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BPL Doubts Remain

Skeptics question FCC's ability to control interference

by James E. O'Neal

FALLS CHURCH, VA.

Despite the FCC's latest endorsement of broadband-over-power-lines industry watchdogs continue to express doubts over whether the wireless technology—targeted to rural broadband deployments—can steer clear of interfering with broadcast signals.

The latest development in the three-year-old "not in my backyard" Access Broadband-over-Power-Lines saga is an FCC order dated Aug. 3, 2006. In the order, the commission reaffirmed its rules for BPL systems "while maintaining safeguards against harmful interference to existing radio services."

The FCC denied requests from the television industry and the amateur radio community to limit or prohibit BPL operations. The order also denied a request from the aeronautical industry to exclude BPL from frequencies reserved for certain aeronautical operations, and further denied a request by the gas and petroleum industry to be considered as public safety entities.

BPL has its roots extending back several decades. The

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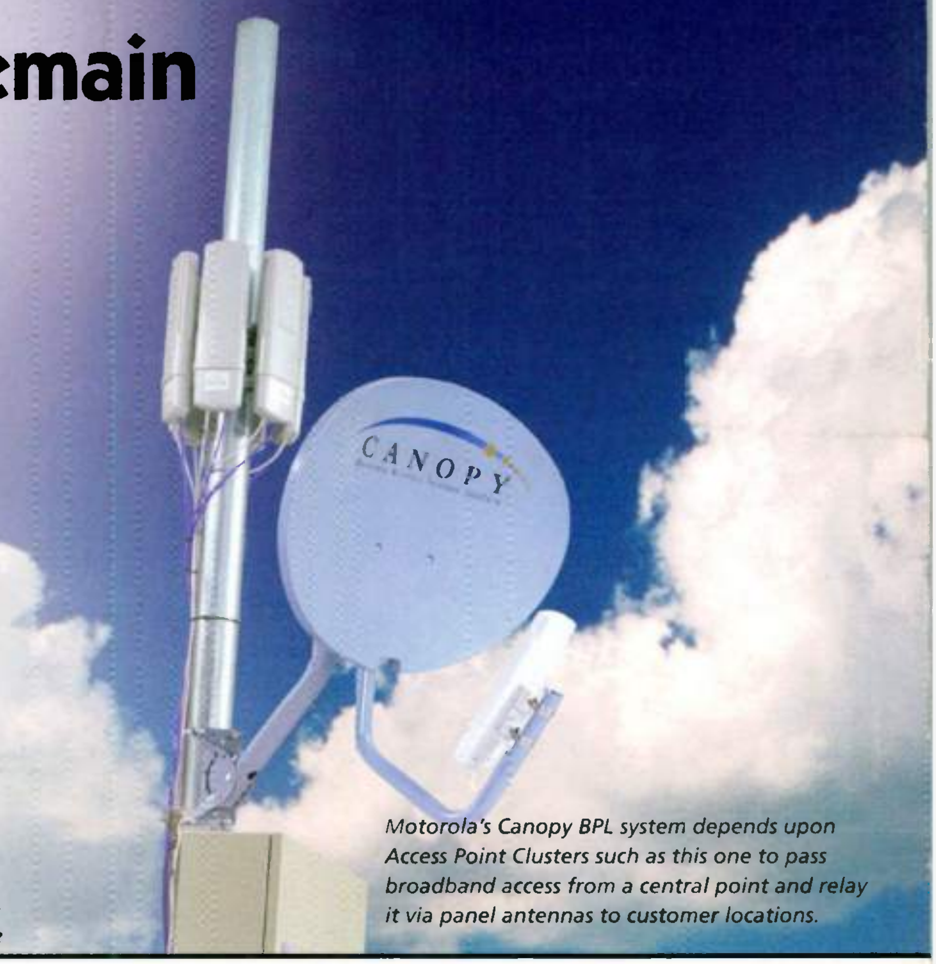

Motorola's Canopy BPL system depends upon Access Point Clusters such as this one to pass broadband access from a central point and relay it via panel antennas to customer locations.

Internet TV Standard Established

Asian markets to be targeted initially

by Craig Johnston

SEATTLE

An announcement almost two months ago in Japan about a consortium of TV manufacturers developing an Internet TV standard got brief mention in the television and computer trade press, but it could be a warning shot from yet another competitor in the video distribution marketplace.

Matsushita, Sony, Sharp, Toshiba and Hitachi have banded together to establish a standard for televisions that will receive video programming directly off the Internet. The companies expect to deliver Internet TVs in Japan that comply with the standard by the spring of 2007.

In the present state of Internet video, members of the consortium found a crying need for a standard.

Sony officials in Japan told **TV Technology**, "Sony considers providing customers more easy and safe ways to use Internet services through TV are key issues," and hence joined the consortium.

Viewing video over the Internet today is anything but easy, with a plethora of encoding schemes, bit rates, resolutions, copy protection techniques and what-have-you.

"The various kinds of formats and standards and things like that that are found are very different and varied," said Dr. Paul Liao, chief technical officer for Panasonic Corp. of North America.

STANDARD, PAGE 8

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FOR THE CHANGING FACE OF TELEVISION

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The production of daily broadcast content is often repetitive, differing only slightly from show to show.

Routine tasks associated with daily operations include the ingest of programs delivered over satellite or videotape, and the preparation of interstitials... p. 39

Doug Lung

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Most of us are familiar with standard NTSC frequencies—3.58 MHz for the chroma subcarrier, 4.50 MHz for the aural carrier, carrier frequency 1.25 MHz above the lower channel edge, offsets of plus or minus 10 KHz to reduce co-channel interference... p. 40

Harlan Neugeboren

News Technology

In my last article, I discussed some of the ways that stations can produce more content to feed the ever-increasing apetites of viewers. All of us do things in newsrooms that tie up valuable resources which could otherwise be used for news-gahering... p. 58

FROM THE EDITOR

The World of HDTV

As broadcasters head to another IBC, perhaps this is a good time to take a look at where the world stands regarding HDTV.

Until recently, it was questionable what Europeans thought about HDTV. I remember attending several Montreaux Television Symposiums in the late 1990s; the show provided an opportunity to gauge the continent's interest in high-def.

"HDTV is simply not a concern for us on a daily basis," declared one Swiss broadcaster. "At the moment, what is more important to the viewer is more channels and new services."

American broadcast officials warned attendees that Europe risked shutting itself out of the world production market if it ignored HD. "Any programmer who wants to compete in the international program exchange market is going to have to produce in HDTV," said one prominent American broadcast executive. (To be fair, many believed that European broadcasters would eventually adopt HDTV; however, having been burned by HD-MAC in the early 1990s, it was thought that they were taking a wait and see approach.)

Fast forward to 2006, and most Europeans are jumping on to the HDTV bandwagon. BSkyB launched its HDTV service in May, German pay-TV channel Premiere began HD broadcasts late last year and the BBC has been doing HD trials of premiere events and plans to launch HD broadcasts next year.

A recent report from In-Stat claims that there are approximately 15 million HDTV households worldwide, and that that figure will grow to 55 million by 2009. Currently 91 percent of HDTV households are concentrated in the U.S.and Japan.

Fifty-five million is still a paltry number when taking into consideration the world's population and how many people have access to TV. Nevertheless, that number is steadily growing and adding Europe to the list of HD proponents is a vitally important factor in accelerating that growth.

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

Send to Editor, TV Technology at e-mail *tvtech@imaspub.com*

Bang for the Bandwidth

Dear Mario:

I have no quarrel with the issues you raise in your column, "Getting to Home Base With a Cast of Multi" (July 26); you get much more bang for the bandwidth with MPEG-4. It's unfortunate that ATSC didn't build an upgrade path into the system.

The only way to have additional channels while doing HD is if you have a stat-mux to allocate bandwidth between the programs.

Before I retired I looked at the packet distribution when doing muxing and there were a lot of null packets that could have been put to better use. A stat-mux would do that. But last time I looked, a good one was north of $100K.

I also saw an example of a broadcast encoded in ATSC at source by PBS versus mezzanine compression by a network so the locals could add bugs and commercials. Same source, but the PBS version was vastly superior.

Roy Trumbull
El Cerrito, Calif.

A Year to Remember

Dear Editor:

As you can imagine, it has been a very wonderful and unusual year for me. I win an Ace and then an Oscar. Nobody could have been more surprised than me. Before this year I can't say I remember one article written about my career.

Well, this year that changed in a big way. Today, a friend sent me an article ("Object Lessons in Breakout Karma," July 12), about my appearance at NAB. I just wanted to say thank you to Walter Schoenknecht. His article, I thought, was one of the better ones. I appreciate it.

Thanks.

Hughes Winbourne
Los Angeles

No Kicking and Screaming Yet

Dear Craig Johnston:

I read your article about the HD experience and your cranky friend ("It's Time for HD Commercials," Feb. 22). I had—and still have—similar complaints with my HD programming... and I do know why.

My real question is: As a small ad agency with auto dealers across the country, my position on HD or 16:9 commercials has been "when the customer is kicking and screaming for it, I'll do it." I hear nothing from the stations.

At some point I thought I'd just deliver true 16:9 SD spots... though I do not know how the station would handle that. If it's not letterboxed SD, can they unsquash properly? Do you see where I'm going here? I'm not sure anyone knows the pathway... and how each station handles it! Oh boy! For local stuff it's going to be a mess.

Any insight? And thanks for getting me going on this.

Thomas Kihneman
PrimeTime Advertising
El Cajon, Calif.

Craig responds:

You're not the first one to ask how to deliver an HD spot to a station and how they would handle it. My guess is that there are a thousand different answers to the question. My sense is the reason for that is that while ultimately it's a question with a technical answer, it somehow washes through the sales department, and it has a financial component because equipment has to be purchased and installed in order to accept the spots.

I'm not a way technical guy, so I guess I can come up with a simple solution that may not be possible. My solution is to deliver the spots both on tape, as an SD spot, and on DVD as a high-def spot, as a data file. The stations need to standardize on what codec the data file should be in. That's my take, anyway.

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Telephone: (703) 998-7600
Editorial fax: (703) 820-3245
e-mail: tvtech@imaspub.com
Online: www.tvtechnology.com

The staff can be contacted at the phone extensions listed or via e-mail using first initial, last name @imaspub.com

Publisher: Eric Trabb 732-845-0004
Associate Publisher: Marlene Lane ext. 128

Editor: Tom Butts ext. 122
Managing Editor: Deborah D. McAdams ext. 177
Technology Editor: James E. O'Neal ext. 150
Associate Editor: Melissa Sullivan ext. 149

News Correspondents: Susan Ashworth, Robin Berger, Ken Freed, Mary Gruszka, Craig Johnston, Claudia Kienzle, John Merli and Sanjay Talwani

Production Director: Davis White ext. 132
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President: Stevan B. Dana ext. 110
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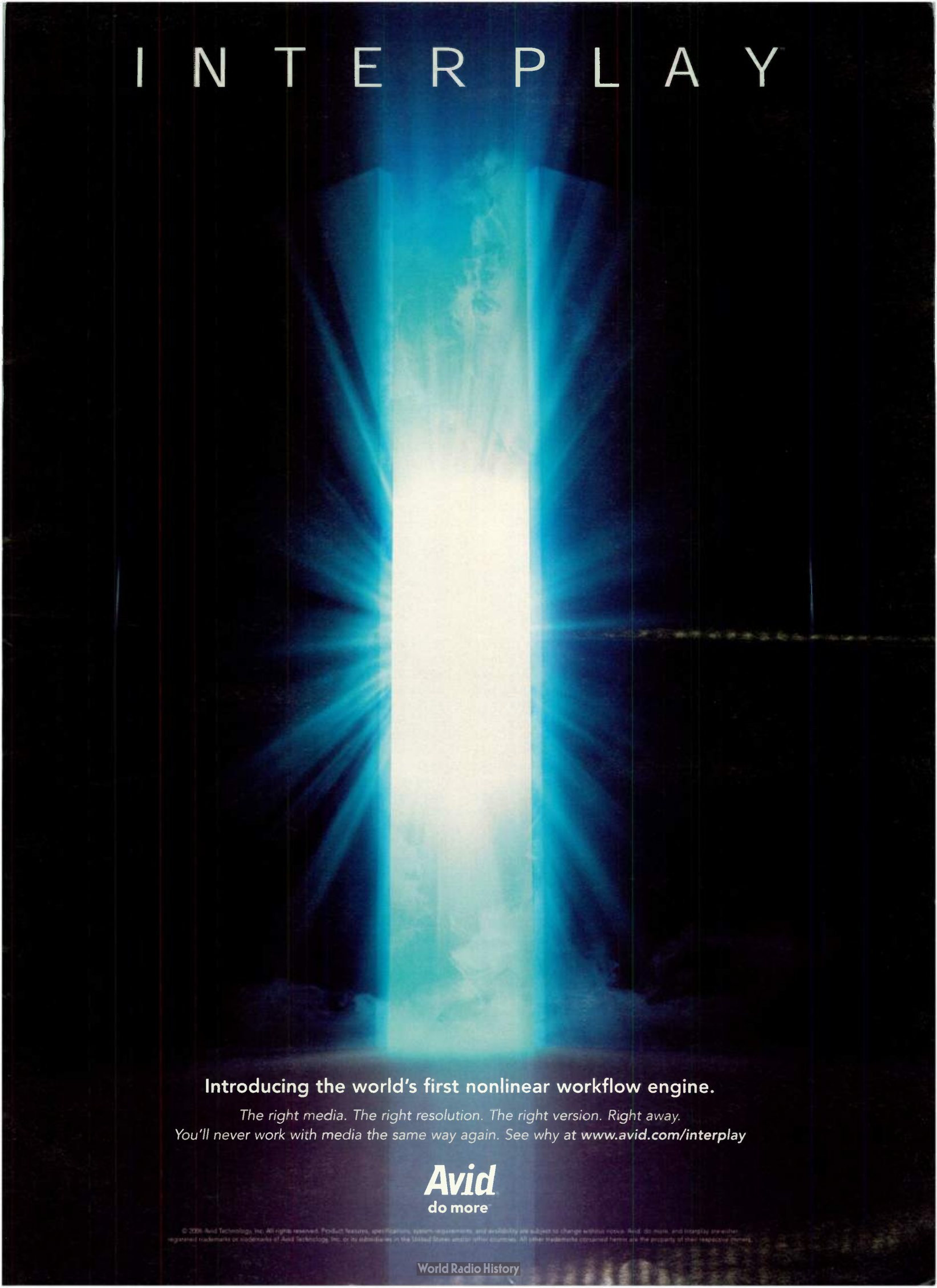


Color Bar Co-Inventor Dies

NEW BRUNSWICK, N.J.

Although his creation is seen in every corner of the world, very few link the name David D. Holmes with television's ubiquitous color bars.

The industry term "test pattern" gave way to "bars and tone" at least a generation ago, as electronically generated color bars replaced the monoscope as an ever-ready video source in TV stations and production houses.

Holmes helped to create the first iteration of that iconic symbol of color television more than 50 years ago. He died Aug. 9 at the age of 79 in New Brunswick after a brief illness.

In 1950, Holmes was a young engineer with a freshly minted MIT master's degree when he reported for work at RCA's David Sarnoff Research Lab in Princeton, N.J. The lab was ramping up efforts to create a backwardly compatible color television system to checkmate the CBS field sequential color system.

When Holmes arrived, his new boss was away on a three-week vacation. Having no real assignments, the young engineer was attracted to the work going on in the color research center and noticed that optical slides were being used as color signal sources. Holmes was appalled at their poor quality and this pushed him to create something better.

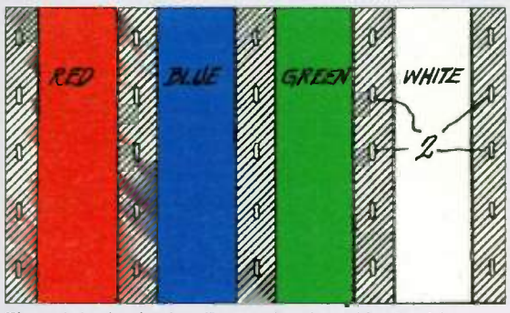
He worked at this with another RCA engineer, Norbert D. Larky and produced the world's first color bar generator.

Their invention was a marvel of simplicity, yet it produced clean vertical bars of the primary colors and white. Even in the pre-digital vacuum tube era, his signal generation device was remarkably stable.

On returning from vacation, Holmes' boss was impressed with the device and ordered additional units constructed.

As color television gradually edged out black and white, electronically generated color bars replaced the monochrome Indian-head test pattern with its linearity circles and resolution wedges. The simple red/blue/green/white color bar pattern underwent numerous changes and additions before morphing into today's familiar SMPTE bars.

Holmes spent the next 25 years of his career at RCA, becoming the group's director of television research and development. Holmes was involved in setting up the NBC Radio City studio 3H for some of the earliest colorcasting at that facility.



The original color bar lineup developed by David Holmes and Norbert Larky. This pattern gradually evolved into today's SMPTE color bars.

He received his bachelor's degree in engineering from the University of Maine and began his career as a professor at the University of Nebraska before joining RCA. Holmes was a pioneer researcher in transistor applications, creating the first solid-state radio for automotive use.

He was also involved in defense and space program research. In addition to his interest in television, Holmes was an avid sailor and participated in numerous Long Island races. He kept boats in the Chesapeake Bay and in the British Virgin Islands. At least one of these bore a spinnaker sail emblazoned with NTSC color bars.

Obituary

Joseph Jumps; Wharton Promoted

WASHINGTON

Two prominent D.C.-area trade associations reported recent changes in their corporate communications departments.

Dennis Wharton

Dennis Wharton, the discerning spokesman for the National Association of Broadcasters, has been bumped up a notch, from senior vice president of corporate communications to executive vice president of media relations.

Wharton joined lobby that represents around 8,300 radio and TV stations 10 years ago as vice president of media relations. The following year, he was promoted to the position he has held until now.

"For more than a decade, Dennis has served broadcasters and the NAB with distinction as our organization's principal spokesman," said NAB President and CEO David K. Rehr. "This promotion is in recognition of his dedication to NAB and the respect he garners from his public relations peers and former colleagues in the journalism profession."

In his new position, Wharton's duties will be expanded to include additional outreach and public policy advocacy to the national news media on behalf of broadcasters. He will continue to serve as a key strategic adviser to Rehr, NAB senior staff and to NAB member stations.

Wharton joined NAB after 16 years as a reporter, for The Times Leader in Martins Ferry, Ohio; AP bureau chief in Columbus; and later for Variety in Washington, D.C. He did a two-year turn as managing editor for Financial Product News before returning to Variety and then being poached by the NAB.

Across the Potomac in Arlington, the Consumer Electronics Association announced that after eight years as vice president of communications and strategic relations, Jeff Joseph is leaving the association for the Biotechnology Industry Organization, which advocates for issues ranging from germ warfare defense to genetically engineered food crops. The organization represents more than 1,100 biotech companies, schools, state research centers and related entities. Its president is James Greenwood, a former congressman from Pennsylvania.

Jeff Joseph

At CEA, Joseph managed the communications de-partment, developed PR strategies and served as spokesman on many issues. Joseph worked intellectual property debates, environmental policy and especially the DTV transition, often in opposition to the National Association of Broadcasters. NAB Executive Vice President of Media Relations Dennis Wharton had this to say about Joseph:

"There is no better PR pro in Washington than Jeff Joseph. The consumer electronics industry has lost a truly remarkable advocate whose command of public policy issues is matched only by his personal charm."

Joseph also spearheaded the media campaign for the Consumer Electronics Show, the January extravaganza in Las Vegas.

CEA President and CEO Gary Shapiro said, "Jeff is an incredibly effective communications professional. He is passionate, honest, warm, quick and has an endless desire to make a difference. His love of our industry, its products and people comes through everyday. I will remember Jeff's tenure at CEA as one filled with passion, fervor, accomplishments and success. We wish Jeff the best of luck in his future endeavors. Our team at CEA will miss him."

People

Emmys Honor Advertising Technology

NEW YORK

The National Academy of Television Arts and Sciences has announced that it will be adding two new Technology and Engineering Emmy Award categories.

Awards will now be presented in the category of "outstanding innovation and achievement in Advance Media Technology for best use by commercials." One of the new awards will be for personal media display and presentation technology and the other will be for non-traditional platforms, including broadband, the Internet, video-on-demand and computer-based media players that are not personal media devices.

For the first time the Technology and Engineering Emmy Awards ceremony with take place on the opening night of the International Consumer Electronics Show, Jan. 8, 2007 in Las Vegas.

"The International CES has long been the launch pad of entertainment technology, so it is fitting that our Technology and Engineering Emmy Awards, which recognize achievement in both television engineering and advanced media technology be showcased there," said Peter Price, president and CEO of the National Television Academy. "With the National Television's Academy's new efforts this year to recognize 'television anytime anywhere' with Emmy Awards for content and technology, this move is particularly fitting."

The Technology and Engineering Awards will be presented for achievements that took place between May 1, 2005 and April 30, 2006.

Awards

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THE NEW WAY OF BUSINESS℠

So You Want to Edit in HD

Frame rates, timecodes and color considerations should be settled before post

by Kirsten Dark and Jayme Wing

LOS ANGELES

Telling someone how to edit in HD is like telling someone how to bake a cake. There are so many types of cake. Would you like to make a four-tiered wedding cake or German chocolate? Each flavor and design is approached quite differently even though they are both merely cake.

I've just finished producing my first independent feature, and Jayme Wing, my partner, works on a daily basis with independent film projects. Together we'll tell you about several seemingly simple steps that can make you or quite literally, break you when editing in HD. These steps occur before post production even begins.

Step 1: Communicate with your editor *before* and *during* your shoot.

Let him or her know what the desired outcome of your project is and work together to come up with the best way to capture the raw material. You need to discuss whether or not you'll ever be taking the finished product to film or to broadcast.

If it's not destined for film, do you really need or want to shoot at 24 fps? Would 30 fps be a better choice? For certain projects such as documentaries, sports or reality shows the answer will likely be, yes.

It makes life in post production much more pleasant (and cheap!) if you edit in the same frame rate in which you shot your footage. There are several frame rate flavors to choose from: 60, 59.94, 24, 23.976 (aka: 23.98). You and your editor should have this part definitively decided upon before principal photography begins.

Step 2: If you're shooting with multiple cameras, be prepared to tell your editor how the cameras were synched. It's important for your editor to know if you used a lock box or jam synched the cameras. He also needs to know if your audio engineer received the same timecode as well.

Here's where a little timecode 101 is valuable. There's a common trend among independent film makers to use time-of-day timecode. It's a valuable tool if you're shooting in a reality environment and you've got two or more cameras shooting in different locations. You can easily show simultaneous action when you post the story.

There is however, a common mistake made time and again that hurts these film makers in post. It's easy to shoot spurts of action all day long and wrap at the end of the day with a tape that still has let's say, 20 minutes of available space left on the end of it.

To save money, the tape is left in the camera and shooting begins again the next day. This results in a tape that has two identical timecode sequences on it or has a higher timecode sequence at the beginning of the tape than at the end, resulting in a nightmare in post.

If time-of-day code is the method of choice, a new tape *must* be started at the beginning of each day.

From an editor's perspective, it is preferred that continuous timecode be recorded in the field. This means that

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Standard

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"You need a general purpose PC so that it has the flexibility and capability to view a wide variety of codecs and video rights management systems. That all comes at a cost."

The cost he refers is the $1,000-a-pop media center PC, as well as the time and frustration that come with configuring the PC for each codec, digital rights management system and conditional access programs. Dr. Liao compared that to the several hundred dollar cost of a cable set-top box.

"They're much, much cheaper, so you're really talking about factors of three, four, five or more difference in price," he said.

"That's because whether it's the cable company or the IPTV company, like Verizon, they settle on, they determine things like 'what's the codec?' 'what's the conditional access system?' 'what's the DRM?'

It's the same for terrestrial television reception.

"Every channel on your TV works the same way, on analog it's NTSC and for digital it's all ATSC," Dr. Liao said. "Most important to the consumer, the operation is straightforward.

"The goal here of the five manufacturers is, 'let's agree on what should be the right things to standardize on, and then we can make a very cost-effective solution to the consumer.'"

Aside from the potential cost difference between the new, mass-produced Internet TVs and media center PCs is the viewer experience. Watching television is an experience designed for sitting 10 feet away from the screen with a remote control in hand, not a foot away, as with a PC, with a keyboard and mouse sitting in front.

All of this may leave the American reader wondering why anyone would opt for Internet video when cable and satellite deliver hundreds of channels, and the budding IPTV promises even more. Therein lies one of the reasons the new Internet TVs will be introduced into Japan and other Asian markets first.

Dr. Paul Liao, chief technical officer for Panasonic Corp. of North America

"You need a general purpose PC so that it has the flexibility and capability to view a wide variety of codecs and video rights management systems. That all comes at a cost."

— Dr. Paul Liao, Panasonic

"[Sony] is considering to put the first priority to the Japanese market, since Japan is the country which has the most customers' interest," said Sony officials.

"Unlike this country," Dr. Liao said, "[in Japan], the number of channels that are available through terrestrial or cable or even satellite is much smaller. And he identified an additional difference between the United States and households in Japan and some other Asian markets.

"Broadband is both much more ubiquitous among consumers as well as much higher data rates. So it's not unusual to have data to the home that has 100 Mbps service, so the Internet can provide truly broadband service, and you can even consider watching content with HDTV type of quality."

That said, Liao predicts that, with more and more Americans opting for high-speed broadband, it won't be long before Internet TV hits the U.S. side of the Pacific Ocean.

"As that situation changes in other parts of the world, and it's happening surprisingly rapidly, even here in the United States—despite people's worry that we're falling behind the rest of the world—speeds are steadily increasing, and I think it's a natural that we'll see it over here."

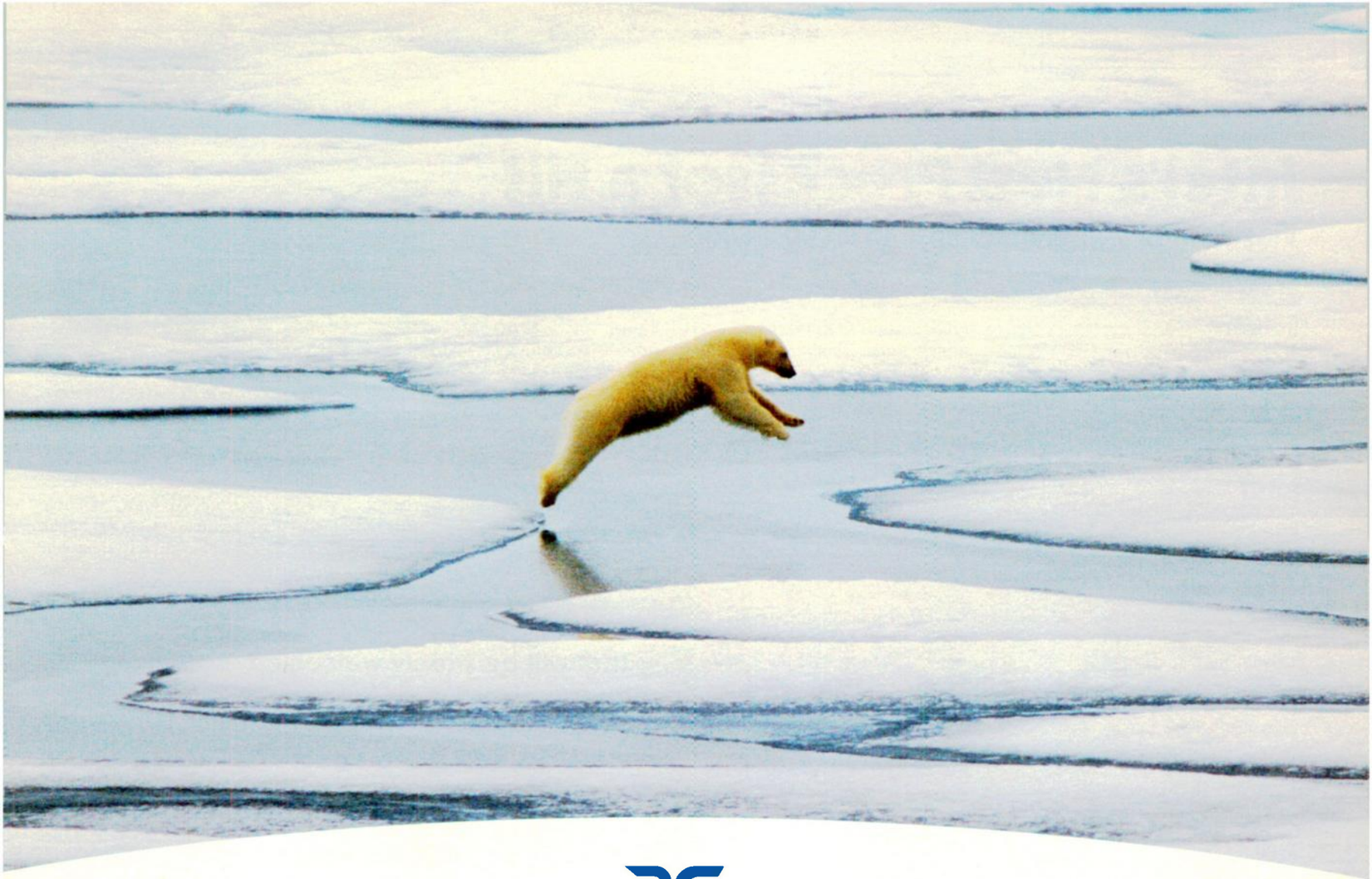
One natural advantage Internet TV brings over terrestrial, cable and satellite TV comes in the video-on-demand field, where tens of thousands of movies can sit on servers throughout the world, waiting for the Internet TV viewer to beckon them to his screen.

What the content producer needs to know about Internet TV is very little, other than the possibility of an additional market for his product. Those involved in content delivery may find it's yet another avenue to the viewer's set.

The five companies developing the Internet TV standard are not willing to put their new products up for sale and wait for a content distribution network to develop on its own. They're also developing an Internet portal that will feature Internet video programming.

Sony officials pinpointed three main services on the portal: video-on-demand; daily information service (news, weather, etc); and features such as payment service and recommendation services.

"The people who have televisions that are capable of receiving this type of service would have a natural way to get to the sites, and the content would be formatted correctly for the television experience," Liao said. ■



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Intel's New Processor a Hit

Video editors welcome Pentium's successor

by Jay Ankeney

LOS ANGELES

Rarely has any technology introduction been greeted with as much enthusiasm as the new Core 2 Duo from Intel, the replacement for its venerable Pentium line of processors.

"Not since Intel introduced the Pentium processor has the industry seen the heart of the computer reinvented like this," said Paul Otellini, president and CEO of Intel at the Core 2 launch in late July. "The Core 2 Duo desktop processor is an energy-efficient marvel, packing 291 million transistors yet consuming 40 percent lower power, while delivering the performance needed for the applications of today and tomorrow."

This new chip should not be confused with the Dual-Core Intel Xeon processors built into the new Mac Pro workstation unveiled by Apple at its World Wide Developer's Conference last month, according to Dr. Jon Peddie of Jon Peddie Research, a multimedia and computer graphics market research firm in Tiburon, Calif.

"The Core 2 Duo is a dual processor on a single die design. With this introduction, Intel has closed the gap in price and performance with their arch rival Advanced Micro Devices," Peddie said. "The Core 2 Duo is a chip that will be widely welcomed by all professional graphics creators and video editors."

Previously known only by its internal code-name of "Conroe," the Core 2 Duo line of processors consists of five models: the 2.93 GHz Core 2 Extreme X6800 at the top end; the 2.67 GHz Core 2 Duo E6700 and 2.4 GHz E6600 mainstream applications; and the 2.13 GHz E6400 and 1.86 GHz E6300 for the entry-level market

Its architecture emphasizes performance more than pure clock speed by running at 2 to 3 GHz compared to the Pentium 4's 3 to 4 GHz, but the Core 2 Duo can still scale better in frequency than the Pentium M.

Built using Intel's 65-nanometer silicon process technology, the desktop PC version of the Core 2 Duo processor provides up to a 40-percent increase in performance over the Pentium D and a 20 percent boost compared to its major competitors, AMD's Athlon 64 and Athlon FX processors. Having shipped its new chips even before the July 27 announcement, Intel claims that more than 550 customer system designs are already geared toward using the Core 2 Duo processors, which is the most in its history, according to Intel.

HP was the first mainstream workstation manufacturer to ship the new Intel Core 2 Duo chip in its new HP xw4400 Workstation last month.

> **"The Core 2 Duo is a chip that will be widely welcomed by all professional graphics creators and video editors."**
>
> **—Jon Peddie, Jon Peddie Associates**

The first mainstream workstation manufacturer to ship a system with the new Intel chip was HP, whose HP xw4400 Workstation containing the Core 2 Duo and Core 2 Extreme processor and 975X Express chipset started shipping in early August.

POWERFUL EDITING

In the high-end professional video production field, one of the early adopters of Intel's new dual core/single chip design has been NVIDIA Corp., a leader in programmable graphics processor technologies. Even by launch time, NVIDIA had already rewritten its unified ForceWare multithreaded driver on Windows, Linux or Macintosh O/S to support the Core 2 Duo processors.

"Since we were working with Intel prior to launch, all of our cards now support the Core 2 Duo right out of the box," said Peter Sheerin, the technical marketing manager for workstation product reviews at NVIDIA. "Our ForceWare driver takes advantage of the new chip's dual cores to transfer data over the PCI-Xpress bus to optimize the GPU's operation and memory management."

Sony is actively running benchmark tests with this new multithreaded, 64-bit chip.

"The instructions are different from the ones needed for the Pentium design," said Hugo Gaggioni, chief technology officer for the broadcast and professional division of Sony Electronics, "so our professional applications that run mostly on Linux will need new code for the new Core 2 Duo chip. It will make them much faster and more powerful. It's not as computationally intensive as our 8-processor Cell chip developed in conjunction with Toshiba and IBM and used in our PlayStation 3, but the Core 2 Duo offers significant improvements over the previous Pentium."

Avid Technology is also looking forward to incorporating the new processor into its DNA (digital nonlinear accelerator) system.

"Avid's hardware accelerators are designed to take advantage of faster chips and to provide incremental performance on top of the CPU and GPU," said Matt Feury, senior product marketing manager at Avid. "So as chips such as the Core 2 Duo come to market, we expect our hardware acceleration performance to improve as well."

The Leitch Business Unit of the Harris Broadcast Division will be releasing its VelocityNX NLE in November using AMD's dual Opteron processing. But according to Rich Green, product manager for editing at Leitch, "we are also investigating the Core 2 Duo chips, which we believe in theory should allow us to process 40 percent faster, bringing real-time HD editing and effects closer to reality. So I feel that by around NAB2007, all of the Velocity based products for servers/post will be shipping with versions that can utilize this technology."

Autodesk had been using both AMD and Intel chips on its original IRIX-based SGI platforms that were historically multiprocessor architectures, so their highly threaded software has always been able to take advantage of boosts in processing speed.

"It's not just the advances in multicore design that is important to us, it's the expansion of the whole memory architecture on high-end workstations

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Digital Content Management Gains Muscle

Three solutions provide better control for newsroom content

by Robin Berger

LOS ANGELES

This year's digital content management engines are more extensive, better integrated, more automated, and have more options to ingest formats, catalogue assets and quickly distribute content to a variety of end users. Manufacturers say all this contributes to better content management.

AVID INTERPLAY

Interplay's edge is its integration, automation and security features, plus price, said David Schleifer, vice president of Avid Broadcast and Workgroups.

"We're starting out at under $20K for the complete system with a five-user license," Schleifer said. "At $18,000, that's the server, the software and the client licenses all up and running—you add other components and licenses as you need them."

Customers can also integrate third party products into the system, he said, noting that "Interplay out of the box supports over 100 file types—we've taken the opportunity of having shared storage, creative tools and asset management all as part of our mix."

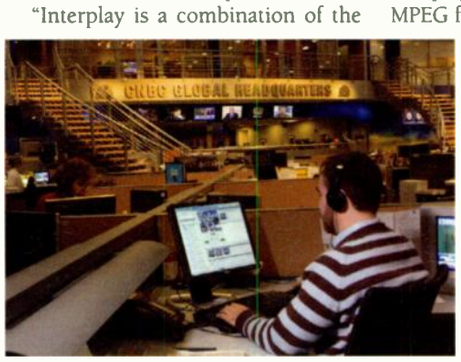
For example, Interplay interfaces with archival products from Storage Tech, Front Porch Digital, Masstech and Avalon (EMC), Schleifer said.

Interplay has its own transcode engine, plus the ability to drive automated encoding products (e.g., Anystream, Telestream), enabling distribution to IPTV, the Web or cellphones. Its Active ContentManager optimizes content distribution to these channels based on a set of customized rules, according to Schleifer. And Interplay lets customers keep and track "any asset in any resolution" through extensive versioning, revisioning and history applications that are "appropriate to multiple outputs," Schleifer said.

The 2004 acquisition of Munich-based NXN Software, a provider of asset and production management systems, also goosed Avid's automation efforts, marrying its in-house product with NXN's Alien Brain.

"The acquisition of NXN gave us back-end technology to build an asset management system," said Schleifer, who noted that Interplay melded an existing Avid Workgroups product with NXN's Alien Brain product.

"Interplay is a combination of the two—it supports all of the Workgroups' APIs, third party connectivity, all of the features and the functionality that NXN did."



CNBC uses Grass Valley Newsbrowse to manage digital content.

And Interplay's new health and monitoring "dashboard" will alert engineers or the IT department to any potential problems, Schleifer said.

Interplay is now shipping.

GRASS VALLEY AURORA

Although Aurora is technically a software suite, the name is also used as a catch-all to describe Grass Valley's Aurora Ingest + NewsBrowse +K2 solution, which addresses the whole news workflow from ingest to archives to playout.

Integration is key to the Aurora solution, according to Roger Crooks, director of server product management for Grass Valley.

It has "extremely tight integration with newsroom computer systems, like ENPS, Avid iNews and Octopus," enabling "a complete workflow of products from ingest to play-out to archives," as well as "tight integration of high- and low-resolution streams—whatever you do on the proxy editor will now work directly on the K2 server," Crooks said.

He believes specific components—like the K2—also provide a cachet.

"Our server can work with all the different compression formats," he said. "With the K2 and news products, you can play a DV25 file, followed by an MPEG file, followed by a long GOP, followed by an HD file."

Like Avid, Grass Valley has a proprietary transcoding engine (part of the Aurora NewsEdit suite of tools) and integration with third parties like Telestream and AnyStream.

The December 2005 acquisition of Canopus by parent company Thomson S.A. also bolstered Aurora's editing options. Previously, Grass Valley focused on fast turn news editing, relying on third parties for the craft editors preferred for promos.

"With Canopus, we've a comparable product to Apple and Avid," Crooks said.

And Thomson is providing a full line of products and platforms for distribution to IPTV services, video-on-demand, mobile TV and digital TV, he noted, spurred by last year's acquisition of Thales Broadcast & Multimedia.

Other upgrades announced at IBC2006 include nearline RAID6 storage, 16 audio channels per video and multi-resolution views of the same asset, according to Crooks.

"Thomson has the technology in-house to generate other formats like MPEG-4, H.264," he said.

Aurora 6.3 will be available by year-end, starting at $17,000 for a standalone Aurora Edit SD workstation.

HARRIS H-CLASS

The Harris H-Class solution targets large customers, according to Mark Darlow, product line manager, H-Class digital asset management.

"There's a price point of about $200,000 and up," he said.

The top three features to H-Class are "smart cataloguing," automated import of data and export of content, and integration of devices.

Smart cataloguing, said Darlow, refers to the system's "unprecedented ability to catalogue, search and capture."

"We can capture metadata at frame level," he said. "If you type in 'Bush eating a sandwich,' it will actually go to the specific clip—as opposed to bringing up a program you have to sift through key frame grabs."

At NAB2006, Harris demonstrated how H-Class can move the broadcast-quality version of a clip found in a low res search off the server to an editing system along with metadata, Darlow said. Conversely, he noted, "we can pull back newly created content, unwrap metadata, import that into our asset management system, move the content onto the server, and create a new low-res proxy automatically."

And, thanks to partner Marquis Broadcast, new media ingest, scheduling and asset management features automate data sharing between H-Class and other applications.

For example, one media ingest message lets the system ingest content, unwrap metadata from Telestream, and publish metadata to both the H-Class scheduling and digital asset management engines, so that the platform recognizes what content is available in which cache server.

Another message lets the Harris scheduling app know where taped content is and which server has the digitized material.

These new features now use SMPTE's 2210 standard to share information between devices. By year end, Harris expects a MOS interface. At that time it also plans to integrate its rules-based content mover—the optional Intelligent Media Mover plug-in—into the platform as a dedicated service.

IMM was "developed to service the emerging IPTV business model, as well as broadcast operations centers," Darlow said.

"By putting it into the platform, it [can] do more and start to feed NetVX information and content for movement over wider distances," Darlow said. NetVX, a network that supports and prioritizes live streaming and file-based transfers, was developed by Canada's Aastra Digital Video (formerly Lucent Digital Video). NetVX was fully integrated into the system this year, when Aastra was acquired by Harris. ■

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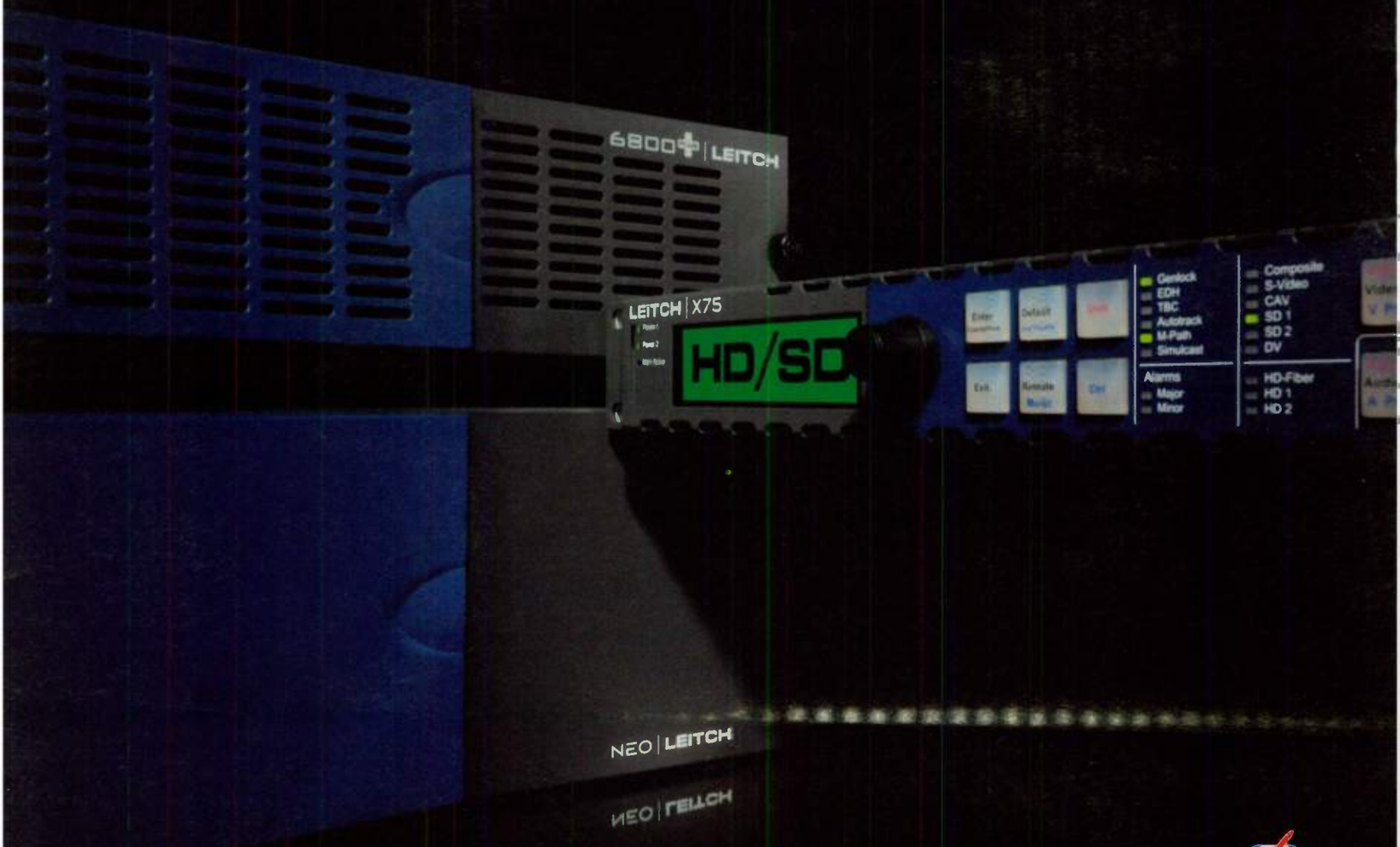

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Weather and the KISS Principle

Graphics vendors offer more than software and hardware

by Claudia Kienzle

HAMILTON, N.J.

With typically three minutes to deliver the local weather report, television broadcasters go to great lengths to ensure that their weathercasts are easy to understand, visually interesting, and relevant for viewers.

While the weather can vary greatly between different regions of the country, broadcasters nationwide distinguish their weathercasts by the quality of their weather graphics, the weather data they have procured, and the way they "tell the weather story."

KEEP IT MOVING

But with so much firepower available in today's weather graphics systems and the ability to illustrate the weather picture using colorful, animated, detailed visuals, how much information is too much? And when is a rapid delivery of complex weather graphics too visually confusing for viewers?

With the Accuweather Storm Hawk, reports can be filed almost instantly.

"It comes down to the question of, 'are you moving so fast that I can't figure out what you're showing?' Or 'are you going at a brisk pace, but still imparting the information that I want you to impart?'" said Bob Morford, news director for WCPO-TV, ABC-9 in Cincinnati.

"You need to move quickly through your weather maps or frankly it just gets boring," Morford said. "And the worst thing you can do to television viewers is to bore them. Going into too much detail on one static map more often than not will drive away viewership. If the meteorologist has two or three important points to talk about, it's better to do that by showing two or three different weather maps rather than having the entire discussion supported by a single map."

With a coverage area that includes southeast Indiana, southwest Ohio, and northern Kentucky, WCPO is ranked No. 1 in the market for its 5, 5:30 and 6 p.m. newscasts. Prior to joining WCPO, Morford was news director at KNXV, which like WCPO is a Scripps Howard-owned ABC affiliate in Phoenix. Morford notes that location can make a big difference when determining how much detail viewers want in their weather report.

"In Phoenix, people tend to focus intently on the weather in late July and August when the monsoon brings sandy, dirty winds blowing across the coverage area. But in the Midwest, where people are fearful of severe weather, people pay more attention to the weather year-round," he said. "Recently, we thought we had a tornado on the ground in southeast Indiana, and we spent 20 to 25 minutes covering that story even though it only affected the extreme western portion of our coverage area."

MULTI-TIERED SOLUTIONS

WCPO uses three different weather graphics solutions daily. Weather Metrics provides a Weather Tracker network of local weather data stations placed around WCPO's coverage area that transmits a still video image along with the current weather data, such as temperature and wind speeds. Morford said this is an effective way to really make the weather "hyper local" by zeroing in on small towns around the coverage area.

Baron Services provides WCPO

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Intel

CONTINUED FROM PAGE 10

that is crucial to our software," said Bill Roberts, director of product management for Autodesk Media and Entertainment. "That is absolutely essential to anyone building a sophisticated real-time editing and effects system. We are now seeing the advent of interactive 2K workstations on both Windows and Linux and these new Core 2 Duo chips are giving us the performance we used to achieve on the Onyx platforms."

The new chip should also increase the customer base for the Canopus line of Edius NLEs from Grass Valley, according to Brandon Higa, product marketing engineer for the Nevada City, Calif.-based company.

"Now that we've made the move to HD editing with our Windows-based systems, the only limit to our scalable compression technology is processing. But like anything innovative on the processor side, with these new chips it will take a bit of time before we'll reach a status quo level of functionality," he said.

The post-production systems from Quantel have always benefited from hardware advances especially as demand for real time HD editing increases.

"We're obviously looking forward to the extra performance the Core 2 Duo will bring," said George Catlow, R&D group leader. "The Core 2 Duo should bring the same power to the journalists' and producers' server-connected standard desktop computers for editing HD video in a newsroom with the same speed and facility that they can handle SD today."

TARGETING LAPTOPS

Intel said that many of the principles behind the Core 2 Duo came from developments in mobile computing.

"The same design team that came up with the Centrino chip for laptops went back to the drawing board to create the Core 2 Duo," said Dan Snyder, technical PR manager for Intel Corp. "Getting more performance with less power consumption almost defies the laws of physics, but this new architecture was designed from the ground up for all the high end encode/decode processes needed for professional digital content creation."

AMD has responded by cutting the price on some of its chips by up to 50 percent. Just before the Intel release of the Core 2 duo, AMD said it was paying $5.4 billion to purchase top graphics chipmaker ATI Technologies Inc. to expand its product portfolio. They followed up this announcement by introducing its next generation AMD Opteron processor which will include the introduction of AMD Virtualization technology and a seamless upgrade path from dual-core to quad-core processing. ■

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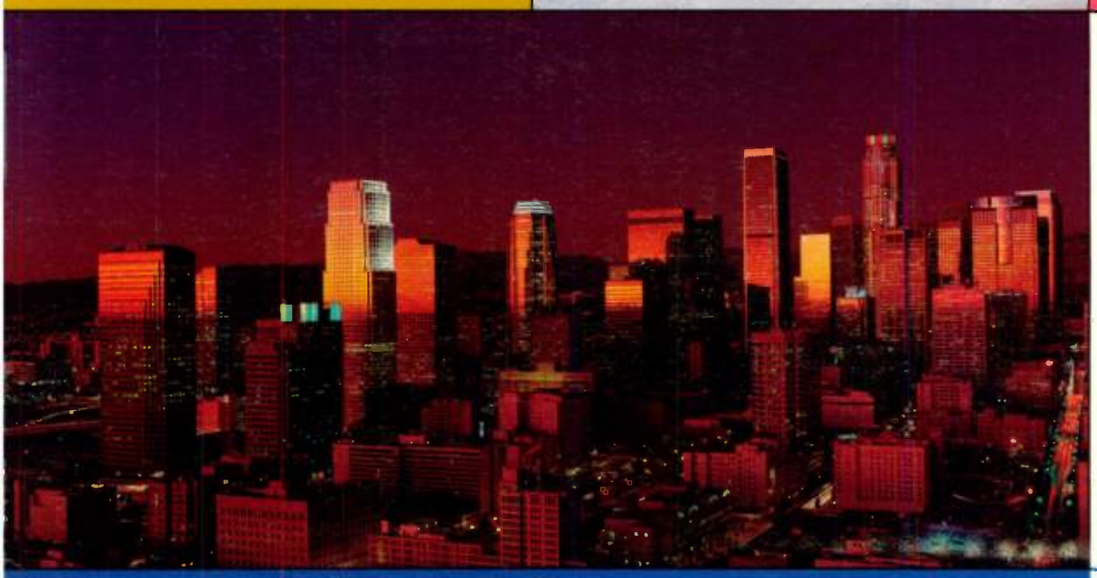

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Panasonic ideas for life

IBC2006 Goes Mobile

European broadcasters set sights on portable video and IPTV

by Mark R. Smith

AMSTERDAM, NETHERLANDS

With the arrow on the attendance chart continuing its upward climb, IBC2006, the world's second largest broadcast show, is set for Sept. 8-12 at the Amsterdam RAI Exhibition and Congress Centre.

Organizers estimate that the expected 45,000 attendees will include more than 1,000 exhibitors, and travel to the conference "from 140 countries that tend to send top buyers," said Michael Crimp, marketing and business development director of the event, which is planning for the best turnout in its 39 year existence.

The strength of the show is within its home crowd, with about 74 percent of attendees coming from Europe and Scandinavia. That figure has stayed consistent for the past several years, as has the 8 percent that attend from North America, the 7 percent from Asia and the 5 percent from central Europe, with the remainder trekking from elsewhere around the globe.

Crimp said show attendance has increased at a rate of "about 6 percent" annually since 2001, when IBC was held during the 9/11 terrorist attacks. There has also been a shift in the number of exhibitors. Last year, about seven of 10 attendees was a visitor as opposed to an exhibitor, while six years ago that number was roughly six of 10.

He said the shift can be explained as a side effect of 9/11.

"Since [then], the exhibitors have looked more closely at their return on investment," he said. "The vast majority of exhibitors send less staff to the show, thus reducing their costs. And there are more buyers, but they may not stay the length of the show, as many used to."

However long the attendees stay, there are ample opportunities to make contacts and initiate commerce.

"This is a fast changing business and we end up having more than 200 new companies or new entities every year," Crimp said.

UNDER THE SPOTLIGHT

The increased focus at IBC this year, Crimp said, is on mobile technology.

"That exhibit area has doubled in size from last year to 1,000 square meters," with participants to include Qualcomm, Siemens, Samsung, British Telecom, Grass Valley Group, Harris Corp. and Snell & Wilcox.

Another area that "has really come from nowhere," Crimp said, is IPTV, which sets a theme at the conference in two areas: in infrastructure and on the consumer end.

"It's being featured quite heavily," he said. "We are anticipating important announcements on this topic from various players on the show floor, including the various telcos."

Another new offering at IBC '06 will be showcases by renowned Bristol, England-based animators Aardman Animations, featuring stop-motion animation and In Front Media concerning its recent FIFA World Cup coverage.

Aardman Animations is the company behind the success of the Claymation duo Wallace & Gromit and the feature film "Chicken Run." The company will demonstrate how it creates animation on stage, and discuss the issues inherent to the stop-motion process. Aardman also will be promoting its U.K. television program, "Creature Comforts," which has been commissioned to broadcast in the United States in HD.

In addition, executives from In Front Media, which holds the rights to FIFA World Cup events, will be on hand to discuss coverage of the 2006 World Cup and explain how they prepared the content and delivered it for broadcast on four different screens: HDTV, D-cinema, Web and mobile.

This year's IBC will also include digital cinema screenings of recent films, including "Pirates of the Caribbean: Dead Man's Chest," and "Monster House," a Sony 3D release, according to Crimp.

There will be a one-hour awards ceremony and champagne reception that is designed for brevity so attendees can participate in honoring the winning companies and still keep up with their hectic convention schedules. It will include the Judge's Award, among others for content creation, management and delivery.

Organizers say that due to continued demand, floor space for IBC2006 exhibits has been expanded by 500 square meters.

ARRIVING AND DEPARTING

The exhibit floor is always evolving, due to the appearance of new companies, the disappearance of old ones—and perhaps the question of whether or not to reserve space.

Last year, Snell & Wilcox decided against allotting the money and time to design and build what had been a 350-square-meter booth in 2004, which raised a few eyebrows in the industry.

At this year's show, it's Panasonic that has decided not to partake in the exhibition, with Snell & Wilcox returning to the fold—albeit on a smaller scale—said Joe Zaller, vice president of marketing for the broadcast technology company based in Hants, England.

Zaller said last year's absence paid dividends.

"Some people thought it was a great idea because it helped us to focus on important issues, rather preparing for an exhibition. As a result, we were more productive across the board," he said.

The temporary retreat of Snell & Wilcox was not about pitting "one show versus another," Zaller said, "but

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IBC

CONTINUED FROM PAGE 16

growing our business." When the company initially stated that it would not be exhibiting, it "outlined a number of things" it would do with the savings, which he quantified in the range of $500,000 to $1 million.

Zaller said not exhibiting gave Snell & Wilcox "the opportunity to better understand the market and to focus on new areas where we can grow the business," which includes honing its focus on the areas of IPTV, mobile TV and Internet video delivery.

And it isn't that company representatives weren't bustling about the show, anyway.

"Despite not having a stand, we still took about 40 people to IBC in 2005," Zaller said, "and they were able to go out and explore the show."

The result, he said, was that the company came out of its show meetings much smarter about the market and where to facilitate growth.

"As a result, sales in Europe went up significantly and the products we are introducing this year are well targeted to specific applications," Zaller said.

While Snell & Wilcox invested that chunk of its marketing budget elsewhere, Crimp said that the cost of the show itself has "never been an issue with exhibitors."

Some attendees have made noise about the cost of accommodations.

"Hotel space is not really tighter in Amsterdam than in any other European city," Crimp said. "But when you have a successful show, demand goes up. We have been working with the city and local hoteliers to address that matter and there have not been any hotel price rises in recent years, nor will there be for a few more. We publish guaranteed prices on our Web site."

If those costs eventually exceed what the IBC finds acceptable and the organizers find a better deal in a locale the exhibitors like, "we would consider it," he said.

BIG PLAYERS

As for who's on the show floor, Crimp said that the IBC would like all of the [big players] there, "but how much space they take is up to them.

"Some of the bigger companies seem to take the attitude that they need to take 400 square meters or nothing," he said, noting that the smallest exhibition stand is nine square meters. "You would think that, with 45,000 decision makers in town, they could find a way to match their marketing budget to the opportunities provided by the IBC."

Still, as announced at IBC last year, Panasonic decided not to exhibit this year, though the corporation, as Snell & Wilcox did in 2005, will have a peripheral presence in Amsterdam.

"We feel, based on the investment, that IBC is not a good model or return on investment today," said Marc Irwin, European marketing manager of professional and broadcast IT systems B.U. Europe for Panasonic, noting that the corporation spent close to 2 million euros on its stand last year.

This year, that money will be reallocated to road shows, like "The TV by IT," which will promote Panasonic's IT solutions and P2 technology. Panasonic's plan at IBC this year is to hold a press conference to announce new equipment and direction, as well as a party for its VIP customers.

"We feel IBC is still very important as a meeting place and a key part of European influence in the industry," Irwin said. "But we need to influence more than just the check signers who come to the show."

That means more contact with users.

"Not enough of them are in attendance for that kind of a financial outlay," he said, adding that "only about one-tenth of the overall key people in the industry in all of Europe," i.e., decision makers and end users, "will be at IBC. They are certainly not the rank-and-file users. Local shows have more of those people."

On the other hand, Snell & Wilcox is returning to IBC's show floor this year, having found that not exhibiting can have drawbacks, too.

To Zaller, it primarily meant that the corporation did not have a convenient place to meet with customers. He seems to have heard Crimp's point of view.

"We booked a smaller [80-square meter] stand to serve primarily as a customer meeting point and a hospitality area," he said.

Snell & Wilcox also made the decision to bring some of its "really important new products," to IBC, including Quasar, which is the first HDTV upconverter to use Snell & Wilcox's Ph.C motion estimation, Helios file conversion platform, and the Hyperion intelligent content monitoring and QC system, among others. It will also be exhibiting in the growing Mobile Zone.

"Don't get me wrong. IBC is important and a number of our customers go there," Zaller said. "We are not against IBC. But we have to remain focused on our ultimate agenda of growing our business and altering our approach because our market is changing.

"Marketing is about the entire mix," he said, adding that next year's approach to IBC might be different yet again. "There are no right or wrong answers." ■

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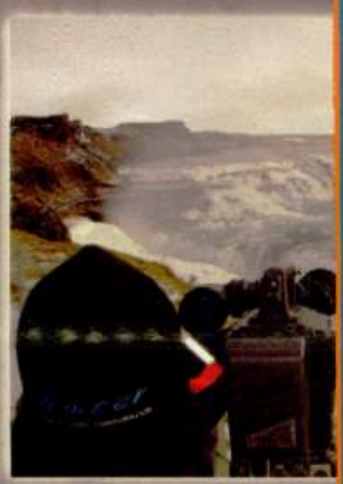

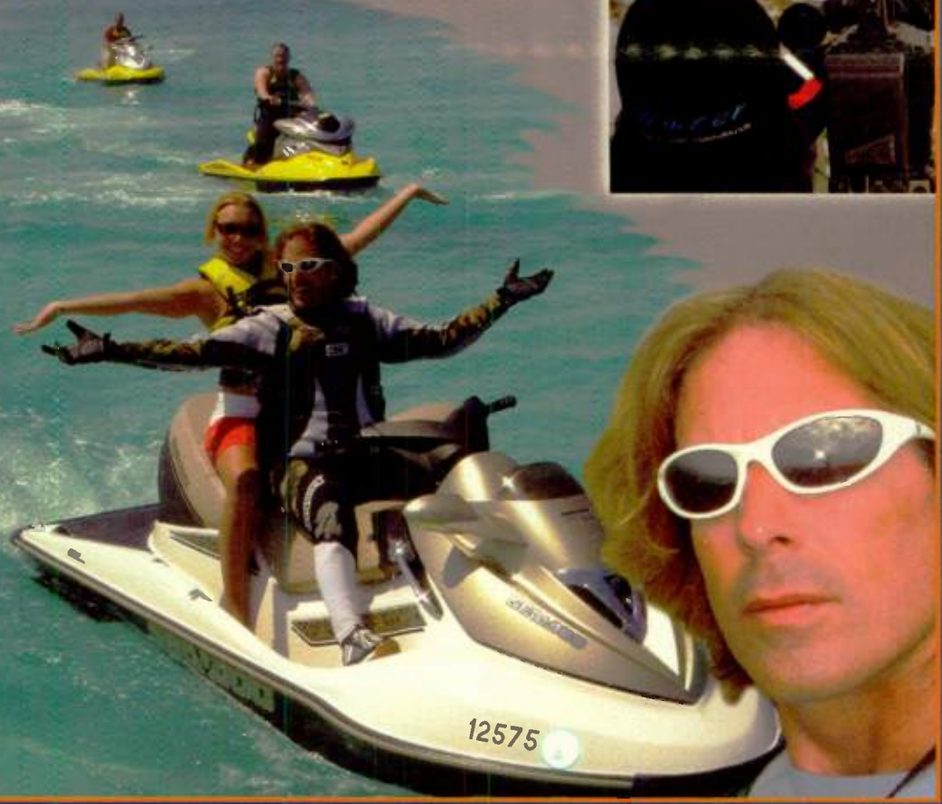

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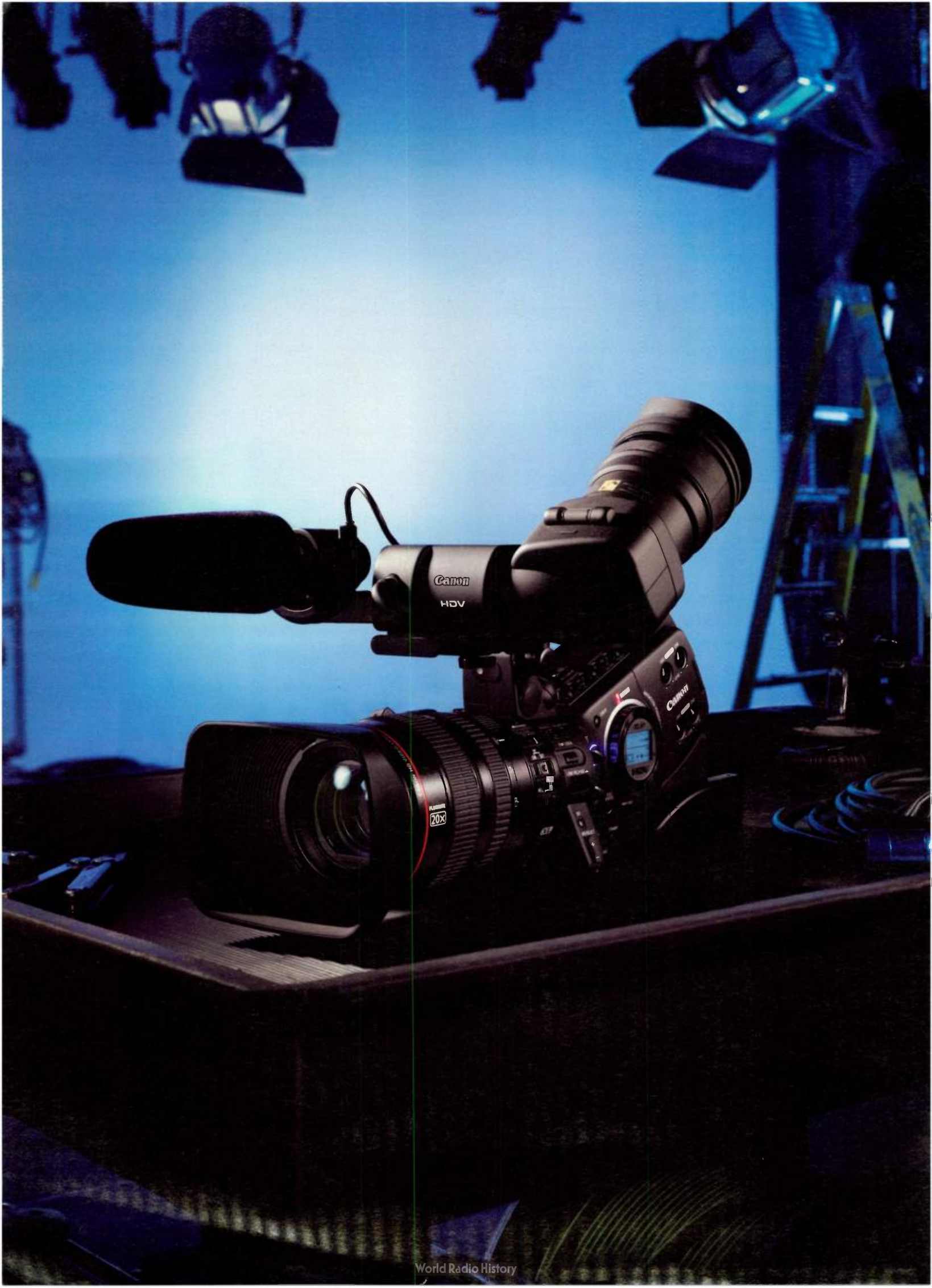

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Newsroom Systems Boast Workflow Gains

Automation adapts to the realities of today's software-based solutions

by Susan Ashworth

SAN FRANCISCO

Pick up any marketing brochure, and you'll probably find it there—those three short words that seem to offer the promise of a strengthened bottom line, a happier boss, a more content staff. The phrase itself? "Improve your workflow." Everyone touts it, but what's it truly mean? Is there a piece of equipment whose improved workflow can actually translate into an improved broadcast facility?

Certainly, if there is one segment within a station that certainly could benefit from the promise of an improved workflow, it would be the newsroom itself.

The key, say experts, is to understand the real-world route that news travels in a newsrooom, and develop technologies that make judicious use of smart short cuts and simple connections that keep information moving.

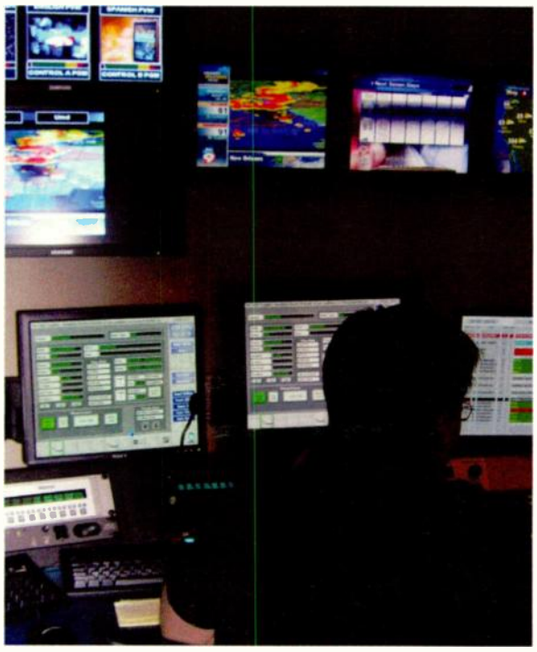
Many of today's solutions seem to take a two-fold but simple approach in terms of design: making the search and retrieval process nearly seamless, and make it easy to use.

"In the early days, customers knew they had a problem and concerns" with the initial way of storing and searching for media materials, said Bob Valinski, director of business development for Crispin. "But they weren't sure exactly what they were looking for."

Manufacturers like Crispin, along with Avid, Grass Valley, AP, Comprompter, OmniBus and others, think they have some of the answers.

START WITH ASSIGNMENTS

For Grass Valley, the answer starts in the assigning room. For years, broadcasters have struggled with how to gather key details from a field shoot—from taking down the (properly spelled) name of a source to sufficiently describing a scene for all the appropriate archive labels that are needed back in the newsroom. After years of research, Grass Valley is introducing a new technology that will improve workflow communications between the home station and cameras in the field. A feature within its Aurora news production system will allow the news desk to send metadata information about an assigned event directly to a camera in the field.



Bay News 9 in Tampa, Fla. controls its news play-out with OmniBus Columbus.

"You will be able to take an automated workflow and extend it into the field," said Ed Casaccia, news workflow manager, digital news production Thomson Grass Valley. "You're going to be able to pull information out of a newsroom computer system, send it to a camera and imprint metadata directly onto a file." That metadata will then be stamped onto that clip as soon as its captured, and will remain with it as it's ingested into the facility, manipulated by the editor, reviewed by the producer and finally stored into an archive system.

"The camcorder will have a list of everything that cameraman is assigned to cover today, and the user will just select the right item," Casaccia said. "From then on, you'll associate all that metadata with that story."

The associated workflow improvements, Casaccia said, are self-evident.

"The goal is to get users to concentrate on the journalistic skills [of the reporter and cameraman]—getting good shots, good sound, a good script," he said. "It adds a new level of workflow efficiency."

Grass Valley has also focused on improving workflow in its Ignite production system, which Casaccia said allows a single individual to control each of the key aspects of a production. "Ignite can change the staffing situation of a production control room from five people down to one," he said.

MORE METADATA

Over the last several years, AP has also been tinkering with the ways that metadata can be used more efficiently to improve workflow in a facility. Grass Valley and AP will be working together on connecting metadata from the studio to the field as part of Version 4 of the ENPS electronic news production solution, according to Mike Palmer, director of video technology at AP.

"The on-site assignment creates a wealth of information that until recently, just got dropped on the floor," he said. "We instead want to take that 'who, what, when, where, why' data and add it to the system."

AP says it is also working with other companies—still under wraps—who hope to offer a similar type of metadata-rich solution that ties together the camera in the field and the newsroom back at the office.

"Assignment editors don't see a segment until the tapes arrive and they're in the process of being edited," Palmer said. "This solution allows the assignment desk to see the status of a clip.

"It means that throughout the production process, [the staff] are now totally linked in and can see the status of a piece," he said.

DIFFERENT PATHS

While different manufacturers have different takes on how best to address the workflow issue, one path to improving a solution often starts with customer feedback.

One key requirement for some Crispin customers: minimal training time for green reporters.

"In television newsrooms, there is a lot of turnover," said Valinski, who was a news editor for a dozen years before his days at Crispin. "We needed to create a system that was extremely easy to use and didn't require any long-term training to operate."

Crispin believes its NewsCat newsroom solution improves workflow issues because it was designed specifically for broadcasters.

NEWSROOM, PAGE 24

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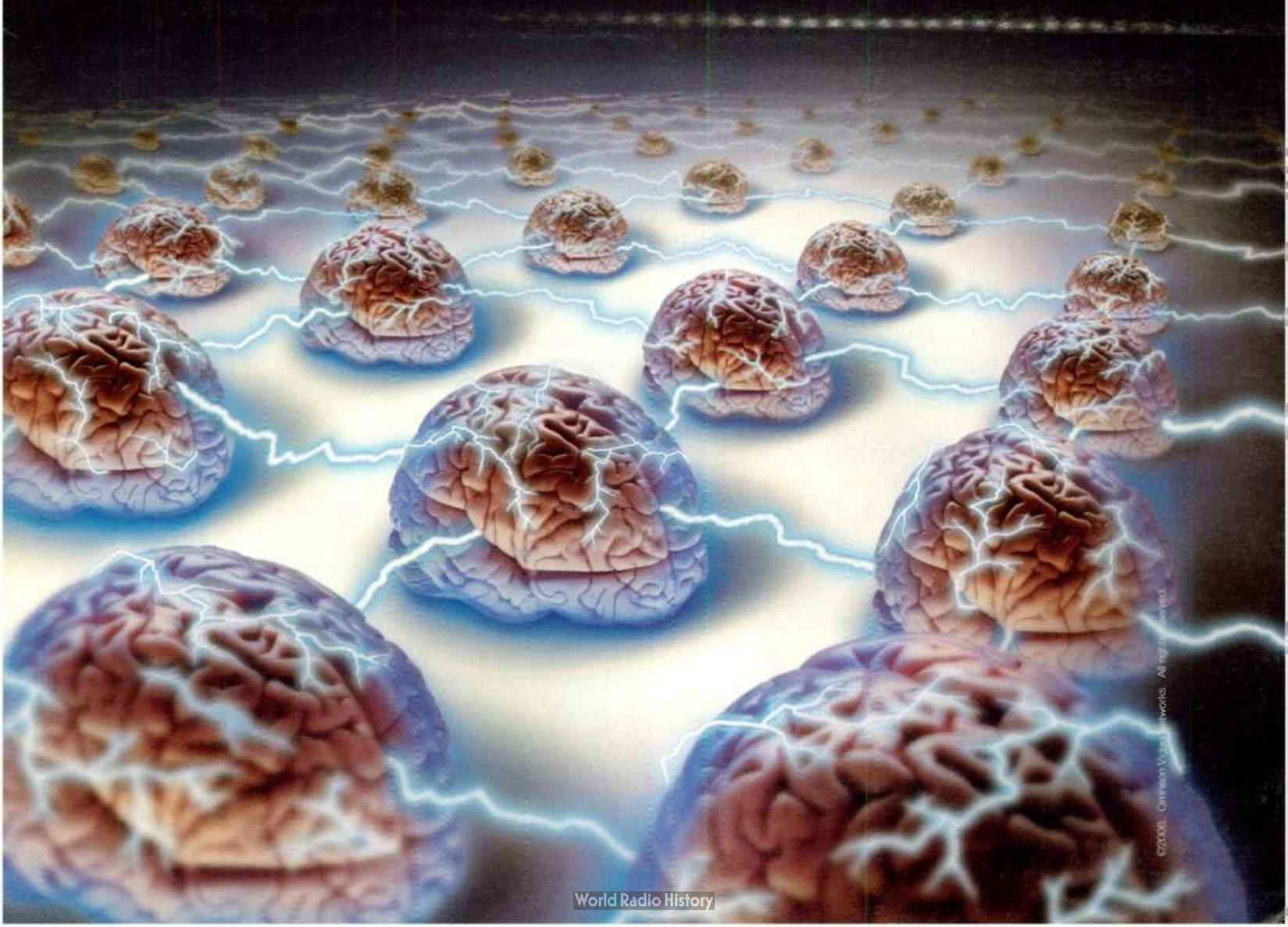


Newsroom

CONTINUED FROM PAGE 22

"This was designed from the ground up to be a news workflow solution, rather than a repurposed asset management system. The entire [the NewsCat system] was designed to address workflow issues," Valinski said.

The NewsCat digital archive and catalog system is a newsroom-specific workflow solution that enables a news department to store, index, locate and retrieve news stories aired from a video server. The system is designed to store video clips as well as organize and manage content so operators can find it when needed. The solution is designed to eliminate the need for tape libraries, cut sheets and card files, instead allowing news personnel to find archived news video with a simple type-and-search method.

How does the solution address workflow issues? One method is by linking archived video clips to a database containing script information from the newsroom computer system. This enables a producer or editor to search for a story using traditional tools such as date, slug, script info or keywords.

The system uses a mix of near-line and shelf storage. Near-line RAID storage offers speedy access to recent stories as well as continuing-coverage reports such as ongoing court cases or recent weather events. The system also incorporates shelf storage, which can handle large news libraries, but still offers relatively quick access to material. The system ties into newsroom computer systems by ENPS, Avid iNEWS and Autocue's QNews.

"It's a very labor-intensive process to create a database of material—to manually create labels and enter data into a system," Valinski said. Today's newsroom systems are designed to address that from the moment broadcast material is created and sent into the station.

JOURNALIST SPOTLIGHT

The journalist himself is the individual that Avid's iNEWS newsroom computer system (NRCS) is attempting to help. One way to improve workflow is to give more control to journalists themselves. That's one feature of iNEWS, which allows users to improve workflow and the accuracy of newsroom operations by allowing journalists or producers to insert graphics and video assets directly into the rundown.

Through a single window, a journalist can browse inside any networked newsroom computer system workstation to view thumbnails and navigate through stills, clips and playlists. Through that screen, users can then add story content, such as text captions, images and video clips, a process that is designed to reduce the cost of operation, speed the publishing of material to air, and create greater efficiency in the delivery of live and breaking news.

The iNEWS system also offers a newsgathering system known as the iNEWS data receiver. While on the scene, users can submit news stories and updates by PDA or phone. Likewise, the iNEWS Web Client allows journalists in the field to log directly into the NRCS via a Web browser and write stories as if they were sitting back at their desk at the station.

iNEWS ControlAir automation-assist system provides rundown lists, tracks script changes, and automates control of production and playback devices—all in an effort to improve those elusive workflow issues for broadcasters.

OmniBus Systems has tackled the news automation dilemma from a different perspective. The company's Columbus automated sports and news playout system offers multiple types of control to users, including the option for single or multi-operator control, which allows a user to build a schedule as needed, or import a schedule from a separate newsroom system. A manual control option allows an operator to take control of to-air events as needed.

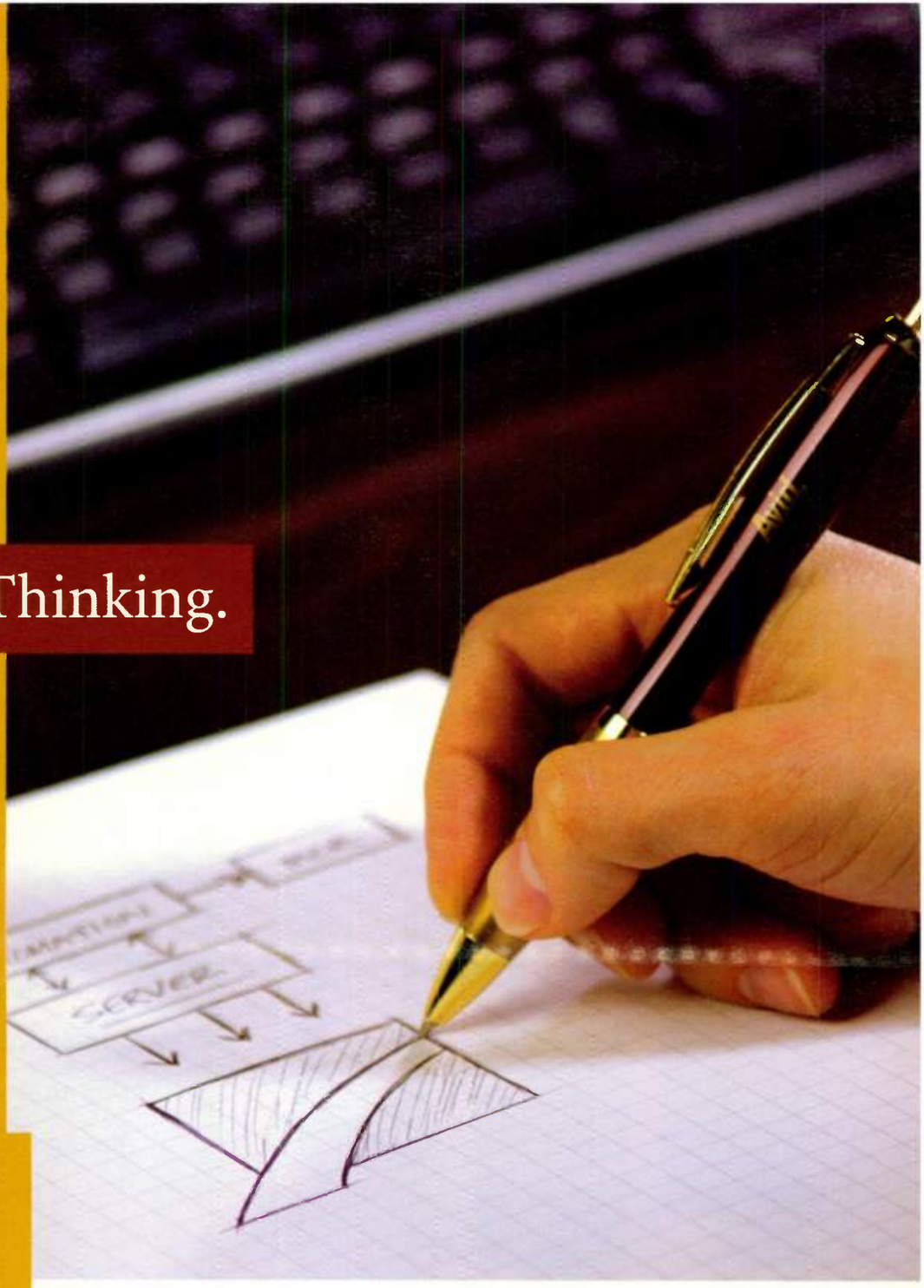
The system addresses workflow issues with its system and content management solution, which allows users to more easily coordinate the transfer of material between devices. In addition the Opus news and sports logging tool is designed to facilitate the quick logging of live or recorded feeds, including auto clip naming. Other features include the ability to add configurable metadata elements and build complex shot lists.

Ralph King, president of Comprompter says the migration from serial type interfaces to Ethernet connectivity has accelerated one important process critical to every automation system, character generation.

"We've been able to go from a 10-second window down to three seconds because of the increase in processing speeds and the fact that almost all of the CGs [now] are computers, instead of the old knob and tube devices that were very proprietary," King says.

This has allowed stations in smaller markets to expand their creative options. KEVN, the Fox affiliate in Rapid City, ND, recently installed a Comprompter NewsKing system to enhance its newscasts. NewsKing allows the station to make and monitor all the captioning and CGs through the production process and instantly make any change made to a script by a reporter or to the rundown order by the producer.

All the CGs are software-driven, "making it much simpler for our computer to control," King said. ■



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DIGITAL JOURNAL

Bill Hayes

PBS NGIS: Getting From Here to There

IPTV attempts to move new distribution system from theory to reality

JOHNSTON, IOWA

Recently I have been pondering the problems and challenges we face when selecting storage for our operations at IPTV. There doesn't appear to be any end to the alternatives and the development of technologies that are currently employed or that will be employed in the very near future. In our environment and based on usage, we have essentially three types of content that we deal with regularly.

We produce a number of weekly news and information shows as well as interstitial spots, underwriting messages and promotional messages that are topical and as such, they have a very limited shelf life.

We have longer form content from our network and syndicators for which we may have usage rites that extend from a few weeks to a few months.

Finally we have content that has historical significance that we intend to keep permanently. The challenge is finding the system that works best for ingesting, storing, managing and outputting each of these diverse content elements.

STORAGE SELECTIONS

As a rule of thumb, I have always thought that topical content is kept on spinning disk storage. Longer form content for which we have limited rights is either kept in online spinning disk or nearline spinning disk depending on the timeframe for playback and number of plays.

The historical content is kept in a high capacity offline archive. Typically, the first two types are stored on video servers as more traditional video and audio file formats whereas the archive stores content as more IT-centric data files. Much of our planning has been focused on this somewhat traditional basis but all of that appears to be changing.

NGIS

At this year's PBS Engineering Conference, much of the program was dedicated to presentations and demonstration of NGIS, the Next Generation Interconnect System. There are two phases to NGIS.

The first phase has already begun and involves the transition of the real-time satellite service from proprietary Digicipher II transmission to open standard DVB-S and with the exception of a few minor hiccups, the transition has gone well. The second phase has significantly greater potential benefits and not surprisingly, has higher risk as well.

Finally we have content that has historical significance that we intend to keep permanently. The challenge is finding the system that works best for ingesting, storing, managing and outputting each of these diverse content elements.

Phase 2 is the transition of the PBS network delivery system from real-time delivery of audio/video content, to a non-real time file delivery system using significantly fewer satellite transponders. Studies done at the network indicate that approximately 80 percent of the content that is delivered can be sent as non-real time files and stored on edge devices at the stations. The challenge and risk from this concept comes from how it is integrated into the station and PBS is exploring two models. One is dubbed the "virtual IRD" and the other is the "file transfer" model.

The differences between the two models are primarily how much PBS' owned- and managed-hardware/software is installed at the member station and how does delivered content get into the station's on-air operation. Signal flow for models is essentially

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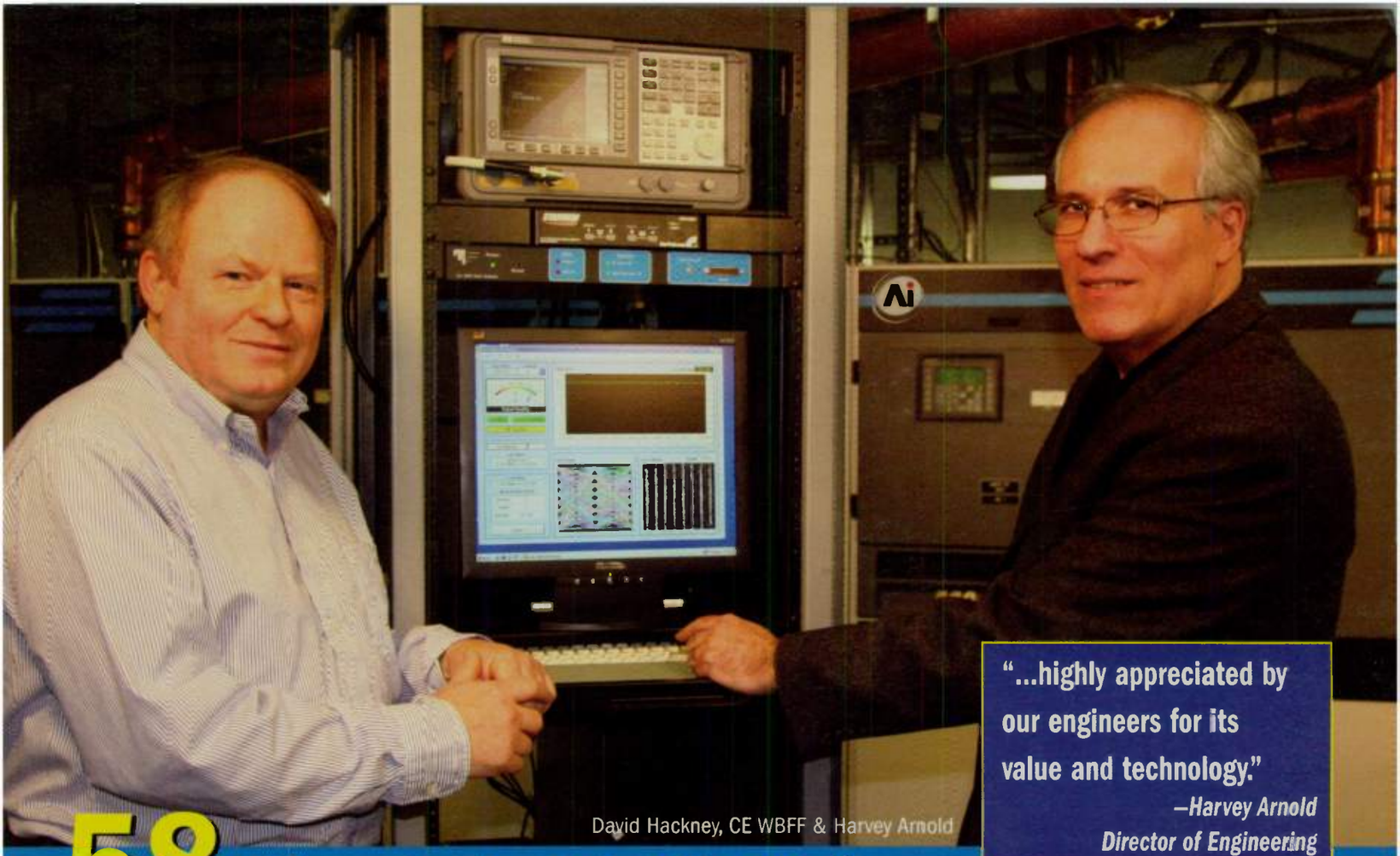

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There

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the same. PBS content is delivered via satellite through an L-band distribution system. Signals are fed to a pair of DVB-IP receivers operating in a dual main configuration.

The UDP output of the receivers is supplied to a router and sent to a file cache server that is managed by PBS. There are also a number of other DVB IRDs that are used for live and near-live content. These receivers provide common interfaces (i.e. HD-SDI, SDI, ASI, AES, etc.) to station operations just as they do now.

THROUGH THE FIREWALL

There is also a VPN client attached to the router that provides the back channel acknowledgement to PBS verifying that files have been received or alerting them that data packets or files have not been received.

In both models there is also a connection through a firewall to the station's local network to provide protection to both the NGIS and station services. What resides on the station side of the firewall is where the real departure between these two models occurs.

In the virtual IRD model, PBS supplies a video server. That server runs play-out software that makes each output port on the server appear to the station to operate like an IRD.

In this model the station makes virtually no changes to how they operate since the feeds from the server appear to be satellite feeds. The station then ingests the feeds like they do now and stores them on their own hardware.

Of course, in this model, PBS would now be managing a video server at each station as well as the cache server and associated hardware. In the file model, there is no server at the station. Files are delivered from the cache server through the PBS router and station firewall to a file translation manager and then stored on the station existing servers.

DEPLOYMENT SUCCEEDS

The most significant challenge in making the latter model work from my view is getting the station's local server and the cache server to play well together. Our experience transferring files between the servers and the NLEs has been frustrating.

Fully two years since purchasing our first server, we are still trying to get file transfers from editing systems to the server to work despite assurances from both vendors that the two systems can be made to work together.

When things go wrong, there exists great potential for station and network to line up on their respective side of the demarcation line point at the other and say "it's your problem, not mine."

To date still, the most reliable way we have of transferring between systems is to output content to an HDCAM tape and ingest it into the target system from the tape.

Now imagine dealing with more than 170 systems trying to get file transfers from one model of the cache server to the various station servers that are out there.

In the virtual IRD model there would be essentially 170 of the same systems out in the field and prior to rollout, the file transfer operation could be completely tested, verified and all aspects would be managed by PBS.

In the file transfer model, PBS manages what goes on the cache server but the station manages the file transfers to the local server. When things go wrong, there exists great potential for station and network to line up on their respective side of the demarcation line point at the other and say "it's your problem, not mine."

In truth we all know it is both our problem but it will take a great deal of skill and open communications to ensure that NGIS is deployed successfully. ■

Bill Hayes is director of engineering for Iowa Public Television. He can be reached care of ***TV Technology****.*

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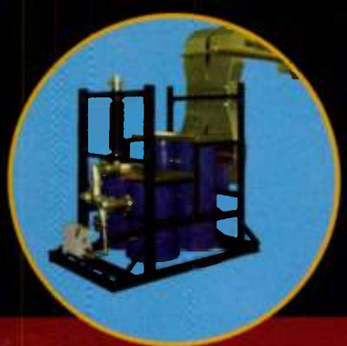

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Weather

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with street level mapping and VIPIR (Volumetric Imaging and Processing of Integrated Radar) which provides a 3D look at the "layers" of a storm—meaning it can turn the weather picture on its side so viewers can see lightning under the clouds, not just a top down view. A third service being used is from WSI, which provides WCPO with real-time hard weather data.

WCPO, which currently broadcasts newscasts in SD, also provides viewers with online weather information at *www.wcpo.com*, including streaming media of live and archived weather reports; a 24/7 DTV weather service on WCPO-DT Channel 9.2, and a mobile phone service, with these next-generation weather venues placing heavy emphasis on current radar.

Based in Lenexa, Kan., Weather Metrics offers a secondary tier of weather products that complement the station's primary weather graphics systems—from such vendors as AccuWeather, Weather Central, and WSI. Weather Metrics offers a variety of solutions to place video cameras and weather data stations throughout a station's DMA, providing viewers with a real-time look at weather conditions.

The latest product from Weather Metrics is WxVision.Net, a robotic, digital tower camera system capable of sending live HD-quality video over the Internet. KYW-TV, the CBS affiliate in Philadelphia, uses one of Weather Metrics' weather data stations at Dorney Park in Allentown, Pa., and the Jersey Shore, among other locations of interest to their viewers.

"Displaying live weather data gives viewers a look at the weather and how it's constantly changing, with real-time information," said Peter Levy, president of Weather Metrics. "Our weather stations are designed to withstand the impact of strong winds by utilizing a mounting system that is similar to those used to mount satellite dishes on roofs.

Atlanta-based WGCL-TV, CBS 46, has been diligently upgrading the tools, technology, and look of its weathercasts. With a coverage area that spans 54 counties across northern and central Georgia, two counties in Alabama, and one in North Carolina, WGCL produces a live newscast at noon, 4, 6, and 11 p.m..

"We're the only station in this market providing a live newscast at 4 p.m.," said Greg Majewski, WGCL's weather producer and field meteorologist. "It includes a weather report of about three to three and a half minutes, as well as a 'first look' and 'last look' at the weather at the start and end of that one-hour newscast."

Baron Services of Huntsville, Ala. recently added new features to its VIPIR system, including NWS Hurricane Tracking, county warning, and the ability to integrate Hurricane Hunter flight observation data and buoy information.

Majewski said he spent the last year creating a new weather graphics package using Weather Central's 3D:LIVE weather graphics system. When the station is ready to go high-def, the 3D:LIVE system will be ready to support HD weather graphics. Majewski said he often travels around the coverage area in the station's weather van to give live reports during severe weather events, such as hurricanes. WGCL-TV also uses tools from Baron Services.

HOOKING THE VIEWER

"Creating unique, eye-catching weather graphics is a great way to distinguish ourselves from other stations' live newscasts in the market," Majewski said. "One very unique look we've established here at WGCL-TV is 'a 3D Skyline Forecast' which 'flies' viewers over virtual 3D places, such as Turner Field, the Phillips Arena, the Georgia Dome, and other attractions in Atlanta. And using the 3D:LIVE system, the skies behind those models change to reflect the actual weather conditions, including partly cloudy, rainy, and mostly sunny."

To accomplish this effect which Majewski created, WGCL-TV's chopper went up and shot video fly-overs of Atlanta and the skyline. Those images were then transformed into virtual 3D buildings and those models were input into the 3D:LIVE system which alters weather conditions to create the virtual 3D Fly-Throughs.

"We really stress the 'local' area, including many small towns, and we use weather graphics to illustrate the points we're trying to convey as concisely and simply as possible," Majewski said.

Hundreds of TV stations, including: WTVT-TV in Tampa, Fla.; KDVR-TV in Denver, Col.; and KTVI, in St. Louis, Mo, use Weather Central's 3D LIVE application, according to Steve Smedberg, director of marketing for the Madison, Wis.-based company. To help broadcasters create the most understandable and relevant weather graphics, Weather Central conducts workshops as part of its WIN Program.

"The challenge for broadcasters is to find the day's weather hook, then to tell that story from beginning to end using informative weather graphics," Smedberg said. "It's also important to find a local connection—perhaps focusing on how the weather will affect a particular place or event."

MetroVision, an optional feature to Weather Central's 3D:LIVE, helps broadcasters create a visual forecast by taking a picture from a real-life location and animating into it what the weather conditions are and what the forecast will be.

STORM CHASERS

Another station serving an expansive coverage area is KWCH-TV12 in Wichita, Kan., which covers 75 counties in Kansas, as well as several counties in northern Oklahoma, Southwest Nebraska, and eastern Colorado. Chief Meteorologist Merril Teller says that, according to the station's research, the number one weather attraction for viewers the seven-day forecast.

KWCH also relies upon weather graphics solutions from several sources, including WSI, and four different radar packages. "Since different systems have different strengths, it's advantageous to use different ones to supplement each other," Teller said.

KWCH has been using Select Warn and Storm Hawk technologies by Wichita-based WeatherData, which was acquired by AccuWeather in May.

"Storm Hawks are a handheld GPS-based device very much like a PDA," Teller said. "It allows you to ingest radar images, temperatures, wind speeds, and weather warnings—so you have that information right in your hand. All of our storm chasers have these devices with them when they're out in the field. If they see some type of significant weather event developing, they can use the Storm Hawk to send that real-time data back to the station and their report is displayed via the Select Warn on-air radar display system."

If broadcast meteorologists want to cover national or regional weather during a local forecast, they should be able to relate that weather pattern or event to how it could impact the local area, according to Mike Steinberg, vice president of marketing at Accuweather in State College, Pa.

"It's also helpful to tell viewers what

the forecast means to their daily lives," Steinberg said. "That's why we introduced Predictive Radar. While most radar maps can show you where it's raining now, or that it was raining four hours earlier, Predictive Radar illustrates where it's going to be raining in the next four hours so people will better understand where the storm is likely to move."

Predictive Radar is a new feature within AccuWeather's flagship weather graphics system, Galileo. The company also recently upgraded its FirstWarn Screen Crawler to include weather data in e-mail, paging, and RSS feeds. The FirstWarn Screen Crawler receives data direct from AccuWeather's satellite-delivered feed of data and graphics or the NOAA Weather Wire, and automatically generates and updates maps, crawls, bulletins, and advisories for delivery to broadcast and the Web.

GATHERING DATA

In June 2006, Baron Services in Huntsville, Ala., added several new features including NWS Hurricane Tracking, county warning, and the ability to integrate Hurricane Hunter flight observation data and buoy information to its VIPIR system. VIPIR is a complete weather system integrating radar, forecast and storm tracking display, live weather graphics with real-time 3D display, and sensor data into one seamless presentation with no rendering.

"One of the key concepts driving modern Baron development is what we call 'consumer-driven weather,'" said Michael Richardson, director of marketing for Baron Services. "We are aware that many viewers would find raw meteorological analysis almost intimidating. And in today's busy environment, not many viewers can take the time to absorb an in-depth weathercast, even if they do understand all the content."

Weather Metrics' WxVision.Net is a robotic, digital tower camera system capable of sending live HD-quality video over the Internet.

In June 2006, WFTV in Orlando, Fla. began broadcasting all of the station's local newscasts in HDTV. This move also marked the debut of WSI's TrueView HD native-HD weather graphics system.

"The HD TrueView fly-throughs and the five-day forecast look fantastic. Now we can offer our audience weather coverage with a level of accuracy and clarity unmatched anywhere," said WFTV news director Bob Jordan.

With 50 percent of the broadcast market, WSI offers the TrueView weather graphics product line.

"We've done extensive market research, and we share our findings with our broadcast customers," said Linda Maynard, vice president of marketing for WSI Corp., in Andover, Mass.

"Since viewers want their weather reports to be tailored to their local markets, especially during severe weather events, we suggest that weather reports cite weather conditions in specific towns or areas, and rotate through different cities and towns to keep it relevant for everyone," Maynard said. "We recommend leading off with the top weather story, and then giving the weather report, followed by a weather wrap-up at the end. And in forecasts, telling viewers how winds, snow, fog and other weather issues will affect their personal plans or daily commute."

WSI's TrueView features realistic graphics capabilities, higher resolution forecasts, satellite mapping, and even the ability to zoom down to the street level, to help meteorologists tell their weather story.

AUTOMATIC UPDATING

The RPM (Rapid Precision Mesoscale) model, part of TrueView, offers realistic, accurate weather models and forecasts. If meteorologists must provide nonstop live coverage of severe weather, Maynard said they wouldn't have to leave the set to update their graphics because TrueView employs Vortex, an automated data source that feeds real-time data from WSI's own 24/7 forecast center.

Because WSI's TrueView offers many tools that automate the weather forecasting process, Maynard said on-air talent withno meteorology degree could rely upon this system to develop accurate local forecasts.

However, she said, "TV stations are increasingly adding a credentialed meteorologists to the staff because they recognize it is extremely valuable to have a credible expert who can make the ultimate determination about the forecast, and leverage specialized training and familiarity about weather patterns in a local area." ■

BPL

CONTINUED FROM PAGE 1

technology is known as "carrier current" communications and involves coupling audio or data modulation onto ordinary power lines. Its uses include unlicensed AM college radio stations (with coverage limited to on-campus buildings), power company internal communications and control functions, wireless intercoms and home control systems.

The latest extension of carrier current technology involves data modulation for high-speed Internet service to homes and businesses. The first rollouts of BPL in the United States were in Manassas, Va. and Emmaus, Pa., where field tests were conducted.

That testing continues and has produced mixed results. On the one hand, Internet users are generally pleased with the service. However, as the band of frequencies used for BPL spans 1.7 to 80 MHz, some of the stakeholders in that spectrum have been displeased.

Licensed radio frequency services operating in the affected area begin at the top of the AM broadcast band, and include international shortwave broadcasters, public service radio, low-band VHF TV broadcasters, CB radio, HF aeronautical services and the amateur radio community. It is the latter group that has been most upset about the theoretical and proven potential for interference to licensed communications.

The amateur radio community was first to raise a flag, and was close by when the Manassas system was deployed for testing. The road has been anything but smooth since the equipment was first activated, with a nearly constant stream of complaints, promises to address the complaints, and more complaints.

The American Radio Relay League, the organization that represents U.S. radio amateurs in legislative matters, has been tracking BPL developments. Allen Pitts, media and public relations manager for the ARRL, said the Manassas BPL deployment "has problems." He also said systems in Briarcliff Manor, N.Y., and Cottonwood, Ariz. are beset with problems.

ARRL records indicate the Cottonwood system was shut down. According to Pitts, "It had unresolved interference reports or complaints that were completely resolved only when the system was shut down."

Yet Pitts said BPL doesn't have to be all bad.

"There doesn't need to be these problems," he said. "Hams want broadband as much as anyone; they just don't want interference."

"Hams want broadband as much as anyone; they just don't want interference."

—Allen Pitts, American Radio Relay League

Pitts gave high marks to BPL equipment from Motorola and Current Technologies.

"These systems haven't caused any problems," Pitts said. "We've even had the Motorola equipment deployed [for testing] here at the ARRL headquarters and it's not causing problems. It's really kind of a neat deal—we're not in a big hurry to get it out of here."

Regarding the FCC order, Pitts said there weren't a lot of improvements.

"From reading the actual document, my immediate feeling is that nothing has changed," he said.

Pitts did cite a comment made by Commissioner Michael Copps concerning complaints from amateur radio operators. Copps said "amateurs shouldn't have to wait for months to get complaints resolved—they deserve better."

MSTV: NOTHING NEW

Joining in the ARRL's concern is the Association for Maximum Service Television (MSTV) and the NAB. The organizations filed a joint reply comment to the FCC in August 2004 that emphasized frequencies used for BPL should not extend past 50 MHz. (TV Channel 2 operates between 54 and 60 MHz.)

The reply stated that BPL systems operating in this range "pose serious risk of interference to television Channels 2 through 5, especially the 11 stations currently transmitting a digital broadcast signal on those channels, as well as several stations who are likely to elect lower VHF channels at the end of the digital television transmission."

The joint statement concluded with a request to the commission not to authorize BPL above 50 MHz.

David Donovan, MSTV president, said the FCC's reaffirmation of the BPL order is nothing new.

"It's essentially the same position as

in the past and is not surprising," Donovan said. "Our concern is with the systems operating above 50 MHz. We would have preferred that that segment would have been carved out. However, most systems that are in place don't operate there right now."

Donovan acknowledged that the potential for interference to existing and future television operations does exist.

"Our analysis on this was submitted in the original petition," Donovan said.

That petition stated that existing BPL modulation techniques have a spectral profile resembling impulse noise, and that studies on file with the FCC indicate that DTV reception is severely impaired by impulse noise in the low-VHF band.

According to the petition, the studies "revealed that the interleaver in DTV receivers reacts badly to impulse noise resulting in the inability of the TV set to produce a picture."

Donovan agreed, however, that BPL probably had a place in the growing demand for broadband communications.

"BPL is certainly another option to get broadband out to rural areas served by power lines," he said.

NTA NOT CONVINCED

The National Translator Association was not pleased with the FCC action. Dr. Byron W. St. Clair, NTA president, issued a statement on behalf of that organization.

"The National Translator Association feels it is unfortunate that the FCC did not protect the low-band VHF TV channels by limiting the top frequency to 54 MHz," he said. "A disproportionate number of translators have low-band VHF inputs because these signals are available further out from metropolitan areas and the three original commercial networks tend to be found on Channels 2 to 6. We feel a safer approach would have been to gain experience on frequencies below 54 MHz before allowing the use of frequencies that are in conflict with the low-band VHF channels."

In a statement issued in connection with the order, Copps said, "...the commission must be available and positioned to respond to interference complaints with alacrity."

St. Clair was asked if he believed that the FCC could honor such a commitment.

"I'm very skeptical that they have the resources—the field people are spread pretty thin right now," St. Clair said. "Asking them to take on this additional problem of protecting consumers is unrealistic."

NOT INEVITIBLE

As indicated by the ARRL's Pitts, deployment of BPL technology doesn't necessarily have to include interference problems. According to Jim Dondero, vice president of marketing for the Current Communications Group, a major manufacturer and service provider in the BPL arena, there have been no complaints received at all in connection with systems using Current gear.

"We have the largest deployment in the U.S. and one of largest in the world," Dondero said. "The system in Cincinnati passes 50,000 homes and has been in service for more than two years. There have been no complaints from radio amateurs, TV broadcasters, or anyone."

Dondero acknowledged that he was aware of the sensitivity to BPL in the amateur radio community.

"Some systems interfere. Ours does not," he said. "It never has."

Dondero pointed out that the Cincinnati BPL system and other installations were not really field trials.

"These are live deployments with paying customers," he said.

Current is in the process of building a network in Texas in cooperation with TXU Electric Delivery to serve 22 million subscribers, he said.

Dondero cited a high rate of satisfaction from broadband customers and the electric utilities, saying that the utility had received a substantial number of customers defecting from established DSL providers. He reported that utilities are pleased with Current's Smart Grid technology, as it allows them to perform such tasks as grid management and remote customer meter reading.

"Hey, guess what—this works and works quite well," he said.

Motorola is offering a competing system that is hybrid wireless/power line in nature, and is designed not to raise any interference issues.

In Motorola's backhaul portion of broadband delivery, data is transmitted in the high-UHF and SHF portions of the spectrum to omnidirectional repeater sites, referred to as Access Point Clusters using the company's Canopy technology.

These repeater sites have a range of several miles, and each has the potential to reach utility step-down transformers feeding as many as 1,200 customer homes or businesses. The HF carrier for the data signals is coupled into the low voltage (120 to 240 V) secondaries of these transformers, located a relatively short distance from user-access points.

"Our state of the art is focused on having a wireless link all the way to the low-voltage transformer," said Richard Illman, principal staff engineer at Motorola. "We're using HomePlug-based technology to get into the house. This already has the carriers turned off in the amateur radio portion of the spectrum, and we've also added some filters to prevent interference to and from amateur radio operations."

According to Motorola, interference to off-air television reception is not possible with the company's BPL equipment, as data signals are only placed on relatively low-voltage AC lines directly at the customer's home or place of business, and the portion of the spectrum used extends from 4.5 to 21 MHz.

Next-generation system enhancements are in the works, but even in that iteration, spectrum usage will only extend to 28 MHz. The Motorola BPL system has been deployed in South Carolina for more than a year with no interference complaints.

DON'T WORRY

Charles Rhodes, **TV Technology** columnist, had a slightly different take on BPL television interference issues.

"Analog [television] will die before BPL can become important," Rhodes said. "As for digital, DTV shouldn't be in the low-VHF band anyway. Man-made noise levels are increasing with the increasing consumption of electrical energy in this country. The high-tension lines have 'creeping' electricity leaking across dirty insulator surfaces. This generates a lot of noise."

Rhodes explained this source of noise particularly affects low-band VHF television frequencies and that broadcasters really shouldn't consider staying in, or relocating to, this part of the spectrum.

"Man-made noise will only grow higher as time goes by," Rhodes said. "More and more people will give up on watching low-band VHF DTV. Low-band VHF antennas will wear out and not be replaced. The public is not aware of what is going on, BPL or not."

Rhodes said even though BPL is marketed as a panacea for extending broadband to those living in rural America, this probably will not happen for some time.

"I think that some people are exerting political influence by saying that we can provide practically free Internet linkage to those in rural areas who are not connected yet," Rhodes said. "Actually, it will be deployed in the urban areas because that is where you will be making money.

"The pitch is that it will help the people in the rural areas. I see the money to develop it going in to the urban areas where there are a lot of people and a lot of money to pay for it. It's disingenuous to think that Wyoming is going to get it and not New York.

"If you were a businessman, which would you rather invest in, BPL in Wyoming or BPL in New York City? It all boils down to the number of customers." ■

Edit

CONTINUED FROM PAGE 8

tape one starts at hour one and tape two starts at hour two. This system ensures that 23 tapes will cycle through before hour one timecode shows up again. It's a quick and easy way to reference footage to its master tape. The use of a smart slate generator/reader provides yet another way to double check accuracy.

It's advisable to always budget for a colorist to visit your movie and get the most out of what you captured in the field. Reality says that not all of us can afford it. In those cases, you can do a good amount of color timing electronically in the field and save yourself some cash in post.

Be careful if you take this route though. It's easy to make mistakes and lock yourself into an image you're not happy with. Avoid clipping whites or crushing blacks at all costs.

Jayme Wing works on a Final Cut Pro system at High Technology Video's facilities in Los Angeles.

Step 3: Directors who are used to working in film and are transitioning to HD will enjoy the fact that the Sony HD Cine Alta Camera for example, records two channels of audio.

If the budget is really tight, two mics can be fed to separate audio channels in the camera directly and mixed in post.

Recording audio to the camera, even when your audio engineer is recording to DA88 or eight-track DVD, is valuable to the editor who does the dialogue editing, foley and final mix. We've seen instances where a piece of dialogue or effect had a problem and the camera master was the best source to use for the fix.

Directors who want to hear all audio channels as part of their dailies can do so simply.

The two channels of audio that are synched to video via the camera commonly appear on the tape that is outputted from the nonlinear editing system. An eight-track DVD Ram recording with its own Timecode locked to the master is provided for the additional tracks.

Step 4: One of the most beautiful things about HD is the ability to see what you're recording while you're in the field. Having a trained HD expert in the field with you seems like a big, unnecessary expense up front to many independent filmmakers, but trust us—it's worth every penny. Images that are captured well on a technical level in the field offer a world of opportunities in post.

Step 5: Downconvert your HD images in letterbox format. It provides the perfect place for you to put a timecode window burn without covering any of your material. If you want to give a demo of your rough cut to someone and you don't want the timecode to be seen, a simple wipe will alleviate it from view. (It may take a little while to render it.)

Step 6: Step 4 is a warning. Dailies without a timecode window burn = formula for disaster! More and more directors are requesting that dailies not contain a timecode window burn. The window burn timecode directly from the master is the most accurate way to identify a frame. It is possible for QuickTime files in Final Cut Pro to be incorrect. In one glance, this problem can be identified by your editor and a simple keystroke will re-set the code in FCP.

We heartily congratulate the maverick spirit of independent film makers and broadcasters who are embracing the art of HD. Welcome to our world. We hope this helps you plant your feet on solid ground and we look forward to seeing what your creativity brings to bear. ■

Kristen Cox is president and CEO of 16x9 Productions and has been producing exclusively in HD since 1996. She recently produced her first feature, "Closing Escrow." Jayme Wing is an Emmy-nominated editor (Best Achievement in Film Editing) with 28 years of experience. He's been working in the HD format since 2002.

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Pete Sockett, Chief Engineer, WRAL-TV

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Naturally, you don't have to take our word for it. Stations across the country have seen just what Baron's HD capabilities have to offer. Here's what a couple of these HD trendsetters had to say.

WTVT-TV

"When severe weather finally hits here, this new Megawatt system will allow the Fox 13 meteorologists to see 50 perfect deeper into storms, measure winds from greater distances and see up to 300 miles in greater detail... what makes Fox 13's radar 'the most powerful in the world' is the combination of the Megawatt system and the 20-foot dish mounted on a 250-foot tower."

from "New Radar System Lets Fox 13 Reign in Weather Wars", Tampa Tribune article on WTVT-TV's new Baron HD radar

WFTV-TV

"Being the only all-digital radar in the Orlando market will allow us at WFTV to continue our market leadership in weather. Whenever any kind of weather affects our local market, we'll be the only place for live HD weather."

Tom Terry, Chief Meteorologist, WFTV-TV

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MEDIA SERVER TECHNOLOGY **Karl Paulsen**

Anticipating Future File-based Workflows

The production of daily broadcast content is often repetitive, differing only slightly from show to show.

Routine tasks associated with daily operations include the ingest of programs delivered over satellite or videotape, and the preparation of interstitials, i.e., promos involving graphic intensive material intermixed with video and audio, and recorded into video servers as recurring individual house numbers.

On-air program continuity switching now includes routine lower-third news tickers, weather alerts and school closings, and the occasional Amber Alert or EAS message. Other events produced in a live-to-air environment include breaking news cut-ins, regional content insertion, or cash or barter programs.

These program clips, announcements and promotions are essentially in the same format throughout the day, and throughout the week. Program video content usually arrives as a part of the program package, sometimes appended to the end of the show, other times sent separately.

In the majority of the cases, this promotional material involves a set of pre-canned production scripts, heretofore accomplished in either a nonlinear editor or offline in a small promotions editing suite. The completed clips are delivered to master control for ingest to the video server.

Graphic elements, audio clips, character generator titling and animated snipes or logos are often created in separate workspaces, stored on different hard drives, and seldom are they managed efficiently.

Due to the often random set of devices used in the generation of a complete segment and it's short-lived nature, the entire process evolves around a getting it done as easily and quickly as possible.

Even with modern tools such as video servers, clip-based editors and the like, the effort necessary to continually crank out these interstitials is enormous.

KEEPING TRACK

Even the correlation and tracking of the house numbers, graphic IDs, audio clips—before, during, and at time of air—is a burdensome task for the traffic, sales, and marketing/promotions departments.

Broadcasters have yearned for a means to automate this process and ease the amount of human intervention necessary to organize, assemble, track, air and validate this segment of their business.

Most recently, a change in operations finds the physical master control switcher taking a back seat to the various graphics and promotions elements.

Broadcasters now find themselves buying not only a video server to playback commercials and programs, but also adding a number of other specialty devices that run newstickers, dynamic linked weather graphics, a dual digital effects devices for breaking news, and a host of others—all of which take inputs from separate, non-linked data sources; many built on conventional PCs with Windows-based platforms.

How and where all these static and moving images are stored, how they make their way through the system, and how those products are managed from a media perspective is changing fast.

The workflow of the facility is steadily moving away from the structured production methods of the past decade to a much more automated, almost unattended set of processes.

As facilities move away from discrete tape decks or robotic live tape play-out devices, the use of traditional video servers continues to grow. The presence of nonlinear editing islands, networked or otherwise, continue their expansion in both the production and the news chains.

Syndicated and commercial content delivery via catch servers, both as MPEG real-time transmissions and as nonreal-time FTP or IP-transfers, are prominent.

On the art production side, graphics file servers remain prevalent throughout the creative circles on both Macs and PCs, as well as on more purpose-built systems such character generators, paint systems and clip players.

Bringing all these units together into a harmonized environment that plays on the strengths of each device while capitalizing on the abilities of network-based, datacentric management is a challenge.

But for a well-rounded operation to be efficient, this marriage must happen. The process must begin all the way back in the traffic department, continue through production (in real time/live-to-air) and back to reconciliation.

The workflow of the facility is steadily moving away from the structured production methods of the past decade to a much more automated, almost unattended set of processes.

DIRECT-TO-AIR

To that end, this is where the latest trends in broadcast equipment and software systems integration seem to be developing: true and efficient management of media with less human involvement.

The future will see the delivery of all moving media directly to the air systems themselves. Today, master control air operations incorporate more clips, snipes, sophisticated graphics and animations; plus a constant stream of news tickers, weather alerts and traffic advisories.

Tomorrow, multichannel digital television will demand more program streams, with more promotional material and in turn more opportunities for revenue. And it won't stop with over-the-air TV. These same technologies will repurpose material to the Web, mobile devices and direct to cable and/or satellite.

Broadcasters are looking at integrated solutions that provide video playback, audio tagging, and sophisticated graphics with the capability to dynamically make last-minute changes.

These systems will comprise file and database servers that act as content aggregators and data parsers that sit in tandem with the graphics and clip generators, and feed properly formatted text strings to the branding engines.

These products are here, they're being used today, and they will drive the workflow changes of tomorrow.

Real-time, live-to-air graphics rendering technologies coupled with remotely integrated database and distributed creation workstations will harmonize media delivery starting at the business side in traffic, through promotion and news, and direct-to-air.

A constantly changing set of killer applications will emerge with technologies on dedicated branding devices, inserted either downstream or upstream of the traditional master control chain.

As multichannel programs emanate from a single control room, the branding device may in fact become the entire master control air chain, fed upstream by the simplest of 12x1 program switchers, using baseband and file-based sources distributed throughout the principal technical facility.

Broadcasters making serious changes in the technical structures of their facilities should look hard at the alternatives before taking the plunge to a digital facility and not rehash that old analog version.

Over the next couple of installments, this column will take a look beyond the conventions of just adding a video server to the air chain and delve deeper into the collection, aggregation, parsing and distribution of data for on-air automation; and look more at how the developments inside of SMPTE S22.10, the committee tasked with developing a data exchange strategy for managing this effort, are going to change air operations permanently. ■

Karl Paulsen is chief technology officer for AZCAR. He is a Fellow in SMPTE and an SBE Life Certified Professional Broadcast Engineer. Contact him at karl.paulsen@azcar.com.

RF TECHNOLOGY

Doug Lung

ATSC Frequencies and New USB DTV Tuners

Most of us are familiar with standard NTSC frequencies—3.58 MHz for the chroma subcarrier, 4.50 MHz for the aural carrier, carrier frequency 1.25 MHz above the lower channel edge, offsets of +/-10 KHz to reduce co-channel interference, and the horizontal (line) sync rate of 15.734 KHz.

Key ATSC frequencies, other than the 19.39 Mbps data rate, are not as well known.

This month, I'll list and discuss some of the frequencies used by the ATSC system from the ATSC encoder to the transmitter. I'll also take a quick look at some new USB ATSC tuners.

SYMBOL CLOCK

The symbol clock frequency of the 8-VSB signal is perhaps the most important ATSC frequency. The precise symbol clock frequency is based on some familiar NTSC frequencies. The formula for it is:

$$\left(\frac{4,500,000}{286}\right)\times 684 = 10,762,223.776 \text{ symbols per second}$$

Does that first number look familiar? The NTSC aural subcarrier frequency of 4.5 MHz has been used to derive the horizontal scan rate (4.5 MHz/286). The NTSC color subcarrier is 455/2 times the horizontal scan rate. Modern equipment typically generates the 4.5 MHz reference by multiplying a 10 MHz reference frequency by 9/20.

Where does the 684 come from? According to ATSC Recommended Practice A/54a, "this multiplier gives a symbol rate for an efficient use of bandwidth in 6 MHz. It requires a filter with Nyquist roll-off that is a fairly sharp cutoff (11 percent excess bandwidth), which is still realizable with a reasonable surface acoustic wave filter or digital filter."

The symbol clock must be locked in frequency to the transport rate. I'll explain how the 19.39 Mbps net bit-rate is tied to this frequency.

Each symbol can carry 3 bits/symbol, but this is reduced by the trellis code rate of 2/3, which provides a gross payload of 2 bits per symbol.

Thus the gross payload is 21.52 Mbps. However, there is additional overhead. The net bit-rate is reduced to 19.39 Mbps by the data field sync and Reed-Solomon encoding, as shown in this formula:

$$21.52 \text{ Mbps}\times\left(\frac{312}{313}\right)\times\left(\frac{188}{208}\right) = 19.39 \text{ Mbps}$$

27 MHz

One of the ATSC frequencies we'll look at is a familiar one—27 MHz. That's right, 11 meters, Citizen's Band. This is the frequency of the ATSC system time clock and it allows timing to within approximately 37 nanoseconds, the length of each cycle of 27 MHz.

This frequency is critical as it is the master clock reference for all ATSC encoding and decoding processes and is required for synchronizing video and audio. It must be accurately recreated in the ATSC decoder. This is accomplished by transmitting program clock references (PCR) in the MPEG-2 transport stream packet's adaptation field.

The system time clock, or STC, uses a 42-bit counter, which means that it will reset to zero approximately every 26.5 hours. In the rare event lip-sync is not important, the STC is not needed. When troubleshooting lip-sync problems, check the accuracy of the 27.000000 MHz clock!

Note that each MPEG-2 program can have its own STC or it can share the same STC by referencing a common PCR PID. Receivers have to allow for discontinuities in the STC caused by switching MPEG-2 programs. The DTV broadcaster should notify the decoder of the STC discontinuity through the MPEG-2 packetized elementary stream packet header's discontinuity indicator.

PILOT CARRIER

The DTV pilot carrier provides a convenient way to measure the frequency of VSB signals. ATSC standard A/53e states the pilot may be generated by adding a small (digital 1.25) DC level to every symbol of the digital baseband data, including sync. As such, it is related to the symbol clock frequency.

ATSC Recommended Practice A/54a explains that the nominal pilot carrier frequency can be determined "by fitting the DTV spectrum symmetrically into the RF carrier."

To do this, center the bandwidth of the DTV signal (one half the 10.76222378 MHz symbol clock or 5.3811189 MHz) in the 6 MHz DTV channel. Subtracting 5,381.1189 kHz from the 6,000 kHz channel bandwidth leaves 618.881119 kHz. Dividing that in half leaves 309.440559 kHz, giving the precise standard pilot offset above the lower channel edge.

Note that the FCC does not require DTV stations to broadcast with this precise pilot carrier offset from the lower channel edge. The only requirement is to meet the emission mask requirements. Indeed, in one situation where a DTV station is transmitting on an upper adjacent channel to an analog TV station located within 32 km, the FCC requires the pilot carrier be offset 5.082138 MHz above the visual carrier of the analog TV station.

This offset is required to reduce the color beat and high frequency luminance beat created by the DTV pilot carrier in some DTV receivers. By using this precise offset, the beat will be visually canceled because it will be out of phase on successive video frames.

This offset is defined by the formula:

$$455\times\left(\frac{f_h}{2}\right)+191\times\left(\frac{f_h}{2}\right)-29.97 = 5,082,138 \text{ Hz}$$

f_h = NTSC horizontal scanning frequency = 15,734.264 Hz.

As you can see, to avoid this very rare interference condition, not only does the DTV station on the channel above the NTSC station have to maintain a precise pilot carrier offset from the NTSC station's carrier, the horizontal scanning frequency of the video transmitted on the NTSC station has to be precise.

FREQUENCIES, PAGE 42

Perhaps the simplest way to make sure all frequencies are in their proper relationship and stable is to lock all components of the DTV system to a known frequency standard such as GPS.

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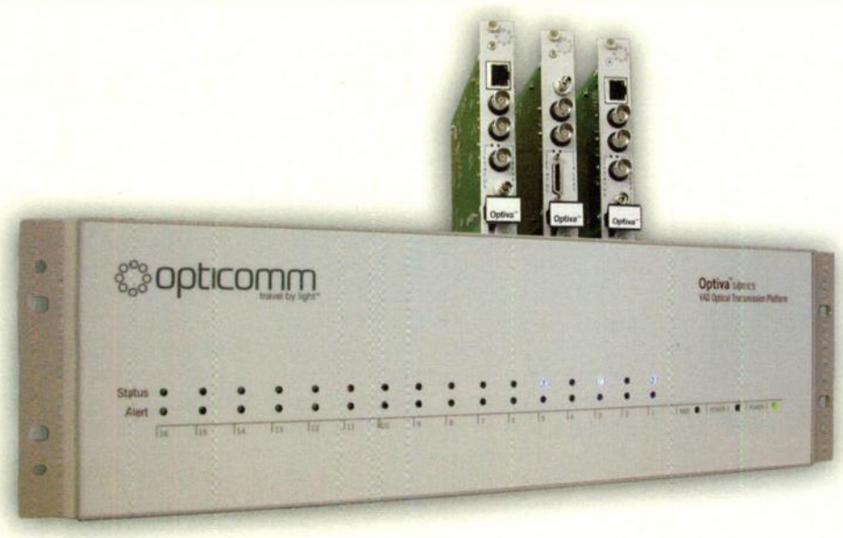

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Frequencies

CONTINUED FROM PAGE 40

transmitted on the NTSC station has to be precise.

For a lower adjacent NTSC station with zero offset, the DTV pilot carrier will be 332.138 kHz above the DTV channel edge, 22.697 kHz above the nominal pilot carrier frequency.

There are several other offsets that can be used to reduce co-channel interference between DTV stations and NTSC or other DTV stations. With help from Gary Sgrignoli of Zenith I described those in an earlier RF Technology column and they are now part of ATSC Recommended Practice A/54a, Table 8.2, which I've reproduced here.

I've described how the 10.76 MHz symbol clock frequency is tied to the NTSC scan rate and showed how it results in a 19.39 Mbps net bit-rate. On the encoder side, this 19.39 Mbps rate is determined by the 27 MHz STC.

Channel Relationship	DTV Pilot Carrier Frequency Above Lower Channel Edge			
	NTSC Station Zero Offset	NTSC Station +10 kHz Offset	NTSC Station -10 kHz Offset	DTV Station No Offset
DTV with lower adjacent NTSC	332.138 kHz +/- 3 Hz	342.138 kHz +/- 3 Hz	322.138 kHz +/- 3 Hz	
DTV co-channel with NTSC	338.056 kHz +/- 1 kHz	348.056 kHz +/- 1 kHz	328.056 kHz +/- 1 kHz	
DTV co-channel with DTV	+ 19.403 kHz above DTV	+ 19.403 kHz above DTV	+ 19.403 kHz above DTV	328.8436 kHz +/- 10 Hz

ATSC A/54a-Table 8.2: DTV pilot carrier frequencies for two stations (normal offset above lower channel edge: 309.440559 kHz)

ATSC standard A/53 refers to the encoder portion of the system as the source-coding domain. In this domain, 27 MHz is the key frequency, and the video and audio sampling rates are locked to it.

The transmission portion of the system, which encodes the 19.39 data for VSB transmission at 10.76 MSymbols/second, is referred to as the "channel coding domain." Since these two domains may be widely separated, unless a common reference (such as GPS) is used for both domains, the frequencies/rates will drift in relation to each other.

The ATSC standard handles this by adding or dropping null packets within the transport stream.

Proper operation, of course, requires that there are null packets in the transport stream to subtract and that the symbol rate remain constant. One indication of the "health" of an ATSC system is the stability of the symbol clock. As Gary Sgrignoli shows in his 8-VSB course, this can be monitored on a spectrum analyzer set to 10.76 MHz.

You can also use a stable shortwave receiver with a beat frequency oscillator to listen to the signal or display it visually on a PC using one of the ham radio PSK software decoders I described in a previous RF Technology column.

RECOMMENDATIONS

Perhaps the simplest way to make sure all frequencies are in their proper relationship and stable is to lock all components of the DTV system to a known frequency standard such as GPS. Look for DTV equipment that includes a 10 MHz reference input and use it. Some older equipment may introduce jitter (rapid frequency/phase shifts) and wander (low frequency drift) into the symbol clock—ATSC exciters have been observed to slowly drift in frequency before jumping back to where they should be.

USB ATSC TUNER UPDATE

Last year, I reported on the V-Box USB ATSC receiver. Combined with Rod Hewitt's TSReader software, this little receiver made it possible to check DTV stations for compliance with FCC PSIP rules as I traveled around the country.

I've since replaced the V-Box with the FusionHDTV5 USB Gold receiver, which is lighter, offers ATSC and 256 QAM (unencrypted cable) and even NTSC reception. With a fifth-generation LG VSB demodulator and a sensitive tuner, this receiver has performed in locations where analog reception was difficult.

From my experience and that of other engineers, as long as the receiver has sufficient signal level, multipath doesn't matter and direct line of site to the transmitter isn't required.

Flash-drive-sized USB ATSC receivers are appearing on the market. I had a chance to check out the Artec T14A receiver. This unit is small! The photo shows the FusionHDTV 5 USB Gold (the square box), the black Artec T14A and, for comparison, my rental car keys and a USB flash drive.

It is also inexpensive—a search on the Web may reveal them selling for less than $50, although after I mentioned

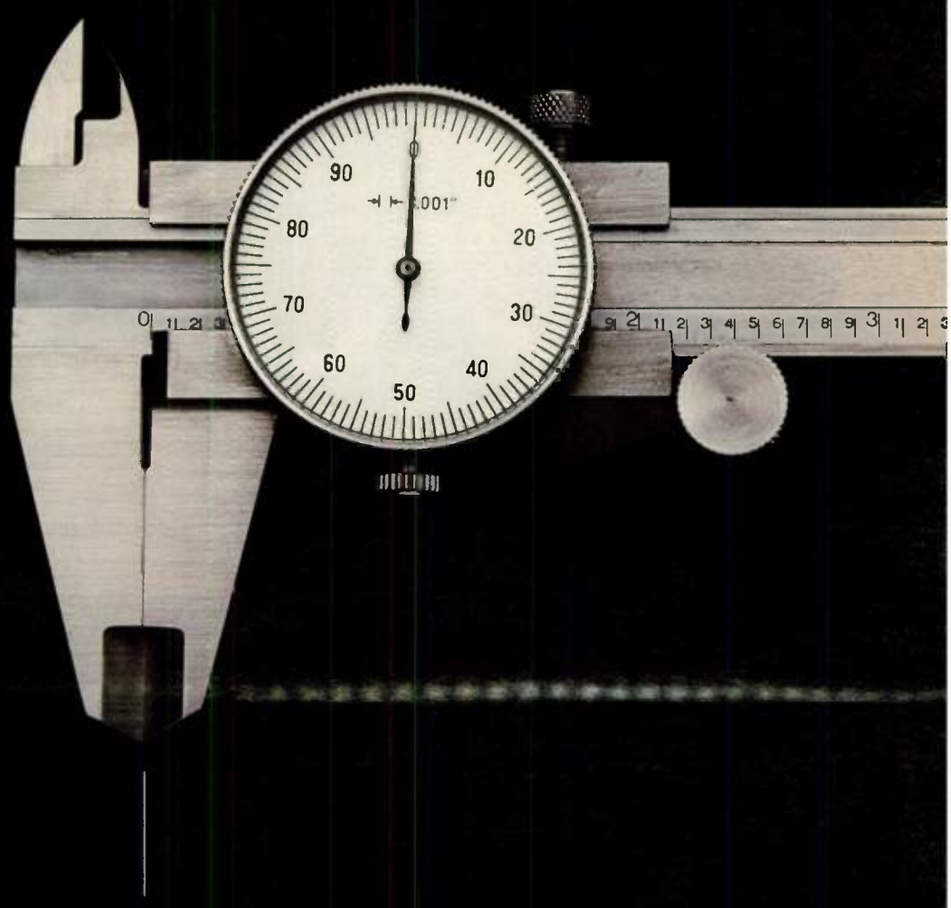
The FusionHDTV 5 USB Gold (the square box), the black Artec T14A and, for comparison, car keys and a USB flash drive.

it in my weekly RF Report e-mail newsletters, one site increased the price by $10 to almost $60.

Unfortunately, in the case of the Artec, lower price means fewer features, minimal software and less performance. The T14A receives ATSC only—no NTSC or QAM signals, and it does not appear to scan VHF Channels 2 through 6.

Performance improved with Version 1.03 software downloaded from the Artec Web site, even though the installer complained it was an earlier version than what was on the CD included with the unit. I found it received fewer DTV stations than the FusionHDTV5 in

FREQUENCIES, PAGE 44



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INSIDE AUDIO — Dave Moulton

Upmixing: From Mono to Stereo to Surround

As alert readers may recall, I've been reviewing some of the problems, pitfalls and occasional pratfalls pertaining to our current broadcast audio distribution system. Specifically, I've been concerned with making the various audio modalities of stereo, surround and mono fit into all of the various consumer setups, which include (you guessed it!) stereo, surround and mono. It sounds like it should be easy. Somehow, it's not!

Last month, I discussed issues relating to downmixing, that arcane practice of stuffing more channels into fewer channels. This month, we'll flip the coin and consider upmixing, that equally arcane practice of creating new and exciting extra channels from fewer ones, in the hope that we can continue to amaze and amuse those lucky viewers that have extra channels in their home theaters and the like, even when our program has only stereo audio tracks, or even, dare we think about it, a single lonely mono track!

UPMIXING IN GENERAL

The idea behind upmixing is to enhance the audio production by giving it the pizzazz that more channels can offer, when those channels weren't included in the original production. Getting more channels is easy. It's getting the pizzazz that's the trick.

It's not enough to just send the same mono signal to all the speakers. It's still mono, but now with some minor weirdnesses. Instead, we need to add "stereoness," or "surroundness."Stereoness is a sense of spaciousness and envelopment along with a reasonable perception that sounds which appear to originate from the left side of the TV screen actually seem come from the left, and so on.

Surroundness is a more complex version of stereoness—ambience really comes from all around and strongly envelops the listener (this envelopment effect, largely unheralded, is actually the most powerful aspect of the surround sound experience, in my opinion). The trick, in upmixing, is to add the stuff that makes stereoness and/or surroundness so pleasurable for us humans.

In postproduction, it is easy to take a mono audio track and make it into stereo, as described below. Similarly, it is possible to upmix a stereo program into surround, using a variety of techniques. Said upmixed program is released to the distribution groups as a stereo or surround production. It works fine, assuming your production craft is up to snuff.

At home, it is all a little more problematic. While many home theater receivers feature DSP programs (with generally helpful names like "Sports Arena," "Concert Hall" and "Action Movie") which can upmix stereo signals into ersatz surround, there are no set-top boxes that I know of with similar capabilities.

Stereo will not magically transform into Dolby Digital. However, stereo can and does transform into Dolby Pro Logic surround, as we will discuss below. Making stereo out of mono is done a number of ways. The most typical is to simply add a modest amount of stereo reverb to the mono signal.

Another standard way is through simple equalization decorrelation using a stereo graphic equalizer with gentle boosts and cuts that are different but complimentary on each channel. Both of these yield a nice fuzzy sense of spaciousness or stereoness, but with no left/right localization of sources.

Getting from stereo to surround is a little more complex, due to the assumed functions of the various channels. In the analog realm, we have the so-called matrix system Dolby Pro Logic (and similar matrices such as Circle Surround). In these systems, all the audio in production (left, center, right and surround) is

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Frequencies

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every location, even when using an antenna with a preamplifier.

My major complaint with the Artec T14A is that it provides limited signal strength and quality feedback. There are two indicators in the latest version of the digital ATSC software, but they are binary—nothing full scale, which corresponds to what I'm seeing in the TSReader status display.

As far as I can tell, there is no way to select a channel manually using the software provided with the unit—the channel has to be detected in a scan before the receiver can be tuned to it. TSReader will tune it to any channel.

The FujiPlus FD-USB728, another new flash-drive-sized ATSC USB tuner, may be comparable to the FusionHDTV5, according to posts on AVSForum. Like the FusionHDTV5, the FujiPlus receives NTSC, 256 QAM and ATSC transmissions.

It offers some features not present in the current FusionHDTV software—closed captioning and multichannel preview. I haven't had the opportunity to test the FujiPlus FD-USB728 myself, but hope to have a report from others who have ordered the unit. ■

As always, comments and questions are welcome. E-mail me at dlung@transmitter.com.

Handy Web links:

ATSC A/54A—Guide to the Use of the ATSC Digital TV Standard
www.atsc.org/standards/a_54a.pdf

ATSC A/53E—ATSC Digital TV Standard, Revision E with Amendment No. 1
www.atsc.org/standards/a_53e-with-Amend-1.pdf

FusionHDTV5 Gold Plus
www.fusionhdtv.co.kr/eng/Products/HDTV5usb.aspx

Artec T14A
www.artecdtv.com/ehtm/be126.htm

FujiPlus FD-USB728
www.mmitek.com/detail.asp?sku=FD-USB728

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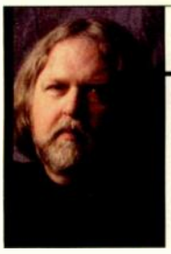

Photo: Steve Jordan

NET SOUP — Frank Beacham

The Long, Sad Saga Of America Online

There's an old truism that the most important attribute for a technology executive is the ability to forget.

Forget all those unfulfilled promises made at last year's news conference. Forget that the product you insisted would change the world is now a hard sell as surplus on eBay.

Remember only the attributes of what's being sold today. Does this remind you of anyone? For me, the name of one man pops to the top of the list. Steve Case was the high-flying entrepreneur who propelled America Online to the heights, only to see it crash and burn in the most spectacular way.

Case was once considered a major American visionary. I first interviewed him for this and other publications more than a decade ago. I watched his presentations and listened to his endless promises about a glowing digital future led by the likes of AOL.

I even snapped a photo of Case and then Time Warner CEO Gerald Levin back in 2000 after they announced the $106 billion "merger of the century." That smug look on their faces soon faded as it became apparent they had engineered one of worst corporate fiascos in history.

Steve Case was the high-flying entrepreneur who propelled America Online to the heights, only to see it crash and burn in the most spectacular way.

Finally, in the overheated summer of 2006, the remaining hot air was vented from AOL.

A subscriber base that once numbered 30 million had dropped to less than 18 million and was still in free fall. About 3 million subscribers disconnected AOL in the past year.

The ship was sinking fast. Desperate measures were necessary. To anyone with a sense of history, the announcement was a stunning new

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Upmixing

CONTINUED FROM PAGE 44

encoded into a 2-channel stereo signal called "Lt/Rt." At the set-top box or receiver, Lt/Rt is decoded to make a surround signal.

This is all well and good. However, a conventional stereo signal (which is not an encoded Lt/Rt signal) may also be decoded as if it were Lt/Rt, upmixing it to a de facto surround state.

Whether or not this happens depends on the set-top box, the receiver and how the program is flagged. In my system, for instance, all programs that are not Dolby Digital are upmixed with Dolby Pro Logic unless I reconfigure my speaker array to be just two speakers, left and right.

The system (my television, not the set-top box) overrides any metadata or other program flags. In general, only programs which are arriving at the home as Dolby Digital have the capacity to announce themselves as being Pro-Logic(II) encoded or not, because they arrive with metadata.

Depending on the specific technology being used in the home, it is even possible to use this same metadata to switch ProLogic decoding on or off as required, although in practice, user settings tend to override these automatic functions.

DISCRETE 5.1 UPMIXES

I've done a number of stereo-to-surround music upmixes for clients, and I've studied a number of other upmix algorithms as well. What I've found is this: a well-rendered upmix will generally be preferred by even critical listeners over its stereo ancestor. However, I've found that such upmixing is pretty touchy and very dependent on the source.

So my experience to date is that there is not a general upmix algorithm that will work for all programs. Further, the things needed to create a really good upmix (excellent delays, ambience and reverb in surround algorithms) are sufficiently complex that they cannot be economically incorporated into a consumer set-top box or receiver.

Upmixing is pretty much a fact of life in the analog realm. Fortunately, Dolby Pro Logic is generally benign as an upmix algorithm. Mostly, I find that it is more amusing, spacious and satisfying than stereo, especially for television.

The things needed to create a really good upmix... are sufficiently complex that they cannot be economically incorporated into a consumer set-top box or receiver.

Music may or may not work, depending on the nature of the stereo mix. Just so you know, I've now added my living room TV surround system to the array of playback environments I use to check my mixes and mastering efforts.

In the digital realm, upmixing really needs to be done in the post-production suite, carefully and with considerable attention to detail. Cruising on autopilot with your favorite setting is not a good way to go as a general rule, because the appropriate surroundness will vary as a function of the scene, the music score, the age of the production and the nature of the editing, among other things. This is not set-top box country, at least in my humble opinion.

For those who have been following the preceding articles, the irony of upmixing should be apparent. Just like any other discrete surround mix, it's generally impossible to know whether or not these upmixes will actually be heard in surround!

In many cases, the viewers (or their equipment) are just as likely to be downmixing to stereo as upmixing to surround. You know that fabulous piece of stereo music that you just painstakingly upmixed to glorious surround? Lots of our beloved viewers are going to hear it in stereo. And what are the chances that the stereo folddown of your upmixed surround version is going to sound anything like the stereo original? Aiyee!!

Overall, we have made things unreasonably difficult for both ourselves and viewers by trying to be all things to all everyone in all places at all times. We've made it a little worse by not fully understanding the implications of what we're doing, and worse yet by making a variety of unfounded assumptions about what will work best at a variety of stages in the transmission chain.

Dolby deserves a lot of credit for bringing metadata into the process, which can undo many of those assumptions.

However, we are still far from understanding and using metadata to its full effect, and its misuse often makes the outcome worse than it would be with no metadata.Unfortunately, we've still got a lot of work to do.

Thanks for listening. And thanks again to Michael Nunan for his thoughtful and indispensable help with this series of columns. ■

Dave Moulton is getting nicely upmixed these days in his new Rt/Lt jacuzzi. You can complain to him about anything at his Web site, www.moultonlabs.com.

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Saga

CONTINUED FROM PAGE 48

chapter in a long running drama about the perils of running a business in the Internet era.

AOL will now give away its software and e-mail accounts for free. Its dial-up service—with an average customer cost of about $20 a month—will continue at the lower rate of $9.95 a month. But dial-up will no longer be actively marketed.

In fact, the aggressive marketing—remember all those AOL CD "coasters" in your mailbox?—is coming to an end. AOL will seek to cut $1 billion in costs. Thousands of its remaining 19,000 employees are expected to lose their jobs.

GOODBYE AOL

How did this happen? Internet users moved on, outgrowing the service that was once called "training wheels for the Internet."

Now, if AOL is to survive in the broadband era, it will rely on the sale of advertising. That's the same business model used by Google and Yahoo, AOL's modern day competitors.

In observing this story's evolution, it's interesting to compare AOL's planned future from its planned past. To his credit, Steve Case was always open with those plans and never deviated from his goal—even though that goal infuriated many who had loftier visions for the people's network.

From day one, Case viewed AOL as a safe, user-friendly consumer shopping mall located in the midst of the wild frontier of an untamed Internet. People repelled by geeky technology found AOL a comfort zone.

A decade ago, however, AOL was to be a closed mall—one only available to AOL subscribers. Think of it as the virtual version of a gated residential community.

AOL was often described as a "walled garden," a frequently used buzz phrase of the era. It was an electronic fortress built in cyberspace. (Add that one to the list of terms that high-tech executives now tend to forget.)

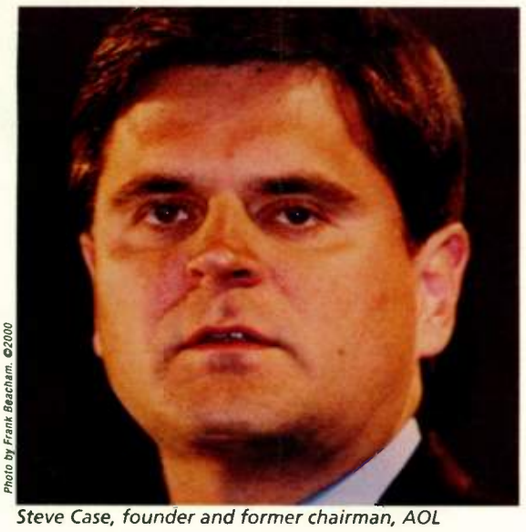

Photo by Frank Beacham. ©2000

Steve Case, founder and former chairman, AOL

From day one, Case viewed AOL as a safe, user-friendly consumer shopping mall located in the midst of the wild frontier of an untamed Internet.

COMMERCE WINS

As I digested the news of AOL's latest woes, I scanned my old notes and stories to recall the many times over a decade that I drank Steve Case's Kool-Aid. One particular memory stood out. It was Internet World, late 1997, at Javits Convention Center in New York City.

I remember it as a sad time for Internet purists. A few years earlier—when Internet World was small and flush with hungry young media mavericks—one could sense some real possibilities for a genuine revolution in electronic communications.

Heads had banged at Internet events in previous years over the critical issue of keeping the network commercial-free. But, as usual, commerce won. Hope had faded by 1997 after the world's largest media and technology companies—with the government's blessing—joined the party.

My notes recall that in 1997, Internet World had become a carnival of corporate hucksters, most of them hawking electronic commerce, TV-style junk entertainment, and private networks for large global corporations.

FREE FOOD, FREE BOOZE

"Free food, free booze," shouted a PR executive to a reporter. It was the most potent weapon he had to lure the press to a mind-numbing lecture on his company's new electronic commerce software. Others used magicians, tap dancers, costumed robots and even guitar-playing actors to generate maximum noise about their offerings.

One of the stars of Internet World in 1997 was Steve Case. I remember well that supporters of a free and open Internet were very wary of his being chosen as a keynote speaker. He didn't disappoint—their collective blood pressure soared that day.

"A few years ago, there were a lot of software companies in the marketplace, and now it's dominated by only a few," Case said in his speech. "The same thing is going to happen to the Internet."

I wrote in an article following Case's speech: "From his earliest days at America Online, he's been unabashedly open and honest about his vision for the 'Net.

He sees endless online shopping, Disneyesque entertainment, and well-filtered, inoffensive 'information' as the core of the online future."

For a few more years, Case was celebrated as a visionary and rewarded with great wealth. Then, when the Internet bubble burst at the top of this decade, the bottom fell out. After the Time Warner deal turned sour, Case's fall from public grace was steep and long.

One thing hasn't changed, though. Steve Case always saw AOL as a vehicle for advertising and marketing products. Ironically, Time Warner, now without Case, is essentially making the same bet—this time outside the walled garden.

Now, as AOL attempts to reinvent itself in the broadband era, we'll see how much things have changed. ■

Frank Beacham is a New York City-based writer and media producer.

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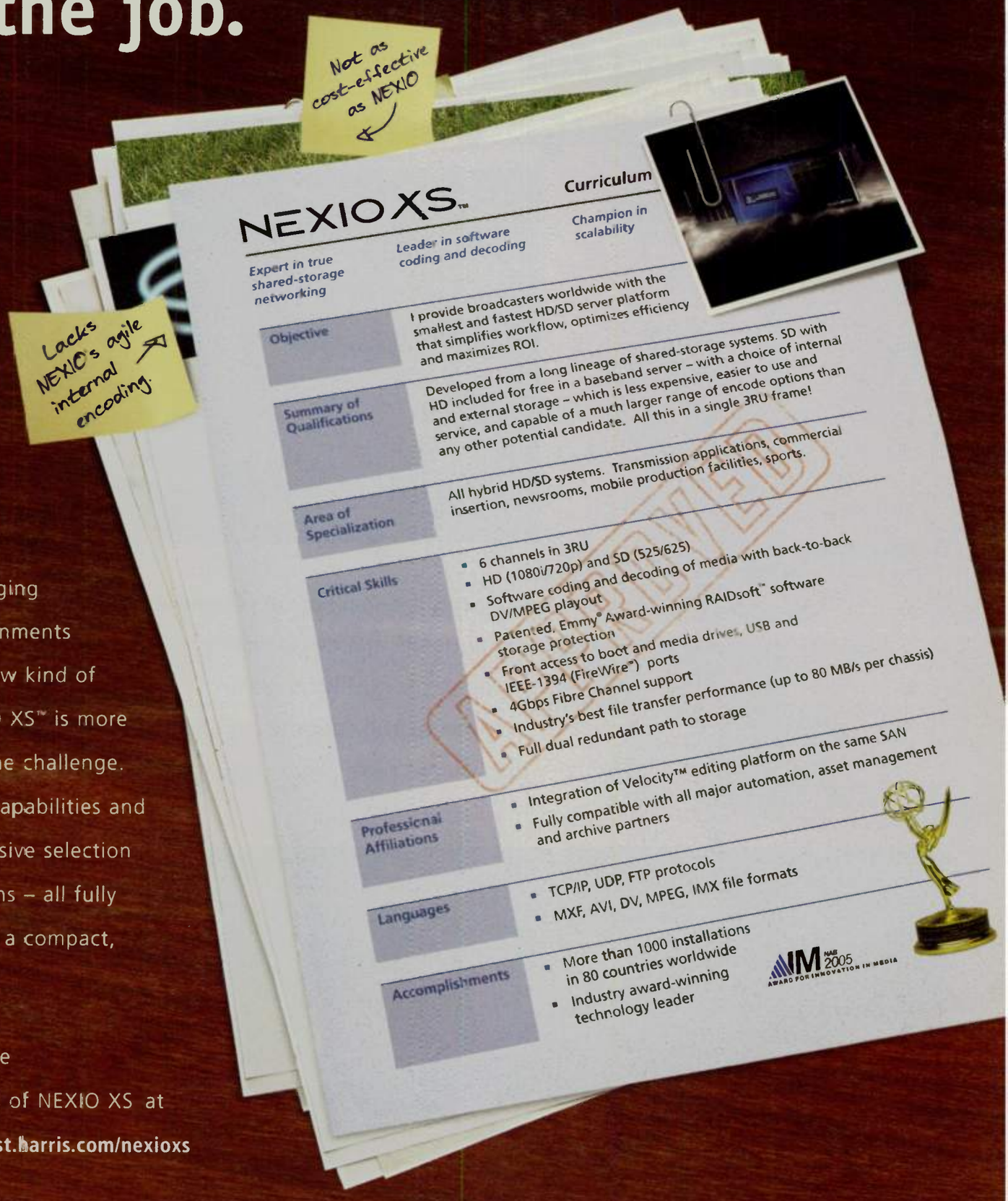

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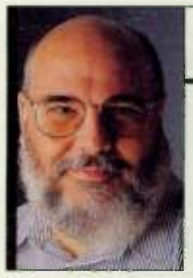


LET THERE BE LIGHTING

Andy Ciddor

Lighting for TV: Just Enough Consolation

Finding a lighting control console that meets your needs has probably never been more difficult than in the situation that faces us right now.

While there have never been so many consoles offered, and there have never been so many functions available on those consoles for doing amazing things with lighting, it seems to me that there have never been so few consoles that have the right mix of capabilities for making television.

I have some definite ideas about what I want out of a lighting desk, and "playability" is one of my primary requirements. Perhaps it's because I started out in the days of real, honest-to-goodness, live-to-air broadcasting.

WISHFUL THINKING

When I made it to the exalted rank of junior lighting director, I got the early Saturday morning kids show with zero rehearsals, and the Sunday evening talent search show with one perfunctory rehearsal for each of the eight live acts.

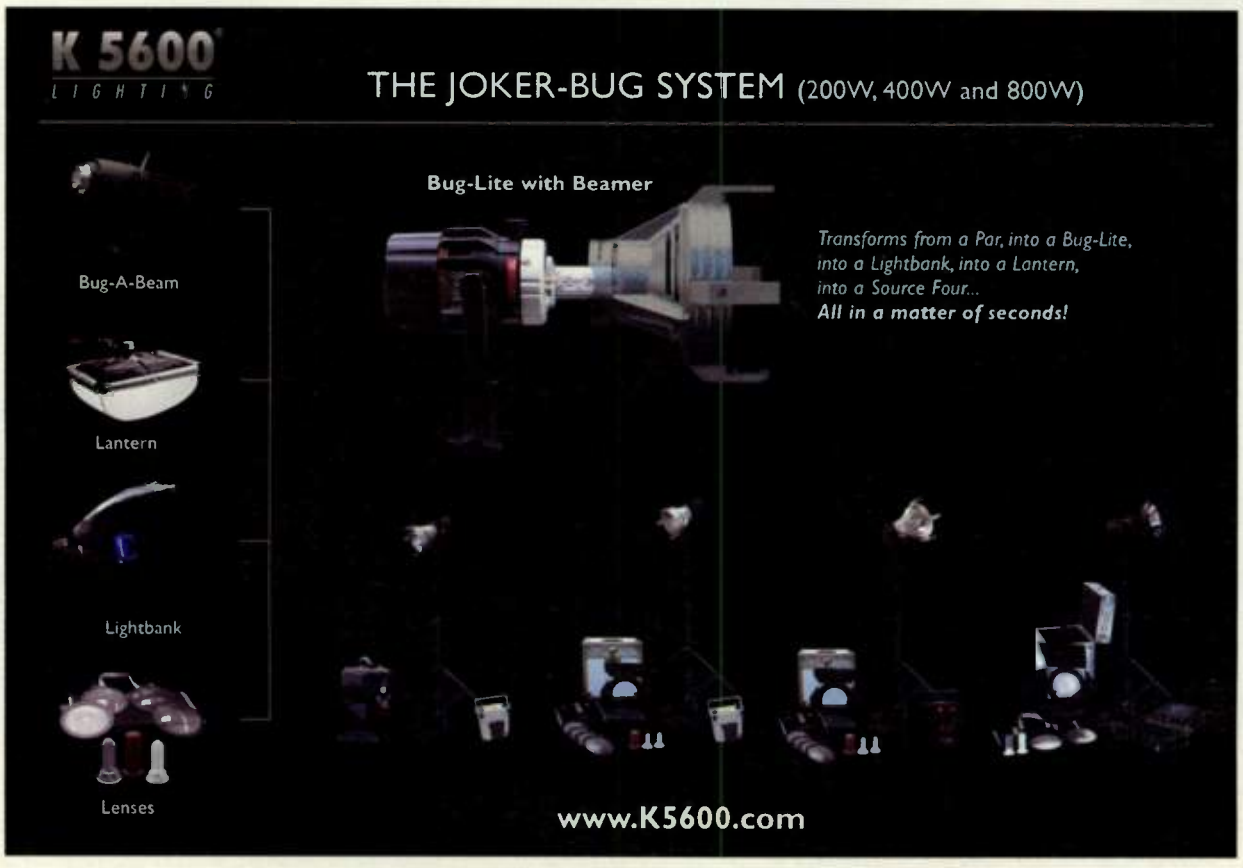
The running sheet for the children's/teen's show was a mix of speculative fiction and wishful thinking. A segment on keeping fit could run anywhere from the scheduled three minutes to an hour, depending on how much fun the hosts were having, and could take place anywhere in the studio, the props bay, or even in the station car park.

The music quiz segment, sponsored by a large consumer electronics company, could take from five minutes to two hours, depending on which musicians dropped by the studio on their way home from gigs or nightclubs. It was not unknown for the hosts to completely forget to throw to any of the sponsor's commercials.

Fortunately, this was before the advent of the U-matic video recorder, and as no one was prepared to waste a 2-inch quad tape to record an early morning live-to-air kids show, the network executives never found out (or perhaps cared) what was going on, and the sponsors were delighted.

Such merry mayhem (and it was great fun to do, for a guy in his early twenties) was very hard to light well for the not-too-sensitive plumbicon tube cameras of the day, and very hard to make look professional.

Although the masses of assignable faders now included on many desks makes this easier, I suspect that this is where the more graphical control interfaces, found on such systems as the Jands Vista and the Avolites Sapphire, may turn out to have great potential for television production.



For a production that fluid, a lighting console required much more flexibility than what was needed for a classic set-piece awards presentation, a games show or a sports panel show.

Interestingly enough, it's only since people became sufficiently bored with our well-planned, prerecorded, shadow-free version of television and turned to "reality" productions that we have returned to making live television. While I acknowledge that most of it is recorded, it isn't usually heavily rehearsed, and often can't be easily repeated just because someone missed their mark, went off-mic a little, or wandered into a shadow.

LIGHTS FANTASTIC

It's these production conditions that require a lighting console that allows the lighting director to respond to events in real time. Such a desk gives direct access to everything in the rig—a very steep requirement if the rig includes more than a handful of moving lights.

The original numeric keypad, even when coupled with a few wheels and trackballs, does not fit well with the

process of dynamically balancing pictures before they go to air. Although the masses of assignable faders now included on many desks makes this easier, I suspect that this is where the more graphical control interfaces, found on such systems as the Jands Vista and the Avolites Sapphire, may turn out to have great potential for television production.

My other big requirement for a really useful television production console is direct access to the desk's critical functions. It is the style for most contemporary consoles to have just a few function keys that are used to navigate through the complex maze of menu options displayed on a small embedded screen.

This is perfectly reasonable for setting the brightness on the console work lights, or the DMX channel and universe allocation of the fixtures and dimmers during setup. However, it's a serious obstruction when it takes seven keystrokes to flip from coarse to fine mode on a fixture.

Admittedly, there is little that is operationally different in a concert production that's part of a musical awards broadcast, and a nightly game show or ballet production.

ALL-PURPOSE OFFERINGS

These operational functions are rarely critical for concert production and don't figure at all in the thinking of theatrical console operations, yet the vast majority of desks available are either specifically for one of those applications or an attempt to cover several markets with an all-purpose offering.

Admittedly, there is little that is operationally different in a concert production that's part of a musical awards broadcast, and a nightly game show or ballet production.

There are, however, substantial areas of television production that have unique operational requirements for the lighting console if the lighting director is going to have a chance to get the best-looking pictures under the constraints that are uniquely television.

As a final note, I feel compelled to share with you my latest discovery from the parallel universe that is reality television. "Star Portraits with Rolf Harris" is a strange production from the United Kingdom's national broadcaster, the BBC. Rolf Harris, a septuagenarian artist-turned-musician, turned U.K./Canadian TV personality, invites three professional artists each to paint a portrait of that episode's "celebrity" sitter.

The viewing audience gets to watch the portraits being created, but the subject doesn't see the pictures until they are all unveiled at the end of the episode, when one must be chosen for the celebrity to take home.

At 34 minutes of air time, the show is about 31 minutes too long, but more than 5 million Britons (equivalent to 25 million viewers in the United States) watched the first series, the highest rating ever for an arts program in the United Kingdom. Set your PVR to record this one when it comes to a cable channel near you—and then watch it at eight times replay speed. It does have some (documentary-style) lighting and at least it doesn't have any crime content. ■

Andy Ciddor has been involved in lighting for more than three decades as a practitioner, teacher and writer. You can reach him via e-mail c/o **TV Technology**.

INSIDE PRODUCTION Walter Schoenknecht

The 'In' Thing Boils Down to Infrastructure

Ask your staff about desktop editing, and they'll tell you it's the "in" thing: Inspiring; intuitive; invigorating; often instructional; other times, introspective or even indelicate. Requires an infusion of investment, personal involvement and insight.

There's one essential *in* thing, though, that probably won't get mentioned... infrastructure.

Today, it's no longer safe to assume that your young video staffers have ever seen the inside of a classically engineered production facility. Now that desktop editing apps have been taught in high schools—and below—for many years, it's perfectly likely that your rookie staff thinks that you need only a camera, a computer, and little else.

Under some circumstances, they're right... it's entirely possible to tell stories that way, in the same way it's possible to build a house with just a hammer and a hand saw. But it's crude, unnecessarily painful, and leaves you unprepared for the unplanned.

Trying to live this simplistic lifestyle isn't easy. Without an investment in infrastructure, it's difficult to consistently meet clients' expectations. When your one DV recorder breaks, how do you make your deadlines? Still, this seems like one of the hardest lessons for beginners to learn... the notion that you'll need to buy equipment you can't directly bill anyone for.

BEST-LAID PLANS

Back in Neanderthal times, the notion of a television production "facility" carried with it certain implications, mostly concerning the nature of the effort required to support production technology—in short, infrastructure. We experienced folks have been in and out of edit suites and studios for years, and we've seen the effort that others put into nurturing both the fragile, 1 V video signals and the technical wizards who work with them. We understand about the noninincome producing overhead we need to carry to consistently tell the best story possible.

Small video businesses rarely develop according to plan.

Today, it's no longer safe to assume that your young video staffers have ever seen the inside of a classically engineered production facility.

Among the small-to-mid-sized production companies I know, few would claim that they laid out a master plan for acquiring equipment and building a facility.

In our own case, I distinctly recall that when we started our little venture, we had a stated goal of never investing in technology; the headaches of amortization, capitalization, obsolescence and brand appeal would be left to others. Owning hardware was clearly the road to ruin, and was to be avoided at all costs.

Today, exactly 25 years later, the verdict is in: we've failed miserably at achieving that goal.

It started innocently enough: Once we realized that our Betacam camera rental fees were easily exceeding the owners' monthly payments, we bought our own. When our editing volume warranted, we bought a small machine-to-machine setup; ditto that early 3D animation system.

Each acquisition shared a single purpose—furthering the creation of our clients' projects—but there wasn't much prior planning, no five-year vision for growing a business.

Of course, given the rapid rate of technological change, it would be difficult to predict where five years' time would take us. And the whims and fancies of our clients seem to act as far greater forces than technological development itself.

This is all the more reason why it's essential to step back every so often and take a good look at past, present and future, and if necessary, actively plan for change.

MAKING CHANGES

After a long period of relatively little change in our own little production business, we've realized that it's time once again to invest in infrastructure, both to keep our facility current and to remain competitive. We've pried open our pocketbook; the old stuff has gone off to eBay, and the new stuff is being unpacked even now.

Stepping back, for instance, we've noticed that virtually everything we own is capable of SDI and AES interconnection. For years, we've used conventional coaxial patchbays to link devices, dreaming of the day when we could afford to trash our nearly useless composite video router in favor of a digital solution.

I spoke with Ray Bryan at Nvision, a company whose early expertise in moving digital audio from place to place has readily translated into digital video routing wizardry as well. Ray noted that Nvision had spotted the beginnings of a trend, and became one of a select few big router companies to offer more modest configurations for shops like us, retaining the control features, redundancies and flexibility that the networks demanded.

The result: We installed an Nvision Compact Router series 16x16 SDI and AES system which costs less than half of what a similarly sized analog system cost us 10 years ago.

Most importantly, we're quickly and conveniently moving the best-looking signals possible, and the entire production process has benefited—editing, graphics, audio, dubbing and mastering.

Building infrastructure is a process, not a one-time event. The process needs to continue throughout the life cycle of a production business, tracking trends in production, hardware improvements, and upticks and downturns in business volume. That's why today, as a whole host of support systems for desktop editing, desktop audio, small cameras and the like become available, it's time to get in step with the *in* thing—infrastructure. ■

Walter Schoenknecht is a partner at Midnight Media Group Inc. a New York-area digital production faciilty. You can reach him via e-mail at walter@mmgi.tv.

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VIDEO NETWORKING

Wes Simpson

Navigating Through Terms of Confusion

In many industries, there is a special vocabulary that professionals use that can be a bit mysterious until it is explained. This is definitely true of broadcasters, who have developed a long list of specialized terms.

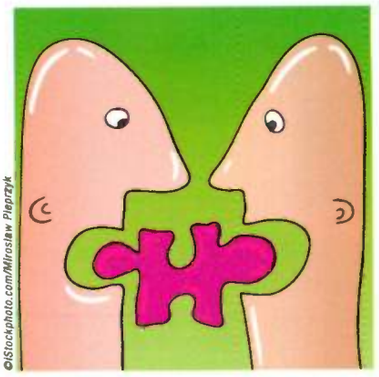
Problems can occur when new terminology is created and not everyone agrees on the meanings. Case in point: the acronym, "IPTV."

While it is true that all Internet Protocol television installations send video over IP networks, it is not true that any kind of video sent over an IP network is IPTV.

For the latter, the term "Internet video" is much more descriptive. In the first half of this column I'll define both terms and show the key differences between the two technologies.

Other problems can occur when the lines between two professions start to cross, and terms used in both have different meanings. In the second half of this column, I'll give my take on the terms "router" and "multicasting," which both have significantly different meanings in the fields of data communications and broadcasting.

Problems can occur when new terminology is created and not everyone agrees on the meanings.



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IPTV IS...

IPTV is simply a way to deliver traditional broadcast channels to consumers over an IP network in place of terrestrial broadcast, CATV, and satellite services. Even though IP is used, the public Internet actually doesn't play much of a role. In fact, IPTV services are almost exclusively delivered over private IP networks, such as those being constructed by telephone companies in the United States.

In a typical IPTV network, SD video signals are usually compressed to 2.5 Mbps or less, and HD signals to between 6 and 10 Mbps. At these bit-rates (which are comparable to those being used by DBS satellite and digital CATV systems), video quality is pretty good, but delivery over the public Internet is pretty much out of the question for most consumers. At the viewer's home, a set-top box is installed to take the incoming IPTV feed and convert it into standard video signals that can be fed to a consumer television.

Here are some of the main characteristics of IPTV:

- Continuous streams of professionally produced content, such as a TV network feed;
- Hundreds of 24/7 channels;
- Uniform content format (all channels typically share one compression method and use roughly the same bit-rate);
- Delivered over a private network, such as a telco digital subscriber line; and
- Viewed on consumer televisions by way of a set-top box.

INTERNET VIDEO IS...

Internet video is used to supply video content to viewers by way of the public Internet. In a typical Internet video installation, service providers set up a Web site portal that can be reached by anyone with a standard browser.

At this site, there will be a list or index of the various pieces of content that are available. Once the user has selected some content, it is delivered from servers to the viewer's PC, where special media viewer software can be used to view it, or

where it can be downloaded to a portable viewer.

Here are some of the main characteristics of Internet Video:

- Discrete content elements, ranging from clips lasting a handful of seconds to full-length movies;
- Millions of content offerings;
- Widely varying content formats, including dozens of different types of video compression, rights management technologies, and image resolutions;
- Delivered over the public Internet; and
- Viewed on PCs with special software or on portable video players.

ROUTERS ARE...

In the broadcast world, a router is used to switch video signals between sources and destinations inside a studio. In the data communications world, a router is often used to transfer IP data packets between local area and wide area network devices. Although both types of routers provide connectivity among a variety of devices, there are some important differences.

Video routers handle constant bitrate, unidirectional signals, with defined inputs and outputs. Each signal is designed to be completely independent and isolated from the others. Software is frequently used to set up and tear down connections, but once a connection is established, software plays a very minor role in a video router.

Data routers handle rapidly changing, bidirectional signals made up of discrete IP data packets, with asymmetric traffic flows. Signals from multiple sources are often combined in order to share a common data link. Software is heavily involved in the second-by-second operation of a data router. It is involved in decisions about which packets get priority, how packets are to be routed, and using monitoring links to assess capacity and performance constraints.

Both video and data routers range in capacity from small, inexpensive ones to costly "big iron." They are often designed to be highly reliable, because failures in either video or data transport can take a broadcaster off the air. Although it is possible to send video signals over a data router, and data signals over a video router, because of their differences in functionality both types of routers will be with us for a long time to come.

MULTICASTING IS...

In broadcasting, multicasting means delivering multiple video programs simultaneously over a single digital broadcast channel. In datacom, multicasting means delivering a single stream to multiple views simultaneously. Let's examine both in more depth.

Broadcast multicasting became feasible with the advent of terrestrial digital television. Within a standard digital channel (19.38 Mbps in the United States), it is possible to have multiple video channels, each occupying a portion of the total bandwidth. For example, ION Media Networks (formerly Paxson) has more than 50 broadcast channels across the country—each one is capable of delivering at least four different standard-definition programs simultaneously using multicast technology.

In IP multicasting, a single video stream is sent simultaneously to multiple users. Through the use of special protocols, copies of the video stream are made inside the network for every recipient. All viewers of the multicast get the same signal at the same time.

Market penetration for both types of multicasting is limited. Broadcast station owners are just beginning to explore the types of multicast services that consumers will actually watch. In data multicasting, most of the networking equipment that has been delivered over the past five or more years is capable of supporting it, but it has been disabled out of fears of an excessive burden on networks. Clearly, both types of multicasting will have an interesting future. ■

Wes Simpson, who has not been able to determine if router rhymes with "outer" or with "scooter," is an independent consultant and author of the book "Video over IP" from Focal Press. He can be reached at wes.simpson@gmail.com.

NEWSROOM TECHNOLOGY

Harlan Neugeboren

Technology Can Be Used To Free Up Resources

In my last article, I discussed some of the ways that stations can use to produce more content to feed the ever-increasing appetites of viewers. All of us do things in newsrooms that tie up valuable resources which could otherwise be used for newsgathering.

This can be changed by looking at what we do in our newsrooms with the attitude: "is this the best way to do it or am I doing it because 'that's the way it's always been done.'"

If the answer is the latter, chances are that there's a more efficient way. The goal is to see if and how we can take existing resources and produce more content.

CLOSINGS

In most stations, people get closing information from schools and businesses in inclement weather. Although some of the systems are automated, they still involve human intervention. In Albany N.Y., all the TV stations got together and formed a consortium to collect closing information.

They used software that one of the stations had written and it fed a SQL database. The stations took turns manning the phones for those who couldn't use the voice system or Web site. The community appreciated it because they could call one number instead of multiple stations.

While this may seem like a small issue, it is one that goes to my point of looking at everything that you do and coming up with a way to do it more efficiently. In this case, it freed up valuable assignment desk resources that could devote more of their time to news gathering.

During most breaking news, especially stories that involve natural disasters such as hurricanes or storms, there are inevitably a number of phone numbers, agency names and Web addresses that need to be conveyed to the viewers.

In many cases this involves the report, producer or assignment editor speaking to the agency and getting all of their information.

When I was involved in planning the launch of NY1, we looked at every task in the newsroom and the potential for mistakes and process improvement.

Some of that information makes its way into the assignment desk queue, while some winds up on a piece of paper that gets handed to a graphic artist. Sometimes mistakes are made in the numbers when they are transferred from one person to another. But there is a better way to do it.

ONE SOURCE

If all this information was entered into the assignment grid, there would be one source for the information. A special column or field could be made that tags this information.

ENPS has the ability to export information from the assignment grid via XML. It also can create tags for this information so when it's entered, it's classified. With a simple XML parsing program, you could feed this information into a graphics template. Chyron, Pinnacle, Vertigo and Vizrt all have applications that parse XML and populate templates. This XML can also be useD to feed a Web site.

This is another example of how workflow and technology can be used to reduce or eliminate tasks that involve human interaction. These resources can then be re-deployed for other uses such as gathering more stories.

NAMES

I've written about this topic before but it amazes me to see how many newsrooms operate without an automated way of naming stories, especially in the edit room. When I was involved in planning the launch of NY1, we looked at every task in the newsroom and the potential for mistakes and process improvement.

Story or slug naming was at the top of the list. We wanted to create a process where the producer or assignment desk could create a slug and that slug could be used, without re-typing, in an edit room or in our feeds room.

We came up with a process using our DOS-based newsroom system. In Newsmaker, editors could open a window with a list of slug names and then associate edited stories with that slug name. That was in 1992 and we were still editing on tape.

When my team built the next generation of Time Warner news channels, we worked with ENPS to extend the MOS protocol to allow us to create empty record clips for VOs, SOTs, packages, incoming feeds and field tapes.

OmniBus, our automation vendor and Pinnacle, our editing vendor implemented the MOS protocol to allow us to see a list of available story names in editing and feed record.

The benefit of naming the incoming feeds was that the other data entered in the assignment grid could be used as metadata for the incoming feeds.

IT'S POSSIBLE

Many of the suggestions I mentioned above fall under the category of "It's Possible," one of my mottos.

It means that if you approach each task with this attitude, you may find new ways to do things, and in the process improve the efficiency of your newsrooms and hopefully be able to produce more news with the same staff.

As the number of potential platforms to view or distribute increase, we all need to re-assess our operations and workflows. "That's the way we've always done it," and "it works, why I need to change it" are not acceptable anymore... ■

Harlan Neugeboren is CEO of The Workflow & Technology Group. He can be reached at Harlan@wftgroup.com.

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TECHNOLOGY CORNER | Randy Hoffner

More About Audio Metering for Television

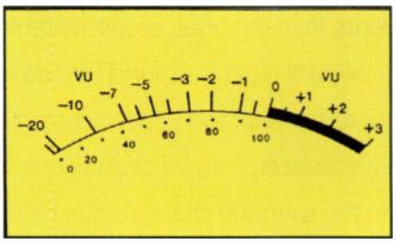
It is unarguably true that one of the thorniest issues that broadcasters have had to deal with is that of audio metering. This is probably no less true today than it was in the early days of broadcasting.

Last month, we saw that a digital audio meter may accurately indicate the level of each individual audio sample while failing to indicate the peak level of the waveform that was digitized, because the peaks themselves were not sampled.

The Nyquist rule holds that if at least two samples are taken per cycle of a waveform, it may be perfectly reconstructed, without knowledge of what happened between samples. If the samples taken by the digitizer happen to fall at points below the waveform's peaks, a digital audio sample meter will not indicate the peak level of the waveform, although the waveform will be perfectly reconstructed, peaks and all, by a D/A converter.

In the analog audio world, two types of standardized meters have been used. It is instructive to look at the origins of these meters and the rationales behind them. In the United States, the confusion caused by the lack of a standard audio level indicator led the Columbia Broadcasting System, the National Broadcasting Co. and Bell Telephone Laboratories to develop a new audio metering standard in 1939.

In the United States, the confusion caused by the lack of a standard audio level indicator led the Columbia Broadcasting System, the National Broadcasting Co. and Bell Telephone Laboratories to develop a new audio metering standard in 1939.



vu meter

The result was the standard volume indicator, or SVI, which is frequently called the vu meter. We note that the 1939 standard and its successors refer to units of volume measurement as "vu," written in lowercase, but nowhere in that document or its successors do we encounter either the term "volume unit" or "vu meter."

The SVI was developed before the dawn of tape recording, and was in fact developed to prevent overload of tube-type audio amplifiers, and to assure that the level readings of two different groups in two different locations could be correlated. Tube amplifiers, unlike digitizers, are not brick-wall clippers, but overload much more "softly," so that a true peak indicator was not required for this application. When analog audio tape recording arrived, its overload characteristics were similar to those of tube amplifiers, producing a rounded overload curve, not a square wave.

One of the first decisions to be made when writing the 1939 standard was whether a peak or an average-responding type of meter should be developed. Average-responding meters were typically found in broadcasting networks and general telephone use in that era in the United States, while peak-responding meters were used for transmitter monitoring, which required observance of specific peak limits.

Peak-responding meters were generally used in Europe, and this led to the standardization of peak program meters there. U.S. standard writers found no sig-

nificant advantage in using PPMs to monitor levels for the amplifiers then in use.

Extensive research in recent decades has in fact shown that when either a vu meter or a peak program meter is used, a maximum of about 15 dB of peaks occur that are not indicated on either type of meter. Because the 1939 engineers found no operational advantage to peak meters, and because average-responding meters could be built as passive devices, while peak meters required some bulky electronics to accompany them, the average-responding type of meter was standardized.

EBU PPM

The standard volume indicator or vu meter was developed and implemented as a passive metering device with full-wave rectification, designed to bridge a 600-ohm audio line. When this is done, it has specific ballistic characteristics.

U.S. preferred PPM Scale

A real SVI is somewhat expensive, and many meters over the years have been manufactured to look like vu meters, but do not come close to exhibiting the proper ballistic characteristics. When vu meters are realized electronically, their driving electronics must mimic the vu meter's mechanical ballistics.

The vu meter has a response time (the time required for the indicator to rise to 99 percent of its steady-state deflection after the application of a reference-level tone) and a fallback time (the time required for the indicator to drop after removal of a reference-level tone) of 300 milliseconds.

The indicator responds so that syllables or words may be discerned in its movements. Any peaks of briefer duration than the response time will not be fully indicated, so several dB of fast, transient peaks will be missed by this meter.

PPM BALLISTICS

There are several PPM ballistics, but the EBU PPM standard, developed for program interchange metering, is the one most frequently encountered, and its ballistics are also standardized in the most recent U.S. ANSI/IEEE program audio level metering standard.

Its ballistic characteristics are specified differently from those of the vu meter. It has a delay time (the interval between the application of a sine wave 9 dB above test level and the time when the indicator reaches 8 dB above test indication) of less than 150 milliseconds, and a return time of 2.8 seconds for the indicator to drop 24 dB after removal of a tone.

It has an integration time (the duration of a 5 kHz burst of tone that would cause a steady state 9 dB above test indication, that produces an indication 7 dB above test indication) of 10 milliseconds.

It rises more quickly and falls back much more slowly than the vu meter, giving it a "jumpier" response to peaks, while the indicator tends to float at a higher overall level in the presence of audio program material. Its 10 millisecond integration time fully registers peaks of much shorter duration than does the vu meter. The integration time is not zero, however, so it is not a true peak meter.

The three meters have distinct applications; vu and PPM meters are best used to monitor audio mixing levels in broadcasting and recording applications, while digital audio meters are designed to be used to avoid digital clipping. Now, we need a digital audio meter that will indicate true peaks, rather than sample peaks. ■

Randy Hoffner is a veteran TV engineer. He can be reached through ***TV Technology.***

ATSC UPDATE | Jerry Whitaker

PSIP Revisited: Getting it Right

Nearly two years after the FCC mandated the use of PSIP, reports can still be heard of stations struggling to get it right. Anecdotal evidence indicates that some stations do a much better job than others, and some are apparently still not doing everything required. The FCC incorporated the entire ATSC Program and System Information Protocol for Broadcast and Cable (ATSC document A/65) into its rules in February 2005. Fortunately, ATSC has developed tools that promise to make PSIP implementation easier and more accurate.

BACK TO BASICS

PSIP is a collection of data structures within every DTV broadcast that enables receivers to find the components needed to create a TV program. This information is organized into virtual channels and programs or events. The virtual channels are identified using a two-part major/minor channel number. The major channel number allows broadcasters to leverage the NTSC channel number brand for DTV.

The three core PSIP tables are:

- System Time Table
- Virtual Channel Table
- Event Information Table

These tables contain information to enable receivers to find the components needed to present a particular program at a certain time.

Each event can have TV parental advisory, or V-chip information; it must indicate the presence of each closed-caption stream, and can provide extended text messages.

There are certain must-have items and must-do rules of operation. If the PSIP elements are missing or wrong, there may be severe consequences, depending on the type of receiver—including not being able to tune your station. Table 1 summarizes the key parameters that must be set and/or checked by each station.

ATSC and Consumer Electronics Association recommended practices advise that three days (24 EITs) of program titles should be sent—with real titles—to enable a meaningful program guide to be presented to the consumer who watches more than one channel.

Several operating parameters may be automatically set by the DTV equipment, sometimes manually by the original equipment installer.

However, for some of these parameters—unless an automated control system is in place—a change in one piece of equipment or the configuration of channels in a multicast can result in nonconformance, or worse, the inability of a receiver to tune the channel. See Table 2.

A checklist of key PSIP items is at *www.nab.org/scitech/PSIP_checklist.pdf*.

To facilitate automated generation and update of PSIP data, the ATSC developed A/76, "Programming and Metadata Communication Protocol." This standard makes it possible to integrate the various information sources needed to compile the key PSIP tables.

PMCP is designed to permit broadcasters, professional equipment manufacturers and program service providers to interconnect and transfer data among systems that eventually must be communicated to the PSIP generator. These systems include:

- traffic
- program management
- listing services
- automation
- MPEG encoder

The overall goal is to ensure proper PSIP implementation while requiring minimum manual intervention by the broadcaster.

PMCP is based on a protocol utilizing XML (eXtensible markup language) message documents. The heart of the standard is an XML schema that defines the message structure, the elements allowed, their relationships and attributes. XML is widely recognized as flexible and usable for various system architectures.

Equally important, it can be deployed without extensive development costs on the part of equipment vendors and/or service providers. XML is a W3C standard that allows structuring of infor-

Parameter	Station Setting	Notes
System Time Table (STT)	The STT should be automated by locking it to house time. Absent that, especially for PC-based systems, it should be checked not less than daily, either manually or via a connection to the Internet.	There are stations on the air that are an hour in error because they have not changed the daylight savings time setting, clearly not meeting +/– one second requirement specified in A/65C.
Transport Stream Identification (TSID)	The TSID must be set correctly in three data locations. As the default value for this number is often used when equipment is powered down and back up, all three locations should be checked if any transport stream processing equipment is changed or reconfigured.	
Major Channel	The NTSC channel number is the major channel number for the DTV virtual channels. The minor channel number goes with the major channel to complete the identification; e.g., 6.1. The combination of major and minor channel number is the virtual channel number.	Each virtual channel is required to have the linkage data associated with the event data, and the MPEG-2 Program Association Table (PAT) and Program Map Table (PMT) data must match the PSIP data.
Event Information Tables (EIT)	At least the first four Event Information Tables must be present. Each must contain the correct linkage data to the virtual channel. When DTV closed captions are present, a caption_service_descriptor() listing all the caption services must be present in that particular event's data (and not present if there are no captions). When a program (event) has a parental advisory, the content_advisory_descriptor() must be in that event's data.	The FCC, in the September 2004 Report and Order on DTV (Doc. 04-192), said: "We expect broadcasters to populate the required tables and descriptors with the proper information to help receivers assemble functioning guides or program information." Proper information is the real program title, not just "DTV program".
Short Channel Name	This is a seven-character field that can be set to any desired name indicating the virtual channel name.	For example, WNABSD1, KNABSD2, WNAB-HD, Tube, etc. could be used.
Broadcast Flag	Although there are currently no processing requirements for receivers upon reception, sending the broadcast flag is still allowed. This is done by placing an rc_descriptor() with the event data in the EIT.	

Table 1: Key PSIP parameters (from NAB TV TechCheck, June 12, 2006)

PSIP is a collection of data structures within every DTV broadcast that enables receivers to find the components needed to create a TV program.

Parameter	Station Setting	Notes
Service Location Descriptor (SLD)	The identification of the contents of each component of each virtual channel must be placed here. The audio and video components are carried in packets with Packet Identifiers (PIDs). The PID number in the SLD and in the PMT must be the same for the same elements of a virtual channel (VC). Once set, PIDs assigned to a VC should not be changed (unless there is a good reason to do so). The program_number is also present in the SLD and must match the value inserted into the PMT by the A/V encoder.	Some deployed systems require a separate manual setup to force the program numbers and PIDs to be the same in each component. Some connected systems detect and overwrite changes made in one component/subsystem when a modification is attempted, making the order of the change important.
Service Type	The service type selects DTV, NTSC, audio only, data, etc., and must be set for each VC. For analog_television the value is 0x01, and if sent an FCC requirement for a TSID within the NTSC signal is triggered. For MPEG-2 video and AC-3 audio, the name is ATSC_digital_television and the value is 0x02 (it can include associated data). Audio-only channels are named ATSC_audio and use the value 0x03 (they also can include associated data). Generic data services per A/90 use 0x04 and software downloads use 0x05.	
Master Guide Table	The Master Guide Table is the single source where all related PSIP data is associated. It lists how many tables are being sent (the minimum is six), their identifiers, where they may be found (their PID number), and must have valid linkages to other tables.	

Table 2: Key PSIP operating parameters (from NAB TV TechCheck, June 12, 2006)

While ATSC standards strictly define the contents and characteristics of the DTV emission transport stream, there may be a number of interactions and interrelationships amongst various components. Successful tuning and display of programs can be ensured if the transport stream adheres to the applicable specifications.

The Proposed Recommended Practice identifies transport stream issues by type, dividing errors into the general following categories:

- Program Specific Information (PSI) errors
- PSIP errors
- Timing model and buffering errors
- Consistency errors
- General errors

Each error type is provided with a defined "error severity," as detailed below:

- Transport stream off-air
- Program off-air
- Component missing
- Quality of service
- Technically nonconformant

Example error conditions for the PSIP Master Guide Table are in Table 3.

All ATSC standards, recommended practices, and informational documents are available for download at no charge from the ATSC Web site (*www.atsc.org*). For additional information on PSIP, visit *www.psip.org*. ■

Jerry Whitaker is vice president of standards development for the ATSC. He can be reached via ***TV Technology.***

mation in a text document that is both human- and machine-readable.

On the operational side, the ATSC is working to finalize a recommended practice on DTV transport stream verification. Document PS-697, "Proposed ATSC Recommended Practice: Transport Stream Verification," outlines a common methodology for describing transport stream conformance criteria.

This document explicitly describes the elements and parameters of ATSC Standards A/53 and A/65 that should be verified in a transport stream for it to be considered a proper emission. The document does not cover RF, captioning, or elementary streams.

PS-697 has been approved by a letter ballot of the ATSC Technology and Standards Group and will go before the ATSC membership for final approval shortly. If all goes as expected, PS-697 could be approved and finalized before the end of the year.

Error Condition	Error Qualifier	TOA	POA	CM	QOS	TNC
MGT repetition error	MGT repetition interval error (found between the last 151 and 300 ms)					X
MGT repetition error	MGT repetition interval error (found between the last 301 to 750 ms)				X	X
MGT absence error	MGT not found for 751 ms (or longer)	X	X	X	X	X
MGT syntax error	CRC is incorrect for table_id 0xC7 [1]					X
MGT syntax error	scrambling_control_field is not '00' for packets containing MGT [2]	X	X	X	X	X

Legend:
TOA: TS Off Air, POA: Program Off Air, CM: Component Missing, QOS: Quality of Service, TNC: Technically Non-Conformant

Notes:
1) Repeated instances of an incorrect CRC will be interpreted as the table not being present. This case is equivalent to a repetition or absence error.
2) An error in the setting of the scrambling control field is most likely an indicator of a hard failure or incorrect setting and will persist until corrected.

Table 3: MGT error corrections

LONG FORM RECORDING

Volicon Observer: Multichannel Recorder

by Geoff Poister

This is a product of interest to any organization that wants to keep track of what is being broadcast on air or cable. The Observer works like multiple digital video recorders, displaying any number of live television feeds while simultaneously recording them onto a server.

Advanced search functions make it possible to do keyword searches that isolate downloadable clips. All channel streams can be accessed via any standard Internet Explorer, allowing one to monitor selected channels worldwide from any computer with an Internet connection.

The Observer is an ideal tool for archiving, but it has even greater potential for content monitoring. It can search closed-caption text across all channels and displays a clip menu for instant access to any topic is selected. This has obvious uses for tracking ads, news analysis and many other types of research.

The Volicon recording system

FEATURES

The first function of the Observer is to monitor and capture live television programming. At its most basic level, it can be used as a single-channel archiving device for an individual TV station. The data rate is scalable from 128 Kbps to 4 Mbps. For most uses, 512 Kbps is good, as it provides better-than-VHS quality and conserves storage space. At this rate, 90 days of video can be stored using only 6 GB of space per day. The video can be then be transferred to DVD for permanent storage.

But the advanced features expand the Observer's uses immensely. Using RAID-protected drives, you can build a monitoring system in groups of two or four channels. The hardware is supplied in a rack-mountable chassis, with monitoring and management of the channel feeds done via a simple interface displayed on Internet Explorer. The only equipment needed beyond the supplied RAID chassis is any standard computer running Windows XP.

Access is controlled by password and different users can be granted varying degrees of access or control over the system.

Capturing channel feeds can be continuous or scheduled for specific times.

For example, a station could choose to only archive its news, or record news at designated times from all of its competitors in the market.

FAST FACTS

Application

Long-form video recording with search functionality.

Key Features

Can store a day's broadcasting activity in 6 GB of drive space; provides program ratings.

Price

Single-channel, $8,995; 2-channel, $11,500; 4-channel, $19,900. Expansion beyond four channels is approximately $5,000 per channel

Contact

Voilcon Inc.
781-221-7400
www.volicon.com

Monitoring is very simple. Clicking on the available stations brings up monitor windows that resize to fit the number selected. You select the desired channel's audio by clicking on an icon. Each individual monitor gives the appearance of a mini-VCR streaming live video in real time while recording. You can pause, rewind or select any time point for review.

For example, you may want to check a news story that aired five hours ago or on a previous day. You simply click on the clock icon and select the desired day and time. You can synchronize all displayed channels to play at that time as well.

The search and management functions are particularly impressive. All channels display closed-caption text, which allows for very powerful keyword searches. If you type "space shuttle," you will get a thumbnail display with a brief description of every video clip from every channel over the selected time period where the space shuttle was mentioned.

Click on the clip and you can view it, save it, or e-mail it to someone if desired. This has obvious applications for learning when specific products or corporations are mentioned on television in any connection. Public relations firms could use this feature to verify the effectiveness of their efforts. It is also useful for verifying adver-

tisements and for any form of media research.

Another interesting feature is the Observer's ability to link the program displays to ratings charts. At any given moment, you can view what stations are airing and compare ratings for the displayed programs.

Finally, the Observer provides all of the necessary tools for parceling and managing the video archive. Clip lists based on topics or broadcast times can be shared and accessed by multiple users. Any clip can be exported and repurposed. Clips can be sent anywhere. And one can choose to download at a higher resolution to create material that can be edited for re-broadcast or DVD distribution.

This flexibility yields numerous applications. As an example, a broadcaster could gather selected portions of daily programming and repurpose it for Web site or other delivery. Or they could quickly find and re-edit material for use on other programs. PR firms can make reels for individual clients. And broadcasters and advertisers can easily verify ad placement.

There is no limit to the number of feeds that can be monitored. Theoretically, an unlimited number of servers can be added without taxing the system. Several major broadcast and cable networks use the Observer for monitoring dozens of stations and feeds from all over the world.

Finally, the Observer has a new cousin called Observer-RPM. This is a revolutionary tool that enables cable operators to sample the user end of all of the channels they carry. The system then alerts operators to any irregularities in video and audio at the set-top box level.

IN USE

My first look at the Observer was in the Volicon offices near Boston. By simply connecting a laptop to the Internet, we were able to monitor the live television signals from four stations in Europe and four in Boston. In fact, the servers can be anywhere in the world and easily monitored from any Internet-connected computer.

Later, equipped with a user name, password and a Web address, I used my own computer to run the Observer. It is amazingly convenient, since no software is required. All of the functions and controls are displayed on the Internet Explorer interface.

The Observer interface is entirely intuitive, and I didn't need any instruction to use it. On the left are small boxes that you click on the channels you want to view. In this case, I was provided with the four main broadcast channels in Boston and one in France.

I could click one box to get a large view, or click as many as five to be viewed simultaneously. Additional buttons allow users to select the audio source and to turn the closed-caption display on or off. It's also possible to select the date and time you wish to monitor and navigate with VCR-type controls.

The faster the Internet connection, the better the performance. But I found that with standard DSL I could view up to three sources in perfect real time. When I brought up four or more windows there was an occasional stutter in the additional windows. Most likely this was due to my Internet connection speed and a computer with less than the recommended 3 GHz processor.

But most users will probably not

VOLICON, PAGE 78

GRAPHICS CREATION

Avid Deko 3000 Graphics Creation System

by Geoff Poister

The line of Deko graphics products, originally developed by Pinnacle Systems, is well known throughout the broadcast industry as one of the leading on-air and post production graphics packages. Now that Avid has acquired Pinnacle Systems, the Deko line has been further developed to fit in seamlessly with Avid's line of post-production, broadcast and news systems.

The Avid Deko line consists of four products. The entry level one is PostDeko, a software toolset providing 3D motion effects and graphics creation for broadcast and desktop post production.

It can be used independently with an NLE or as an offline system for transfer of graphics into other Avid Deko online systems. Avid Deko 550 is the entry-level online graphics system capable of basic 2D real-time effects in SD. The Avid Deko 1000 offers SD and HD capability and enhanced 2D DVE effects. The Avid Deko 3000 is the top of the line and the subject of this review.

FEATURES

The Avid Deko 3000 provides all of the tools necessary to create multilayered 3D motion graphics linked to sound and text in SD or HD. The hybrid model allows both SD and HD graphics creation and play-out. Although highly advanced and brimming with options, it is carefully designed for the speed requirements of live broadcast.

Avid Deko 3000 allows the user to import 3D models and combine them with Deko graphics and real-time text data. All of the elements animate with the 3D model, but remain separate and editable.

Graphics are created and controlled on separate channels allowing the designer to display tickers, bugs, animations and text. Multiple SD or HD clips can be played back with motion timeline control, 2D scaling, fills and static or moving mattes.

As creation of graphics for SD and HD play-out is both necessary and problematic, the Avid Deko 3000 incorporates a dual-window system that allows quick reformatting of graphics in either resolution or aspect ratio. It even allows you to easily change the language of the text. To simplify management, dual versions are saved as a single asset.

Avid Deko 3000 provides templates and 3D motion text boxes that automatically scale font size to fit the area. In situations such as a sports event or election, text can be constantly updated while retaining the animation effect of the template. It's also possible to save numerous macro commands that can be recalled in a single keystroke. This and many other shortcuts are incorporated into an optional "Fast Action Keyboard."

To make graphics appear more integrated with the content, Avid Deko 3000 provides a Motion Behavior feature with a predesigned ability to make text and graphic elements interact with each other. For example, a graphic object, such as a soccer ball, can move across the screen, pushing text letters out of its way as it moves. Additional preset interactive behaviors include repel, attract, grow, shrink, skew, dim and brighten.

Another major timesaving feature is the Deko 3000's ability to interface with Adobe Photoshop files. Deko 3000 is able to access individual Photoshop layers and display them simultaneously. The advantage here is that one or more elements of a complex graphic can be changed and the complete composition will be instantly updated.

The ability to blend Deko 3000 into an active and varied work environment is a major goal of Avid. To this end, Deko 3000 is able to import QuickTime files to an SD or HD database and export rendered QuickTime movies for networked file sharing. Any complex graphics created on the Deko 3000 can be easily rendered and output as a video file or Targa series.

Deko graphics can be created not just for playback on Deko systems, but also for sharing a consistent design with other departments and Avid broadcast products, such as NewsCutter and MediaComposer editors and iNEWS. Journalists can open Deko templates, insert new text and images to support an active story and link directly to the script.

Of course, the advantage of the hybrid version of Deko 3000 is the ability to output either SD or HD at full frame rate in real time from a single system.

Upper level Deko models are offered as turnkey systems. The Deko 3000 Hybrid comes in a rack-mountable case with dual 3.0 GHz Intel Xeon processors running Windows XP Professional. It has 2 GB of RAM and internal storage of 200 GB or more. It also comes with a DVD burner and Ethernet connection. The supported HD standards are 1080i/60, 59.94 or 50 fps, and 720p/60 or 59.94 fps. SD is NTSC or PAL in both 4:3 and 16:9 aspect ratios. The downstream keyer provides 10-bit video and key resolution in HD and 8-bit in SD.

The Avid Deko SD/HD 3000 graphics system

FAST FACTS

Application
Live-to-air graphics with 3D capability in SD and HD

Key Features
Importation of 3D models, quick reformatting of graphics in different resolution or aspect ratio, automatic text font scaling

Price
$54,900

Contact
Avid Technology Inc.
800-949-2843
www.avid.com

IN USE

I had the chance to examine the Avid Deko 3000/Hybrid system in a simulated broadcast environment at the Avid Technology headquarters.

The first thing that struck me was

AVID, PAGE 71

MASTER CLOCK AND REFERENCE SYSTEM

Evertz 5600MSC Time and Sync Generator

by Ken James

What a treat it is to be given an opportunity to play with such a feature- packed device as the Evertz 5600MSC master clock and sync system! The clock/sync system is critical to a broadcast operation, as it sits at the top of the facility food chain, supplying reference signals for the whole plant. The 5600MSC provides everything that any facility could possibly ever need.

The 1 RU package provides more than multiple individually phased analog color black outputs. Also included are bilevel and tri-level signals supporting all of today's video and audio broadcast requirements, both analog and digital, plus several intrafacility pulse rates including 23.98 Hz, 24 fs, 25 Hz and 47.95 Hz.

The Evertz 5600MSC master time reference and sync pulse generator

FEATURES

The basic system includes:

- Six independently timeable bi-level or tri-level reference outputs
- Two independent LTC timecode outputs
- a 5 MHz/10 MHz frequency reference input
- a 10 MHz frequency reference output
- Two factory presets and three user presets
- VITC reader on reference input

Avaliable options include:

- Dual power supplies
- Modem for time reference dial up
- Analog TSG including DARS and analog audio tone outputs
- SD SDI test generator
- HD SDI test generator
- GPS antenna and reference lock
- Network time protocol server

The people at Evertz have packed and incredible mount of features into a single rack unit of space with the 5600MSC. Functionality includes 16 channels of embedded audio on the SDI outputs, each with individual frequency and level settings, along with both VITC and LTC configurable outputs and an integrated Network Time Protocol server.

The system can be configured with several levels of redundancy. Internal to the 5600MSC I reviewed are dual auto ranging power supplies, with independent AC line cords. In the event of a complete power failure, an internal battery keeps the system clock going. A fully redundant system can be configured by using two 5600MSC master units and a changeover switch. Communication and synchronization between the two devices is accomplished with a serial cable.

Lastly, three system configuration presets plus two factory default modes enable quick setup and recall of operational modes.

IN USE

The front panel interface consists of a green 16-digit alphanumeric display, a few small status LEDS, surrounding pushbuttons and a shaft encoder. It was nice to see a few levels of user restrictions. A lock mode for the panel buttons and user-versus-engineering operational modes comprisemake up the system security. The panel lock mode allows viewing of the system status, while inhibiting configuration changes.

A simple two- button sequence is required to unlock the panel. The user-versus-engineering operational mode, when coupled with the VistaLINK PRO software application, enables a higher level of security. The PC-based application allows the engineer to configure a four-digit password securing user-versus-engineering mode changes from the panel. Additionally, individual user

EVERTZ, PAGE 75

HD CAPTIONING ENCODER / CG

Link HDE-3000 HD Caption Encoder/CG

by Joey Gill

Starting Jan. 1, 2006, the FCC required that most analog and digital broadcasts contain closed-captioning information. Although there are some exceptions, broadcasters are required to caption a large portion of their DTV broadcast.

In response to that need, Link Electronics has expanded its product line to include an HD closed-caption encoder. The company is no stranger to captioning and has provided professional CC products for many years.

Unlike analog captioning, which is encoded on line 21, DTV captioning is embedded into the data that is broadcast in the ATSC stream.

Most all equipment associated with digital broadcasting is microprocessor-based and units for encoding captioning into a data stream are certainly no exception. However, the Link Electronics encoder makes the user feel that they are using a piece of broadcast equipment instead of just a PC.

The Link Electronics HDE-3000 HD/SD closed-captioning encoder and character generator

FEATURES

The HDE-300 occupies two standard rack units and weighs 15 pounds. The front panel contains the power switch, a 3.5-inch floppy drive, a reset switch, two USB ports (future option), six status LEDs, and five function keys laid out in standard cursor format.

The rear of the unit reveals a cooling fan, AC input, com ports, an Ethernet port (RJ-45 100/T), VGA output, mouse and keyboard ports, time code input and video I/O connectors. There is plenty of room around them and all are adequately marked as to purpose.

The encoder accepts HD or SD video, with no external PC or software required. In addition, the unit provides a VGA output for previewing captions and has a built-in LTC timecode reader.

The HD-3000 has a 20 GB internal drive and is powered by an Intel Pentium III processor running the very stable Windows NT 4.0 with SP5. Link has employed common PCI backplane architecture and redundant power supplies. The unit can be networked using Dynamic Host Configuration Protocol techniques. There's even a modem option available.

The HD-3000 is packed full of operational features. It will allow you to select which Vertical Ancillary Data Area (VANC) lines to put the data packets onto and where to put the VANC markers, or, alternatively, the unit can select placement automatically. It can encode V-Chip data, transport stream identifier information and it can transcode Spanish between CC2 and CC3 as necessary. You can even check your CC for "safe title" compliance, if you purchase the CG option. The HDE-3000 really has too many features to list in this review!

IN USE

The HDE-3000 can be operated in three ways: (1) via the front panel, (2) by using an attached keyboard, or (3) with a remotely located PC on your network. In my opinion, the keyboard provides the easiest operation. The main menu is simple and straightforward, but is only viewed via the VGA port on the back of the unit, or by using the remote PC operation method. There is no direct user display on the unit.

Like most equipment powered by computer processors, there are "log-in" and "password" screens, but these are simple and painless. The instruction manual is very clear and easy to follow in this and other areas. Most of the captioning duties performed by the HD-3000 are considered "jobs" by the software, and the jobs can be loaded from a floppy or can reside on a shared folder on your network. Once you load the jobs, they can be stored for future use either on another floppy, the hard drive, or on a network drive.

Because most programming aired by broadcasters already has the closed-captioning information encoded on it, a broadcaster may never need to create a job for the HDE-3000. For instance, to create captioning for a live newscast, an RS-232 data feed from some type of prompting software would be inserted into the encoder's com 1 or com 2 ports. This application would require very little setup and would be almost automatic.

Another task that the HDE-3000 could perform without creating a job would be to encode 608 data recovered from an analog network feed onto a simulcast HD network feed that had no closed captioning. I work at an NBC affiliate and was surprised to discover that NBC provides no CEA-708 content in affiliate HD feeds. We had to acquire a product to do this and the one supplied by our contracted vendor was complex and difficult to set up.

In the case of the Link HDE-3000 unit, all you need is an additional product (decoder) to recover the 608 data and provide that data to one of the HDE-3000 com ports. The Link's PDR-885 (analog) or 895 (analog or SDI) caption decoders, or similar products, would make this decode/encode process very simple. This application would be almost automatic as well.

As most captioning is generated in post-production facilities, that is where more of the advanced features of the HDE-3000 would be utilized. For example, selecting which lines to put the VANC packets, VANC markers, moving the Spanish closed captions between descriptors, as well as the using the character generator function.

FAST FACTS

Application
HD-SDI closed caption encoder

Key Features
Supports multiple video formats, ease of operation, scalability

Price
$9,750 as tested

Contact
Link Electronics, Inc.
573-334-4433
www.linkelectronics.com

After captioning is built using additional software, it would then be saved as jobs containing additional commands that were added using the HDE-3000. The encoder would then run them as directed. For this test, however, I had no access to advanced closed captioning creation software.

To create a test environment, I mounted the 3000 in an equipment rack and connected the power cord, a VGA monitor, an SDI video feed (without closed captioning present), SDI video output, keyboard, mouse, LTC timecode and a DB-9 connector with RS-232 closed-caption data present and running.

I turned on the rear-mounted power switch, and powered up the HDE-3000 using the front panel power switch. After the machine booted, I pressed the "enter" switch on the front panel (a prompt is printed near the switch to do so). The HDE-3000 application self-started and the "run" menu came up on the VGA monitor.

There are four windows displayed on the VGA monitor. The upper left is a menu window, the upper right window displays any 608 Captions, the lower right displays any 708 captions, and the lower left displays "service descriptors."

At this point I could see no caption information in the 608 window. However, the "data in" light was flashing on the front of the unit indicating data present.

It was at this time I read the manual and discovered how to navigate the menus. I found the setup menu for the com ports, and I proceeded to check baud rates, and bit structure, but was unsuccessful in seeing any 608 captioning.

I decided to call the Link factory for help. A real person answered the phone, and I was directed to expert factory personnel in a matter of seconds. The help desk person was very pleasant and was most knowledgeable about the product.

He suggested I double-check the baud rate, bit structure, and just to be sure, restart my prompting software *after* connecting the data input to the HDE-3000. Our news prompting software is manufactured by Autoscript, and in addition to studio prompting, the application also provides closed-caption data to be used by encoders. I went to the studio and restarted the prompting task.

When I returned to the HDE-3000, it was displaying the 608 CC data not only in the "608 window" of the VGA monitor, but also on the SDI monitor I'd connected to the HDE-3000 video output. This task started automatically—something I really like.

The next step in the test process was to encode 708 closed caption information onto an HD feed. For this purpose, I connected a SMPTE 292 HD video directly from our NBC affiliate feed to the HDE-3000 video input (SDI and HD share the same BNC I/O connectors). I also connected up an HD monitor. As with the SD test, I fed the encoder with closed-captioning data from our prompting software. As soon as I connected the HD input, the HDE-3000 started encoding the stream with CEA-708 captioning. It was truly that easy!

In both tests, the captions generated were crisp and clear. They were easy to read, properly located, and well within safe title areas.

SUMMARY

The Link HDE-3000 feature set is extremely large. Closed captioning can be very difficult to manage, and I suspect even more so in post production. Tools such as the HDE-3000 can help make the process easier to manage and understand.

Link maintains its longstanding reputation as a quality professional audio/video equipment provider with this product. In addition, Link's 10-year product warranty shows how confident they are in them.

This unit appears to be a keeper! ■

Joey Gill is chief engineer at television station WPSD-TV in Paducah, Ky. He has been with the station for 25 years and has worked in broadcasting since 1977. He may be contacted at respond2jgill@yahoo. com.

SIGNAL PROCESSING SYSTEM

Ensemble Designs Avenue Signal System

by Michael Hanish

Avenue is a signal processing and facility integration system from Ensemble Designs, available in either one or three rack unit frames, which can be populated with any of a wide variety of modules. Not only is the Avenue system an industrial strength problem solver and space saver for broadcast facilities of all types, but it is a budget saver as well.

The 3 RU Ensemble Avenue card tray, shown with the optional LCD touchscreen display

FEATURES

The 1 RU Avenue holds up to three modules; the 3 RU can hold up to 10 modules. It is configuration heaven and option city, designed to be extensible and interoperable. Networking is built in, meaning multiple racks can be tied together for easier configuration and control; remote control and operation are possible through serial, Ethernet or AveNet (Avenue's proprietary LAN networking protocols) for all rack units with a system control module installed. Local control is always possible through each module's front panel or through an optional touchscreen panel on 3 RU frames.

The 3 RU frame (the basis for this review) comes with a power supply and a slot for a second redundant power supply module. The beauty of this Avenue system is the wide range of modules that can be chosen and installed as needed. There are video conversion and synchronization modules; SD and HD digital-to-analog and analog-to-digital converters; aspect ratio converters; up/down converters; TBC and frame syncs; distribution amps (analog, digital, SD and HD); electrical to optical (and vice versa) converters; sync pulse and test signal generators of many varieties; protection switch modules; audio conversion; audio distribution and tracking/delay modules (including Dolby E); proc amp and noise reduction modules; 8 x 1 video routers; logo inserters; and GPI/serial interface modules.

The Avenue system is solidly engineered. By way of illustration, our test frame for this review came populated with five modules (in addition to the system control module necessary for remote operation, about which more below): digital reclocking d.a., dual sync generator and test signal generator, serial digital protection switch, analog to SDI video converter with proc amp and TBC and eight channel audio processor.

The reclocking d.a. has eight reclocked, jitter-reduced, equalized and EDH error-corrected SDI outputs and a composite monitor output, with user definable alarms. The sync generator/TSG features more than 30 test signals, digital and analog outputs, HD tri-level sync output and the ability to output 525 and 625 standards simultaneously.

The protection switch monitors a primary input (SDI) for TRS, black, EDH checksums, or silence, and when a fault is detected it switches the secondary input to the output. The switch can operate in automatic mode (the unit switches back to the primary input once it has been restored) or non-resetting mode (the unit stays switched to the secondary input until it is manually reset).

The analog-to-SDI module is a very flexible unit, featuring 12-bit composite, component, and S-Video analog inputs and an SDI input, 4x oversampling, automatic 525/625 switching, simultaneous SDI and analog composite outputs fully timed to house reference. The proc amp section of this unit has the standard video and chroma gain, hue rotation, black balance and pedestal adjustments; in addition, it features a detail enhancer to compensate for the effects of poor frequency response upstream.

The proc also has a sharpness filter, a predictive composite clipper (which limits illegal analog color saturation and luminance levels), and a split screen mode. The eight channel audio processor, which functions as a submodule for the analog-to-SDI module above, is a full-featured 8-channel mixer, SDI disembedder / embedder, and delay unit. It features 24-bit processing and the ability to re-map channels, adds up to 12 dB of gain, and can invert the phase of a selected channel.

IN USE

I was able to put the Avenue

ENSEMBLE, PAGE 80

FAST FACTS

Application
Professional reference signal generation, as well as video/audio signal conversion, processing and distribution

Key Features
On-card, front panel or PC control accessibility and a wide variety of modules for specialized applications

Price
1 RU frame $695; 3 RU frame $1,400; touchscreen feature $1,200; system control module $700; redundant p.s. $449; digital reclocking d.a. $545; dual sync and test generator $2,800; SD protection switch $1,200; A/D video converter with proc amp and TBC $3,200; audio proc $1,800

Contact
Ensemble Designs
530-478-1830
www.ensembledesigns.com

Avid

CONTINUED FROM PAGE 66

the speed with which one can go from graphics creation to on-air play-out. This is made possible by a set of streamlining features. Templates or graphics previously created offline can quickly be modified for a new purpose.

For example, we took an animated lower-third graphic containing numerous objects, text windows and layers. Using the auto scaling, we typed in new text content and the font size instantly adjusted to the space available. All of the 3D motion was retained.

Avid Deko 3000 provides just about every 3D motion you can imagine, but I found one of the more subtle ones to be most intriguing. This is called Motion Behavior and it allows different objects and text elements to respond to each other. The effect is not only visually appealing, but enhances communication by drawing attention to certain words. It also allows one to present information over time as opposed to single image delivery.

We tested many of the features described above. In one instance, there was a multi-layered graphic consisting of text inside a semi-transparent 3D logo that curled onto the screen settling in the lower third. Other parts of the screen had sports identification text and objects and in the corner was a small logo.

We decided that we wanted to change only the logo so that the graphic could be instantly played to air for a different purpose. Obviously, in an on-air situation, there is no time to create a new graphic. However, with Deko 3000 we were able to simply go to Photoshop and change that particular layer. The new graphic was instantly updated in Deko 3000 and ready for air.

Deko instantly updated the finished graphic because it is able to work with individual Photoshop layers instead of composited files. The result is that you have the ability to work from any previously created graphic and quickly reconfigure it for a different purpose.

In another instance, we decided to take a complex graphic created for HD in 16:9 and make a 4:3 SD version in a different language. Using the Multi-Compose feature with simple drag and drop placement and formatting, we created an alternate version of the graphic in just a few minutes.

This type of speed and flexibility is the hallmark of the Deko series. Text can be linked to a database and updated instantly. Graphic objects can be quickly changed. Sequential actions can be saved as macros. Predesigned motion behaviors and templates can be integrated into any graphic design. And graphics can be created off-line and networked to the on-line system where they can be further modified or sent to air.

SUMMARY

The Avid Deko 3000 is designed from the ground up to provide lively and attractive 3D motion graphics with maximum speed and ease of use. Every feature has been designed to simplify the life of the person who must constantly update graphics and get them out in a live-to-air situation. Needless to say, if one can create elaborate motion graphics under extreme time pressure, they can achieve greater artistry, given the luxury of time.

By taking advantage of the full-featured Avid PostDeko for creating graphics off-line and networking with the online systems, users can create a workflow that maximizes creativity and speed. Avid has taken Pinnacle's product that was many years in the making and refined it further to maximize system integration. The result is a superbly creative toolsets with rocket speed performance that meets the demands of live broadcast. ■

Geoff Poister, Ph.D., is a member of the Film and Television faculty at Boston University and a regular contributor to ***TV Technology****. He may be contacted at* poister@bu.edu.

PRODUCTS & SERVICES SHOWCASE

PRODUCTS & SERVICES SHOWCASE

VIDEO CAPTURE AND PLAYBACK

Blackmagic DeckLink Multibridge Extreme

by Stephen Murphy

Last year I reviewed Blackmagic Design's DeckLink HD Pro PCI card for **TV Technology**. For a month and a half I put the card through its paces using a variety of software applications. Whether working on hi-res graphics in Adobe PhotoShop, editing and outputting SD and HD video in Adobe Premiere and Sony Vegas, or playing back video from Steinberg Nuendo during audio post, the DeckLink card functioned flawlessly.

Not one to rest on its laurels, Blackmagic Design maintained its place as one of the leading manufacturers (if not *the* leader) of reasonably priced, high-quality computer video solutions with the introduction of the DeckLink Multibridge Extreme.

FEATURES

Like Blackmagic Design's popular DeckLink series of internal cards, the Multibridge Extreme is a high-quality video capture and playback solution compatible with Mac- and PC-based computers. In addition to its ability to capture and play back uncompressed video when used with a workstation, the Multibridge Extreme also can operate as a standalone dual-rate HD/SD SDI bi-directional 14-bit analog/digital converter.

FAST FACTS

Application
High-quality capture and playback system

Key Features
Single rack space dual-rate HD/SD-SDI bi-directional 14-bit analog/digital converter; Mac/PC SD/HD capture and playback via PCIe interface; analog component and composite I/O

Price
$2,595

Contact
Blackmagic Design
408-965-0500
www.blackmagic-design.com

The Blackmagic DeckLink Multibridge Extreme unit

The rear panel of the single-space rack-mount chassis contains all of the video and audio input and output connections (no breakout cables!). For analog video, eight BNC connectors provide separate and simultaneous NTSC/PAL composite and component I/O. The composite input also doubles as the sync reference input. Four BNC connectors provide two channels of SDI input and output, allowing for support of SD and HD SDI 4:2:2 (YUV) and 4:4:4 (RGB) video plus 8- to 12-channel SD/HD embedded audio capture and playback.

A DVI-D dual-link connector plus two analog audio outputs on RCA connectors provides a dedicated monitoring output for connecting to an LCD display (capable of pixel-for-pixel 2K film resolution on LCD monitors up to 30 inches), and an audio monitoring system. An included DVI-D male-to-HDMI female adaptor lets you connect the video monitor output to HDMI-equipped displays.

In addition to the aforementioned RCA audio outputs, a pair of XLR-M and XLR-F connectors provides two channels of balanced analog audio I/O. A DB-25 connector is used for eight channels of digital audio I/O (four stereo pairs of AES/EBU). The DB-25 connector can be connected directly to similarly equipped professional multitrack audio recorders, or an optional breakout cable can be used to access the four AES stereo pairs on the more common XLR connectors. Mac Core Audio and PC ASIO drivers are provided for integration with popular pro-audio workstations. The audio converters use the 48-kHz/24-bit broadcast standard.

Other connectors include a direction-reversible (via software) 9-pin RS-422 serial port for device control, and a USB 2.0 port for configuring the hardware via the included Mac and PC graphical-based software applications.

The Multibridge supports PAL and NTSC SD formats and 720p through 1080i and 1080p HD formats.

When used with a workstation, Multibridge SDI metadata support includes VITC read for 3:2 pulldown removal and VANC capture/playback.

IN USE

The Multibridge Extreme box connects to a workstation computer's PCI Express slot via an included 2 meter cable and PCIe adapter card. The diminutive adapter card (literally 1.5-by-3 inches) must be installed in a four-lane-capable (minimum) PCIe slot, and a very fast disk array is required to get the maximum capture/playback performance from the Multibridge.

For this review I used the Multibridge with a quad-AMD processor-equipped PC running Windows XP Professional. A four-disk SATA RAID of Western Digital 10K-RPM Raptors proved adequate for uncompressed HD work, though a fibre channel array most likely would have been merrier.

Time to ante up! By the way, Blackmagic includes an excellent disk speed test utility for assessing the real-world speed of your disk system for video use (it even displays results in video frames per second).

Installing the driver and software applications was a simple affair. Like the DeckLink HD card previously reviewed, once everything was installed, I experienced no compatibility issues and the Multibridge performed reliably and without issue throughout the review process.

The 1 RU hardware box comes with detachable/reversible rack ears so it can be mounted with the connectors to the rear or front of the rack—a thoughtful touch. I also appreciated that Blackmagic provided separate composite and component outputs, as opposed to the increasingly common (and annoying) practice by equipment manufacturers of "stealing" one of the component connectors for composite use.

With separate component and composite connectors, plus its wealth of additional A/V connections, I was able to leave the Multibridge hooked permanently to my monitors, decks and patch bays. Very rarely did I have to go to the back of the rack and reconfigure inputs or outputs (the exception was the sync input, which shares the composite video input).

Using a variety of sources including Beta and DigiBeta decks, plus another HD workstation equipped with a

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Evertz

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mode functions can be hidden from panel access, eliminating any chance of unwanted changes.

The array of options was found to be a bit overwhelming when trying to quickly and easily view the configuration of my machine. Some of my confusion stemmed from the fact that there are different names for similar functionalities. By using the serial port download function, I was able to view the machine's option content.

Options were listed as SDI, ATG, HDTG, Dual Power Supply and NTP. These translated as:

- NTSC/PAL test signal generator
- Audio tone generator (analog)
- DARS generator (balanced & unbalanced)
- AES generator (balanced & unbalanced)
- SDI test generator with two SDI test signals and two SDI black outputs
- HD SDI test generator with two HD SDI test signals and two HDSDI black outputs
- Redundant power supply
- Network Time Protocol
- GPS (including GPS antenna and 50 feet of cable)

I found that the operations manual clearly explained the low-level details of the menu structure, but lacked a complete menu tree for quick high- level reference. The top-level menus consist of Input, Output, General, Status and Display. The readout changes, depending on where you were in the menu tree.

A bright display indicates the function is available and ready to select. A dimmed display indicates the function is not available or has been overridden. A blinking display indicates the function has been selected or a system jam is required.

A system jam indicates the internal oscillator is out of phase with the external reference. This might occur if the external reference becomes unlocked for a period of time. Green LED status indicators clearly showed PS1, PS2, Reference and Fault conditions.

Not too many years ago, in-depth testing of a master SPG involved measurement of signal rise times, blanking widths and internal oscillator frequencies. These tests are still important, but today's technology relegates them to an area of lesser concern. A quick glance at many of the signal parameters showed normal levels and widths. An exception was the infrequently used mixed/composite sync drive signal. I was expecting to see 2 V peak-to-peak, terminated into a 75-ohm load.

The manual show this is normal. When standard amplitude is required, an external d.a. with 2x gain is needed.

The selection of drive signals and frame rates was almost overwhelming. I was hard pressed to find anything needed in today's television environment missing. H and V drive pulses, and digital audio references at other than 48 KHz were the only absent signals.

The reference input is differential, providing common mode rejection—often ignored in modern equipment.

The GPS input consists of multiconductor cable and a small Trimble Accutime 2000 antenna. The cable can be extended to 1,000 feet if required. On activation, the configuration selection of GPS input reference displayed "GPS Searching" status. Shortly, the 5600MSC acquired reference lock and displayed signal strength of 25 with three satellites found and it worked great.

After trying to set my local time UTC offset I realized the primary clock display is fixed at UTC time. The timecode outputs have user-settable offsets for local time. An LTC configurable provides power down the line for Evertz external clocks, and also provides configurations for other vendor's clocks.

There is an optional dial-up modem interface and a 10 MHz reference input, but these were not tested.

Six video drive signals are provided via BNC connectors. Each output has individually adjustable H and V timing, as well as format selectable bilevel or trilevel drive signals. Frame rates are selected as part of a group and can support all broadcast standards and many intrafacility requirements. When color black is being supplied, a VITC data stream can be inserted on a user-selected line. Additionally, the user bits on LTC and VITC are user programmable.

I was impressed with the extensive array of test signals provided for both analog and digital applications. Video signals are available in analog composite NTSC and PAL, SDI 525/625 and HD at several rates. There is the pathological pink panther signal and a lip-sync blip included along with a user-settable text string. SDI signals additionally include 16 channels of embedded audio. Audio test signals include a DARS reference along with analog audio outputs.

FAST FACTS

Application

Television facility master reference sync and clock generator

Key Features

Supports of both analog and digital systems, bi- and tri-level outputs and audio support

Price

Base unit is $6,000; as configured for this review, $14,999

Contact

Evertz Microsystems Ltd.
877-995-3700
www.evertz.com

I used one of the GPI outputs to indicate a fault condition of fan failure, power supply, system fault and missing reference. In addition to the GPI, both serial and Ethernet interfaces are available. The serial connection offered a "status" dump mode that enabled my PC to ingest the configuration files. Firmware upgrades appear straightforward using the serial interface and ".bin" files that I assume are downloaded from the Evertz Web site.

The Ethernet interface allowed VistaLINK PRO application interface and supplied the NTP server connection. Setting up the NTP server involved a few simple configuration parameters. First is the system IP address, then up to eight exclusions are used to inhibit connections from specific addresses. I used the NTPT server to lock my PC clock. After a few minutes a message appeared on the PC "NTP State: Synched and Locked within 1.124496 seconds (approximately)."

VistaLINK PRO configuration screens allowed me to make password changes needed to effect an operational change between USER and ENGR modes.

At power-on, the system boot-up duration for full operation was less than 15 seconds. I did notice during the last four or five seconds of boot up, the analog test signal output was not muted and showed trash until it properly locked to the selected pattern.

The weakest links in the 5600MSC are cooling fans. It has two internal fans moving air from side-to-side. I suggest keeping the wire mesh screens clean and using one of the programmable GPI outputs to indicate fan failure.

SUMMARY

After several days of using the device, I was hard pressed to come up with a few suggestions to make it better. These include a simple power cord retention device, some method to quickly indicate the option content, a complete menu tree in the manual and some sort of SNMP proactive reporting mechanism.

The flexibility and extensive functionality of the 5600 MSC make it the fullest featured master clock/SPG system I have used. I would personally recommend the 5600MCS to anyone looking for a full- featured clock/SPG. ■

Ken James is a video engineer with more than 30 years experience. He spent most of his career in Grass Valley, Calif. before retiring to Montana. He remains active in video technology. He may be contacted at kenjames@blackfoot.net.

SOFTWARE KEYER

Primatte Keyer Version 3.0

by Michael Hanish

It used to be that hardware keying was far and away the best looking and most flexible. As computers have gotten more powerful, software has advanced and now software keying rivals effects only achievable before with hardware devices.

The newest version of Primatte Keyer 3 from Red Giant Software boasts significant advances over previous versions: more and better tools for DV and HDV sources, increased speed, higher quality and improvements in spill, color matching and composite controls.

FAST FACTS

Application
editing accessory

Key Features
very large tool set

Price
MSRP $695; upgrade $149

Contact
Red Giant Software
260-625-5343
www.redgiantsoftware.com

FEATURES

Primatte works as a plug-in with numerous editing and compositing applications. The version reviewed here is for After Effects only (versions 6.0 and later, Macintosh or Windows).

Primatte is applied as an effect to a layer in After Effects; the interface and controls appear as a single effect tab in the Effect Controls palette. There are four main components in the interface and four major stages in pulling a good clean key with Primatte: de-artifacting, keying, alpha controls and composite controls. The de-artifacting controls, a major new feature, are invaluable for removing compression artifacts, blockiness and other digital debris from DV and HDV sources. There are two parameters: a mode pop-up, for selecting the type of source footage (none, DV/HDV, HDCAM, or other) and a strength slider to set the amount of image correction. De-artifacting is usually done before pulling the key, but can be applied at any stage in the process.

The Primatte Keyer Version 3.0 GUI

The keying controls are largely unchanged from previous versions. These controls are used to select and clean the background and foreground areas of the matte, and then perform fine-tuning on problem areas. They are pretty much the heart of the process and the main factor in achieving a successful composite in a reasonable amount of time. The user samples either background or foreground areas, avoiding transitional areas where the two will be blended, until the matte is fairly clean. Sampling can be done either on a pixel-by-pixel basis or by selecting with a rectangle tool. Fine-tuning controls allow correction of problem areas by adjusting spill, transparency and detail. Spill takes a sampled foreground color and adjusts the amount of background color present in that sample. Transparency adjusts the opacity of the

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Blackmagic

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DeckLink HD Pro interface, I performed numerous up/down format conversions with the Multibridge in standalone operation. With a laptop connected to the USB port on the Multibridge, I was able to navigate through the various routing and format options via the graphic interface.

The interface seemed fairly complicated at first, but once I dug in and got started, it turned out to be one of the most intuitive and logical control applications I have used. In all test cases, the Multibridge performed the real-time (including simultaneous bi-directional!) conversions perfectly, though I was a bit disappointed to learn that the unit will not up-convert SD to HD. It will, however cross-convert among the various HD formats.

In addition to using the Multibridge to perform standalone format and standards conversion, I captured, edited and outputted SD and HD video and graphics using a variety of PC software applications including Adobe Premiere Pro and Photoshop, Sony Vegas and Steinberg Nuendo. Like the DeckLink HD Pro card, the Multibridge integrated and operated seamlessly across the applications with which it was used and throughout my existing workflow. As the Multibridge driver is open standard DirectShow- and Quicktime-based, it's unlikely that there is any pro software that can't take advantage of the Multibridge interface/converters.

The Multibridge Extreme software package now includes a free HD-capable two-camera live switching application called "On-Air." I was unable to test the application within my workflow because it is currently only available for Mac OS X systems, but it looks to be very cool.

SUMMARY

Having tested and reviewed two of its higher-end HD products and used its PCI cards for many years prior, I am convinced of one thing—Blackmagic Design is one of the most innovative and reliable professional video equipment manufacturers around. The DeckLink Multibridge Extreme bi-directional converter further reinforces my opinion of the company. Its thoughtful I/O implementation, switchable workstation/standalone use, and rock-solid driver and easy-to-use utility applications make this reasonably priced and highly flexible unit a best buy. ■

Stephen Murphy is an engineer at the National Press Club's Broadcast Operation Center in Washington, D.C., and a freelance video editor and audio engineer with more than 20 years of broadcast and production experience.

Primatte

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matte in sampled areas, such as the softness of foreground shadows. The detail control restores fine foreground detail, such as that in hair or smoke, which might otherwise be lost due to similarity to the background color. A new feature is the ability to keyframe the base color sample, which is the average of colors sampled during the "select background" stage of the process. The ability to keyframe this color value means that you can sample different color ranges throughout the clip you are working on and Primatte will interpolate between the base samples accordingly, adjusting all other color samples as well.

Alpha Controls is another new feature in this version. It allows adjusting the matte overall by manipulating gamma and alpha cleaner parameters. Gamma allows adjustments to the gamma curve of the matte using the histogram-based levels filter interface. Alpha Cleaner applies a separate cleanup pass, hopefully eliminating the need for a separate touch-up in problem areas. It removes specks (white noise in black areas), plugs holes (black noise in white areas) and can perform both functions in the same pass.

The composite controls are also a new feature of this version. They provide color correction functionality for the filter set and include Spill Killer, Color Matcher and Light Wrap. Spill Killer acts as another spill removal filter pass, independent of the spill suppression functions mentioned above. This one is especially good for semi-transparent areas that would otherwise be quite difficult. Color Matcher does its best (results are usually very, very good) to match the foreground colors by adjusting the tonal exposure of the foreground. Light Wrap adds a soft light to the foreground edges, with the intent of making it appear that light is being reflected from the background environment.

IN USE

As the capabilities of the software become more advanced, the interface tends to get more streamlined and easier to navigate. That is if its developers are clever. The developers of Primatte Keyer are quite clever.

Using Primatte inside After Effects is really quite simple, and about as far away from the tedious, multi-stepped work that pulling a key used to be. The results are nothing short of excellent. I had no need to export footage to an external program for further adjustment or processing, and I can foresee very few instances where that would be necessary, given the toolset available in Primatte.

Rendering is fast and the quality is excellent. Previews are fast and accurate, which makes tweaking and touch-ups go much faster. Primatte Keyer renders with 16-bit accuracy, if the host program supports this, which After Effects Professional version does.

At that level of quality, Primatte's output is suitable for all formats, including HD and 2K and 4K film, with Cineon DPX support. Primatte also ships with a render-only version that can be installed on multiple machines for network render farms.

SUMMARY

For those relatively new to pulling mattes and keying, Primatte Keyer makes the job easy and as automatic as possible. The interface design makes the workflow very clear and easy to follow and gives maximum efficiency.

All controls are at the same level of the interface, so there is no burrowing to tweak parameters. The manual is an excellent reference for both Primatte Keyer and the whole process of keying for compositing. This new version of Primatte Keyer is not only excellent in quality and ease and efficiency of use, but also an excellent value for the money. ■

Michael Hanish runs Free Lunch, a video/audio/multimedia production house near Guilford, Vt. He may be contacted at mhanish@sover.net.

Volicon

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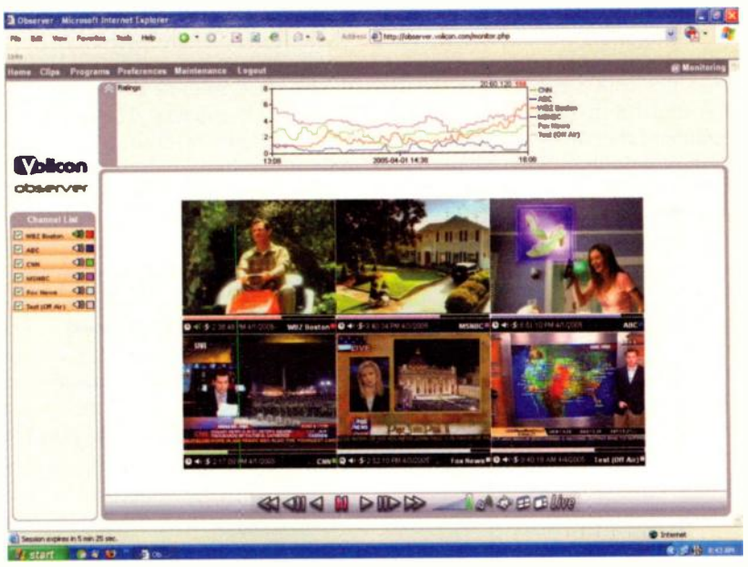
spend the day watching the monitor windows. It's the advanced search and clip filing capabilities that really make the Observer useful.

Selecting the "Search" tab brings up a window for entry of any word or phrase. When this is done, Observer will scan the closed-caption text for that entry in any or all channels. I typed in "Madonna," and instantly retrieved 26 clips from the last five days on the four stations I'm monitoring.

Each clip was displayed with a thumbnail frame, a brief description, the date and station on which it aired.

The resulting clips were each a minute long, although you can select the desired clip length and place a limit on the number of clips that are displayed. Clicking on the clip description allows you to view the clip with a basic log of the closed-caption text, both of which can quickly be downloaded. I downloaded a one minute video clip, which was saved as a 3 MB Windows Media file in about 20 seconds.

To assist with sharing files and information, clips can be referenced in a central bulletin board accessed under the "Clips" tab. Here, for example, you could store news items related to a given topic. Other users can access this menu from any computer and view or download the clips. The clips are actually pointers to the media on the server, so you can list as many as you want without taking up additional storage space. You can even press a button to e-mail the link to a client who may wish to know when a name or topic was mentioned.



Volicon user screen display

The Observer makes it easy to select programs or advertisements to record by tapping into the TV station's program log. The Observer allows you to import a station's electronic program guide, as-run log, or custom company data. After importing the program log, you can click on the "Program" tab and see a detailed report of everything that is broadcast. Clicking on a specific program brings up the clip, which can be downloaded or sent to the Clips window for other users to access.

And for television stations concerned with their ratings competition, Observer can display ratings information for all stations selected. The ratings are displayed as a graph showing how ratings compare at any point in time.

SUMMARY

After testing Volicon Observer, I can't imagine why any station or network would not want to have one. First of all, it is a very efficient method of archiving programming around the clock that eliminates tapes and vastly improves access capabilities.

But it is the monitoring, search and management functionality that make this an incredibly powerful asset for a wide range of users including PR firms, ad agencies, content providers and media research groups.

There are hundreds of applications made possible by the ability to search unlimited television streams worldwide for any topic, brand, name or phrase. And the ease of clip management and transfer combine to make this an extraordinary tool with a universe of applications. ■

Geoff Poister, Ph.D., is a member of the Film and Television faculty at Boston University and a regular contributor to ***TV Technology****. He may be contacted at* poister@bu.edu.

VIDEO SERVER / CLIP PLAYER

BUF Technology Sport Replay System

by Michael Hanish

Size, as they say, matters. In the case of formerly large, rack-sized appliances such as replay systems or video servers, it is quite significant when a *small* standard-definition instant replay system/video server lands in the marketplace. Double the significance when the price is low and the performance specs are high.

FEATURES

BUF Technology's Sport Integrated Replay System comes in a small package (about an 8-inch-square footprint; the tapering control panel making the unit about 1.5 inches high in the front and 4 inches at the rear) and packs a large batch of functions. Sport in its basic configuration features analog inputs and outputs for standard definition video (BNC composite and 4-pin mini-DIN Y/C) and audio (+4 dBu balanced stereo) and a 40 GB hard drive (good for roughly three hours of 5:1 compression, about which more below). An optional 80 GB hard drive doubles the amount of SD video storage and there's also an option for SDI video in and out. Power required is 12 volts DC; this is supplied by a separate rear-connecting transformer. There is no off/on switch.

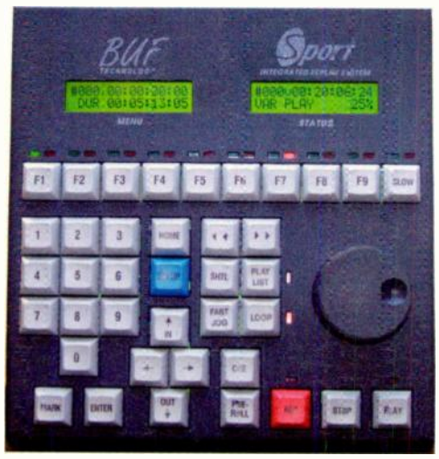
Front (really top panel) controls, as seen in the accompanying photograph, are the key to functionality. They include two high-contrast, two-line LCD control and status screens, a row of preset keys, number keys, function keys and a jog/shuttle dial. The left LCD display shows the menu and control choices; the right LCD display gives output status, including cue, timecode, and playback speed.

Compression is field-based Motion JPEG, with a variable compression ratio from 20:1 down to 4:1. The Sport unit ships with compression set at 5:1 (or 550 lines of horizontal resolution), a very good starting point, and one which provides quite excellent and artifact-free video, even when paused on a field. Internally, video is sampled at 13.5 MHz through an 8-bit ADC and maintained in a 4:2:2 Y/Cr/Cb format. Output is through a 10-bit DAC. Audio specs feature 20 Hz to 20 KHz frequency range, about 80 dB dynamic range and 0.022 percent THD.

IN USE

Controlling and using the Sport is quite straightforward and easy to learn, thanks to the simplicity of the front panel design. At the simplest level, one button records, one button cues and one button plays. The internal logic structure of the Sport allows for up to 1,000 cues, each with editable in and out points, and up to 10 play lists, each of which can have up to 100 cue points. Both cue points and play lists can be looped indefinitely.

The spring-loaded jog/shuttle dial provides instant access to any point in the clip. Slow motion can be assigned to any clip by either using one of the "F" keys to apply a preset speed to any cue, or by applying a custom speed to each with the dial. Cues can be assigned any of the top row of function keys for quick access, or they can be called up by their numbers.



The Buf Technology Sport Integrated Replay System

I used the Sport unit in a variety of sessions in my project studio and found it not only easy to set up and use, but also really useful in a number of unexpected ways. Setup and wiring connections were easy and self-explanatory; rear panel connections are clear and well marked. The unit can operate with or without an external reference signal.

Source selection (composite, Y/C, SDI) and input adjustments (SC-phase, H-phase, brightness, contrast, saturation, hue), among other things, are done from the setup menu. Other set-up items include scanning speed, preroll time, video standard, renumber or erase recordings, and slow-motion speeds.

I was initially curious about the various compression levels and image quality. At 5:1 quality, the images were excellent, vibrant, with no evidence of compression artifacts when compared to the original source. Even replays of pans, fine detail, zooms, and slow motions showed virtually no additional artifacts, making the Sport perfect for work requiring the highest fidelity and detail, broadcast, projection, even for HD post upresing. The 4:1 compression looked indistinguishable from 5:1. All slow motions are at full resolution and play at a full 30 frames, 60 fields per second. They look rock solid, even on freeze-frames.

It took only a very short time to learn the key sequences to capture, edit and assign cues on the fly. Thanks to a recent software update in response to user suggestions, newly recorded cues can be assigned to any playlist (rather than just the current one), making it much easier to sort clips and build custom sequences, such as highlight reels, on the fly.

One of the nice things about the Sport's software architecture is that you can't delete or record over cues in the heat of the moment or by accident; erasing is a feature of the set-up menu, invoked by a separate key sequence. Newly recorded cues are automatically given a unique identifying number.

SUMMARY

Bottom line number one: This unit is rock solid, high quality, very responsive, and built for speed. Replays start immediately upon the press of a button, which is vital, of course, for live work. I used the Sport to quickly make a video projection for a dance performance and timed to some heavily beat-oriented music. After ingesting the clips I planned to use, and making note of which numbers referred to which clips (all of which happened in real time), it was simply a matter of playing the soundtrack into my NLE as I cued and played clips from the Sport. Every cue, even the stutter-step quick, split beat cues, was right where I hit the cue, down to the tiniest shading of the beats. My job couldn't have been easier.

It is important to remember two other things about the Sport. It is *not* high definition, just great looking 720 x 486 (in NTSC-land) pixels worth of full-motion video. It is a single-channel server, not capable of playing out and recording at the same time as a dual channel system could. These are in no way faults or deficiencies, just economic facts of life.

Bottom line number two: The Sport is a bargain at its price point and worth serious consideration for a wide variety of applications, even beyond sport replays. ■

Michael Hanish runs Free Lunch, a video/audio/multimedia production house near Guilford, Vt. He may be contacted at mhanish@sover.net.

FAST FACTS

Application
Live sports instant replay/slo-mo, post production

Key Features
Easy operation and learning curve; standard 40 GB drive stores three hours of video; SDI in/out available

Price
$6,495 as reviewed; 80 GB drive option, $400; SDI I/O option, $1,495.

Contact
BUF Technology
858-451-1350
www.buftek.com

Ensemble

CONTINUED FROM PAGE 70

frame through its paces for an afternoon at the headend ingest suite of our local cable company. Quite happily, the selection of modules Ensemble sent for this review was almost exactly what was needed for this particular application, and we easily routed signals past the rackload of equipment that the Avenue frame replaced.

The satellite signal (SDI with embedded audio) went into the SDI input of the analog-to-SDI module described above. The submodule audio processor took care of resyncing to the video. House sync was easily and reliably replaced by the sync generator/TSG module.

All in all, we replaced 10 rack spaces of equipment with the modules contained in the single 3 RU Avenue frame. Cable runs were shorter and hook up greatly simplified; there was less "spaghetti" on the floor. Each module comes with a specific and very clear label template for back panel connections. Any questions we had about connections or control functions were quickly cleared up by consulting the manual.

Controlling the Avenue frame on site is a matter of either using the optional touchscreen door or remote PC control, via the Avenue PC application. Either approach provides an equal and total amount of control over each module in the system, and more control than the front panel of each module provides. Parameters can be adjusted from one or many locations, and secure access and lockouts are supported. Module menus, alarms, and controls can be combined and customized by creating "virtual modules."

The Avenue PC application runs on virtually any Windows OS, with the controlling PC or PCs connecting to the Avenue frames through serial port control or via Ethernet. Only one PC is needed for control (although, depending on the plant size and other variables in the installation, more access points might be handy) as all frames can be linked together. In addition, the Avenue PC application can be used to download and install new operating software into any of the modules, as well as to copy and paste module configurations between modules of the same kind. Sadly, the one thing we weren't sent for this review was the disk containing Avenue PC software. However, we happily used the installed touchscreen panel to put the modules under unified control.

SUMMARY

The beauty of this kind of system lies in its flexibility, customizability, and extensibility. Both the 1 and 3 RU frame configurations can be populated with the appropriate card sets for the user's particular application, connected into an intercommunicating network, and controlled from a central location and/or locally. Application situations can include television broadcasting, remote trucks, satellite or MPEG ingest, video servers, or distributed production and post-production environments.

These systems and components are most definitely not bargain-basement quality; they are very well engineered and solidly built to very high QC standards for long years of trouble-free operation. Ensemble Designs provides the opportunity to design exactly the kind of processing, routing, mixing, and/or control and test system you need for the present, easily modify it in the future without major renovations to the facility, and stay within a reasonable budget. ■

Michael Hanish runs Free Lunch, a video/audio/multimedia production house near Guilford, Vt. He may be contacted at mhanish@sover.net.

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NADY HM-10 HEADMIC

The HM-10 Mini head worn condenser microphone from Nady Systems Inc. is a new addition to the company's Headmic series. It is an omni-directional wide bandwidth electret condenser mic providing enhanced vocal pickup.

The unit is constructed with a durable thin-metal frame which is easily shaped to any user and has an ergonomic design to provide comfortable use for persons with or without eyeglasses.

The HM-10 can be supplied with a mini-XLR or a 3.5 mm phone plug for wired and wireless applications and fits most standard wireless bodypack transmitters. The microphone is available in black or beige.

For more information, contact Nady Systems Inc. at 510-652-2411 or visit *www.nady.com*.

Send new product press releases along with color photographs to:
Marketplace Editor, P.O. Box 1214,
Falls Church, VA 22041, USA

PANASONIC AJ-PCD20 P2 SOLID-STATE MEMORY DRIVE

The AJ-PCD20 from Panasonic Broadcast & Television Systems is a five slot P2 solid-state memory drive with both IEEE 1394b and USB 2.0 interfaces. The memory storage unit can transfer files at 25 Mbps with DCVPRO applications, 50 Mbps with DVCPRO50 and 100 Mbps with DVCPRO HD applications.

The AJ-PCD20 mounts five 8-GB P2 memory cards and provides instant access to all recorded content on any of the cards. The device can store 160 minutes of DVCPRO recordings, 80 minutes of DVCPRO50 recordings and 40 minutes of DVCPRO HD format recordings.

The unit is compatible with Windows 2000/XP and Mac OS X. It may be installed as an internal drive into a standard 5.25-inch PC drive bay enclosure or can be connected to a host computer through a LAN.

For more information, contact Panasonic Broadcast & Television Systems at 201-348-7000 or visit *www.panasonic.com/broadcast*.

JVC SR-DVM700US PLAYER/RECORDER

The SR-DVM700US ia a new player/recorder from JVC Professional Products Co. It replaces the company's SR-DVM70 and incorporates MiniDV, hard disk drive and DVD playback and recording capability in one package.

It provides a self-contained and efficient solution for archiving video and audio media and is designed for use in post-production, educationa institutions, corporate and government applications.

The 250 GB hard drive in the SR-DVM700US provides recording times of up to 18 hours when used in the DV mode, and up to 473 hours when used in the FR480 mode. The deck has built-in synchronized editing functionality, allowing content edited on the hard drive to be digitally transferred to disk via the DVD recorder.

Additional features of the SR-DVM700US include a BNC output connector, an RS-232C interface and designated dubbing point start.

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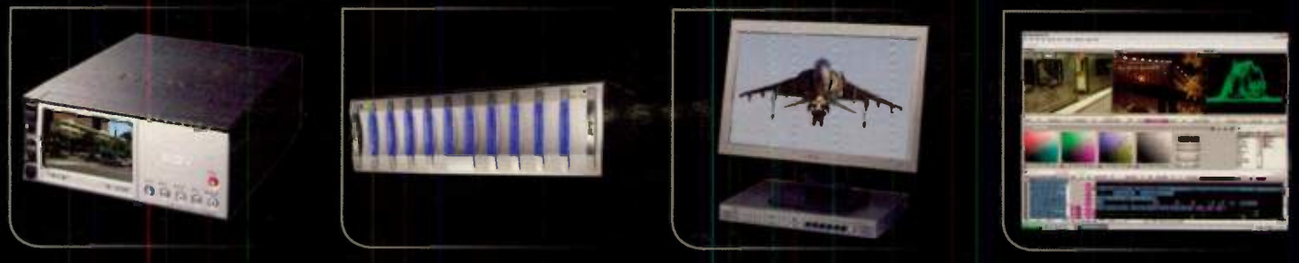

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Telemetrics Camera Control Panel

The CP-ITV3-D100 is the newest version of the Telemetrics Inc. CP-ITV robotic camera control panel and features three-axis control for faster and easier camera movement. The unit is designed for use with PTZ cameras from Canon, Elmo and Sony.

The panel will control up to four cameras and uses a proportional rate joystick for smooth and simultaneous control of pan, tilt and zoom functions. The joystick is newly designed with a rotating dial for zoom control, with the joystick itself providing X-Y axis control of the camera.

The CP-ITV3-D100 provides users with six memory presets for recalling frequently used combinations of camera pan, tilt, zoom and focus positions. The panel can be connected to other panels via an RS-232 port to provide control of camera functions from multiple locations.

For more information, contact Telemetrics Inc. at 201-848-9818 or visit *www.telemetricsinc.com*.

Wheatstone D-10 Digital Television Audio Console

The D-10 digital audio console from Wheatstone Corp. provides users with full scale digital peak and VU metering, along with a variable delay feature which is adjustable in either milliseconds or television frames.

The D-10 is engineered around mixing router-based technology and provides router source/destination selection functionality. It has motorized faders and can be ordered with a redundant power supply. Each input channel has pan/balance, blend, mode, eq/dynamics controls.

The console provides 5.1 surround sound and has three stereo masters. It provides eight stereo subgroup mixes and has eight mix-minus outputs.

The D-10 can be ordered with a redundant power supply and redundant failsafe DSP/CPU card options.

For more information, contact Wheatstone Corp. at 252-638-7000 or visit *www.wheatstone.com*.

Pulizzi Engineering Power Cables

Pulizzi Engineering Inc. is now providing a complete line of AC power cables and cable accessories in a variety of lengths and plug types. More than 30 versions are in stock, including NEMA 5-15P to IEC C19 and NEMA L6-20P to IED C19.

Standard configurations include 120 V, 208 V and 230 V cables, available in both 15 amp and 20 amp current handling capacities. Both straight and "twist-lock" blade types of connectors are available. Standard lengths start at 8-feet and range up to 15-feet. The multiplicity of connector types available allows a single power supply unit to be used anywhere in the world. The company can also provide unique plug types on special order.

In addition to power cord sets, Pulizzi provides C13 to C14 jumper cables in lengths ranging from 2-feet to 12-feet.

For more information, contact Pulizzi Engineering Inc. at 800-870-2248 or visit *www.pulizzi.com*.

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Want to Sell

1,109' guyed stainless G-7 tower, tower originally constructed in 1970 to hold top mounted UHF antenna as well as several solid reflector microwave antennas, tower is currently standing on a site near Farmville, NC, purchaser is responsible for disassembly of the tower and removal from the site, contractor to remove the tower must be approved by the site owner. Contact Wayne Estabrooks, 919-549-7265.

Clear-Com AP-22, $2000; Lexicon 1300S, $1150; Orban 516EC, $175; Otari PM-PAR, $1000; Presonus ACP 88, $700; Sony PCM R300, $349; Symetrix 421M, $329; Symetrix 302 dual micpre amp, $150; Videotek ADS-24, $175; Tascam DA-88, $1150; 360 Systems DIGICART II, $1200; Clear-Com ICS-92, $700; RTS MRT327, $215; GV AMX-100S, $300; GV AMX-170S, $300; Mackie 1604VLZ PRO, $550; Mackie CR-1604, $250; Ramsa WR-8616, $900; Sony DMX-E3000 w/DMBK-3000, $4500; Sony MXP-29, $760; Sony MXP-S390, $1500; Wheatstone SP-5, BO; Wheatstone TV-CONSOLE 600, $2000; Yamaha 02R digital mixer, $2199; Yamaha MC-802, $190; Yamaha PROMIX01, $590; Wohler MSH-8 8-chnl audio LED, $350; ADC 4-26845-0024 2x24 audio patch, $225; Kings KS4848000-75 48 pt video patch, $375. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

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Bittree & ADC Audio and Video Patch Panels from $250; 45RU racks from $400; Graham-Patten D/ESAM 230 audio mixer, $5900; Yamaha O1V 16-input digital mixer, call; Mackie 1604 VLZ used, $550; Mackie 24-4, make offer; Tascam M-2600 MK II 16-Channel Mixer, $1,500; Digidesign 888, $650; Sony PCM7040 DAT, $3,990; Panasonic SV-3800 DAT, $300; Wohler Amp 1-A, $325; Wohler AMP-1A-VTR, $550; Wohler AMP-1AP, $325; Wohler Amp-1APF, $325; Wohler MSH-8AL Audio Level Meter, $600; AKG C 414 B ULS Microphone, $950. 818-246-7100 or 212-564-9933 or www.tvprogear.com.

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Avid Adrenaline, $15500; Avid Symphony Version 3.5 on IBM Intellistation, $12500; Avid MC 9000 on Mac G4, $10500. 818-246-7100 or 212-564-9933 or www.tvprogear.com.

Sony VO-5850 3/4 U-matic editor, $850; Sony VA-500, $400; Sony DNW-A220 Betacam SX port, $12000; Sony BVW-70, $9850; Sony BVW-75, $7000; Sony PVW-2800, $6000; Sony UVW-1800, $4750; JVC BR-D85U D-9 editor, $2700. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

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Adtec MPEG2 Commercial Insertion Equipment, models: Adtec Duet & Adtec Soloist 2S, will accept working & non-working models. 800-829-5330 or craig@controlnetworkavails.com.

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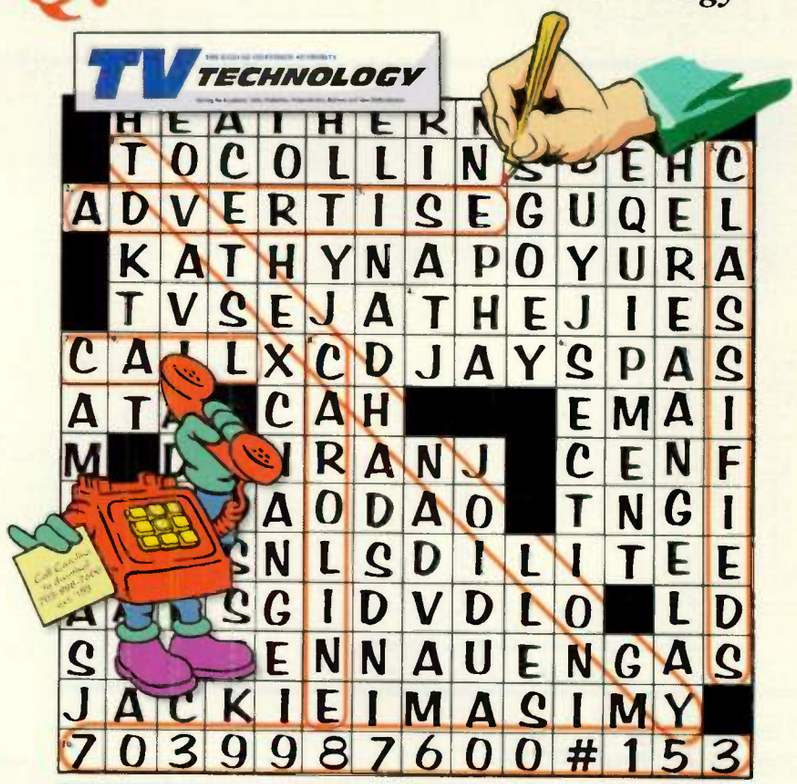

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BOB KENNEDY
+44-1279-861264
Fax: +44-1480-461550
bkennedy@imaspub.com

JAPAN:
EIJI YOSHIKAWA
+81-3-3327-2688
Fax: +81-3-3327-3010
callems@world.odn.ne.jp

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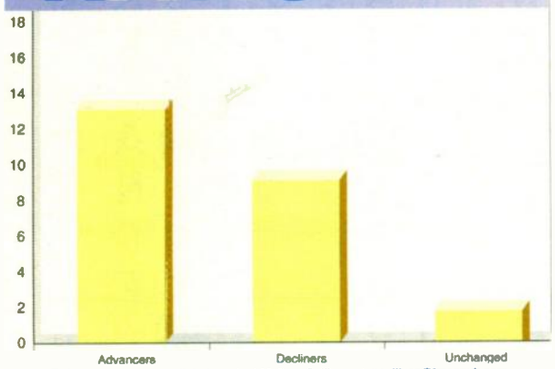


To have your company listed, contact Melissa Sullivan at msullivan@imaspub.com.

TOP ADVANCERS BROADCAST STOCKS
(August 4 - August 18)

Tribune	+5.40%
Hearst Argyle	+4.85%

TOP DECLINERS BROADCAST STOCKS
(August 4 - August 18)

Young	-20.33%
Entravision	-7.09%

TOP ADVANCERS TV STOCKS
(August 4 - August 18)

Harmonic	+9.27%
Avid	+6.16%

TOP DECLINERS TV STOCKS
(August 4 - August 18)

Ciprico	-15.59%
Scopus	-6.80%

TV Tech STOCKS as of August 18

Company Name	52-Week Range	August 4	August 18	% Change
Avid	32.05 - 59.10	36.55	38.80	6.16%
Belden	18.65 - 33.70	31.81	31.88	0.22%
Ciprico	3.95 - 6.84	5.13	4.33	-15.59%
Harmonic	3.79 - 6.95	5.18	5.66	9.27%
Harris	36.46 - 49.78	44.42	45.45	2.32%
LSI Logic	7.60 - 11.81	8.41	8.05	-4.28%
Scopus	3.05 - 8.35	3.38	3.15	-6.80%
SeaChange	5.07 - 9.89	6.80	7.14	5.00%
Tektronix	22.64 - 36.89	27.21	28.66	5.33%

Broadcast STOCKS as of August 18

Company Name	52-Week Range	August 4	August 18	% Change
Acme	3.50 - 5.74	5.19	5.19	0.00%
Belo	15.11 - 24.68	16.35	16.42	0.43%
Entravision	6.59 - 9.18	7.48	6.95	-7.09%
Fisher	38.89 - 49.89	39.37	39.72	0.89%
Gray	5.15 - 13.09	6.46	6.10	-5.57%
Hearst Argyle	19.97 - 26.27	21.01	22.03	4.85%
Nexstar	3.80 - 6.37	4.34	4.51	3.92%
Lin TV	6.12 - 15.44	6.66	6.59	-1.05%
Ion Media	0.37 - 1.15	0.93	0.93	0.00%
Sinclair	7.18 - 10.07	8.28	7.95	-3.99%
Univision	23.52 - 36.67	33.46	33.49	0.09%
Young	1.70 - 5.04	3.00	2.39	-20.33%
Tribune	27.09 - 39.06	30.00	31.62	5.40%
Meredith	45.04 - 56.83	47.58	47.15	-0.90%
EW Scripps	40.86 - 51.19	41.88	43.75	4.47%

Tandberg Takes Zetools for IPTV

LOS ANGELES

Tandberg Television is acquiring Zetools Inc., a Los Angeles-based developer of software for delivering next-gen Internet digital video services.

"The deal with Zetools enables us to help our customers build broadband businesses through the delivery of digital video over the Internet to PCs and to the TV using the next generation of broadband enabled set-top boxes and PVRs," said Eric Cooney, Tandberg Television president and CEO.

Zetools customers include AOL, NBC Universal, MTV Networks and Viacom. The companies expect the merger to be completed by the third quarter of 2006.

Blackmagic Names New President

MILPITAS, CALIF.

Blackmagic Design has appointed Dan May as president of the company. May joins Blackmagic as the company begins the relocation of its U.S. corporate headquarters from Las Vegas to Milpitas, Calif.

"Our move to the Silicon Valley from Nevada is an extremely exciting opportunity for us and will enable us to have stronger ties with our alliance partners," said Grant Petty, CEO of Blackmagic Design. "We welcome Dan to the team and are confident his talent and strong sales skills will enable us to move forward and into new markets and opportunities."

May comes to Blackmagic Design from Inlet Technology, where he joined the company in 2005 as director of sales. Prior to Inlet, May was responsible for sales and distribution channels for Canopus video technology solutions. May is a frequent contributor at industry forums and on panels.

Bexel Offers New Finance Package

CINCINNATI

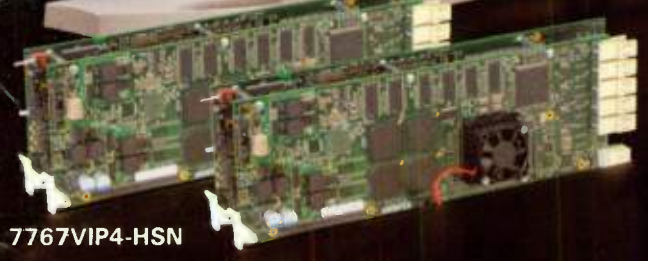
Bexel, the video operations arm of Vitec Broadcast Services, is teaming up with National City Media Finance, a division of City Commercial Capital, to provide custom financing programs and ancillary services.

The new financing program will allow Bexel to offer equipment and service packages. The companies said there are long- and short-term options; and payments can be spread over the life of the technology.

"By working together with National City Media Finance, we can offer financial products that are tailored to specific capital schedules or project cash flows, as well as a variety of return, disposal or upgrade options, said Vitec Chief Technology Officer Jerry Gepner.

"Bexel also can provide wrap-around services, including equipment installation, maintenance and seasonal repurposing. As a result, our customers can overcome the capital challenges they are facing as technology cycles shrink, therefore substantially lowering their overall net cost of equipment ownership," Gepner said.

VIP™ The Mini Multi-Image Display & Monitoring Solution



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