thirds is carried basically on the principle that our purpose isn't just to make money. Our purpose is to serve the community and to serve our marketing department. Just the year before we started our upgrades we won five CTAM awards for our promotions. So, we work very diligently on trying to serve our marketing part," Rock adds.

Although Continental Cablevision has not been able to make a news operation work in St. Louis, Rock is still convinced it can succeed in cable. "I personally see a whole trend of more service to the community" and he believes a news operation is one way of doing that. "So, it's going to cost us money," Rock admits, "but still you can't put a price tag on some of the public relations value for franchising, keeping people aware of why we need rate hikes when we ask for them."

Rock is confident. "Local origination is going to surprise a lot of people by becoming one of the major local and regional media entities. And, somewhere down the line we are going to get the advertising dollars that independent stations do."

New Castle County

Heritage Cablevision of New Castle County, a northern Delaware cable system, is operating a rather extensive local production business. "We have actually three stations going now," reports Mike Williams, director of program operations. Channel 22 is the system's leased access productions. "We do in the neighborhood of 70 hours a week of programming on Channel 22," Williams reports. "There are some in-house productions done at that location. We have an on-going program there called 'Short Stops', (which presents) specials. When the 'Batman' movie came out, we did a special on Prince and the music."

"Channel 2 is our local origination programming. Our programming right now is primarily late evening. We have programming starting at 6 p.m. with 'First State News,' which is our own daily half-hour production," says Williams.

New Castle County also offers local clients commercial production services. "Most of the production that goes on

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is for clients that are also going to be purchasing commercial time through us. Since we are part of the cable system, we do insert programming on seven of the satellite services we carry."

Williams reports the production staff is fairly satisfied with the quality of their productions. "We've been moving into the future slowly but surely. We went from standard tube cameras to CCDs. We've got the Sony 3-CCDs and we just got a new Grass Valley switcher.

"We are re-outfitting our remote trucks. For the remote production truck, we have a new JVC sound mixer and new chip cameras."

Williams reports that cost figures have averaged $100,000 per year including equipment replacement and upgrading. "We have been steadily increasing the budget every year," he says. This has resulted in more clients and higher rates. "We've definitely brought in more clients primarily because the quality has gone up," Williams says. And, as a result of better quality, they have been able to increase rates and total revenue from ad sales.

Better equipment has improved insertion verification. "We went from a semi-automated system to the ARVIS computerized automated system (for commercial insertion). We went from somewhere around a 20 percent loss to less than 1 percent."

MIKE WILLIAMS

> 'We've definitely brought in more clients primarily because the quality has gone up.'

New Castle County's 'First State News' program does not pay for itself in ad revenues, Williams reports, "but what it does provide is good community relations and it makes people more aware of Heritage Cablevision."

Has any of the local production work paid for itself? "Most of the stuff we are doing that's local origination programming," Williams says, "is strictly community oriented information and sports. We cover all the local sporting events. Those programs tend to pay for themselves."

Southwestern Cable TV

"We haven't gone full force in local origination. We didn't see any value in it up until now," says Berry Helfand, production supervisor at Southwestern Cable TV in San Diego. What local production is performed is mostly public affairs and infomercials. "We don't have a channel committed to local programming with the exception of perhaps the commercial programming that we do."

But Southwestern may be doing more in the future because of syndex. "We've talked about the fact that if we decide to fill syndex holes, we would prefer to do it with entertainment rather than infomercials," Helfand says.

"In terms of ad insertion, we just started doing that." Armed with a new interconnect agreement, Southwestern can weave its 140,000 subscribers with Cox Cable's 330,000 sets of eyes. The interconnect inserts on five channels, but Southwestern has begun inserting on two more (A&E and TNT) and is making plans to add two more.

Helfand's production department is admittedly playing catch-up with equipment. "We made a minor jump into Super-VHS but it's really an acquistion

format. Price was the biggest factor with that because we were using industrial 3/4-inch up until that point."

"In the last two years we bought a multi-machine editor, a DVE (digital video editor), a new switcher and a (Sony) SP 3/4-inch deck to master on. The only thing we are really weak on, and I'm not satisfied with, is our capabilities to do multi-camera shoots. We have only one camera at this point which, in terms of just making commercials for scripted shows, is all we need."

Helfand's equipment purchasing budget is limited. "We spent something like $50,000 (in 1989). It's just a dent. What can you buy for $50,000?" Capital expenditures are on a need-to-have basis. "For a lot of people here in our company it's a new game for us, so we're still trying to learn it," Helfand explains.

"Rather than go the full ad insertion route as a revenue center, especially because we have the interconnect agreement with Cox, we looked into photo-classifieds. We set aside some channel space and started running ads and it's been very successful for us," Helfand reports. "Within a year we started turning a profit."

Helfand advises, "It's a good point of departure. It allows you to build a client base fairly easily with a low buy-in. They don't have to spend a lot of money to get on TV. And it shows value for cable. We are always trying to build value for cable and a lot of people don't realize what cable can do."

Southwestern Cable TV, in spite of having better than 70 percent penetration, has not yet fully seen what cable can do. "Even with being so penetrated here, I know there are other cities that are less penetrated that are doing a whole lot more in LO." But it's not for want of talent and desire. Helfand's ambitiousness is evident when he relates his programming successes. "I just produced and directed a local version of the Easter Seals Telethon and I believe that we are one of the very few cable companies in the nation that did that."

Southwestern stole the project from the local CBS affiliate, which did the telethon for years. "We picked up the telethon, used the interconnect, which gave us access to something like 750,000 cable homes and it was a raging success. We raised more money than last year. We met their goal where they didn't meet their goal last year. In fact, we exceeded the goal."

Yet Helfand laments the difficulty in getting large projects off the ground. "It's hard to put on a show if you only have 140,000 subscribers. There's a million people in this city." Show sponsors will go for the numbers. "How are you going to sell the show when you're saying, 'If we just hit the ceiling, and we hit every viewer, we still have only 140,000 viewers?' So, I don't see a lot of future in selling LO programs unless you put them on everywhere." Slotting informercials across the same channel on the interconnect is teaching Helfand how to get the viewership needed.

"But there's nothing new that we are going to invent that broadcast hasn't already told us," Helfand has concluded. "We can expand or augment it but the bottom line is viewership."

Austin Cablevision

Austin Cablevision in the capital city of Texas has 120,000 subscribers in a market with three network stations that have full-time news operations. But local origination is working. "On the LO side we do quite a bit of program production," says David Crews,

production manager. "We do not have a local newscast but we do a live call-in show every week night called 'Austin Talks' with various subjects each night. We do a lot of remote productions. We cover women's basketball, concerts and special events and a reasonable amount of commercial production. We have an advertising sales department that actively sells avails and production services that we provide." The system inserts on 12 channels.

"Of course, we are never satisfied," says Crews, referring to the quality of production. "We always want bigger and better things especially since some of the people who are operating our LO and came out of broadcast and are used to that level of quality."

They've recently spent $120,000 to upgrade some equipment. "We've gone with the Sony M7 cameras for our remotes and in-house LO production. And we are also going with type 9 SP 3/4-inch decks." This upgrade has resulted in tighter budgeting. "We had to almost combine two year's worth of capital budget in order to make the purchases we needed to make. It's really been pretty tight for us." Austin's equipment budget for preceding years was around $50,000.

To recoup that investment, the system is persuing all avenues. "Ad sales alone are never going to cover that," Crews knows. "We do a lot of external production that is not through our ad people."

One limitation is a lack of a loaded van with the equipment in place for remote work. "We have empty vans we have to put our remote gear in. Our remote gear is contained in trunks, so it's a bit of a hassle for us to do that each time, but we do it anyway," says Crews.

Does the production department pay for itself? "I would say no, not at this point. It's really something we are really trying to establish right now. We think that it could if we had certain equipment, specifically a real production van. We could probably market that successfully in this market," Crews believes.

WGRC Rochester

What will be the envy of local production folks throughout the cable industry is WGRC, the Greater Rochester Cable system's experiment in direct competition with local production houses and broadcast stations. With a healthy infusion of capital from American Television and Communications, the Rochester system is hoping its WGRC unit will look as good as any other independent station. The equipment, the staff, the talent and the look is broadcast quality.

WGRC, which took the place of a smaller but fairly active local origination channel, is on the air from 6 a.m. until 1 a.m. "At the moment," reports Phil Smith, manager of local origination, "we are doing a two-hour block of children's programming with a live-on-tape host five days a week." Add to that a helping of sports, a half-hour of public affairs programming a week and starting in mid-April a seven-day-a-week half-hour local news broadcast. Also, with a significant amount of commercial production for both general ad insertion across 13 channels and much more for WGRC, it is doing 20 or 25 spots a week of one kind or another.

It also provides outside production and rents its facilities to others. "We happen to have a good sized remote truck here along with everything else. That's actually a fairly good profit center for us," reports Smith.

The production staff inherited some

good equipment from the old LO operation, but newer and better equipment was needed for the expanded operation. "WGRC works all in MII and one-inch, which is fairly new for cable people. The rest of our commercial production work is on (Sony) 3/4 SP and, in 1991, we will be fully into Beta," says Smith.

WGRC operates three production suites, one of which has a Grass Valley 200 production switcher in it and an Ampex 5G still-store, both of which were bought for the news operation, and a Microtime RP-1 digital effects unit, and Chyron Scribes and Super-Scrives for character generators. Also, two smaller edit suites are outfitted with A/B roll 3/4-inch with Chyron Scribes and Sony SP decks.

After all the parts, pieces and rewiring was done, the upgrade invoice amounted to $300,000. Rochester is recouping most of its investment through increased ad sales and the rental of its facilities, studio edit suites and particularly its remote vehicle to outside commercial clients. But it's not paying for itself, yet. "This is a big investment this year to compete directly with the local broadcasters," Smith points out.

The system is confident that the news operation will be profitable. Even with a staff of 17 full-timers and about nine others, the project should hit profitability within 12 months.

"One of the things that this local channel, which is really operating in a broadcast environment, needs to do is set itself apart on the system. In other words, the bulk of their programming looks like any other independent television station: syndicated programming, re-runs, 8 p.m. movie, and all that kind of stuff. If you look across the channels, it could be WTBS, it could be anybody else," says Smith.

But the channel needs to be clearly "local." "How do you make that appear like a local entity?" Smith asks. "We have a real popular children's program with a host who we hired away from one of the local broadcasters. That gives real high visibility. A lot of people know who he is. The next thing you look at is doing news.

Will WGRC become a superstation ala WTBS? "There are synergies that will occur because of this operation here. You can certainly take your children's programming host and make him available to other operations within the Time-Warner company without becoming a superstation." The whole two-hour block of programming could be dropped into any system easily.

Smith, with a 15-year broadcast background, sees a blending of cable and broadcast as the wave of the future for both industries. "I look at that (broadcasting) as a shrinking and contracting medium. Their audience base is going down and cable's is growing," says Smith.

"This is a fairly large cable system, 175,000 subscribers, but broadcasters in this same ADI reach 320,000 people. So, they are not going to go away," Smith admits. "My opinion is that only the very strongest of the local broadcasters will survive in anything that approaches what we now recognize as a traditional broadcast station."

Greater Rochester's experiment will have an impact on cable systems across the country and, in turn, local broadcasters as well. The commitment is there. ATC is giving it five years. "Realistically, when you consider that this operation has already spent, between hardware, personnel and particularly programming, about $4 million," Smith asserts, "it's not the kind of thing even a mid-sized system can dive into with both feet without being sure it's going to work." ■

Automated tape editing, tape compiling, random access

Now that the smoke is clearing and most local ad insertion operations are up and running smoothly, cable managers can afford to turn their attention primarily to increasing ad revenue and saving operating dollars. One significant area for potential savings is in the realm of tape editing. Thousands of manhours are spent each year editing spot playback reels.

The smart corporate cable system manager would see a solution to the intensive labor in the form of a tape compiler or editor. But with all the different methods of local ad insertion possible, there will be no single equipment solution for every system.

By Tom Walsh, Vice President, Business Dev., Channelmatic Inc.

Selecting the right editor

In an informal survey of cable operators, polarized views of the "best" ad insertion and tape editing methods would become evident. One cable operator will swear by full random access, and another will say that a compiler is the only way to go. A third will say random pod works fine for him and the fourth will say that all the others are wasting their money—that sequential playback is the ticket. So who's right and who's wrong, or are they all skinning the same cat, so to speak, in a different manner?

The truth is that each of the methods mentioned has its advantages and disadvantages, and each would work very well in the appropriate ad sales environment, meeting specific network requirements. Once that appropriate match is made, it is a matter of learning to operate the equipment and making it work at its full capability. In many cases, methods are prematurely abandoned as ineffectual and wrong for an application, when it is simply the management of the method that is faulty.

Tape preparation requirements vary with each type of insertion method used. Some use FSK data for encoding, others use DTMF tones, and still others use SMPTE time code. Some put spots anywhere on a spot reel and others put spots in the order of playback.

Before ideal systems are discussed, the distinction between automated tape editing and tape compiling should first

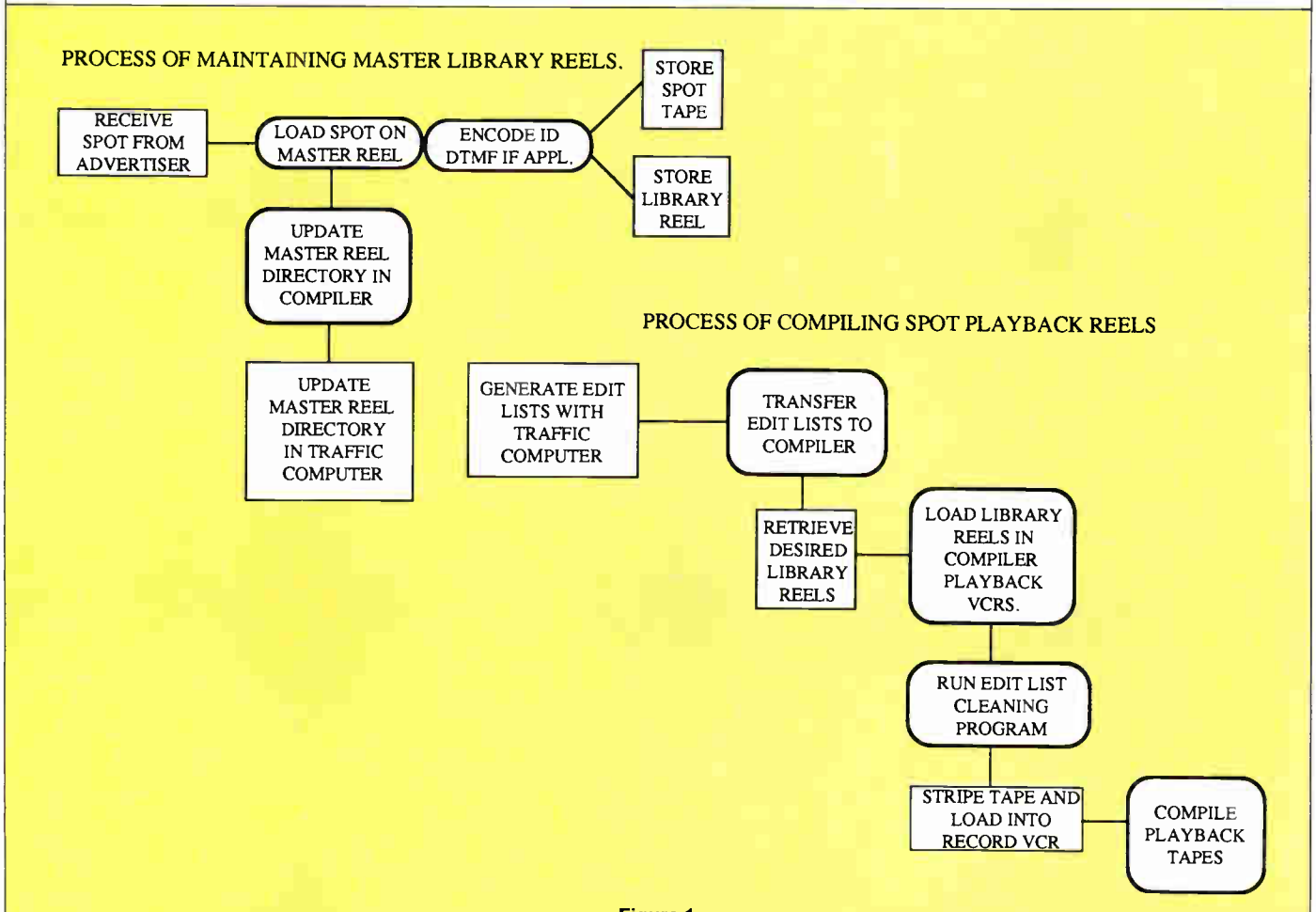

Figure 1

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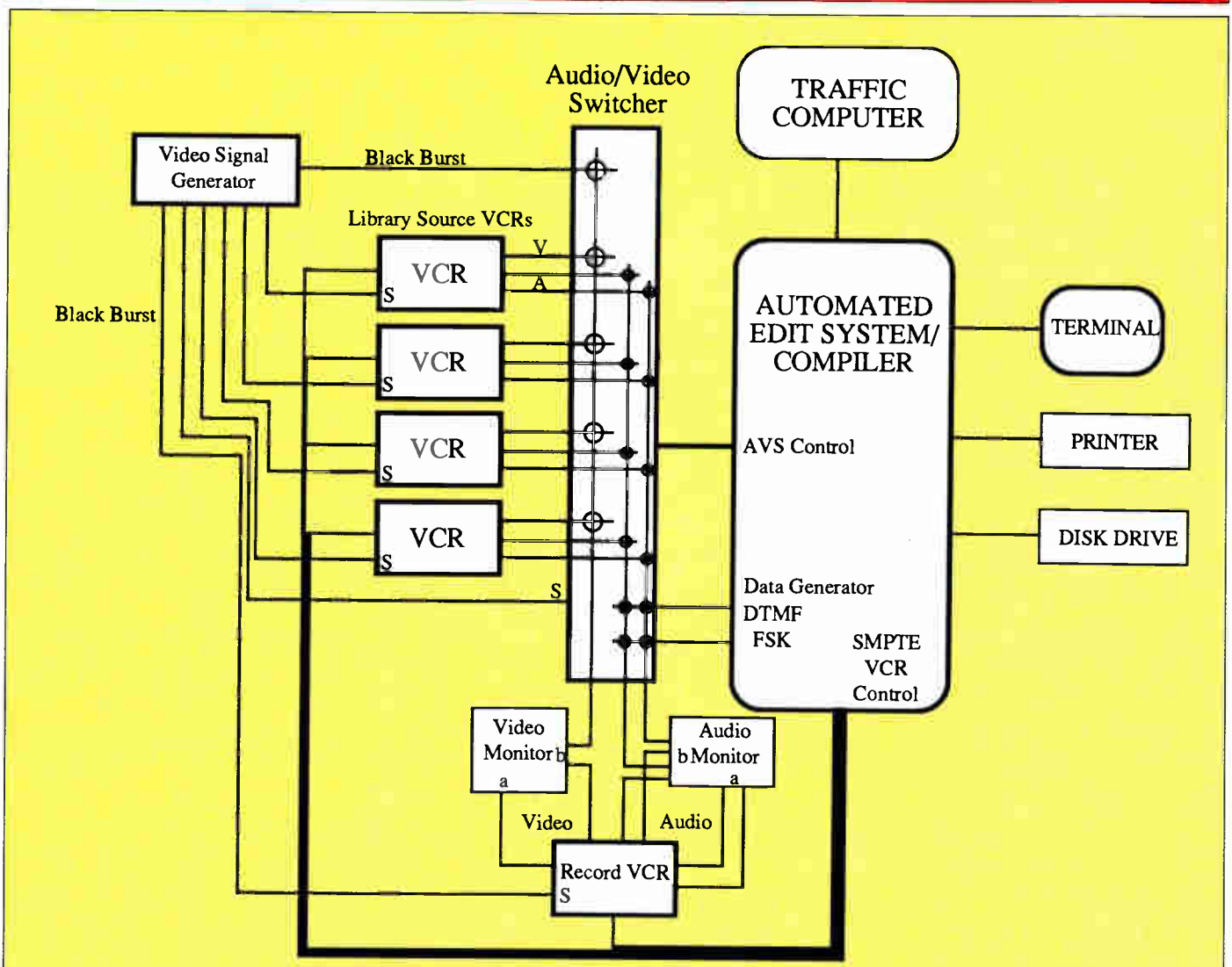


Figure 2

be made clear. Some cable operators use the terms interchangeably, but there is a difference—not only between the two technologies but also within them.

Automated editing and compiling

An automated tape editor is a device used to move segments of video from one tape to the desired location of another without the intervention of an operator.

The traditional low-end editor requires that the operator visually and manually locate both the source video and the destination video. After locating the segments for the editor, the operator can then push the "auto edit" button and the editor executes the edit.

The automated editor does not require the operator to visually locate each video segment if the SMPTE time code or control track locations are known. In this case, he simply enters these locations in the order he wants them to appear and the editor executes the list.

If the specific location addresses are not known, the operator can visually locate the video segments using the editor. The editor will automatically log in its memory the location addresses as the operator marks the beginning and ending of the video to be recorded. When all the spots are

located on the source reels, the destination address only needs to indicate where the first video segment will start; all the other addresses can be calculated from that point.

These editors are widely used in the broadcast television and video production industries, but are applicable to certain cable operations as well. Most manufacturers of these editors are not familiar with the cable industry or its applications. The term "spots" or "spot reels" would only meet with a blank or quizzical expression on the face of a broadcast pro. Instead, these non-cable types take a "scene" and place it somewhere in a "show." And then they practice all sorts of cuts, fades, wipes, dissolves and special effects with those scenes. In contrast, "cuts only" is the only term needed in cable editing, which is only appropriate for the practical, just-plain-folks environment.

The editing required to place a spot on a spot reel is one of the most basic. It is called an "insert edit" or "cut edit." When doing an insert edit, the control track markers are not disrupted, which is good because disrupting the control track may cause problems for the ad insertion system and produce a poor-looking video switch during playback.

A cut edit requires that a transition from one video segment to another occur at the same field of video during the vertical blanking interval. Automated editors assure that each video segment is field and frame locked to each other before the edit is made.

The editing required to place a spot on a spot reel is one of the most basic.

On the other hand, the tape compiler is generally an automatic editor plus. It would be used to create a playback reel with spots arranged in the order of play. It generally creates an edit list from a playback schedule, pulls spots from a group of library tapes called "bank reels," and then records these spots on the playback spot reel.

Some compilers even encode the DTMF ID tones or FSK locating markers on the tape while it is compiling. Doing this saves an extra step in the spot reel editing process.

Benefiting from auto editing

Benefits from the use of an automated editor would be the greatest for a full random access ad insertion operation, whose primary editing requirement is in updating spot reels. If second generation playback is desired, a spot reel for each VCR of each CATV network must be maintained.

Cable systems managing a healthy volume of ad sales would require at least five to 10 spot reel updates per day per spot reel. With the assistance of the automated editor, a cable operator can do this in a very short amount of time and still maintain his second-generation playback.

On the other hand, a typical tape compiler normally creates a third-generation playback reel. And simply

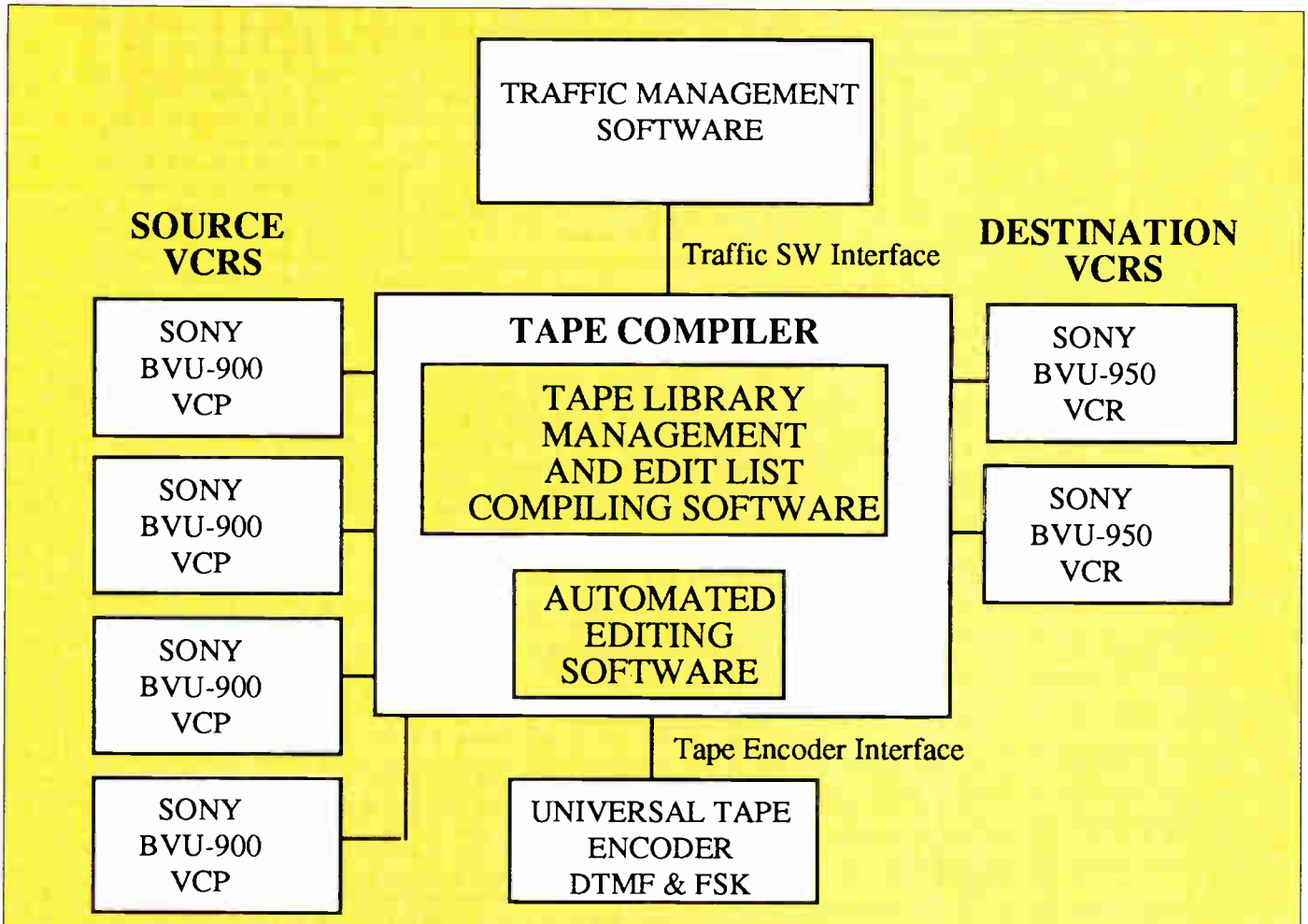


Figure 3

using a compiler for random access spot reel updates is really overkill, and besides, some compilers aren't effective at it anyway.

Run-of-schedule (ROS) sequential playback ad insertion operations can benefit from low-end automated editing systems. In such a case, cable systems would be selling spots by the pound, and specified program positioning would not be a major factor.

Generally, low-end automated tape editors are reasonable in cost and usually control three VCRs or fewer. Such limitations would not be a con-

cern for the smaller ROS operations.

Benefiting from a compiler

The first use of compilers in cable came about after the advent of the first random access ad insertion systems. Some cable operators felt that random access systems were too complex to be operating on-air. They felt that the complex part of randomly accessing spots should be performed off-line and only simple sequential insertion should be done on-line.

With random access on-line, if an operator should daydream or make a typo while editing a schedule manually, his mistake would be publicized immediately on-air. In contrast, if a mistake should be made during a compiling process, a good quality control system would detect it before the error got on-air.

Though this concept is sound and has proved successful for many cable operators, it is not without its drawbacks. For one, most compilers are very expensive. Only larger systems or central operations that service many headends generally find it cost effective to use top-of-the-line compilers.

Another drawback with compilers is that although it may not be easy to screw up the on-air playback with mistakes made in scheduling, it may be a lot more difficult to recover from any. If 12 tapes that are incorrectly done are not discovered until air time, a lot of revenue could be lost before those 12 tapes can be redone. A random access system can quickly be rescheduled, and make-goods can be accomplished immediately.

If 12 tapes that are incorrectly done are not discovered until air time, a lot of revenue could be lost...

In short, editing a random access system while on-line may produce more mistakes, but they're small in scope because they can be easily and speedily fixed. The tape compiler produces fewer mistakes on-line, but they can be major ones, requiring hours in tape-rebuilding to correct it.

In the case where a central ad sales operation covers multiple headends, a compiler-based system may be the wisest choice. The playback equipment can be simple, reliable and low-cost. The compiler can be centrally located and produce tapes for all sites.

Currently, most compilers are used to create sequential spot reels in which each spot is edited on the tape in the order in which it is to be played back. These spots are intermingled with cable promotions to assure that a particular spot runs during specific programs. In this way, a cable operator can sell spots for fixed programs and play them back with ROS ad insertion gear.

The ideal system

The ideal automated editor/compiler (EC) would require the following features:

- It would be user friendly and prompt the operator through each stage of the editing process to prevent errors.

It should also be able to interface with typical traffic management software systems through either a floppy disk or an RS-232 file-transfer process. (In this process, playback tape edit lists would be sent from the traffic system and spot reel updates would be returned to the traffic software from the EC.)

- The EC would maintain a database on all master spot and bank reels, which would contain the time-code location of each spot. When a playback list is received from the traffic system, the EC would look up the spot locations and create a functional edit list. While the edit list is executing, the operator would be prompted to load specific library reels into the source videocassette players. The EC should be capable of controlling a multitude of VCRs, from one-inch Beta machines to half-inch Super-VHS, by different manufacturers.
- Most ad insertion systems on the market today do not use SMPTE time code for locating spots during playback. In the past, this method was not practical because of the cost of time-code readers and generators. Generally, only high-priced ad insertion systems have time-code capability. But with a reduction in the cost of time-code readers and more time-code-based editing systems, use of time-code will become more prevalent in lower priced ad insertion equipment.
- The majority of ad insertion systems operating today use FSK data for random access spot location, and DTMF tones for sequential spot location. The ideal EC would either have a built-in data generator or an interface to an external data generator. If both insertion methods are used in one cable headend, the EC must be capable of generating both types of data.
- Encoding-data formats vary among manufacturers. Therefore, the compiler must be able to do tapes for a variety of ad insertion manufacturers' equipment.

The capability of tape editing can greatly affect the success of a cable system, but the investment can be costly. Well-designed tape-editing processes can save both time and money and increase ad sales potential due to an improved on-air look and operational efficiency.

Tape editing, present and future

As cable becomes more of an advertising force to be reckoned with, its programming and networks are being more scrupulously rated and analyzed for viewership. In the past, ad insertion manufacturers judged cable systems as being small, medium and large, and determined types of equipment to sell them based on their size.

Today more and more cable systems are taking the purchasing initiative and configuring a variety of ad insertioin equipment in their headend according to an individual network's spot value. Thus, the system is operating a full random access system on ESPN, random pod on Lifetime, and sequential on Discovery and The Weather Channel.

Tape editing with this eclectic assembly of equipment can be a challenge. What's needed in today's market is an editing system that can automate editing, compile tapes, encode control data and interface with the ad insertion equipment and the traffic and billing systems—all at a reasonable price. Major strides are being made in the development of automated editing/compiling systems. Choose a system that can fit and grow with your needs from a supplier that understands your local CATV ad insertion business. ■

COMMERCIAL INSERTION CALLBOOK

The following companies have paid a fee to have their listing appear in the Commercial Insertion Callbook.

ARVIS™
VIDEO INFORMATION SYSTEMS

ARVIS Corp. . . . . .(800) 272-7847
FAX . . . . . .(617) 890-7857
300 Second Ave.
Waltham, MA 02154
PERSONNEL: Gil Moreira; Tracey Smith
DESCRIPTION: ARVIS manufactures and services automated advertising insertion, playback, trafficking and photo classified equipment for the cable television industry. ARVIS insertion systems utilize Laser Disc technology as well as 3/4 inch VCR and 1/2 inch SVHS products. Systems can be ordered with a mix of the three video technologies.

AD SYSTEMS

Ad Systems, Inc. . . .(801) 263-1661
6170 S. 380 West, Ste. 150
Murray, UT 84107-6988
PERSONNEL: Gerald Van Mondfrans, President; Bob Hall, V.P. Marketing
DESCRIPTION: Ad Systems manufactures and markets a complete line of local ad insertion equipment. Key products include: Ad Lieutenant (ADL-100), low cost, four channel, one VCR system with logging and remote capability; Ad Commander IV-R (AC-400R), four channel, break random access system with logging and remote capability; Automated Break Compilers (ABC), units which reduce labor up to 60 percent by automatically preparing insertion tapes for most brands of insertion equipment; Syndex/Automatic Program Controller (ADL-100+), automatically inserts alternate networks, videotaped programs, or character generated messages.

CHANNELMATIC

Channelmatic, Inc. . .(619) 445-2691
WATS . . . . . .(800) 766-7171
FAX . . . . . .(619) 445-3293
821 Tavern Rd.
Alpine, CA 92001
PERSONNEL: Tom Walsh, VP of Business Development; Mike Watson, VP of Sales
DESCRIPTION: The recognized leader in ad insertion and the CATV automation experts with 16 years of service to the cable television industry. Manufacturer of over 200 TV equipment products for A/V switching, program playback, commercial insertion systems from low-cost sequential to full random access, clock controllers, custom time/tone switching, distribution amplifiers, automatic videocassette changers, barker channels, black-out and syndex switching, A/V accessories and more!

LA KART

La-Kart Corp. . . . . .(617) 244-0354
FAX . . . . . .(617) 244-6752
287 Grove St.
Newton, MA 02166
PERSONNEL: Jeffrey O'Brien, Vice President of Sales; Michael Carlozzi, Director of Sales Support
DESCRIPTION: LA-KART II automation system for commercial insertion and playback automation. The LA-KART II is a SMPTE time code based system capable of controlling both serial and parallel VTRs. Integrated compiler software for multi-recorders is standard. LA-KART II can be configured in "true" random access; any deck to any channel or in a random pod with compiler.

MONROE ELECTRONICS, INC.

Monroe . . . . . .(716) 765-2254
Electronics Inc.
100 Housel Ave.
Lydonville, NY 14098
PERSONNEL: B. Ives, Director of Marketing; Roland Phillips, Applications Engineer
DESCRIPTION: Monroe Electronics, the Cue Tone Signaling pioneer, offers series 3000 to put program switching control at your fingertips. The program timer offers 999 event capability and has 16 open collector outputs. It can be remotely addressed by an IBM computer using CASEY's software.

Telecommunication .(717) 267-3939
Products Corp.
FAX . . . . . .(717) 261-1162
1331 S. 7th St.
Chambersburg, PA 17201
PERSONNEL: Leslie Miller; Rick Montgomery
DESCRIPTION: TPC offers complete software and hardware ad sales automation packages for all system sizes: Administrator/Nexus for true spot random access, Adpod/Medius for dynamic random pod, and on-Q for spot sequential. A clear upgrade path allows operators to easily accommodate equipment expansion. TPC further supports full system packages by providing authorized dealership services with Sony, Everex compilers, and Novell network equipment.

Measuring fiber transmission systems

As with most technologies, the thought of installing single-mode optical fiber for use in video transmission can be a little scary. On one hand, fiber optics brings many benefits to video transmission, including immunity from electrical and RF noise, low loss and the prospect of improved signal quality and reliability. On the other hand, the thought of measuring or testing fiber transmission systems may seem like a big challenge to the uninitiated.

In fact, once you understand a little bit about the magic inside these laser boxes, the technology of measuring or testing fiber transmission systems will seem like a natural extension of the testing performed now on coaxial cable systems.

Continuity of fiber system

One of the largest investments in a fiber transmission system is the cost of the installation itself. And, while fiber is a very reliable medium, acts of man or nature can create problems. Therefore, the cable TV operator should know how to monitor the optical performance of the system.

Most cable TV operators will find an Optical Time Domain Reflectometer (OTDR) to be the essential all-purpose tool for installing, monitoring and troubleshooting their systems.

Many users tend to think that an OTDR measures fiber attenuation (loss rate), connector and splice loss, fiber length and system continuity. Actually, an OTDR measures none of these. But, all of these characteristics can be *inferred* from what actually is measured, if the results are properly interpreted.

Simply put, an OTDR measures light that is backscattered, or reflected, in the fiber under test. An OTDR a widely used tool because it only requires connection and access to one end of an optical fiber.

Maximizing your OTDR investment

As system operators look at ways to support their fiber installations, inevitably someone in the organization asks, "Do we really need an OTDR?"

Cost is often a big factor in answering that question. For a moderate- to high-performance OTDR instrument capable of measuring single-mode fiber at both 1310 and 1550 nanometer (nm) wavelengths, an MSO should expect to invest between $30,000 and $40,000.

To demonstrate how quickly OTDR technology has advanced, just five years ago a similarly priced instrument could measure only a single wavelength and such measurements typically took almost 10 minutes to complete.

OTDR vendors such as Anritsu Corp., Hewlett-Packard Co., Laser Precision Corp., Photon Kinetics Inc., Siecor Corp., Tektronix Inc. and others offer units with a wide variety of features and functions. Many of the models that might be used in the field by cable TV operators are about the size of a small portable oscilloscope.

To save money, a cable TV system might consider sharing an OTDR among several operators in a region, geography permitting. Additionally, as another cost saving alternative, an MSO might consider renting an OTDR for short-term use.

Using an OTDR

Whether renting or purchasing, cable TV engineers and technicians should understand the basics of how an OTDR works. An OTDR launches infrared light at either 1310 nm or 1550 nm into the fiber and measures the amount of light backscattered (or reflected back) from the fiber. The OTDR does not measure directly the amount of light

Basics of OTDR Operation

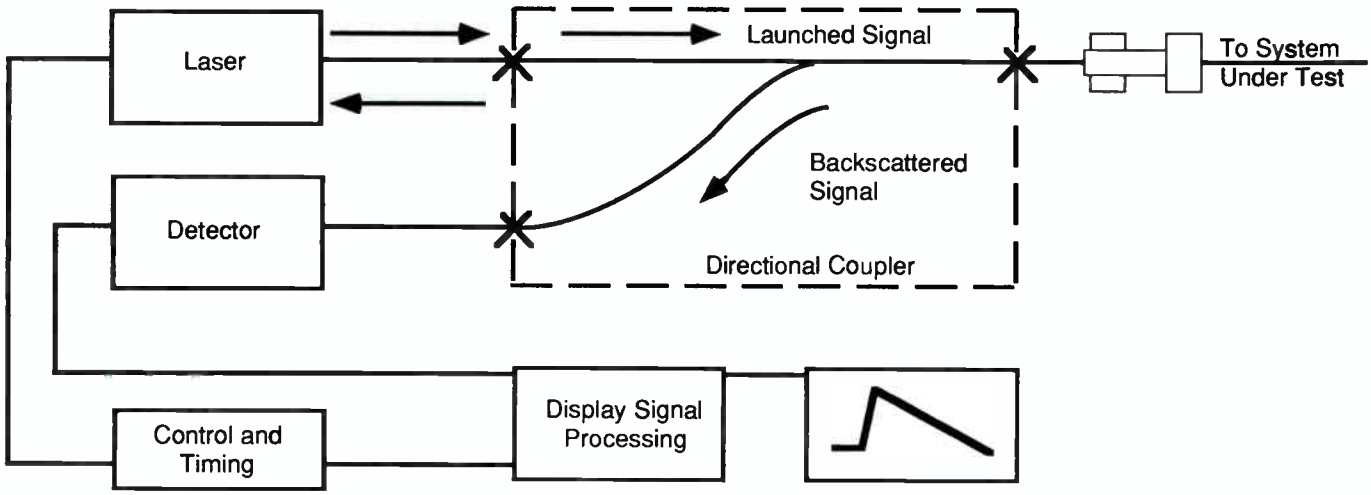
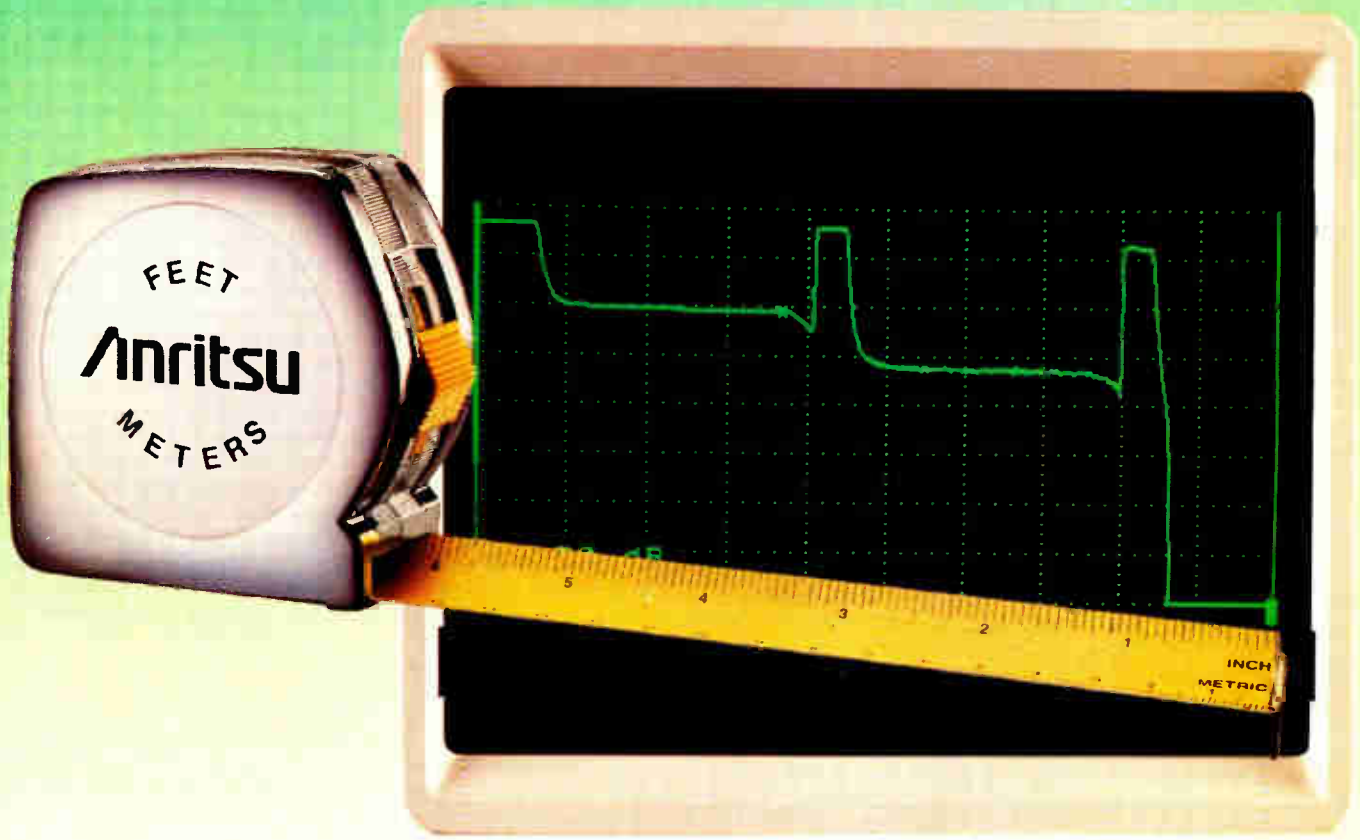


Figure 1

By James E. Matthews III, Supervisor, Product and Applications Engineering, Telecommunicatiions Products Division, Corning Inc.

FROM START...TO END



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Reader Service Number 31

transmitted through the fiber.

There are two reasons why light in a fiber system is directed back into the OTDR. The first and more obvious reason is reflection. Light is reflected whenever there is a fiber end or a break in the fiber. Therefore, these reflections usually occur at fiber breaks and non-contacting connectors.

The other cause of backscattered light is known as Rayleigh scattering. As light travels through the fiber, a small amount is scattered in all directions, including back toward the source in the OTDR. The amount of Rayleigh scattering changes as a function of wavelength, with the longest wavelength having the smallest amount of Rayleigh scattering.

By measuring the backscattering as a function of time, the OTDR can determine the distance along a fiber to a fault. The loss rate of the fiber, as well as splice or joint loss, can be inferred from the amount of backscattered light. The estimates of loss from the OTDR are reasonably accurate as long as the user knows and understands the difference between real problems and measurement artifacts described below.

How an OTDR works

Figure 1 shows how an OTDR operates. Timing and control circuitry trigger the laser to fire, launching a pulse of light into the system. As light is backscattered toward the source, most of it is directed into an optical detector. The electrical signal from the detector, which is proportional to the amount of backscattered light, is displayed as a function of time or distance.

Additional signal processing and averaging occurs within the timing and control circuitry to reduce noise. A small amount of the backscattered light does go into the laser source, but the signal level is so low as to negate the effects of this light on the source.

OTDR pitfalls

All OTDRs have a limit to what they can resolve or "see" as a function of the intensity and pulsewidth of the laser light. Unless the OTDR is a high-resolution model with a short pulsewidth, enabling the user to distinguish between closely spaced objects (less than 50 meters apart), elements such as connectors and pigtail splices cannot be seen as two separate losses.

Figure 2 shows the effects of OTDR resolution and dynamic range for a sample system. Those models with wide pulsewidths will have more energy in the pulse and be able to see further along the fiber—but at the expense of resolution. Higher-resoluton models generally have narrow pulsewidth, so their ranges are somewhat limited.

Most OTDRs allow the user to select a long or short pulsewidth, with relatively low or high resolution. This feature should not be confused with the OTDR's fast or slow averaging or scan options. A slow or long scan means more samples of pulses are taken and averaged in an attempt to reduce noise. This option does not provide any additional resolution, or the ability to distinguish between two closely spaced objects.

When making measurements with an OTDR, there are a number of ways to misinterpret the results and draw the wrong conclusions. Following are some of the more common "pitfalls."

The OTDR dead zone: All OTDRs

experience an initial "dead zone" of tens to hundreds of meters, where the initial pulse of light from the unit saturates the receiver detector of the OTDR. This makes it impossible to measure accurately any defect in the first few tens to hundreds of meters of fiber.

It's possible to get around most of this "dead zone" by using a long (1 km-plus) single-mode fiber pigtail on the OTDR. If the system under test is not very long, the OTDR will have sufficient dynamic range to see the end of the system plus the launch pigtail. Many OTDR manufacturers have taken steps to reduce or minimize this dead zone, and on the top-of-the-line, high-resolution models, it is almost nonexistent.

Splice loss measurement: When measuring splice loss with an OTDR, most models require the user to position one or more on-screen markers, known as cursors, on the splice to be measured. By bracketing the splice, the OTDR can calculate the backscattered optical power levels before and after the splice. It infers the splice loss as the difference between the two.

It is important that the cursors be accurately positioned in accordance with the OTDR manufacturer's instructions. It also is important to note that if the measured trace is not smooth and linear in the measured region (see Figure 3) the calculations might not be accurate. If there are other anomalies in the area of the splice, then measure the power levels on each side of the splice and calculate the change in decibels.

Splices with gain: The only way to get a truly accurate splice loss value with an OTDR is to measure the loss from both directions and calculate a bidirectional average. Otherwise, the splicing of fibers with different mode-field diameters (MFD) could cause an apparent gain in signal power across the splice to appear on the OTDR in one direction. This is sometimes called a "gainer." In other words, when going from a fiber with a larger MFD into one with a smaller MFD, the splice joint will appear to have negative loss or "gain" in power.

When going in the other direction, the joint will appear to have a higher than normal loss. This is only an artifact of the OTDR measurement and the mismatched MFDs. The transmitted light traveling in a working system sees exactly the same splice loss in both directions. An example of what this looks like on an OTDR is shown in Figure 4.

It should be noted that this effect holds true whether the splice is a fusion splice or a mechanical splice. The amount of gain observed is proportional to the difference in mode-field sizes between two fibers. When splice losses are routinely low, small-magnitude gainers may be noticed for very low-loss splices. While it is possible to have gainers with any mode-field difference, the ones most likely to be of concern to operators occur when the MFD mismatch is large.

Even in this cawse, however, laboratory measurements on mismatched MFD splices prove that the actual amount of light reflected back into the system transmitter, such as a reflection-sensitive AM laser, is so low as to be virtually indistinquishable from unspliced fibers.

Reflections: An OTDR can be used to estimate the amount of reflected

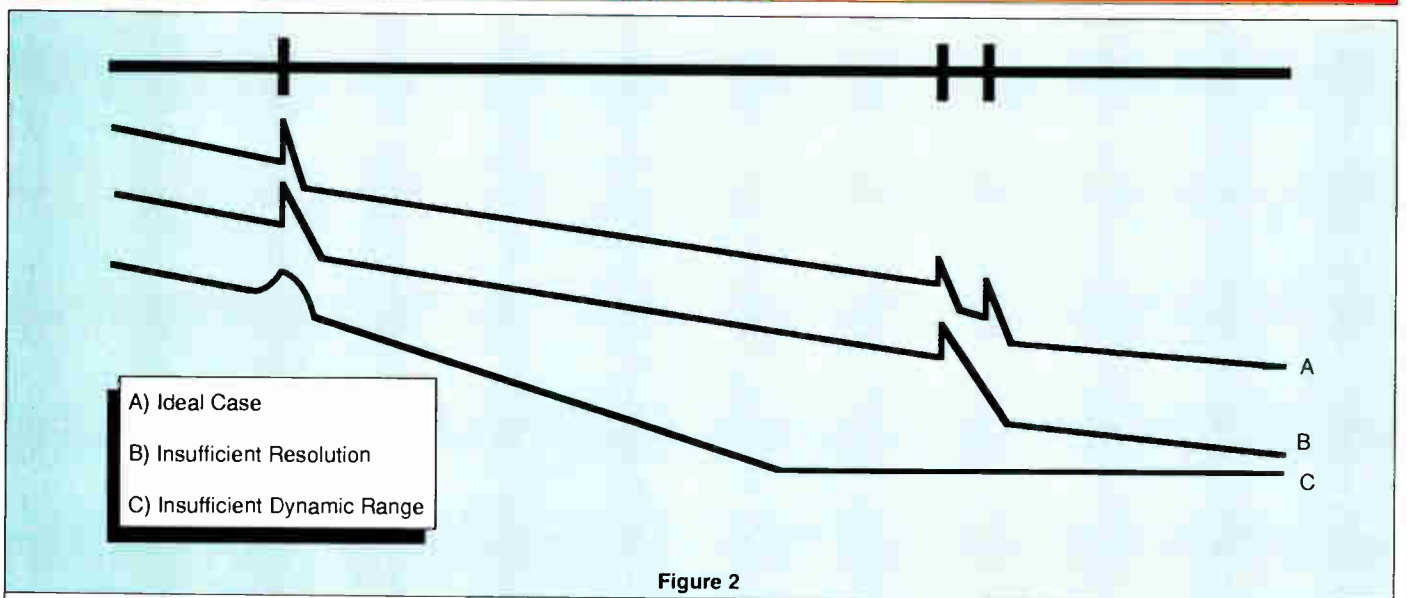

Figure 2

light from a joint or other element of a fiber system. While it is not as accurate as a direct measurement using an optical source and directional couplers, for most cable TV applications it is a useful indicator of the optical reflections that could degrade the transmitted signal quality.

In January, Laser Precision announced its TD-250 Fiber Analysis Software™ (FAS), which automatically detects faults along fiber and provides optical return loss (ORL) measurements at each reflective event on a fiber. With this new tool, ORL can be analyzed quickly and easily on any fiber optic system.

Length accuracy: One of the primary uses of an OTDR is to locate breaks, such as cable cuts, in an optical system. Almost all OTDRs will provide a length reading as a function of cursor position. This number can be reasonably accurate if a few simple precautions are followed.

First, each fiber manufacturer provides a group index of refraction value for its product. For example, Corning SMF-28™ optical fiber has a typical group effective index of refraction at 1300 nm of approximately 1.471.

Index	2 km error	15 km error
1.460	15 m	113 m
1.465	9 m	61 m
1.468	4 m	31 m
1.471	0 m	0
1.475	-5 m	- 41 m

Table 1: Error contribution from using the wrong value for index of refraction.

Since this value is only an approximation, the use of a calibration fiber of known length is recommended. Table 1 shows the length error from using different index of refraction values on systems that nominally are 2 km and 15 km long. Most OTDRs allow the group index of refraction to be set from the instrument's front panel.

The second source of length error comes from the cable itself. In most stranded designs, the fiber intentionally is longer than the cable. The excess

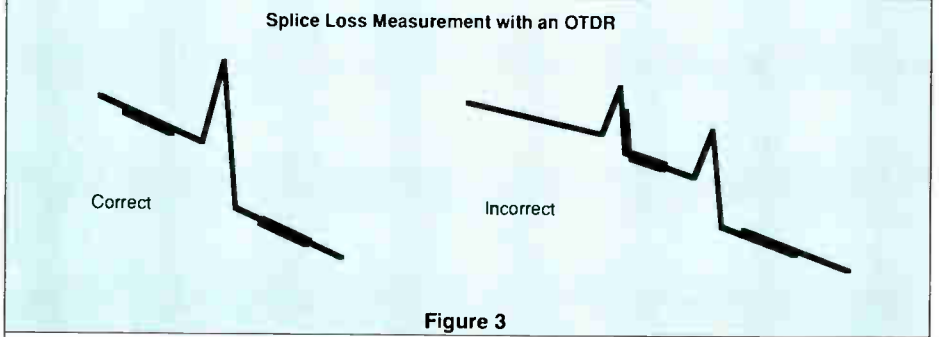

Figure 3

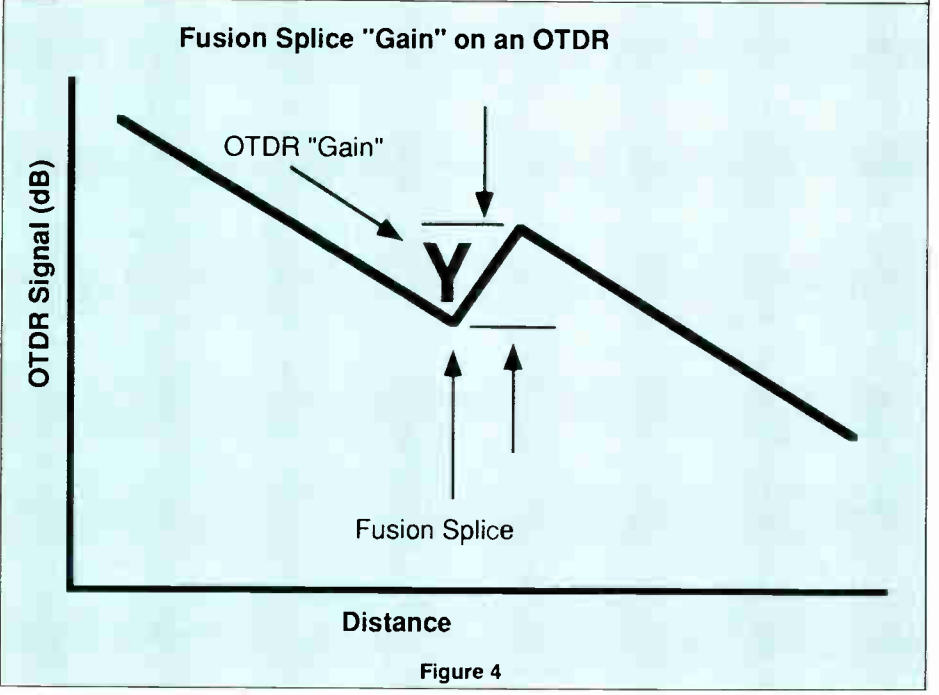

Figure 4

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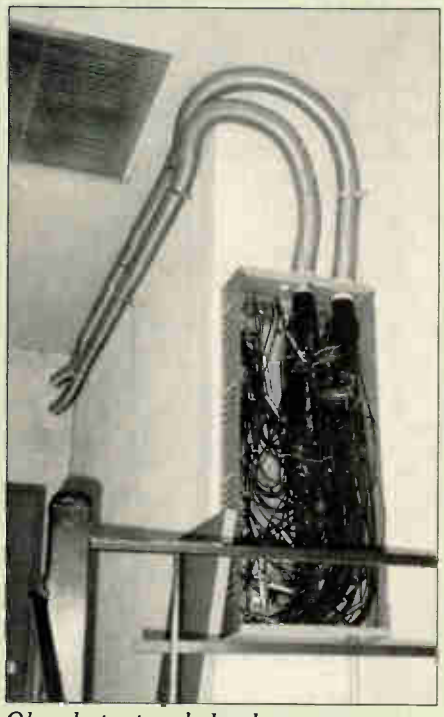
Reader Service Number 33

Advantages and savings by pre-wiring MDUs



Oh, what a tangled web

When it comes to installation procedures in today's multiple dwelling unit environment, the wiring of the MDU enclosure gets no respect. Open up a typical box and you are likely to find a spider's web of drop cables ready to pop out at you in disarray. After a typical installation, you may find a few F-connectors, splitters and weather boots scattered around the work area. But don't worry, they'll be used when another installer has to make a service call to the same location a few days later.

Why are the simplest tasks, the least technical, the ones that result in subscriber dissatisfaction and cost the cable company so much money? It is an ongoing dilemma which the industry struggles with day to day. The recently announced NCTA customer service standards represent the cable industry's admonition to customer service problems that threaten the foundation of cable's future.

It is often taken for granted that the contractor or technician will do a quality job when loading the components and connecting the drops in a lock box. In reality, it may be the source of a large percentage of customer complaints. A typical MDU box will service anywhere from six to 36 subscribers. Now, consider all the required signal splitting, security, and connecting devices that go inside the box, not to mention a particular style of lock to prevent illegal access.

A typical box is constructed of a painted mill-galvanized

The economic savings if a pre-wire program is used could look like this:

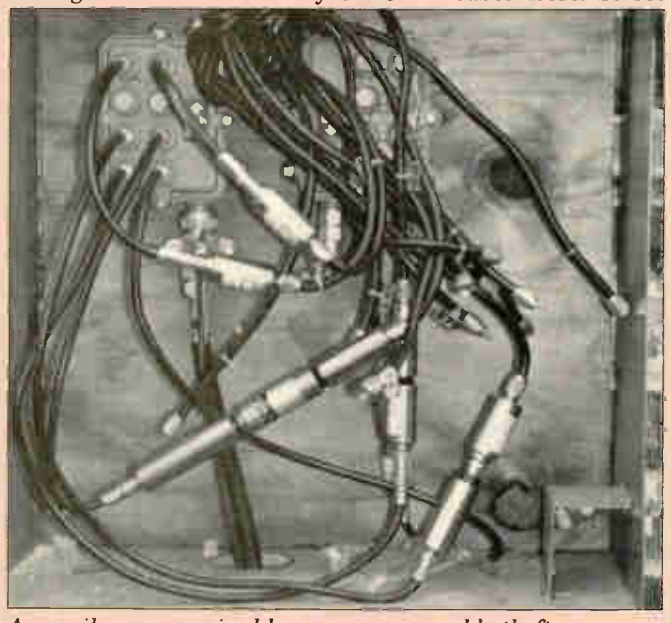
Hourly rate of field installer	$12.00
Truck roll costs	$30.00
Hourly rate for warehouse assembly work	$ 6.50
Pre-wire a 12x18x8 MDU plate	$ 2.00 (15 minutes)
plate	$ 3.75 (35 minutes)
Wire a 12x18x8 box in field	$12.00 (1 hour)
Wire a 18x24x8 box in field	$24.00 (2 hours)

By Frank Priebe, Product Manager, Reliable Electric

The value of a quality MDU enclosure

Over-the-air broadcast television creates a mindset in the American public that says, "All television signals received at the back of the TV set should be free of charge."

Imagine the thrill of receiving premium cable programming in the comfort of your home at no cost. By making an illegal entry and the right connections, the free programming service is yours for the viewing. This temptation runs through the minds of many cable TV subscribers. Street gangs are making a business of breaking into the MDU enclosures and stealing traps to provide service. "Do you need HBO?" Call Joe in unit 101.



An easily compromised box encourages cable theft

A tough pill

With the advent of cable television came the requirement for cable distribution and new programming. Along with that came the requirement of getting people to pay for the new programming services. In rural areas the concept of paying for additional services is readily accepted due to lack of programming. In metropolitan areas however, the idea of paying for more programming is a tough pill to swallow for the cable thief. In large cities, multiple off-air signals abound. Availability of these signals fortifies the "free TV" mindset.

Consequently, theft of cable service is higher in metropolitan areas than it is in rural areas. Cable theft is prevalent in urban areas because there is a higher percentage of multiple dwelling units (MDUs). Multiple dwellings mean higher concentrations of subscribers, ease of accessibility and higher profits for the potential thief. In general, theft will occur whenever the signal is available and easily accessible.

Armed with the desire to steal the service and a

By Russ Udelhofen, Vice President, Business Development, Electronic Metal Products

THE BEAST™ STOPS THIEVES.

Stop The Thieves And You'll Stop Signal Leakage In MDU's.

Thieves who steal your service are the most common cause of signal leaks in MDU's.

So shut out those thieves with The Beast™ high security apartment box. Made with 16 gauge aluminized steel, box-in-a-box construction, and stainless steel arc welds, The Beast is virtually vandal proof. And when equipped with our SuperLock locking system, even employee tampering is almost impossible.

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Thieves not only get you in trouble by causing serious signal leaks, they also steal your revenues. But if you've installed The Beast, they can't get into your box. So they'll have to get their cable service the old fashioned way–they'll have to buy it.

This increase in subscribers, plus lower maintenance and leak detection costs, helps make The Beast cost efficient in almost any MDU application.

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The Beast Looks Great With Our New Molding.

To make wiring quicker and servicing simpler, Cable Security has always offered a full line of custom features and options for The Beast.

Now with our new line of plastic and metal molding and accessories you can order everything you need at one time from Cable Security.

Trust Cable Security For Your CLI Solution.

Theft means signal leaks. It's as simple as that. And wherever you've got MDU's, you've got a high probability of theft.

But if you install The Beast with the SuperLock, you turn thieves and vandals into revenue generating subscribers. You also cut down on your CLI compliance problems. And you save on future maintenance and truck rolls.

No wonder you'll find The Beast working for almost every major MSO and in almost every major city.

To find out how to put The Beast to work for your system, call Cable Security today. We're the industry's number one source for high security installations.

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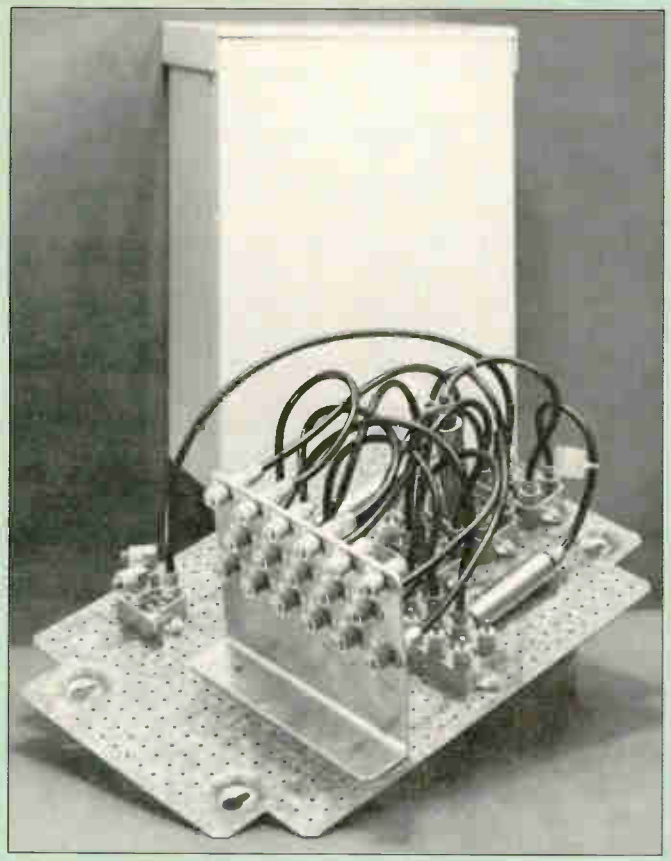


A pre-wired design allows for greater control in or out of field environments

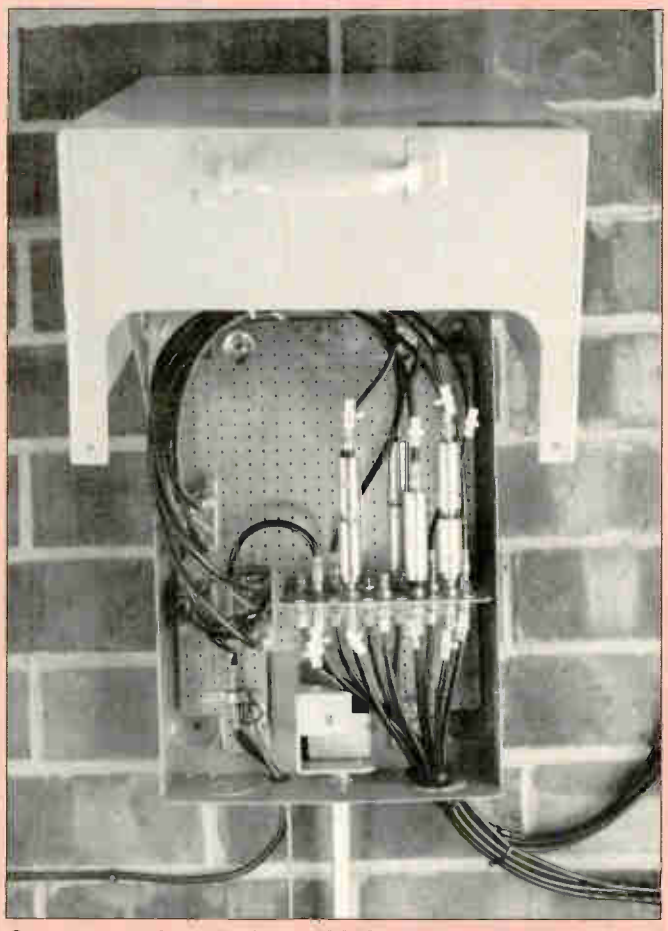
steel base and front cover with holes or knock-outs provided for the entry and exit cables. Because signal security is an issue, the box has to be tamper-proof to keep illegals from hooking themselves up. So, each box has a locking device, of which there are many in cable today. Inside a box, a wood backboard or mounting plate may be provided on the backwall of the base to mount the internal components.

A large percentage of the time, the box is installed on the wall of a building and the components are then mounted in whatever configuration is deemed necessary at the time. There is not a standard method as each system has a different signal security scheme. There are addressable cable systems, hard trapped, on-premise, and off-premise systems, to name a few. Making a uniform and orderly arrangement of components can be difficult when there is only so much area to work in, and the working conditions may be awkward.

Imagine then an installer perched on a ladder connecting

12x18x8 Initial Install:	
Field install 1 Hr. @ $12.00/Hr. labor wage	$ 12.00
Truck roll cost—one time cost	$ 30.00
Total field installation costs	$ 42.00
Pre-Wire MDU plate 15 minutes @ $6.50/Hr. wage	$ 2.00
Truck roll cost—one time cost	$ 30.00
Field install 15 minutes @ $12.00/Hr.	$ 3.00
Total field installation costs	$ 35.00
Savings per 12x18x8 box installation with pre-wire	$ 7.00
Average system w/500 boxes to install saves	$3500.00

screwdriver, crowbar or hammer and chisel, the potential thief will direct his attention to the apartment box. After prying open the box the thief is greeted with an array of cables, connectors, splitters and traps. The cable thief makes the appropriate changes and his mission is complete. Positive traps are sold at a premium and once installed inside the subscriber's home will forever remain a free



Organization benefits from added security

service. The resulting damage means missing equipment, interruption of service and more truck rolls. The final result is loss of revenue.

The MDU enclosure

Functionality is another word for user friendly. How easy is the MDU enclosure, or box, to carry up the ladder or from the truck? How easy is the box to install? How easy is the box to get into standing on a ladder? How accessible is the box? Is it easy to work in? Will it save instal-

The lengths some people go to break in

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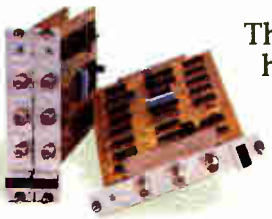

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TRILITHIC

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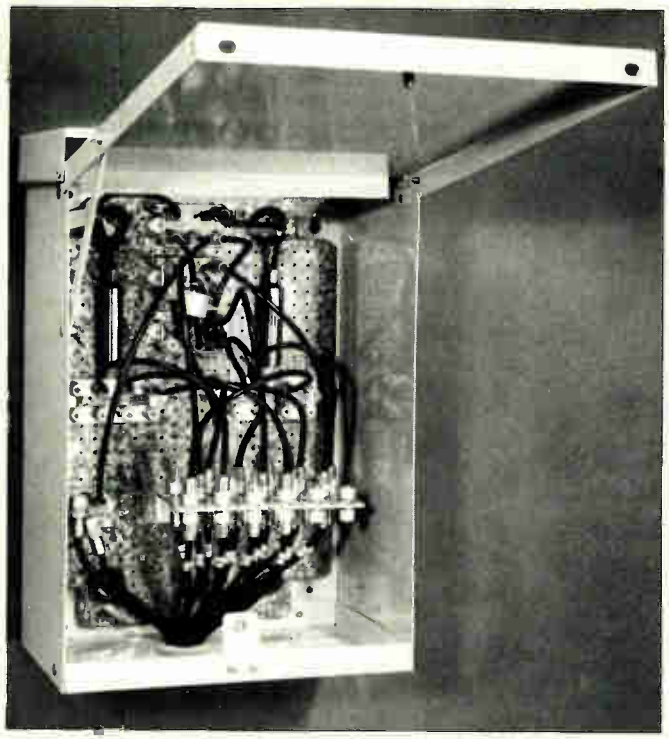

The pre-wired plate is eaisily snapped into place in the field

drops in a box with a cold rain coming down. Not ideal conditions for doing quality work. In most situations like this, the work is rushed, resulting in bad connections requiring future service calls. It is possible that this contributes to the problem of signal leakage. This all translates to those dreaded and costly truck rolls to service and repair a job that wasn't done right the first time.

The cost associated with a truck roll service call is approximately $30. What if most of the components used in an MDU box were pre-wired to a grid plate that had all the drops organized on one plate and this task was done in a controlled environment, and then that pre-wired plate was snapped into the lock box in the field? Wow, what an idea! Think of the time and money saved, not to mention the quality achieved by doing the job at a tech's work bench. Another important feature of this style of MDU box is that the subscriber drops can be easily tagged for prompt and easy identification.

The cost of doing the pre-wire, which doesn't require the time or cost of the truck, will save the company quite a few dollars and help promote better customer service in the long run. The advantages to implementing a program like this are many and have a long term value-added benefit.

18x24x8 Initial Install:	
Field install 2 Hr. @ $12.00/Hr. labor usage	$ 24.00
Truck roll cost—one time cost	$ 30.00
Total field installation costs	$ 54.00
Pre-Wire MDU plate 35 minutes @ $6.50/Hr. wage	$ 3.75
Truck roll cost—one time cost	$ 30.00
Field install 15 minutes @ $12.00/Hr.	$ 3.00
Total field installation costs	$ 36.75
Savings per 18x24x8 box installation with pre-wire	$ 17.25
Average system w/500 boxes to install saves	$8500.00

More and more MSOs are recognizing the benefits of a pre-wire MDU box design. TCI has spent a considerable amount of time and effort in developing a program that employs the option of MDU pre-wire installation procedures. Call it a trend or just a logical installation tactic, cable systems will require either a retrofit grid plate kit for existing boxes, or purchase an MDU box with the mounting hardware included.

The benefit of quality control can also be addressed when applying the pre-wire approach. A bench technician can load signals into the input and, in less than 10 minutes, determine if the passive equipment is working right. This eliminates faulty equipment going into the box and creating a future service call.

By adopting this plan, some definite savings can be made. If you average the savings of the two sizes of MDU boxes, the savings for 500 units would be $6,000. The long term value-added benefit, resulting from the quality control achieved by doing the work in a controlled environment and testing the components, are where the real savings exist. If the procedure eliminated only three service calls at $30 a call, the system would save $45,000 for 500 MDU boxes.

As signal security and customer service problems become more of a public issue, and more pressure is placed on the cable industry to perform, it's important that applications such as pre-wiring MDU boxes become common practice. Reducing service calls is the goal of today's cable operator so that he may invest more on quality programming with the money saved by eliminating unnecessary service calls. ■

lers and technicians time? Can you get at the components with both hands? Is the box interior organized or is it a rat's nest and a safety hazard to work in? Does the box have a mounting grid plate? Does the box have a common demark point? Is the box weather resistant or does it have holes in the top for ease of moisture entry?

Heat dissipation must not be overlooked. Products installed in enclosures should be heat tested to temperatures between 145°F and 160°F for extended periods of time. Generally, the inside temperature will run 15°F cooler than ambient temperature when mounted on a vertical surface.

In addition to the previously mentioned features, an MDU enclosure must be safe. Most MDU enclosures weigh in excess of 30 pounds. MDU enclosures are a safety hazard! Safety means the box must be easy to install for the installer. A template for mounting the box must be provided. The box must be easy to hang, allowing the installer greater provisions for safety.

Steps to optimize installation and performance of MDU enclosures include providing: a safe enclosure; a user friendly enclosure; a secure enclosure; a functional/organized enclosure; and a cost effective enclosure.

Security in a box

The coming trend in the cable industry is to generate more revenue per cable enclosure. This will be driven by the new off-premises addressable equipment which is currently in various testing stages. The value of equipment used in the enclosure will remain an important asset.

The solution to cable theft is to provide your systems with a safe, secure, functional enclosure that makes sense economically. ■

PEDESTAL CALLBOOK

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Opelika, AL 36801
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DESCRIPTION: Manufacturers of the Beast™ lines of high security, low maintenance apartment boxes featuring our superlock locking system; distributors of padlocks, pedestals, plastic and metal riser guard and molding products.

Champion Metal Products .(417) 736-2135
FAX . . . . . .(417) 736-2662
Rte. 1 Box 422
Strafford, MO 65757
PERSONNEL: James F. Moore, CEO; Carl Tiedt, Executive Vice President
DESCRIPTION: Manufacturer of custom designed heavy-gauge, mill galvanized steel CATV pedestals, closures, and high security apartment boxes. All closures go through a superior powder coat finishing process for optimum resistance to the environment. Have a complete line of mounting posts, brackets, and accessories. Call us for fast response to your individual requirements.

ComPedCo Inc.

ComPedCo Inc. . . . . . .(816) 483-5314
P.O. Box 419028
Kansas City, MO 64141-0028
PERSONNEL: Rob Waldrop II, Vice President; Ron Owsley, Senior V.P. & General Manager
DESCRIPTION: ComPedCo offers a low profile pedestal featuring heavy gauge zinc coated steel. Heavy gauge steel padlock hasp and knockout provision for keyed cylinder lock provided in every box. Available with environmental green finish of thermoset polyester powder coating which provides the most durable, non-corrosive finish available.

Diversified Control Systems

Diversified Control Systems . . . . .(716) 835-1818
327 Windermere Blvd.
Amherst, NY 14226
PERSONNEL: Brent James, President
DESCRIPTION: High security locks with individual key codes available for pedestals, apartment boxes, and power supplies. Tap-auditing equipment also available.

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PERSONNEL: Sonny Dickinson, National Director of CATV Sales; Derwin Otwell, National CATV Accounts Manager
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plier also offer a single, focused point of contact for the CATV system/product engineer, thus eliminating redundant activities related to multiple vendor purchases. The CATV project engineer can utilize the program management contact to plan, coordinate and schedule all material deliveries and installations. The single point of contact allows an uninterrupted, logical sequence of events, resulting in a time efficient installation.

In 1988, Barden Cablevision of Detroit, Michigan, expanded its existing CATV microwave system by utilizing a system supplier for the installation of an additional hub site in Chadsey, Michigan. "Everything went smoothly because we utilized a system supplier with an experienced program management team," said Wayne Robson, Barden's project engineer. "This eliminated the coordination problems one might encounter when relying on multiple vendors."

Choosing a service oriented organization should be considered a must. Many suppliers provide adequate service only until the sale is complete. The ultimate supplier should provide service and assistance in:

- The planning stage (budgeting, feasibility, suggestions)
- System design (best fit for need)
- System installation
- Post installation.

Service should be continuously available. The system supplier should offer customer support services, and be willing to assist during all phases of the business cycle.

Installation/testing expertise

Products such as the "mysterious" circular waveguide, elliptical waveguide and terrestrial microwave antennas are sensitive to proper electrical testing procedures. The system supplier should offer guaranteed performance of the products and services provided. Antenna/transmission line systems can be tested independently of the radio equipment through the use of transceivers, assuring a proper functioning antenna system and eliminating costly downtime. Towers, equipment shelters and foundations are the building blocks and support of the antenna system. Installation schedules for these products must be coordinated through program management for a smooth flowing system installation.

Towers, equipment shelters and foundations are the building blocks and support of the antenna system.

Summary

In summary, the planning and installation of CATV systems requires a variety of engineering, product and service resources. The CATV systems are revenue generating and typically subject to aggressive installation schedules. The resources offered by a qualified system supplier can help assure a timely installation resulting in earlier revenue generation. ■

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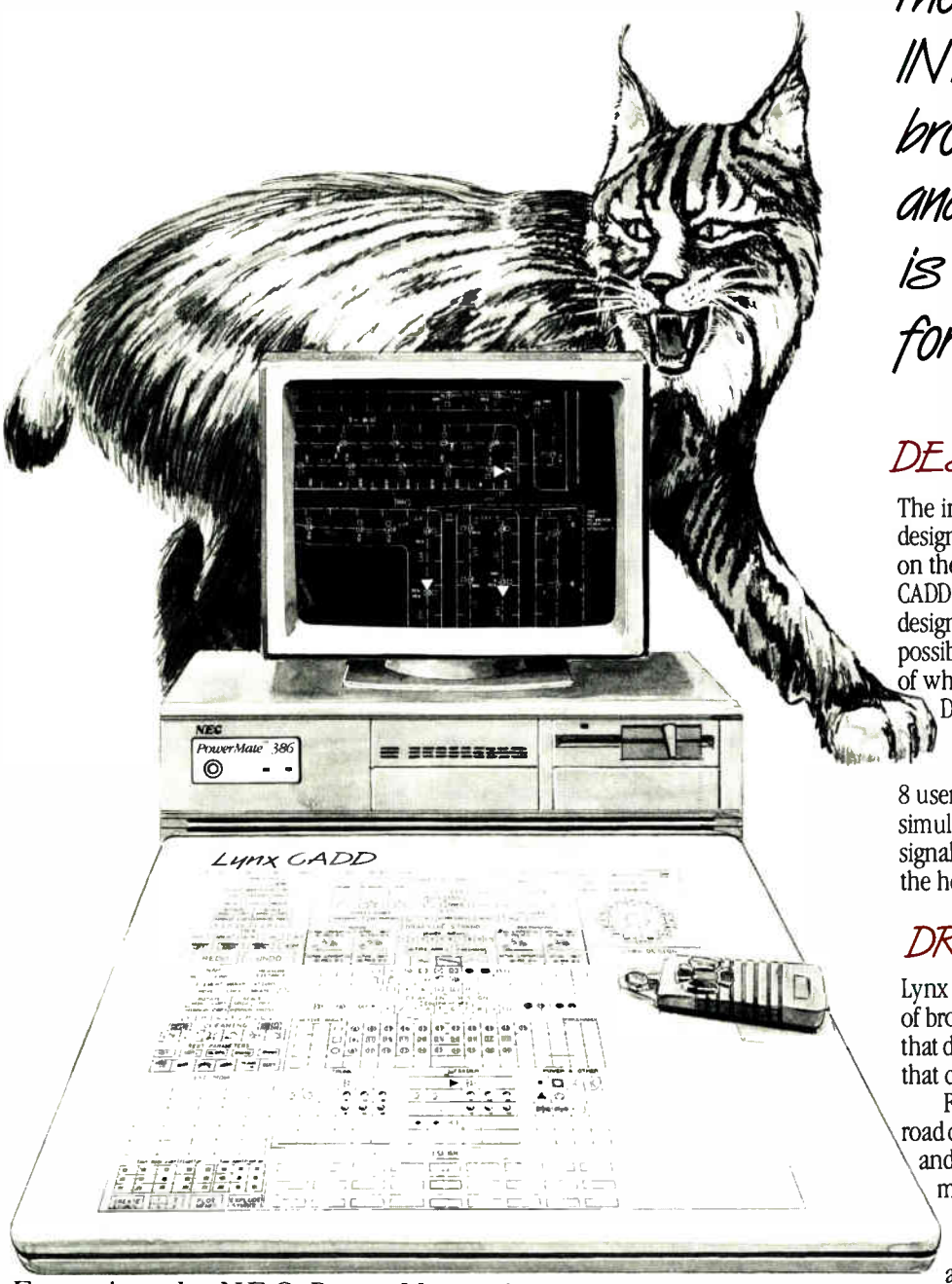

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Reader Service Number 40

Cable piracy's effect on the industry

This article is an adaptation of a presentation made to several local SCTE chapter meetings.

Piracy of copyrights, patents and other intellectual property costs the U.S. economy tens of billions of dollars and thousands of lost jobs every year. In a 1988 report, the U.S. International Trade Commission found that 431 U.S. companies suffered aggregate worldwide losses of more than $23.8 billion in 1986 due to inadequate intellectual property protection. Piracy of all kinds is big business, and unfortunately, cable signal piracy is no exception.

The nature of the problem

Having begun my career in the cable industry in marketing more than 10 years ago, I have always been atuned to the value of cable services. To me, anyone who intentionally receives cable without paying for it is stealing. It doesn't matter whether you take a shirt from a department store or a signal from a cable system, it's just not right...and it's against the law.

Unfortunately, many people don't see it that way and attempt to make false distinctions between cable theft and other forms of theft. People who would never consider shoplifting anything see no problem with receiving cable services and not paying for them.

Let me hammer this point home. Not long ago, a cable executive in Connecticut told me he had a Chamber of Commerce luncheon in one of the towns he services. He sat with the Chief of Police and several of the local merchants. During the course of their conversation, the merchants complained to the Chief that shoplifting was a major problem and that it was having a destructive impact on their businesses. The conversation then shifted to cable, and the merchants began joking about how they were able to obtain all of the extra pay services for free. To them, cable theft was the "in thing" to do. Yet in almost the same breath, shoplifting was a crime. They simply failed to see that there is no distinction.

Unfortunately, theft of cable service crosses all geographic and demographic boundaries. Doctors, clergymen, public defenders, mothers-in-law—all these, under the surface, are potential cable pirates. Cable thieves brag of their exploits at parties. They become helpful neighbors and pass their secrets on to the people next door.

Perhaps the honorable H. Lee Sarokin in the *U.S. v. Kaufman* case stated the situation most appropriately just before he sentenced Kaufman to three years in federal prison. "The court is not unmindful of the fact that the defendant's success is due in large measure to the willingness of his customers to cheat cable television companies. That the defendant was able to find over 6,000 customers is a sad commentary on the ethics of our society, but the fact that he profited from their misconduct does not minimize his crime. We must make it clear that theft through electronic means is just as much a crime as taking money out of a cash register."

Unfortunately, this "perception problem" flourishes. Many homeowners and business people continue in their illicit courses of conduct. As a result, individual unauthorized reception in homes, commercial unauthorized reception in bars, hotels/motels and multiple dwelling units, and illegal decoder rings are thriving; to the tune of more than $1 billion in lost revenue each year, not including pay-per-view.

Effects of unauthorized reception

The above figure itself is staggering, but the effects of unauthorized reception extend beyond the bottom line of our industry. Illegal connections and pirate decoders cause technical problems which subject cable operators to FCC scrutiny and reduce the quality of the signal at the paying customers' homes. The honest customers, in effect, must subsidize the freeloaders and this negatively impacts the perceived value of the services in valued subscribers' minds.

The "why should I pay $27.50 a month when my neighbor gets it for free" attitude needs to be changed. Furthermore, unauthorized reception reduces investor confidence. With systems trading in the $2,000 to $3,000 per subscriber range, a five percent unauthorized reception problem can negatively impact the buying or selling price.

But the effects of cable piracy are felt beyond the bottom line of the cable industry. In cable systems where unauthorized reception flourishes, the lost cash flow negatively impacts the cable system operator's ability to maintain a high level of service quality. It also affects the operator's ability to reinvest proceeds in the development of programming.

Beyond the direct economic injury suffered by the cable industry, unauthorized reception translates into lost tax dollars and franchise fees for states and their political subdivisions.

What's being done?

Many cable operators are well aware of the negative impact that unauthorized reception is having on the cable industry in general and, more specifically, the effect it is having on their systems. In response to this growing problem, operators have developed signal security programs designed to reduce unauthorized reception. Common elements of these programs include awareness campaigns, tap audits and litigation. In addition to reducing unauthorized reception, many operators have found such signal security programs can increase subscriber numbers.

In the November 20, 1989 issue of *CableVision* magazine, theft of service was examined in the "Cable Poll" section. The Cable Poll is a sampling of industry opinion conducted on a regular basis by Ryan/Samples Research Inc. for Midwest CATV, *CableVision* and *CED* magazines.

Interviews showed 62 percent of operators estimated that passive theft (the unauthorized reception of services by consumers resulting from inadequate cable operator procedures) amounts to almost five percent of total revenues lost; 28 percent put the figure at between five and 10 percent, while

By Jim Allen, Director, Office of Cable Signal Theft

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15 percent of operators said passive theft amounts to between 10 and 15 percent of lost revenue. By averaging the midpoints of these responses, it may be determined that operators, on average, are seeing 4.75 percent of total revenues disappear down the wire, a figure that translates to more than $731 million based on estimates of $15.4 billion in total industry-wide operator revenues in 1989.

From tightening up operational procedures to reducing "coffee shop disconnects," to assisting federal authorities in breaking up interstate black box rings, it now is evident that cable operators are making a major commitment to combat theft of service.

Increasingly, that commitment is taking the form of a new staff person, the system security manager. These people, often former law enforcement personnel, are becoming responsible for tap audits, converter box security and prosecutions, and in many cases, they are more than paying for themselves through increased cash flow generated when illegal customers become paying subscribers.

According to data from the Cable Poll, 16 percent of all systems (and an eye-opening 50 percent of all systems with more than 50,000 subscribers) now have a security person either on the local staff or at a regional headquarters.

These security managers also appear to be hard at work as 80 percent of all systems have instituted regular sweeps or tap audits of their plant to detect homes that are receiving unauthorized service.

Thirty-six percent of all systems and 50 percent of the larger systems have instituted an amnesty or public awareness campaign.

And 45 percent of all systems (73 percent of the larger ones) have adopted tighter controls over converters, both as a means of eliminating theft of pay channels by legal basic subscribers and to reduce the number of boxes that disappear into the black market.

But perhaps the most striking figure from the survey is that 36 percent of all operators have filed civil or criminal charges against an individual or a company in the past year, a figure that rises to 55 percent of all systems with more than 50,000 subscribers.

As growth in penetration slows, the industry is finding as many new customers among the illegal population as in the community at large.

Active theft

Economic loss figures from active cable theft (due to illegal decoder distribution enterprises or commercial theft in hotels/motels and bars) is a much more difficult figure to arrive at.

Intelligence data gathered in the past 24 months indicates that the black market device universe may be much more extensive than previously believed and probably expanding. In early 1987, when OCST updated Showtime/The Movie Channel's 1983 research, estimates of economic impact attributable to organized decoder rings ranged from $200 million to $250 million annually. Actual business and sales records seized in just 18 cases nationwide since 1987 substantiate losses in that dollar range alone.

The estimated loss figures may be conservative as the formula utilized does not incorporate unauthorized reception of pay-per-view programming. Engineering analysis of pirate product

seized by the FBI to date in 1989 (more than 50,000 devices) substantiates that 75 percent of the units were capable of circumventing addressable technology.

The Leonard-Duran fight took place in December 1989. According to fight promoters, they expected more than 13 million homes would have PPV accessibility. They also projected that more than one million homes would pay for the fight, producing a gross of about $32 milliion.

Let me just present a hypothetical situation based on percentages that very well may be conservative: Industry estimates as to the percentage of unauthorized black box devices in consumers' possession range as high as five percent. If two-thirds of those have PPV capability, we arrive at three percent. Three percent of 13 million homes which were offered the fight gives us 390,000 with possibly unauthorized devices. And 390,000 times $30 (the average charge for the fight) equals a potential loss of $11.7 million on just that one event.

The industry must be concerned about the converter/decoder black market. I'm not sure we have a percentage breakdown as to where this product originates but we definitely have a feel for various directions from where it's coming. Business records from federal case seizures indicate that indeed there is a tie into off-shore manufacturers, namely Taiwan and South Korea. Usually this type of equipment would be an add-on variety that may look similar to original equipment.

The thieves are sneaky

It would also appear that there are illegal decoder distribution enterprises who are passing themselves off as either legitimate cable operators or companies who solicit equipment not only from legitimate manufacturers such as Jerrold, Scientific-Atlanta and Oak but also from cable operators and legitimate third-party brokers.

They use acronyms that are similar to legitimate cable companies or names that are different only by one word, or an interchange of whatever title they are using for that particular entity.

Thirdly, there is a problem with the used equipment market, in that perhaps people are not being as conscientious of doing due diligence with the businesses that they are buying and selling from, because it would appear that there is obsolete and excess equipment in the marketplace that finds its way into the wrong hands.

There is also some concern with converter repair facilities. There hasn't been any direct substantiation of it, but there are indications that not all equipment that is sent in for repair is repaired or repairable, or it is claimed to be irrepairable and a certain percentage that is allegedly headed for the scrap pile never quite makes it that far and ends up on the black market.

I cannot stress enough how critical it is that all facets of the industry conduct due diligence inquiries consisting of background investigation of public record information pertaining to subject companies interested in purchasing equipment. The due diligence inquiry, if properly conducted, can help separate the legitimate buyer from the pirates.

The cable television industry has taken some dramatic steps in confronting the piracy problem.

It's illegal, it adversely impacts everyone's bottom line and damages the perceived value of the service in the honest, paying subscribers mind. The cable industry must continue to take whatever measures necessary to protect one of its most valuable assets: it's programming. ■

COMPLIANCE

ready for takeoff. In reality, some contractors are booked far in advance to assist the eleventh hour crunch of systems struggling to meet the July 1 deadline.

The distance from the contractor's home base to your system is another factor in arranging (and budgeting) for a flyover. Scheduling one in conjunction with other systems in your area is perhaps the most cost-effective approach to take.

On the other hand, the time required to perform a ground-based CLI is dependent upon your available personnel and the size of your system. Of course, there are contractors who perform driveouts but this is a short-term fix. It must be stressed again that, in the long run, your system should be staffed to perform your CLI testing as well as regular monitoring.

Experience in the Jones Intercable's Albuquerque system has shown that the average technician can monitor about 30 miles of plant per day. In other systems, this is dependent on the location of plant, number of leaks and method of recording them. In our system, this time also includes repairing leaks in excess of 200 μV/m immediately upon finding them. So, by multiplying the number of techs doing the driveout by 30, then dividing that product into the number of your plant's strand miles, you can approximate how many days it will take to complete the legwork of a driveout.

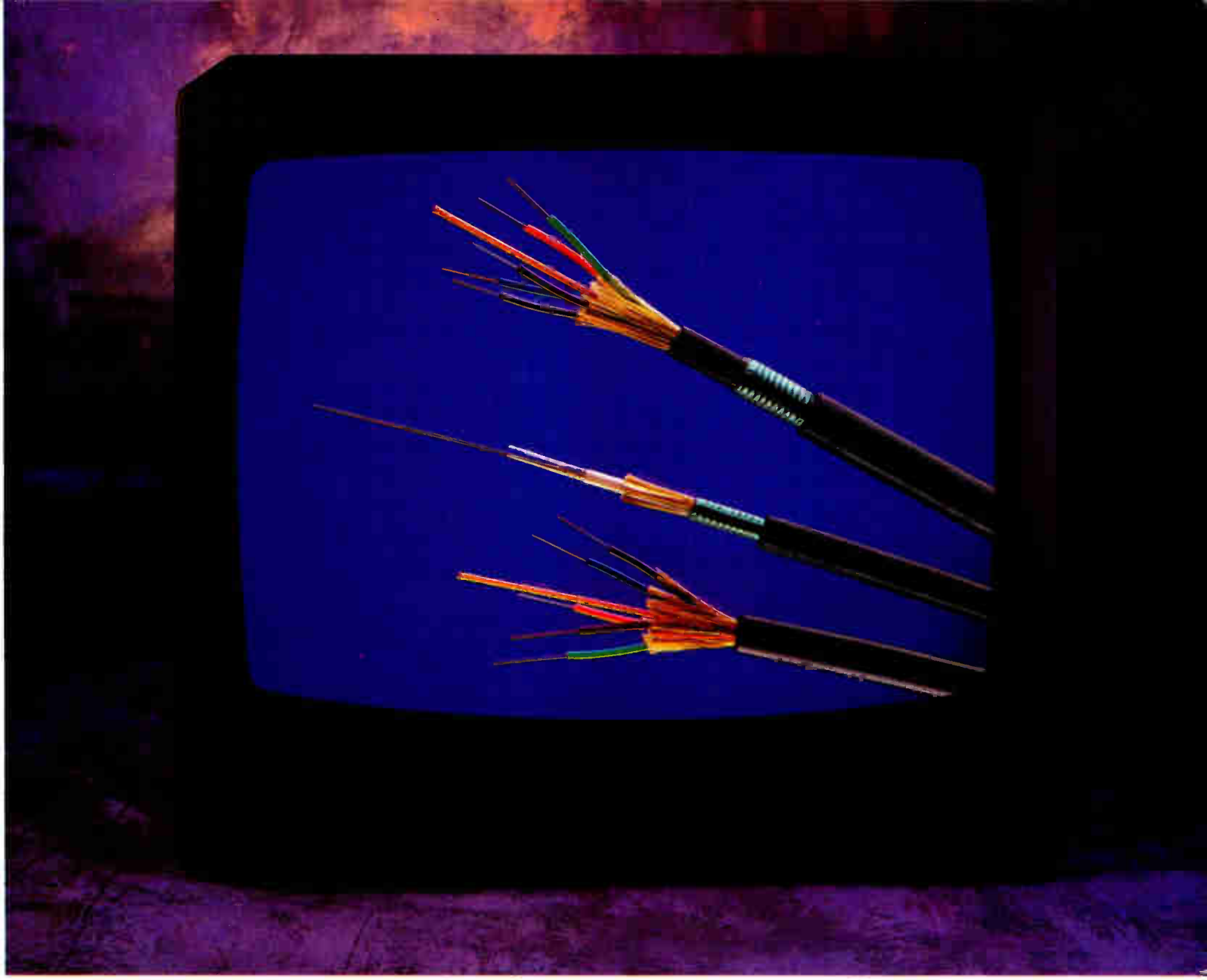
Cost: As mentioned before, the cost of a flyover is dependent upon the distance the contractor must fly to get to your system, as well as the number of square miles in your plant. Call to get an estimate on your particular system; most flyovers cost in the range of $3,000 to $10,000.

Costs for a driveout conducted in-house are based on the number of strand miles of plant at about 30 miles per day. This is easily figured out by factoring in your system size and the cost of a tech and vehicle per day. For example, assume a tech and vehicle cost $22 per hour to operate. A driveout of a 300-mile system will cost as follows: 300 miles of plant divided by 30 miles/day equals 10 days (or 80 hours). So, 80 hours times $22/hour equals $1,760.

Data compilation following the driveout is another cost that must be considered if the work is done in-house. You can buy ready-to-use computer software. If your system is relatively small or the number of leaks is low, and you're not afraid of a little math, do the formulas yourself using a scientific calculator.

Repair: You should always consider the possibility of failing your first CLI, then figure out how you will repair the leaks and retest. If a flyover is performed, you'll have an idea of the "hot spots" in your system. But in order to locate all of the leaks you'll still eventually need to drive out to find them.

The ground-based method, on the other hand, gives you the exact location of all the leaks, which makes repair much quicker. Generally speaking, the average tech can repair eight to 10 leaks per day, obviously varying with the type of repair required. ■



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Use of the zone plate as a video test signal

The circular zone plate is well known as an optical test pattern. Although Drewery[1] proposed the zone plate as a video test signal in 1979, its use for this purpose became more widespread with the advent of digital video processing since the signal's properties are particularly well suited to detection of artifacts generated by digital processing techniques.

Mathematical expression

Mathematically, the following equation, where x and y are the horizontal

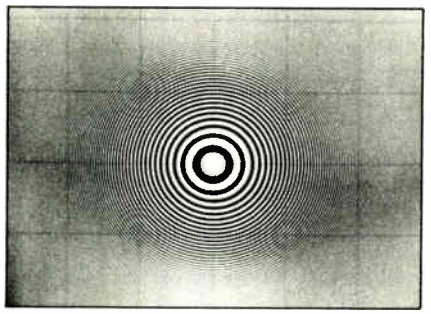

Figure 1

and vertical coordinates at any point in the picture area and x0 and y0 are the coordinates of the origin, expresses the zone plate.

$$f(x,y) = \cos [\pi ((x-x0)^2 + (y-y0)^2)]$$

Figure 1 shows the zone plate pattern. The pattern appears on the monitor as a series of concentric black and white rings with gradually decreasing spacing between the rings. This is equivalent to a pattern of gradually increasing spatial frequencies in a radial direction from the center of the TV screen.

Therefore, horizontal frequency is proportional to horizontal distance and vertical frequency is proportional to vertical distance. Thus, among other things, the zone plate can determine the frequency response (resolution) of a video system in the horizontal, vertical and diagonal directions.

The BTS Model D7 Pattern Generator and DC7 Component Decoder are one set of devices capable of generating a zone plate pattern. The test signal generator outputs a digitized zone plate video signal in a 4:2:2 format (four samples of luminance [Y] followed by two samples per color difference signal [R-Y, B-Y]). If desired, the test signal generator can be genlocked to an external NTSC or PAL video signal.

By Joe Waltrich, Senior Project Engineer, Applied Media Lab, Jerrold Communications

Other uses

In addition to the zone plate, the D7 Test Pattern Generator can also produce more commonly used video test signals such as color bars, multiburst, etc. The component decoder converts the digital information from the signal generator to analog video in either RGB or Y, R-Y, B-Y format. Figure 2 shows a typical zone plate test set-up.

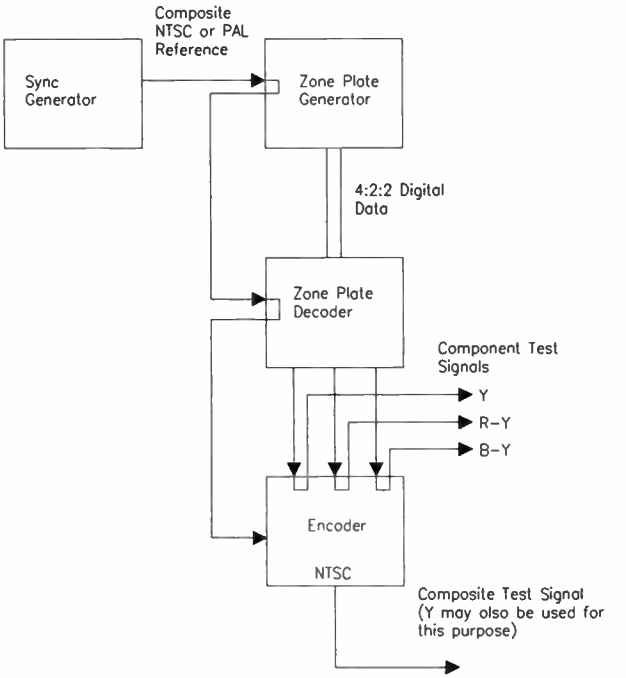

Figure 2

Although both luminance and chrominance components can be transmitted, the zone plate is often used as a monochrome test signal. Front panel controls on the test signal generator permit the operator to disable the chrominance components and transmit only the luminance information. Frequency markers may also be inserted into the signal.

Figure 1 shows these as horizontal and vertical lines. In Figure 1, the markers are spaced at 2 MHz intervals. Note that the center of the screen corresponds to DC while the left and right edges correspond to 6 MHz or 235 cycles per picture height (470 lines/picture height). In the vertical direction, the top and bottom edges correspond to about 4.5 MHz or about 175 cycles per picture height (352 lph).

When viewed on an oscilloscope (Figure 3), the zone plate test signal appears as a swept frequency which starts at 6 MHz and gradually de-

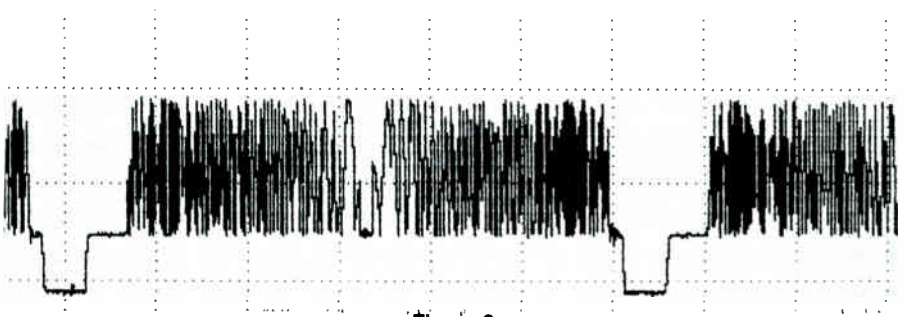

Figure 3

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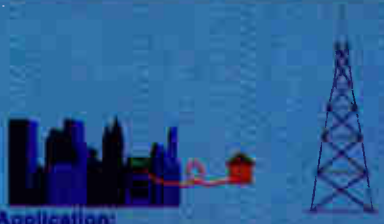

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creases until it reaches zero halfway through each horizontal line at which point it increases again to 6 MHz at the end of the line. This horizontal sweep is combined with a similar vertical sweep to generate the circular pattern.

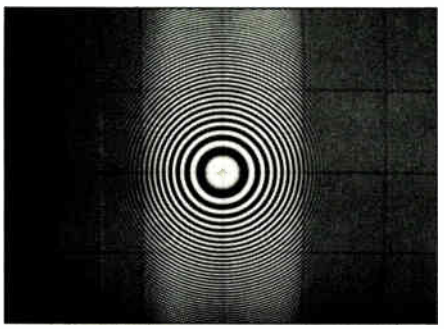

Figure 4

Although it may be interesting to observe oscilloscope displays of the zone plate, this signal is primarily intended for use as a visual test signal. A great deal of information about system performance can be obtained by the zone plate in conjunction with visual observation of the system output on a monitor or receiver.

Frequency response

Figure 4 shows the use of the zone plate to determine a system's frequency response. In this instance, the zone plate is used as an input to a system whose horizontal resolution is limited to about 2 MHz (approximately 160 lines per picture height in the NTSC system). The lowpass effect is clearly shown in Figure 4. From Figure 4 it is seen that the zone plate rings are visible only in the 0 MHz to 2 MHz region (i.e. only in the region from the center of the screen to the 2 MHz markers) while the rest of the screen is a uniform shade of gray.

Obviously, the zone plate may also be used for determination of the vertical resolution of a system. A system having limited vertical resolution would show gray areas at the top and bottom of the picture. Similarly, reduced diagonal resolution would appear as gray areas in the corners of the picture.

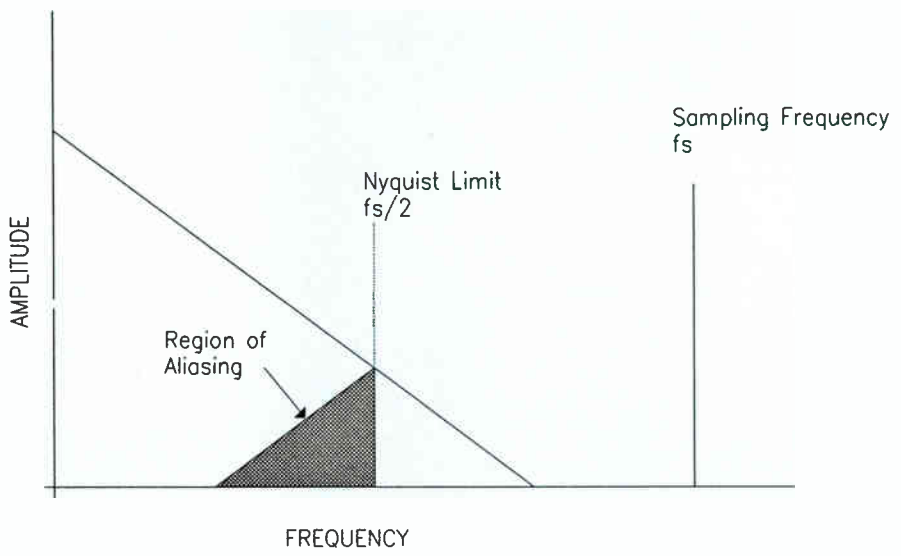

Figure 5

The zone plate is particularly useful for showing the characteristics of digital video processing systems. For example, if a system is improperly filtered before it is sampled by an A/D converter, frequencies above the Nyquist limit (i.e. frequencies greater than half the sampling frequency) are aliased.

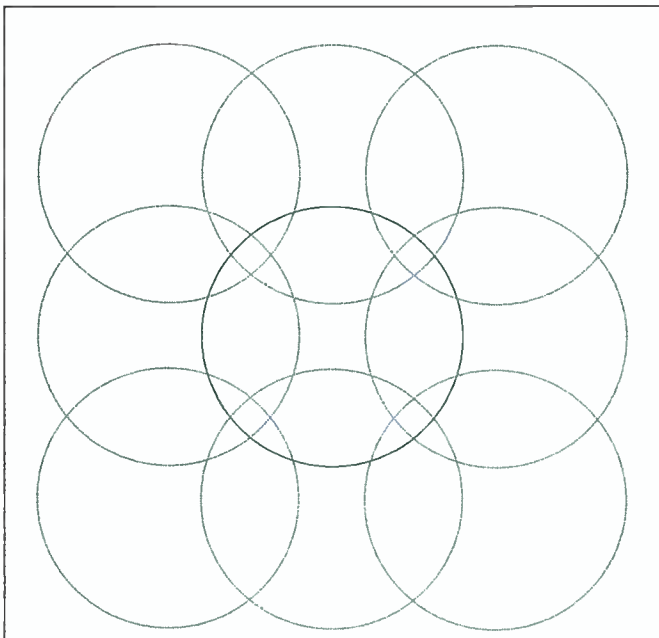

Figure 6

For instance, an input signal whose frequency is equal to three-quarters of the sampling frequency would appear at the output of a digital system as one-quarter of the sampling frequency. Similarly, an input equal to seven-eighths of the sampling frequency is output as one-eighth of the sampling frequency.

Spectral folding

That is, spectral components above the Nyquist limit are "folded" around

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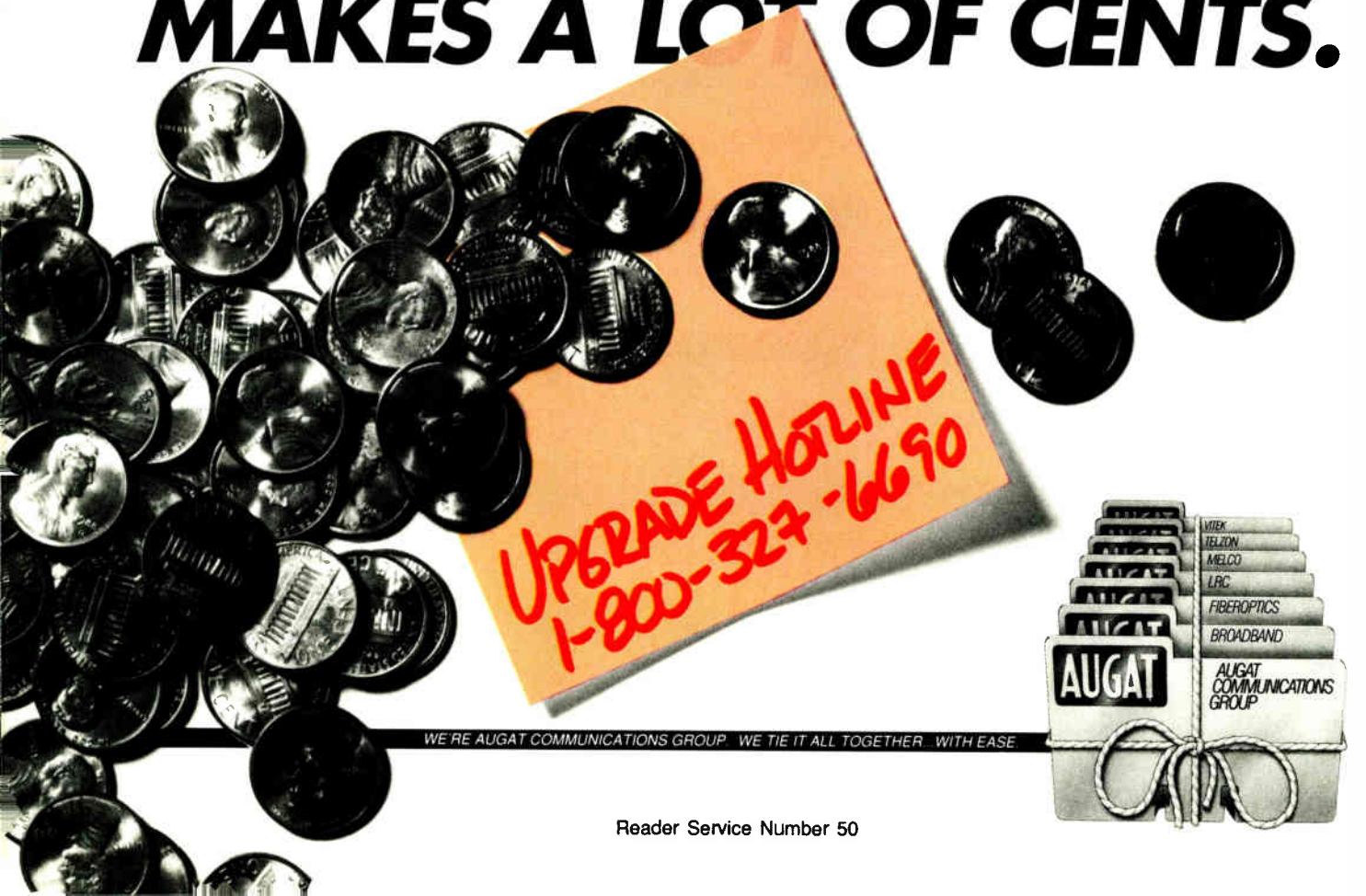


Reader Service Number 50

the Nyquist limit into lower, or aliased, frequencies. Figure 5 illustrates the spectral folding phenomenon for a one-dimensional spectrum. In Figure 5, those frequencies which lie above the Nyquist limit are reproduced as lower frequencies within the shaded area.

The one-dimensional spectrum folding shown in Figure 5 can be extended to the two-dimensional case of a television spectrum. Since a television signal is sampled in both the horizontal and vertical dimensions, two-dimensional aliasing can occur, resulting in spectrum folding in both the horizontal and vertical directions. This results in a two-dimensional replication of the original pattern as shown in Figure 6. The manner in which the original signal is repeated mirrors the input sampling structure.

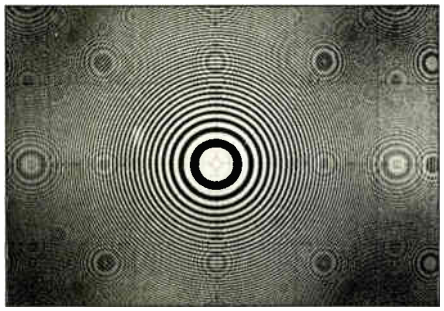


Figure 7

For example, an orthogonal sampling pattern such as that generated by sampling an NTSC signal at four times subcarrier produces aliasing components which are arranged on a rectangular grid relative to the original signal. The positions of the aliased zone plate spectra for such a sampling pattern are shown by the dotted circles of Figure 6. If the input were sampled at three times subcarrier, resulting in a diamond-shaped sampling structure, the aliased signals would appear in a diamond-shaped pattern.

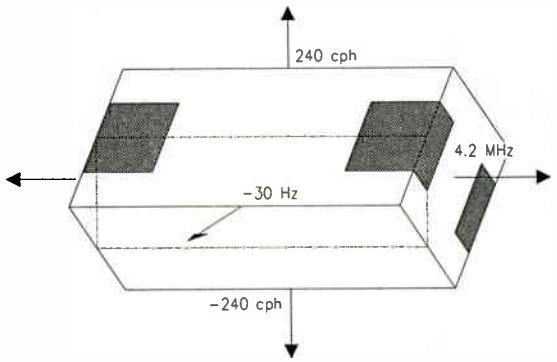


Figure 8

Detecting aliasing

Figure 7 illustrates an example of the use of the zone plate to detect aliasing. The signal pattern shown in Figure 7 was produced by D/A conversion of a digitized zone plate signal without pre-filtering. The aliased components are clearly visible as replications of the original zone plate.

In addition to showing spatial frequency response, the addition of motion to the zone plate test pattern permits the observation of a system's frequency response in three dimensions (i.e. horizontal, vertical and temporal). The three-dimensional spectrum of an NTSC signal is discussed in publications [2,3,4] and is shown in Figure 8.

Note that, in Figure 8, the luminance spectrum occupies ±4.2 MHz in the horizontal direction, ±240 cycles/picture height on the vertical axis and ±30 Hz on the temporal axis. The position of the chrominance components is shown by the shaded areas located at four edges of the spectrum.

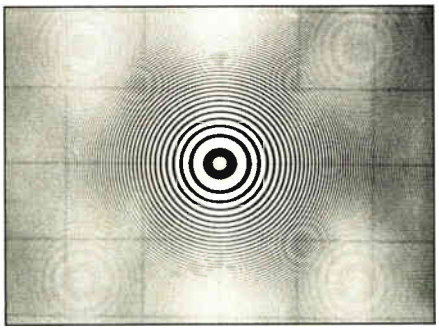


Figure 9

The BTS zone plate generator can be programmed to provide a moving zone plate pattern at rates ranging from ±0.47 Hz to ±30 Hz. By programming the zone plate generator for a particular rate of motion, it is possible to examine the behavior of a video system within a selected "slice" through the spatio-temporal spectrum.

For example, if the rate of motion is set to 15 Hz, the spectral slice cuts through the center of the chrominance region and, therefore, a system's luminance/chrominance separation can be evaluated. This is illustrated in Figure 8 for the case in which the zone plate motion has been set to 15 Hz.

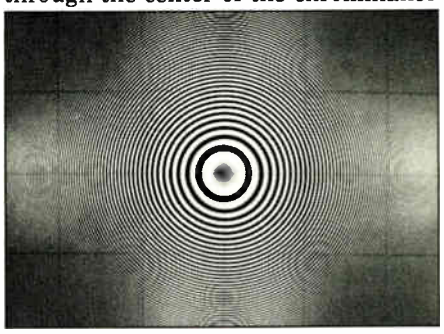


Figure 10

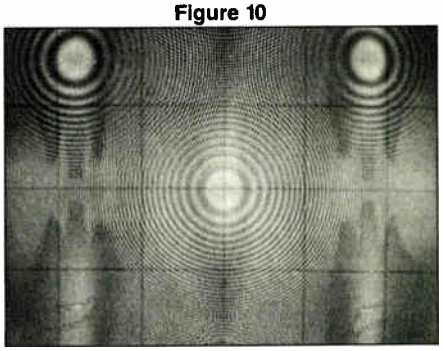


Figure 11

In this case, the zone plate pattern occupies the spectral slice shown by the dashed rectangle in Figure 8. Note that this slice passes directly through the center of the chrominance region.

Y/C separation

The motion capabilities of the zone plate generator are quite useful for determining the effectiveness of various chroma/luminance separation circuits such as comb filters. Figure 9 shows a zone plate luminance signal displayed on a typical television receiver which uses a notch filter for chrominance separation. The incomplete chroma/luminance separation is shown by the presence of cross color which appears as colored rings in the corners of the picture.

With the zone plate motion set for 15 frames a second, the spectral slice is that shown in Figure 8 and the rings are quite pronounced and appear stationary. Passing the signal through a comb filter encoder before displaying it results in a significant improvement in chroma separation and, therefore, almost complete removal of the cross color, as shown in Figure 10.

Figure 11 is another illustration of the use of the zone plate for observing spatio-temporal filter characteristics. In the instance, the signal is viewed on an IDTV (line doubling) receiver. The horizontal and vertical frequency response of the receiver's filter is well defined as indicated by the pattern of light and dark areas in Figure 11. In this instance, the receiver's luminance filter has a response of about 2.5 MHz (98 cph) in the horizontal direction and about 1 MHz (40 cph) in the vertical direction. A complete three-dimensional frequency response may be obtained by observing the frequency response at various rates of motion.

When both luminance and chrominance components of the zone plate signal are enabled, the zone plate can also be used for a visual observation of luminance vs. chrominance delay since, in a system having unequal delays, the colored center portion of the pattern will be improperly registered relative to the surrounding luminance.

The two- and three-dimensional characteristics of the zone plate are useful for testing equipment such as VTRs, frame synchronizers, A/D and D/A converters, encoders/decoders/transcoders, equalization circuits and transmission links, including component transmission systems. The advent of digital video compression systems should also result in more frequent use of the zone plate since this pattern is particularly useful for showing artifacts associated with the compression and decompression process.

Several manufacturers are planning to introduce HDTV versions of zone plate generators in the near future. We can expect to see this test signal employed much more frequently as video processing systems increase in complexity. ■

References

[1]J.O. Drewery, "The Zone Plate as a Television Test Pattern," J. SMPTE, 85, 763-769, November 1979.

[2]E. Dubois, M. Sabri, J. Ouellet, "Three Dimensional Spectrum and Processing of NTSC Color Signals," J. SMPTE, 91, 372-378, April 1982.

[3]E. Dubois, W. Schreiber, "Improvements to NTSC by Multidimensional Filtering," J. SMPTE, 97, 446-463, June 1988.

[4]M. Isnardi, "Exploring and Exploiting Subchannels in the NTSC Spectrum," J. SMPTE, 97, 526-532,

WHAT'S AHEAD

SCTE

Following is a list of SCTE technical seminars with contact name. If known, location and seminar topic are listed.

April 10 *Central Illinois Chapter* to administer BCT/E examinations (tentative) in Pekin, Ill. Contact Ralph Duff, (217) 424-8478.

April 11 *North Central Texas Chapter*. Contact M.J. Jackson, (800) 528-5567.

April 11 *Palmetto Meeting Group*. Contact Rick Barnett, (803) 747-1403.

April 12 *Chesapeake Chapter* on "CLI" at the Holiday Inn in Columbia, Md. Contact Keith Hennek, (301) 731-5560.

April 18 *Great Plains Meeting Group* will administer BCT/E examinations in Categories I, III, IV and VI at United Artists Cable in Bellevue, Neb. Contact Jennifer Hays, (402) 333-6484.

April 18 *Sierra Meeting Group* on "Signal Security and Scrambling Techniques" presented by Scientific-Atlanta and "Satellite and System Theft of Service" with Jim Allen of the NCTA. The seminar will be held at the Oxford Suites Hotel in Roseville, Calif. Contact Steve Allen, (916) 786-2469.

April 20 *Miss-Lou Chapter* in Baton Rouge, La. Contact Dave Matthews, (504) 923-0256.

April 24 *Chattahoochee Chapter* at the Perimeter North Inn and Conference Center in Atlanta, Ga. Contact Richard Amell, (404) 394-8837.

April 25 *New Jersey Chapter* on "CATV Basics" including NEC codes, theft of service and troubleshooting at the Victor's Holiday Inn in Wayne, N.J. Contact Art Mutschler, (201) 672-1397.

April 28 *Tip-O-Tex Chapter*. Contact Mike Strakos, (512) 664-8715.

May 2 *North Country Chapter* on BCT/E Category II, "Video and Audio Signals and Systems" at the Sheraton Midway in St. Paul, Minn. Contact Douglas Ceballos, (612) 522-5200, ext. 705.

May 8 *Central Illinois Chapter* on "Preventive Maintenance" at the Sheraton Normal Hotel in Normal, Ill. Contact Ralph Duff, (217) 424-8478.

May 8 *Chattahoochee Chapter* at the Perimeter North Inn and Conference Center in Atlanta, Ga. Contact Richard Amell, (404) 394-8837.

May 9 *Mount Rainier Chapter* on "Outage Control." Contact Sally Kinsman, (206) 821-7233.

C-COR® ELECTRONICS INC

C-COR Electronics "state of the art" seminars are three-day events designed to instruct relatively new technicians in basic theory, installation and maintenance of cable TV systems. Attendance is limited to a maximum of three persons from one system. The fee is $245. Call Kelly Jo Kerstetter, (800) 233-2267, Ext. 422 to register or for info on any of the following 1990 seminars.

April 24-26
Albany, N.Y.
May 22-24
Allentown, Pa.
June 19-21
Indianapolis, Ind.
September 18-20
Dallas, Texas
October 16-18
Los Angeles, Calif.
November 13-15
Orlando, Fl.

TRADE SHOWS

MIPTV **April 20-25** Cannes, France. Contact International Exhibitors Organization, (212) 750-8899.

NCTA **May 20-23** Atlanta, Ga. Contact Michael Hill, (202) 775-3606

Canadian Cable Expo **June 3-6** Edmonton, Alberta. Contact Christiane Thompson, (613) 232-2631

BPME & BDA Seminar **June 10-14** Las Vegas, Nev. Contact Gregg Balko, (213) 465-3777

SCTE **June 21-24** Nashville, Tenn. Contact Anna Riker, (215) 363-6888

Colorado Show **July 12-14** Breckenridge, Colo. Contact Rebecca Scoggins, (303) 863-0084

CTAM **July 15-18** San Diego, Calif. Contact Christina Nelson, (703) 549-4200

NECTA **July 29-Aug 1** Newport, R.I. Contact Rosemary Vozzella, (617) 843-3418

Eastern Show **September 16-18** Washington, D.C. Contact SCTA, (404) 255-1608

Great Lakes Cable Expo **September 19-20** Indianapolis, Ind. Contact Dixie Russell, (614) 272-0860

Atlantic Show **October 2-4** Atlantic City, N.J. Contact Rhonda Moy, (609) 848-1000

Wireless Cable Association **October TBA** Location TBA. Contact Conifer Corp., (202) 452-7823

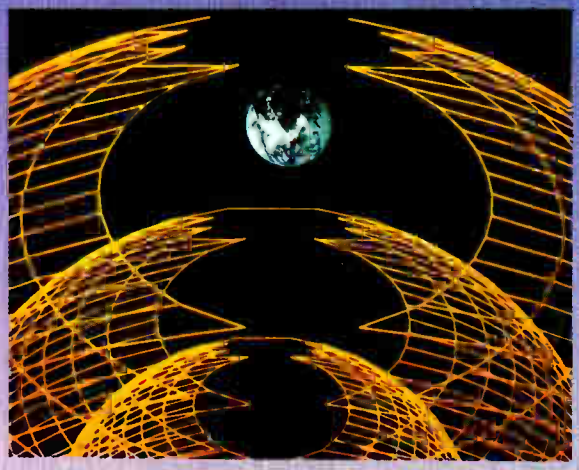
MIPCOM **October TBA** Cannes, France. Contact International Exhibitors Organization, (212) 750-8899

Mid-America Show **October 9-11** Kansas City, Mo. Contact Rob Marshall, (913) 841-9241

BCTA Convention **November TBA** Location TBA. Contact British Cable TV Assocation, 011 44 01 437 0549

Western Show **November 28-30** Anaheim, Calif. Contact Trade Associates Inc., (301) 468-3210

OFF-AIR, ON-LINE, WORLD-WIDE



The Leader in Off-Air Antennas is Taking a *Hard Line* in Distribution Electronics.

Lindsay's off-air antennas are the standard of performance in CATV systems. Now, Lindsay is setting the standard again with its *Hard Line* distribution electronics.

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To find out more, write Mike Dowling at 1248 Clairmont Road, Suite 3D-231, Atlanta, Georgia 30030 or call **404-633-2867** and receive the 1990 Lindsay Products Catalog.

Lindsay

Reader Service Number 53

The CABLE POLL

™Midwest CATV • CED • CableVision

Reliability, signal quality, capacity reasons behind plant rebuilds/upgrades

Fully one-third of the systems reporting to the latest edition of Cable Poll™ will rebuild or upgrade their plants this year.

And about a quarter of those rebuilding or upgrading said the construction decision was based on their franchises nearing renewal, although two-thirds said improving signal quality was very important.

Additionally, 70 percent reported that the overriding decision was based on improving system reliability, while 69 percent tagged increasing their ability to offer new services as the reason behind the construction.

Plenty of work to come

This and other information gathered during nearly 400 interviews with system management personnel nationwide paints a picture of rebuild and upgrade necessity, in preparation of the new cable TV era ahead.

Worth noting, 55 percent of the total respondents said increasing the profitability of their systems was very important, but not as great as improving system reliability and signal quality, as well as expanding channel capacity. Apparently, telco entry is not a pressing threat, because only 23 percent said preventing further competition was very important in making the rebuild decision, and another 19 percent said it was somewhat important.

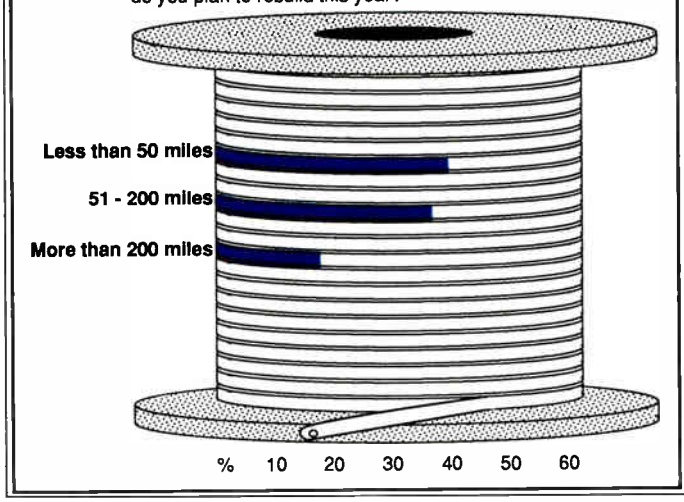
The size of systems doesn't figure significantly in whether or not to rebuild or upgrade. For example, 33 percent of the systems polled with fewer than 10,000 subscribers (small system), said they planned to rebuild or upgrade their plants in 1990, while 34 percent with between 10,000 and 50,000 subs (medium system) and 38 percent of those systems with more than 50,000 subs (large system) have construction plans.

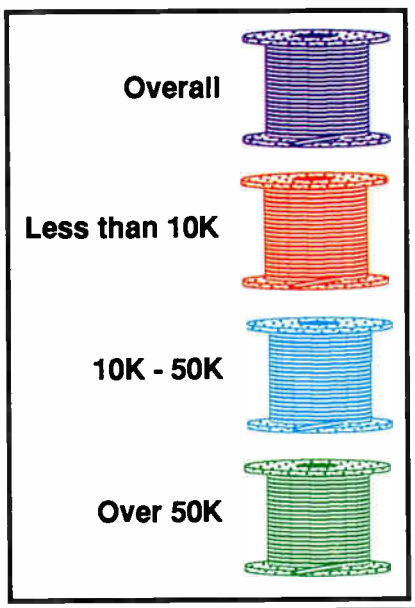
Number of miles varied

The amount of miles being rebuilt was divided fairly evenly between the small and medium-sized systems, but for obvious reasons, the huge system rebuilds are occurring far less frequently. With total respondents reporting, 42 percent reported they were rebuilding less than 50 miles, while 37 percent are rebuilding 51 to 200 miles. Fifteen percent said they were rebuilding more than 200 miles.

In this area, for obvious reasons, there was some divergence in terms of system size. Only 1 percent of systems with fewer than 10,000 subs said they were rebuilding more than 200

Thirty-three percent (132) of the total (396) respondents are rebuilding or upgrading physical plant. Those affirmative respondents were asked: How many miles within your system do you plan to rebuild this year?





miles, but 23 percent with between 10,000 and 50,000 subs and 67 percent with more than 50,000 subs are rebuilding that vast mileage.

In the 51-to-200 miles category, the results were a different story. Thirty-five percent of the small systems, 45 percent of the medium systems and 25 percent of the large systems, said they were rebuilding within that range of distance.

The franchise question

For no apparent reason, there was some divergence in responses, according to system size, when the respondents were asked, "In your decision to rebuild or upgrade, how important was it to you that your franchise was nearing renewal?"

For example, 40 percent of the medium systems replied the renewal issue was very important, while 8 percent of the large systems replied affirmatively. (Nineteen percent of the small systems said it was very important.)

Responses also varied some on those who felt improving signal quality was very important in the rebuild decision: small systems (71 percent); medium (74 percent); but interestingly, large (42 percent).

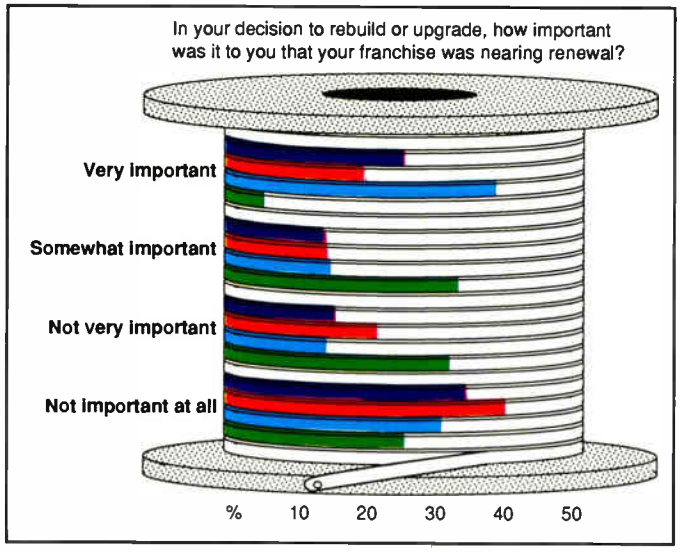
System reliability fared similarly, with 71 percent of small systems replying that it was very important to the decision, 74 percent for the medium and 58 percent for the large.

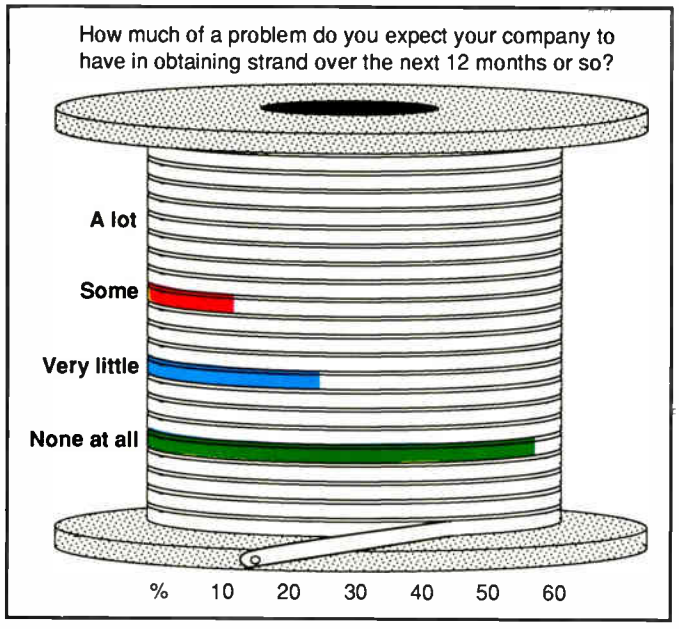
The recent onslaught of new programming services, such as The Comedy Channel and Mizlou's Sports News Network, the imminent launch of HA!, and further down the road, the Sci-Fi Channel, the Cowboy Channel and In Court, easily explains why 69 percent of the total respondents said increasing their ability to offer new services was very important in the rebuild/upgrade decision.

The system-size breakdown was fairly consistent: small (63 percent); medium (79 percent); and large (67 percent).

Of course, many cable systems, no matter their size in terms of subscribers, are facing the same channel capacity crunch, and still trying to find room for now channel mainstays like TNT and The Discovery Channel, important niche services

like Black Entertainment Television, and newcomers like CNBC.





Not looking over the shoulder

The respondents did not appear to be too worried about losing market share to other (present or future) video providers, with 56 percent of the total respondents saying that preventing further competition was not very important or not important at all in influencing their rebuild decisions.

Fourteen percent of the total respondents said their companies experienced some problems in obtaining strand to purchase in the last year or so. Those companies responded to the problem in different ways: order from a different vendor (27 percent); order from multiple vendors (46 percent); did nothing—shipment was going to be late (13 percent); paid a premium to ensure receipt (4 percent).

However, 45 percent said they paid a premium price to obtain the strand they needed.

In response to the question, "How much of a problem do you expect your company to have in obtaining strand over the next 12 months or so?," 12 percent said they expected some problem, but 25 percent forecasted very little problem and 56 percent none at all.

Cable Poll

The Cable Poll™ is a sampling of industry opinion conducted on a regular basis by Ryan/Samples Research, Inc. for Midwest CATV, *CableVision* and *CED* magazines.

Telephone interviews for this edition of The Cable Poll™ were conducted between February 1-15, 1990. A total of 396 interviews were completed.

Interviewers used a listing of system management personnel obtained from the CableFile Research database. Potential respondents were chosen at random from the database of more than 2,000 cable company employees.

No sample can guarantee an exact replica of the total number of system management personnel within the cable industry.

However, for this edition of The Cable Poll™, researchers are 95 percent certain that any aggregate result (of all 396 respondents) won't deviate more than 4.9 percentage points plus or minus for all system management personnel included in the CableFile database. ■

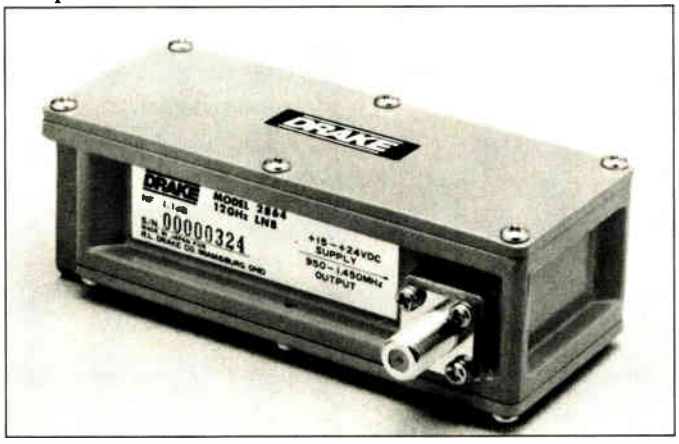
RMT, Quality RF form joint venture

RMT Engineering and Quality RF Services announced at the Texas Show in late February that the two companies have entered into a joint venture where RMT, a repair services representative and distributor, will represent QRF's products in California, Arizona and Nevada. QRF, located in Florida, manufactures components used to upgrade and repair electronics. RMT is based in California and can more efficiently represent QRF's products in the far West.

Other news from the San Antonio show include new products from Texscan MSI, Trilithic and Drake.

Texscan MSI showed its new Spotwatch switch, which has been designed to monitor commercial insertions on all networks. It shows the pre-roll and the out-take as well as the commercial itself, according to Texscan MSI officials. Also, the company announced that it has begun shipping PCMarkers, a computer-driven system designed to automatically assemble and mark ad locations on videotape.

Trilithic showed its 1 GHz bench sweep system. The system consists of the PS1000Z sweep generator with digital display (showing center frequency, sweep width or variable marker frequency), the DSC 1000 Digital Sweep Comparator with attenuators to simplify gain and loss measurements and the SDS 1000 nine-inch display scope.



R.L. Drake's Model 2864 Ku-Band LNB

Finally, **Drake** showed a new commercial earth station receiver and Ku-band LNB. The ESR1250 receiver offers dual video outputs, a fixed audio channel and modular design. Functions can be customized via plug-in cards for broadcast or private business use.

Drake's new LNB offers a 1.1 dB noise figure and is priced at $282. The Model 2864 is a broadcast quality LNB designed for commercial downlink applications. With a frequency range of 11.7 GHz to 12.2 GHz, the LNB captures Ku-band signals and converts them to the intermediate frequency range of 950 MHz to 1450 MHz. The Model 2864 measures 4 inches high by 2 1/4 inches wide by 1 1/2 inches deep.

Meanwhile, in other news

RF Technology Inc. has announced the RF-FOM-13L fiber optic link system. Based on a 1300 nm laser, the

ANNOUNCING: THE STANDBY POWER SYSTEM FOR THE 1990's

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Fotec's new S780 "Minilaser"

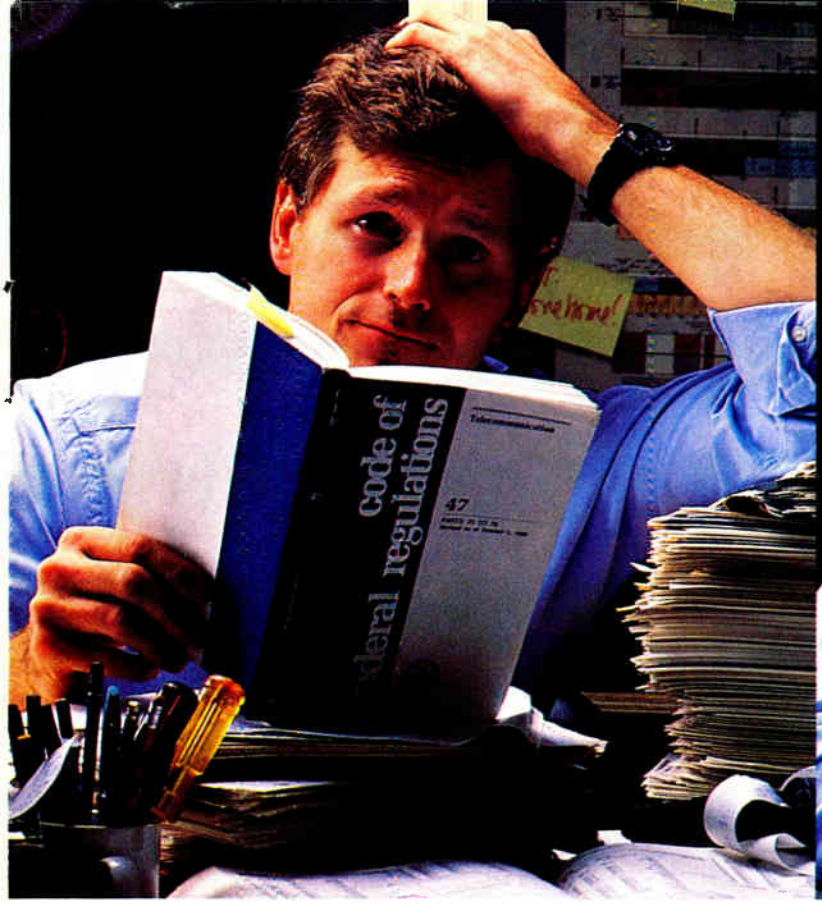
Amoco Laser's fiber digital and 30-dB isolator options

system is capable of transmitting video plus four audio channels over a distance of 35 miles unrepeated. Features include 70 MHz injection, repetition or output which allows the system to be used as a spur from an existing heterodyne microwave backbone system. Diagnostics, alarms and test waveforms are also available. For more info, call (203) 866-4283.

Available from **Fotec Inc.** is a fiber optic test source designed for users of singlemode fiber optic systems. The model S780 "Minilaser" uses a 1300 nm laser diode with FC connector interface for singlemode fibers. The laser output is approximately -6 dBm, and is optical-feedback stabilized to enhance loss measurement accuracy. Output modulation can be selected to be either continuous wave or 2 kHz "tone." The S780 package weighs 6 ounces and uses a 9 volt battery or optional AC adapter for portable or on-site applications. For additonal info call, (800) 537-8254 or (617) 241-7810 in Mass.

Amoco Laser Company has introduced a new fiber pigtail and 30 dB isolator option for its microlaser products. Amoco now offers two models of 1.3 μm, Whisper 1.3 microlasers with single-mode or polarization-maintaining fiber pigtails and 30 dB optical isolators. The output power of the devices is specified at greater than 20 mW for the 1320-25W4F and greater than 50 mW for the 1320-75W4F. Price includes power supply with delivery approximately 12 weeks ARO. For additional info call, (708) 961-8400.

Developed by **Integrated Switching Systems** is Pathfinder, a series of high speed digital fiber optic matrix switchers using a modular design. The I/O modules convert from optical to electrical at the inputs and send the signals into 1 GHz gallium arsenide crosspoint modules where they are routed to the assigned output, or out-



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With the FCC's Compliance Regulations, the way you seek, find and document cable leakage is under careful scrutiny.

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

CLM-1000 with CLIDE* is just what you've been waiting for.

The CLM-1000: Amazing.
If you had one instrument to buy to solve your leakage problems, this would be it. It measures field strength at any frequency from 50 to 550 MHz. At any range from 9 to 200 feet. And what it finds, it remembers, so you've got foolproof recall to simplify your documentation.

The end of calculated risks.
With just the push of a button, the CLM-1000 takes precise measurements. The dipole antenna receives signals as far as 200 feet and as weak as 20 μV/m. All you do is approximate and input the distance between the antenna and the leak. The system automatically converts the measurement to a 3-meter distance. No number crunching with conversion tables or formulas. No question about accuracy. All the information you need is displayed in an easy to read two-line LCD display, including analog level bar.

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

As easy as rolling off a log.
The CLM-1000 contains a complete logging system. At the touch of a button you can store all the measurement data, leak location, date and time of measurement. Then you can print it out on site.

The CLIDE software can instantly transfer the CLM-1000's data and compute a system's Cumulative Leak Index. This and subsequent repair data is stored and printed to form an FCC leakage report log. It virtually puts an end to complicated paperwork and recording errors.

The CLM-1000 provides a detailed log—just for the record.

Just for the record, the CLM-1000 with CLIDE is the most precise, versatile and thorough field strength meter you can buy.

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

*CLIDE is a product of Telecommunications Products Corporation.

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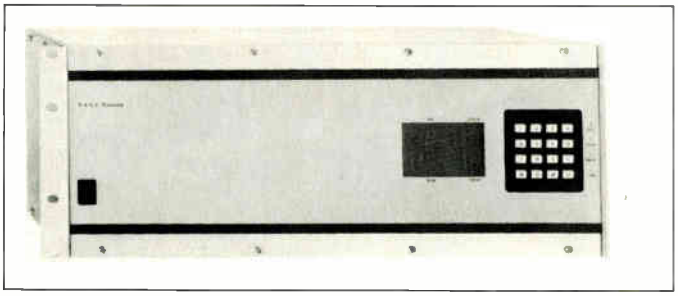
Reader Service Number 58



Fiber optic routing switcher from Integrated Switching Systems

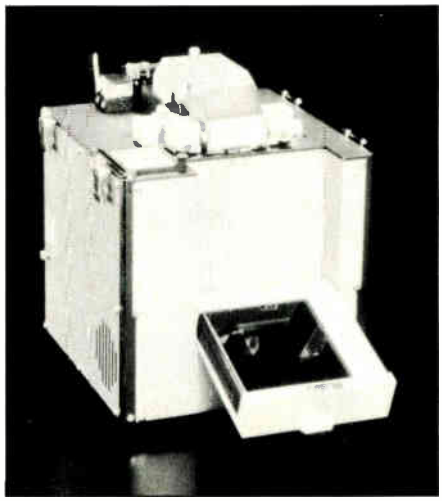
puts. At the outputs, the I/O modules make the conversion back to optical. The fiber optic connectors may be ST, SM, FC or FDDI and will operate at 800 nm or 1300 nm, multimode or singlemode fibers. For more details call, (916) 272-8240.

Alcoa Fujikura Ltd. has introduced the FSM-20R12 high-speed, multichannel fusion splicer that automatically aligns and fuses up to 12 optical fibers in either bundled or ribbon cable. The splicer is 8.3 inches by 8.3 inches by 7.9 inches and weighs 19.8 pounds. It features a built-in 3.5 inch TV monitor which permits the operator to monitor the quality of prepared fiber ends. For more info call, (803) 439-5207.

Integrated Communications Inc. is offering a free fiber optic cable assembly specification chart. The chart, measuring 17 inches by 22 inches, will provide a primer on the various types of fiber optic connectors (SMA, ST, D4, Biconic) as well as information on adaptors and mating sleeves. The chart also covers various types of fiber optic cables that are available for pigtails, patch cords, jumpers and hybrid cable assemblies. The chart is being reduced in size, 8 inches by 11 inches, and made into pads for those specifying a large number of fiber optic cable assemblies. For more info call, (201) 770-2633.

Frequency modulator

Leaming Industries has introduced a new fixed frequency modulator, the model FMT411F, to its existing line of audio transmission equipment. Each FMT411F transmits one program audio channel. The FMT411F modulator transmits the program material on any



FSM-20R12 automatic multichannel optical fiber fusion splicer from Alcoa Fujikura Ltd

specified frequency between 4.5 MHz and 10 MHz, 52 MHz and 88 MHz or 88 MHz and 126 MHz. Audio bandwidths of 3.4 kHz, 7.5 kHz, 10 kHz or 15 kHz are available. The modulator may be powered by either the KAC707 (powers two FMT411Fs) or the PS420 (powers eight FMT411Fs). For details call, (714) 727-4144.

Available from **Sadelco** is the model

Reader Service Number 59

Leader's Model 5864A dual input EFP/ENG waveform monitor

7600 signal level meter for cable installers and technicians. The 7600 SLM is designed with an expanded frequency range (54 MHz to 600 MHz), new peak detector and steel housing with a foam padded nylon carrying case. The 7600 replaces both the 7450B and FS-4VS SLMs. Features include a surface mounted tuner, four band color coded dial and weatherizing package. For more info call, (201) 569-3323.

Leader Instruments Corp. has announced an upgraded version of its hand-held waveform monitor. The new EFP/ENG waveform monitor, Model 5864A, offers dual input capability. It provides 2H/2V MAG and 2H/2V sweep rates in a battery-powered instrument weighing less than three pounds. Features of the 5864A include flat and IRE filters as well as a 4 times vertical magnifier that simplifies setup level and black balance checks. The Model 5864A is designed for use with Leader's Vectorscope Model 5854 and SID signal generator LCG-413. Call (516) 742-2022 for details.

CADCO Inc. is in production on two new products. The new agile signal processor, Model 361HL, accepts any off-air channel 2 through 69 for conversion to any cable channel 2 through YY, SAW filtered. The 361HL is microprocessor controlled and features phase-locked synthesized crystal-referenced oscillators. Output channel is selectable or HRC, +60 dBmV.

Also available is the new Model 360HL agile modulator. The 360HL is also microprocessor controlled and channel output is selectable, standard or HRC, channels 2 through YY, SAW filtered at +60 dBmV. In addition to the traditional baseband audio and video input, the 360HL has 4.5 MHz audio subcarrier input for stereo insertion. I through F loops for separate audio, video and composite is standard for scrambling. For more info on either product call, (800) 877-2288 or (214) 271-3651.

Introduced by **Channelmatic Inc.** is a four-channel, single-VCR sequential ad insertion system, the Moneymaker Special. The Special, made up of the Li'l Ben clock controller; Li'l Moneymaker sequential commercial insertion system; the Logmatic, automatic logging system; and the Network Share Switcher will be offered at an introductory price of $7,245 with the VCR and slide rack or $5,125 without. The Moneymaker Special will insert ads on up to four satellite networks from only one VCR, log advertiser and spot ID event times and offers automated, expandable (up to 400 channels) vertical-interval switching, programmable preroll times, selectable start delay and black-out switching with built-in aux source fill switcher. For more info call, (800) 766-7171 or (619) 445-2691 in Calif.

The IS-TVRO multi-strike series of satellite dish/receiver protectors has been introduced by **PolyPhaser Corp.** The two-stage patented protectors have a RF protection circuit that passes DC and starts protecting LNBs at the +22VDC and -1VDC levels. Designed to withstand a maximum surge current, on the center conductor of 13,000 amps, the protectors will insure the LNBs, which down-convert to the 400 MHz to 1450 MHz range, survive a direct lightning strike. Using type F-59 connectors, the VSWR is 1.2 to 1 and the insertion loss is less than 0.5 dB. For more details call, (800) 325-7170 or (702) 782-2511.

Extra security

Viewsonics Inc. has introduced cable assemblies with locking "F" connectors for security against tampering with headend connections, converter theft and elsewhere where security is desired in cable connections. The cable assemblies are available in 3-, 6- and

12-foot lengths. Special lengths are available upon request. Call, (800) 645-7600 or (516) 921-7080 in N.Y. for info.

Ripley Company Inc. has announced the introduction of a crimp tool maintenance kit. The CRMK-1 will contain all the parts necessary for maintaining individual Ripley Cablematic CR hex crimp tools. The kits are available through Ripley Cablematic distributors. For more info call, (203) 635-2200.

Standard Communications is producing remote control hardware and software to configure its MT830 satellite receivers from an IBM compatible computer. The CRC850 allows for the automation of space segments at up to 60 times per day according to preset time control functions. Communications can be established by direct connection to the serial port of a computer or over telephone lines. Additional features contained within the CRC850 remote control board allow remote operation of video and audio level settings, custom alarms, signal meter readings and three audio subcarrier demodulators. Remote video audio settings allow the computer to program and preset output levels thorugh the link. Five built-in alarms notify the computer of loss of scrambled or unscrambled video, any of three audio sub carriers plus a programmable auxiliary alarm. For additional details call, (800) 243-1357 or (800) 824-7766 in Calif.

Standard's RS232 computer remote control

Tektronix's 497P spectrum analyzer

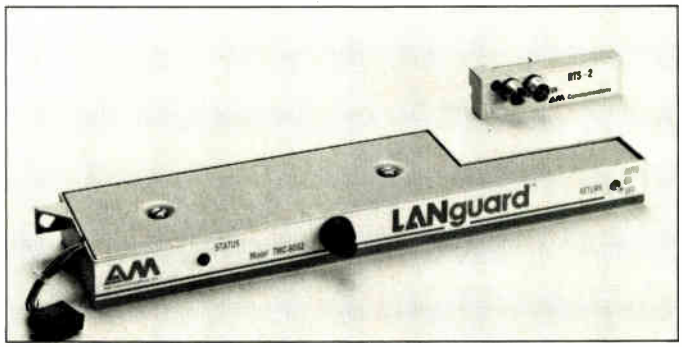
Tektronix Inc. has announced its 497P Spectrum Analyzer now includes 10 Hz resolution bandwidth as a standard feature. The product enhancement is available at no additional cost. Introduced in June, the 497P features coverage of the frequency range from 100 Hz to 7.1 GHz. The newly added

10 Hz resolution bandwidth provides the performance needed to test various digitally-encoded communications systems. Call, (800) TEK-SPEC or collect in Oregon at (503) 235-7315 for details.

Seavey Engineering Associates Inc. now offers a full line of standard gain antennas. Current designs operate from 0.7 GHz to 26 GHz, waveguide of WR975 to WR42. Nominal gain is 16 dBi with higher gains available upon request. Each unit is shipped with its own calibration chart and comes with an L-bracket. If requested, the antennas can be designed to have a weather sealed front aperture by using a low loss window. For additional info call, (617) 383-9722.

AM Communications has announced its TMC-8052 amplifier monitoring and control transponder for C-Cor trunk amplifiers is now in full production. The TMC-8052 is the newest member of the LANguard™ family of status monitoring and control products for cable television and broadband LAN systems. Controlled by the LANguard™ operating system and software, the TMC-8052 is a plug-in replacement for the C-Cor SMT 3000 series monitor. For more info call, (215) 536-1354.

Available from **American Polywater Corp.** is CableFree™ Loosener to help free and remove old cable which is stuck in conduit. The loosener serves as both a dissolver and lubricant to dissolve or soften a variety of cable-binding agents, including wax, rust, dirt and bitumen residue. CableFree™ Loosener is available in quarts, gallons and five-gallon pails. For details call, (800) 328-9384 or (612) 430-3634.



AM Communication's TMC-8052 amplifier monitoring and control transponder

Moving ahead

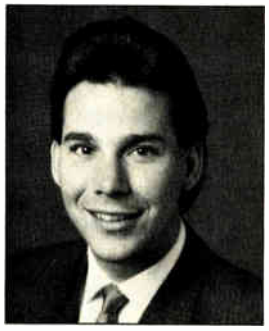
Cable Television Laboratories Inc. (CableLabs) has named **Brian James** to the post of director of advanced television testing. James will be responsible for management of CableLabs' ATV testing program to be performed in Alexandria, Va. at the site of the Advanced Television Test Center. James will also represent CableLabs on the FCC Advisory Committee on Advanced Television Service, and at the Advanced Television Systems Committee. James was previously director of engineering in the NCTA Science and Technology Department.

CableLabs also named **David Eng** to serve as senior electronics technician. Eng will be responsible for completing the CableLabs headend and laboratory facilities. Prior to CableLabs, Eng worked for Rogers Cable TV in Minneapolis, where he served as director of engineering.

In a final announcement by CableLabs, University of Colorado at Boulder Professor **David C. Chang** has been appointed to serve on the Techni-

cal Advisory Committee (TAC) Steering Subcommittee. Appointed by TAC Chairman Dr. Walter S. Ciciora, Chang assumes a previous vacant seat. Until recently the chairman of the Colorado University Department of Electrical and Computer Engineering, Chang is also a director of ATC, serves on its executive committee and chairs several board committees. He also is a director of the National Science Foundation Industry/University Cooperative Research Center for Microwave and Millimeter-Wave Computer Aided Design at the University of Colorado at Boulder; is president of the International Electrical and Electronics Engineers (IEEE) Society on Antennas and Propagation; and is secretary of the U.S. National Committee of the International Union of Radio Science (URSI).

Standard Communications has announced the appointment of **Clayton C. Dore** to the position of Eastern technical sales manager in the company's satellite communications division. Dore will be responsible for direct contact with MSO headquarters and regional offices, coordinating all activities concerning rebuilds, upgrades and customer problems with the home office and Standard's sales representative force.



Clayton C. Dore

Kathleen V. Horst

Kathleen Horst has been named Western regional sales manager for **Cable Security Systems Inc.** Horst, a 12-year veteran of the CATV industry, comes to Cable Security from Horizon Cable Supply where she served for the past three years as sales representative/purchasing agent. Horst will be headquartered in Laguna Hills, Calif.

UNR Industries Inc. has announced the promotion of **Christopher Sophinos** to President of **Midwest CATV**. Sophinos will be responsible for all operating functions of Midwest CATV,

Christopher Sophinos

including operations, sales, materials, engineering, finance and marketing. Other announcements by Midwest include **Terry French** as senior vice president. French will be responsible for Central and Southwestern region operations. French will also oversee the nationwide expansion of the SYNC truck program.

For the Northeastern and Southern region operations, Midwest announced **Jim McCauley** as senior vice president. Promoted to Sales and Operations Manager is **Bill Cody**. Cody will be responsible for running Midwest's Southwest facility in Dallas, Texas, along

CLASSIFIEDS

The Electronic Program Guide

Twelve to 15 years ago, when I was very active in work on teletext, I had a desire to apply that technology in ways that would be directly useful to cable subscribers. It was my hope that cable subscribers could have an interface that would make using their television receiver and VCR easier than the headaches suffered by non-cable subscribers. For a variety of reasons, the concepts never got beyond the discussion stage. There were other priorities.

Now, as we consider serving subscribers in an increasingly competitive marketplace, maybe the time has come to revisit these ideas. The first step is to discuss the need for an Electronic Program Guide. The next step is to automate the Electronic Program Guide. The final step is to make it intelligent and much more useful to the subscriber.

Introduction

The cable/consumer electronics interface has received a lot of discussion. The problems subscribers have in trying to use their TV and VCR with scrambled channels is a familiar complaint. What if we could somehow make it easier to use a VCR on a cable service than in any other way? What if we could stop the VCR clocks from interminably flashing "12:00"? What if subscribers were given the tools to help them to never again miss programs that would be of interest to them? Wouldn't this make cable more attractive? Wouldn't this result in better subscriber retention?

By Walter Ciciora, Vice President of Technology, American Television and Communications

Information Age services

We've heard a lot about the Information Age and the great new services it will bring. Major corporations have spent millions of dollars pursuing such services. Vast expenditures continue today. The phone companies have used this promise as part of their justification for putting fiber to the home.

But this is not new to cable. The franchise wars brought promises of home banking, residential security, meter reading, emergency alert, opinion polling, etc. Teletext and videotex were tried. Home shopping based on high quality graphics and even on still photographs was offered. Zenith built teletext hardware to two proposed standards. A graphics intensive approach was built for the Time Inc. teletext trials. A more cost-effective approach was built for the Westinghouse Cable teletext experiment in California. The practical results of all of this "information age" technology were very disappointing.

Why didn't any of this work? Was the technology not yet ready? Were consumers not ready? Were the trials poorly implemented? Was it just bad luck or bad timing? Everyone has an opinion. We must allow for the possibility that the answer is simply that no one wanted these services! This may change in the future. On the other hand, it may not.

There is one category of information which is still difficult to come by: What's on TV? What's on now? What's on later this evening? What might I want to tape record when I'm not home or am otherwise occupied? And how do I set up my VCR anyway?

There are two types of program guides currently available: the printed program guide and the video guide on a cable channel. Printed guides appear in local newspapers and as separate publications provided to cable subscribers either for free or at a modest charge. The video guide appears as scrolling text describing current programs and programs for later in the day. In the last few years, the guide has incorporated a small video sample of programming. One interesting variation has no text at all. The screen is divided into nine or 12 boxes. Each has the video from a channel along with the channel's number. This program guide would serve even the illiterate!

The deficiencies of the printed program guides include the fact that they are complex. They contain a massive amount of information in small print on cheap paper. The ink comes off on your hands, especially when you're snacking on popcorn or chips. There often are several columns of channel numbers since the guide is meant to serve several cable systems, each with differing channel lineups. There is inadequate detail to decide what to watch. A serious problem for those of us over 40 is that we need reading glasses and a bright light to be able to read the fine print. Neither of these are normally required for TV viewing. And, of course, the printed guide is often missing behind the couch, between the cushions or under the magazines on the coffee table. When there are multiple TVs, the guide is always at the other TV.

The deficiencies of the video guide include the fact that a valuable cable channel is consumed. In these days of spectrum shortage, this is a major disadvantage. It always seems to take too long to scroll to the part of the guide covering the time of interest. When the guide finally gets there, the text goes by too fast to read. The detail in the video guide is even more sparse than in the printed guide. It's simply inadequate to decide what to watch.

The Electronic Program Guide

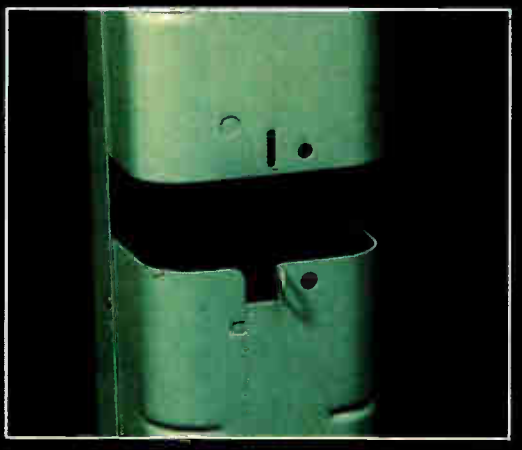
Subscribers have become accustomed to "on-screen displays" on their TV receivers and VCRs. The VideoCipher consumer descrambler provides useful programming information. The time has come for cable to seriously consider implementing an electronic program guide which overcomes the deficiencies of current printed or video guides.

The benefits to the subscriber include never again being puzzled over what is available to watch and never again wondering where the printed guide went. Satisfaction with cable increases, cable becomes more of a "must" than an option.

For the cable operator, a more satisfied customer means better retention, more pay sales, perhaps more pay-per-view sales and a channel freed up for other purposes. Next month we'll peer into the crystal ball and try to see where this could lead. ■

Fast field security for your cable TV pedestal

Pedestal cover with knock out in place.



Knock out is easily removed with hammer and ordinary screwdriver.

Locking clip fits over pedestal in seconds.

Star Lock is tightened and removed only with special screwdriver type key for maximum security.

Only Utility Products Pedestals come with factory-provided knock outs for installing **Diversified Control Systems** Star Locks.

A small but important feature . . . because it provides maximum security for cable TV pedestals or apartment boxes fast and easy right in the field.

Hasp broken or missing? No problem. Diversified's Star Locks are designed to deliver a secure closure without using the hasp. It's a great combination: Star Locks and Utility Products, the best-selling pedestals in the industry. And you can get them both from one trusted source: Anixter Cable TV.

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