Telcos Revisit Video
Unbundling provides impetus to lay fiber

by Craig Johnston

SEATTLE

The sound of a telcoTV starter pistol could be heard in the innocuous sounding "Review of the Sec. 251 Unbundling Obligations of Incumbent Local Exchange Carriers," issued in mid-October by the FCC.

Regional telephone companies had been waiting for relief from Sec. 251 of the Telecom Act of 1996. Sure enough, in a matter of days, Verizon and SBC announced plans to speed up building fiber networks into neighborhoods and, in Verizon's case, to the home itself.

The Telecom Act had required local phone companies to provide access to parts of their networks to competitors at low rates. Mandated sharing made it possible for competitors to spring up without having to string their own wires.
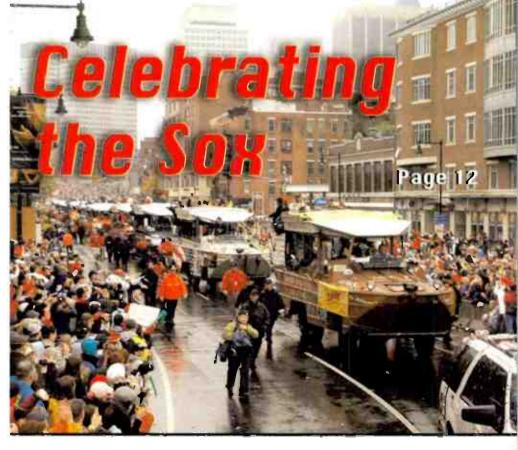
But the phone companies successfully argued that broadband should be regulated differently than voice service. With cable and satellite already reaching the home by coax or dish offering TV and broadband, the phone companies asserted there was already competition and therefore no need for them to share new fiber networks.

The commission agreed.

"Deep fiber networks offer consumers a 'triple play' of voice, video and data services and an alternative to cable," said FCC Chairman Michael Powell. "By limiting the unbundling obligations of incumbents when they roll out deep fiber networks to residential consumers, we restore the marketplace incentives of carriers to invest in new networks."

In fact, the phone companies were starting to feel the heat on their local phone service due to com-

TELCO TV, PAGE 6

Celebrating the Sox

Page 12

Moonves Unrepentant
CBS chief decries current 'scary climate'

by Frank Beacham

NEW YORK CITY

A defiant CBS Chairman Leslie Moonves, citing a "very, very scary" government regulatory climate, has vowed not pay the FCC's $550,000 Super Bowl fine and not to order changes in the content of programming on the CBS television network.

Moonves, who is also co-president and co-chief operating officer of CBS parent, Viacom, vowed to continue to take risks with live programming and not live by "a five-second buzzer" of program delays. Speaking at a "Future of Television" forum at New York University on Nov. 19, Moonves was emboldened in his defiance by the Veterans Day incident involving the motion picture, "Saving Private Ryan," on ABC.

"The 'Saving Private Ryan' fiasco is about as ludicrous a thing as I've seen in the history of broadcasting," Moonves said. "The fact that thirty percent of the ABC affiliates would not show it...a show about World War II, D-Day, about American heroes...made by arguably the greatest filmmaker in the history of the

MOONVES, PAGE 8

IN THIS ISSUE

P.6
Sony unveils pro-HDV system

P.24
Full-res HD in 2K

P.38
Station automation & asset management

P.16
Getting ready for ole man winter.

CONTRIBUTING WRITERS

NAME:
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COLUMN:
Tuning In

This month marks the second anniversary of the digital cable TV plug-and-play pact between cable operators and consumer electronics makers. That agreement resulted in a grand total of 700 digital-cable ready (DCR) sets in American homes by Labor Day 2004... P. 22

NAME:
Karl Paulsen

COLUMN:
Media Server
Technology

Portability is becoming a driving force in both consumer and professional media systems. The implementation of video-conferencing, videophones, Webcams and transportable hard-disk devices has given rise to widespread adoption of the Universal Serial Bus (USB)... P. 23

NAME:
Doug Lung

COLUMN:
RF Technology

Last month, I reviewed a petition by Hammett and Edison for reconsideration of the FCC's Second DTV Periodic Review Report and Order. The petition pointed out errors in predicted coverage and interference due to the FCC treatment of Longley-Rice error... P. 32

FROM THE EDITOR

Dial-Up DTV

I t's easy to get jaded when you talk about "telco TV."

The concept of telecom companies delivering video services is nothing new, but the industry has been plagued with so many false starts and broken promises that those of us who have been following it have doubted that it would ever take off. Until now.

A confluence of events in recent months has created a "perfect storm" of news that leads one to believe that telecom companies may actually become competitive with cable, broadcast and satellite in the next couple years.

As Craig Johnston reports in this issue, the "starting gun" that has led to this new optimism was instigated by the FCC in October when it effectively gave ownership of the phone lines for advanced services back to the telecoms. This prompted announcements from Verizon and SBC that the companies would spend billions of dollars over the next several years to build out their fiber

capabilities to deliver advanced voice, video and data services to the home. Verizon's news was not new; it made its investment intentions known more than a year ago and began deploying advanced "Fios" fiber to the premises (FTTP) technology to homes in Keller, Texas last summer. SBC's "Project Lightspeed," which promises to deploy similar advanced services, has an estimated $5 billion price tag and is expected to serve up to 18 million customers over the next several years. In addition, the company's announcement of a $400 million, 10-year deal to deploy Microsoft's IPTV software in its set-tops marks the software giant's biggest investment yet in advanced DTV services.

These are big numbers, folks, but let's remind ourselves why they're doing this. Yes, we've heard the arguments from the analysts that telecoms are concerned about cable operators siphoning off customers by offering VoIP phone services to the home, but that's just part of it.

Another major concern comes from that other over-the-air technology that has become so commonplace in recent years—cellphones.

Millions of cellphone customers are disconnecting their fixed line services in the home and the telecom companies need to offer some incentives to prevent all those installations from becoming just a useless jumble of wires. Hence, the belief that telco TV will solve the problem.

But throwing all this money into fiber technology doesn't guarantee success. Cable operators will not sit idly by without a fight. In the end, market forces will determine who will win the contest for the consumers' home (and mobile) entertainment buck. The difference now is that telcos are finally in the game.

Tom Butts
Editor
tbutts@imaspub.com

Who Cares?

Dear Bob Kovacs:

Very insightful editorial in the the recent issue of TV Technology and I certainly agree with you on the points you make ("HD Isn't News—Yet," Oct. 20, 2004). Allow me to add a wrinkle or two.

The HD issue is difficult for the average guy on the street to wrap his head around, plus the stores selling the stuff aren't well versed enough about the technology to allay peoples' fears and uncertainty. My neighbor went to investigate HD sets at the local mega store and he said that the sales people only added to his uncertainty about what to buy. I've heard this before. Shoot, it's only recently that they began to display true HD in the doggone stores.

I went in one day asking about an HD display and if I could see one. First of all it took them three eons to determine what signals were being fed to what displays, and it turned out that the HDs were only getting a basic DVD signal, no HD. When I asked the manager how they expected to sell HD without showing people an HD picture, I got a resounding shrug of the shoulders with an added (though unspoken) "like I care."

I'm worried that when we really start pulling the plug on NTSC and the public starts feeling like the FCC and broadcasters are cornering the consumer, there is going to be a backlash that hasn't been seen since Coke discontinued its classic flavor. I just think the industry is too close to the issue to see that the folks sitting in their living rooms have no idea (and many don't care about) what is going on with HD at all. And it's going to be 2005/2006/2007 faster than we anticipate.

BJ Randolph
Pittsburgh

Exit Strategy

Dear Editor:

I am one of those viewers that chooses to view off the air television only. I live 81 miles from the Houston antenna farm and enjoy good to excellent analog reception from all of the Houston television stations. Only occasionally do I have a co-channel problem with channel 2...with Baton Rouge channel 2 on one side and Kerrville, TX, channel 2 on the other. With that exception, I am totally and completely happy with my analog signal.

I am not an early adopter, however late last year I purchased the fourth generation Zenith set-top. It was not difficult to set up. There is a problem however: After working with all manner of antenna and pre-amp combinations, I have yet to watch even a 30 minute show that didn't drop out totally, freeze frame or pixilate. What I have discovered is that the 8-VSB signal is nowhere nearly as robust as the analog signal. Further, I've found that the 8-VSB signal doesn't like warm fronts, cold fronts, stationary fronts, rain, fog, sunshiny days, cloudy days, thunder, lightning and probably winter, summer, fall or spring! In fact, I'm still trying to find an environment in which I can make DTV work for me. And the lip-flap: It drives me crazy.

I know the industry is headed for digital but I can assure you of this: If you think I'm going to sit by idly while I lose all off-air television, you haven't begun to see me, or the rest of us that rely on off air reception, start to fight! Can you imagine the hub-bub that's going to occur when the switchover is made and several million TV viewers begin to call their elected representatives? Somewhat like the war in Iraq, very little thought has been given to a workable exit strategy!

Gerald R. Proctor
Livingston, Texas

World Radio History

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Panasonic ideas for life

Sony Touts Affordable HD Production
Company unveils pro HDV camcorder, VTR

by Dave Everitt

Following up on its prototype demonstration at NAB2004, Sony officially rolled out its first professional HDV production system, which includes camcorder and VTR. Sony is touting the system as a cost-effective upgrade from standard-definition digital.

Launched in 2003 by JVC, Canon, Sharp and Sony, the HDV format allows users to record MPEG-2-based high-definition 720p or 1080i images on MiniDV cassettes. JVC has already released its HD10 HDV camcorder, and several editing companies, including Pinnacle Systems and Canopus, have launched editing systems to handle HDV.

The HVR-Z1U 1080 camcorder can record at 60i, 50i or 30, 25 and 24 frames per second. According to Bob Ott, vice president, Sony Electronics Broadcast and Production Systems, the new camera incorporates more than 40 features and capabilities not included in the company's consumer version, the HDR-FX1, introduced in September.

The camera, Ott said, produces images "substantially more detailed than any standard-definition performance."

To illustrate the point, Sony displayed HVR footage (a travelogue compilation shot in Asia) on both a movie-style projection screen and the new Lumina LCD monitor at the New York press event in mid-November. On the monitor, the images often featured intense clarity and, in those scenes emphasizing depth of field, approached a 3D quality.

Sony envisions the camcorder will be used by wedding and event videographers, corporate and independent-feature producers, government agencies and news stringers, Ott said.

TRANSITION TO HD

How practical will the HVR system be for professionals making a gradual high-definition transition? Ott outlined several qualities that could facilitate the process: One is a built-in ability to downconvert to standard definition. Another feature, the 4:3 marker, allows the user to produce in either 16:9 or traditional TV proportions. Perhaps most significant for economy-minded professionals, the HVR-Z1U can use standard digital video minicassettes—although Sony is clearly promoting the use of its new 63-minute DigitalMaster tapes to potential camcorder buyers.

In more general terms, Ott emphasized the possibilities for "DVCAM-to-HDV migration."

He said the user could integrate the HDV system in either a limited or comprehensive way, depending on how many system components the user buys. The ultimate goal, he added, is a pure HD stream that leads to Blu-Ray delivery, the basis for Sony's optical disc-based XDCAM format.

The Sony HDV production system will cost under $10,000 and ship in February 2005.

Will the HVR camcorder cut into the sales and use of Sony's more studio-oriented HDCAM currently employed by such broadcasters as the Turner Entertainment Group? Ott doesn't think so, because for those already incorporating HDCAM into their operations, the HVR would be "an adjunct in their arsenal."

Alec Shapiro, Sony Broadcast vice president of marketing, added that the HDCAM, priced between $35,000 and $40,000, was often acquired as a rental rather than a purchase. The HVR-Z1U, which will ship in February 2005, is priced much lower at $4,900.

The new camcorder's features that Ott stressed included use of three Super HAD 1/3-inch CCDs. Sony said this design will allow "more light to reach each pixel in the imager" when working in conjunction with the camera's 12X Optical Zoom Carl Zeiss Vario-Sonnar T Lens and 14-bit A/D with Digital Extended Processor. Other attributes include manual 24-step iris control, a color-correction function that allows the user to isolate an object and adjust the color without affecting the rest of the image, and an LCD panel and viewfinder that can be operated simultaneously.

As for other components in Sony's HDV system, the HVR-M1DU is a compact 1080i VTR that can record and play back standard-definition digital video in addition to high definition. The VTR is priced at $3,700 and will also ship in February.

Editing software for the HDV system can come from a variety of sources: Adobe, Apple, Avid, Canopus, Pinnacle, Ulead and Sobey, as well as Sony's Vegas 5 NLE software. For a limited time, Vegas 5 customers can purchase CineForm's Connect HD software for $149.95, a savings of $149. Connect HD allows users to capture, edit and export HDV in the 1080i format.

For those interested in making an investment in a new recording medium beyond standard digital tape, Sony's DigitalMaster minicassette relies on dual-active magnetic layers and is, according to Ott, "a more robust tape with less dropouts and errors." ∎

Telco TV

petition from cellphones and voice-over-IP (VoIP), with local revenues declining 7 percent a year over the past three years. And cable companies have just begun to offer local phone service.

But phone companies are hoping to get in the cable companies' collective face by rolling out television over the fiber networks. With their newer technology, telcos have up to 10 times more bandwidth than cable can offer.

FIBER OPTIONS

There are three flavors of fiber-optic network installations: fiber-to-cable, fiber-to-the-curb and fiber-to-the-home.

Fiber-to-cable is what digital cable has deployed. It's a mixed network of fiber-optic and coax cable yielding up to 10 Mbps and capable of providing 500 channels, HDTV, VOD, broadband Internet access and phone service.

Fiber-to-the-curb is what SBC is installing. Called "Project Lightspeed," it is aimed at serving 18 million homes by 2007 with fiber-optic lines to a neighborhood hub, then uses upgraded wiring to bring it into the home.

With bandwidth of 25 Mbps, in addition to what cable provides, fiber-to-curb offers faster data service and interactive possibilities such as the ability to choose camera angles.

"Project Lightspeed provides a number of important advantages, including superior speed to market with exciting, market-changing services," said Lea Ann Champion, SBC IP operations and services senior executive vice president. "And it allows us to leapfrog today's U.S. telephone and cable TV networks." SBC also announced a 10-year $400 million deal with Microsoft to deploy Microsoft's IPTV software in SBC set-tops.

Fiber-to-the-home is the top-of-the-line buildout that Verizon is already deploying in parts of Texas, Florida and California. Additional rollouts aiming to serve 2 million homes by next year have also been announced for six northeastern states.

By extending fiber right into the home, Verizon will offer bandwidth of up to 30 Mbps. The company said that amount of bandwidth would allow a home to simultaneously view several HDTV channels on-demand, to play games online, download from the Internet and talk on the phone.

"Building fiber into homes and businesses today essentially future-proofs our network," said Mark Wegleitner, senior vice president and chief technology officer for Verizon. "It allows us to offer future high-bandwidth applications that aren't even in existence today, without having to upgrade the fiber."

Wegleitner said that later, by upgrading hardware inside the home and on the network itself, the fiber being installed to the house now could deliver in excess of 100 Mbps.

None of this is cheap to do. A Carnegie Mellon University study pegs the cost per home served from $300 to more than $2,000.

This led some local phone companies to sit this round out. Qwest pioneered telcoTV systems a decade ago in Colorado and Arizona, losing lots of money in the process. The company plans to only install fiber in new housing developments, where it can avoid the cost of tearing up streets and sidewalks. Qwest is placing its bets on WiMax to serve existing communities.

Two final steps are programming and marketing. Will these telcoTV efforts match cable and satellite TV services in programming offered?

"We actually view that as table-stakes, you've got to have that," said Mark Marchand, Verizon's director of media relations. "We're actually looking beyond that... we're ultimately going to be looking at applications that you just can't get today."

On the marketing side, press accounts of telcoTV's newest forays were full of naysayers, who noted that history showed phone companies have tried and failed at these kind of new services before.

"'Successful marketing' and 'phone companies' in the same sentence is kind of an oxymoron," said one cable channel executive in an article in "The Wall Street Journal."

But with regulatory help from the FCC and cable and others eating into their local telephone service cash-cow, phone companies have extra incentive to get it right this time. ∎

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Panasonic **ideas for life**

CES: It's a Digital Life

Show to focus on 'living room of the future'

by Frank Beacham

LAS VEGAS

The convergence of computing, telecommunications and video entertainment will be among the highlights of video technology topics at the International CES, Jan. 6-9 in Las Vegas.

The CES show will open after a highly successful 2004 when estimated annual sales of digital television equipment was expected to exceed $6.2 billion. DVD player sales were expected to top $2.9 billion by year's end.

Gary Shapiro, president and CEO of the Consumer Electronics Association (CEA), called the DTV category "the most successful product launch in his-

tory in terms of dollar sales." The driver of that popularity, he noted, has been DVD home video.

"The truth about the success of HDTV—at least up until the last year or two—is that a lot of HDTV is sold because (it makes) DVD looks better. And there's nothing wrong with that," Shapiro said, noting that the CEA doesn't care whether the set owner chooses cable, satellite, broadcast or packaged media as a source of programming. "We are alternative media agnostic."

International CES, produced by the

CEA expects more than 120,000 attendees from around the world to attend CES2005.

CEA, will feature more than 2,400 exhibitors in at least 20 product areas. In excess of 120,000 attendees are expected

from 110 countries. The sprawling exhibits will span the Las Vegas Convention Center and three additional hotels.

SUPERSESSIONS

Of special focus among video technologies will be "SuperSessions" titled "Battle for Control of the Digital Living Room"—a survey of home media center technologies—and "Now, A Word From the Cable Company," a look at where the cable industry is heading with HDTV, broadband, digital recording technologies and VoIP.

"Digital Hollywood," another major component of the show, will analyze the impact of computing and telecommunications on the entertainment industry as

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Moonves

CONTINUED FROM PAGE 1

world...and the FCC didn't have the courage to say (to the affiliates) 'don't worry, you won't be fined.' As a result, thirty percent of the country did not see "Saving Private Ryan" because the FCC, by their silence, said 'you know what, we'll fine you.'

Moonves made his comments only hours before Viacom agreed to pay $3.5 million to settle 16 indecency fines for radio broadcasts leveled earlier by the FCC against Viacom's Infinity Broadcasting radio stations. The bulk of those fines were against the "Opie & Anthony Show" and radio shock jock Howard Stern. Artists from both shows are moving to satellite radio to avoid the FCC.

Moonves made it clear in his speech that he sees a big difference in the type of fines leveled by the FCC on some his company's provocative radio programming-which he said he could not defend-and FCC policy toward television.

The CBS chief made sure his audience knew it's not just the Republican "right wingers" on the FCC attempting to censor program content. "The two Democrats on the FCC are just as bad, if not worse," he emphasized.

"We have been fined $550,000 for the incident at the Super Bowl. We are not going to pay it. We'll go through the court system, let's put it that way...we will take it as high as we can go," Moonves said.

"They are claiming that we are responsible for what we knew nothing about. Their claim is that CBS knew what was going on (at the Super Bowl) and we should pay the fine," he continued. "A, we didn't know about it, and b, on live television it's the risk we have to take. Everything can't be on a five-second buzzer. That's a mistake."

Describing the FCC's initiative as "horrible," he said "it's literally to the point that people are talking about delays on live news and sports programming, which I think would be a total travesty."

In Viacom's radio settlement following Moonves' speech, the company said in a statement that it would try to "safeguard live broadcasts" by using delay technology, though it was vague in how such technology might be used and whether it applied mainly to live radio broadcasts.

Moonves cited an incident on NBC during a sports interview after the University of Pittsburgh beat Notre Dame in a football game. "A quarterback from Pittsburgh, who was very excited, used a four letter word in a post-game interview," Moonves noted. "It was no big deal. Everybody has heard that word. The kid was excited. He'd beat Notre Dame. It was his dream come true. Yet, NBC is probably going to get fined for it."

Asked by **TV Technology** if the FCC's indecency campaign will impact future programming on the CBS network, Moonves responded "no" to any self censorship.
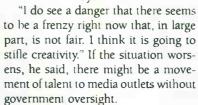
"We are telling our people 'look, let's not be stupid, let's not be gratuitous, let's keep our eyes on the ball and be aware of what's out there and going on in the climate,'" he responded. "But we have not asked our people to change their programming content or do different kinds of shows.

"People have asked me 'how has the election changed what you are going to do?' I said 'we don't program for the red states and the blue states.' Ironi-

Les Moonves

cally, they say that morality is the number one issue of why people voted the way they did. Well, the two highest rated shows are 'CSI,' about murder, and 'Desperate Housewives,' which is about adultery. So I don't know."

Also addressing the conference, David Baldwin, executive vice president of programming at HBO, said pay television services like HBO are also keeping a wary eye on the FCC.

"We're invited guests and that, over the years, has certainly protected us to some degree from the FCC and those that govern commercial broadcasting," said Baldwin. "I think even with those safeguards in place, they are very much going to make some inquiries and make some noise, and I think, create whipping boys."

"I do see a danger that there seems to be a frenzy right now that, in large part, is not fair. I think it is going to stifle creativity." If the situation worsens, he said, there might be a movement of talent to media outlets without government oversight.

Todd Leavitt, president and COO of the Academy of Television Arts and Sciences, told those attending the media conference "not to minimize this problem. It is extremely, extremely severe."

Calling the "Saving Private Ryan" incident "ludicrous, amazing and unthinkable," Leavitt said the FCC's actions are already having "an unbelievable chilling effect."

On other issues facing network television, Moonves noted that cable has become a force in siphoning audience share and that the broadcast networks are down four percent from last year.

"There's is no question that cable is hurting us," he said. "Ironically it's not the big guys, but its the little guys who are eating away at us. The point 1s and the point 2s."

However, he noted that to draw the same audience size it takes 350 episodes of "Queer Eye For The Straight Guy" to equal one episode of "CSI." It takes 190 "Nip/Tucks" to equal one "CSI." And "Larry King Live," the highest rated program on CNN, wouldn't make the top one hundred on network television.

"I think there's a lot of misconception about how important cable is. But the highest episode of "The Sopranos" is watched by one third of the amount of people who watch 'CSI,'" he said.

He said ancillary television markets are getting much tighter. "Markets are drying up for syndicated sales. Many countries are limiting the number of American shows that can be sold in their countries. After markets are less than they were before."

On TiVo, he said it's here to stay and is something that every broadcaster must be aware of. Right now only four percent of Americans use TiVo, he said, but that number will grow dramatically in coming years.

Though TiVo helps viewers skip commercials, Moonves said the overall amount of TV viewing will rise and there's evidence that people who use TiVo devices are among the more intense of television viewers. "There's an argument that TiVo might, in fact, help us."

That said, he predicted that the networks will redefine their relationship with advertisers. "Because of TiVo and other issues in the marketplace, we are going to have to use more product placement. We can be smart about it, integrate (products) in shows, and the future will be much brighter than just relying on a 30-second commercial spot." ■

MPEG Monitoring Expands Frontiers

Companies cite increased interest in IP, MPEG-4

by **Mary C. Gruszka**

NEW YORK

According to makers of MPEG monitoring and analysis tools, three key trends are clear.

"We are seeing interest in MPEG-4. We're getting calls every week about product," said Howard Barouxis, Director of Multimedia Sales for Thales. "MPEG-4 will continue to develop. We are also seeing a high level of interest in MPEG-2 carried over IP, cable, and broadband operators."

There's also a demand for carrying MPEG-4 content encapsulated in MPEG-2 transport streams, said Jon Hammarstrom, Market Development Manager, Tektronix.

But MPEG-2 will be here to stay for quite awhile, considering the high level of investment in that technology, with MPEG monitoring for terrestrial broadcasters reaching a stage of critical mass, according to Barouxis.

"Before, stations were just concerned with getting on the air, but now that they are on the air, they need to monitor all stations in a group. Now terrestrial broadcasters and station groups are starting to deploy MPEG-2 monitors in affiliates and remote sites, and integrate them into overall management systems," he said.

ADVANCED VIDEO CODING

Advanced video coding at this point may have less immediate applications to terrestrial broadcasting, but interest is high for telcos and cable companies.

"We're starting to see new services, like interactive, video on demand, voice, video, data, and non-traditional players like telcos, providing video over DSL, in addition to the cable MSOs" Tektronix's Hammarstrom said. "They want to gain as much efficiencies as they can grab in the video environment and deal with the challenge of coming up with additional services to differentiate themselves from the competition."

Pursuing those efficiencies has led to advanced video compression, such as H.264, MPEG-4, Windows Media 9, to encode video using less and less bandwidth. And with that, the monitoring and analysis gear to support it.

"Tektronix is working with manufacturers and designers of ICs, encoders, and set top boxes," Hammarstrom said. "We announced at NAB that we added H.264 and Windows Media 9 support to our comprehensive set of MPEG analysis tools for our AD953A analyzer."

The Tektronix MTS-4EA elementary stream analyzer, software only product, also now has H.264 support.

At IBC2004, Thales introduced its H.264 Analyzer that performs in-depth analysis and decoding of both raw H.264 video sequences, and MPEG-2 transport streams carrying H.264 video. Applications include H.264 codec development, video-on-demand (VOD) content validation, compliance testing and interoperability verifications, and system diagnostics.

MPEG OVER IP

Related to the development of new video codecs is the transmission of video content over IP networks.

"MPEG over IP lends itself nicely to VOD," said Phil Dubs, director of sales for North America, Pixelmetrix. "The telephone guys are looking for ways to compete with cable, and they own the IP networks."

Pixelmetrix has partnered with IneoQuest to provide a combined MPEG and IP analysis system that consists of the Singulus G1-T IP analyzer from Ineo-Quest, the Pixelmetrix DVStation, plus new software.

"IneoQuest provides the front end to our transport stream analyzer," Dubs said. "IneoQuest doesn't do MPEG transport stream analysis and we don't do full Gigabit Ethernet analysis, but together, this system allows us to do full MPEG over IP testing."

With this system the IP signal is fed into the IneoQuest analyzer for verification of IP performance parameters like packet jitter and how much forward error correction is being applied.

While the Singulus G1-T can recognize various MPEG payloads, it does not perform MPEG analysis. That's where DVStation comes in. The signal from the IneoQuest analyzer is converted to an ASI output which then feeds the DVStation for full MPEG analysis.

In addition, Pixelmetrix developed special software that integrates into the IneoQuest system, Dubs said.

IneoQuest has also aligned itself with Tektronix and Rhode and Schwarz, according to Tom Tucker, director of marketing & business development, Ineo-Quest Technologies, based in Mansfield, Mass.

Triveni Digital added an IP input to its collection of input interfaces for its Streamscope MPEG analyzer. "We can monitor a number of different inputs simultaneously," said Rich Chernock, senior member of technical staff and product manager Streamscope and Guide Builder, Triveni Digital.

Thales now has a software upgrade to its Mercury "full-blown" MPEG analyzer for MPEG over IP, according to Barouxis.

MPEG over IP analysis capabilities are provided in the Sencore MAP 1853. "The MAP 1853 offers a Gigabit Ethernet interface and bridge for IP analysis of the audio and video in the MPEG-2 transport stream," said Stephane Billat, Communication Division Application Engineer, Sencore. "It is suited for cable operators

Mark Rapson, television director of engineering for Paxson Communications uses Thales' Granite MPEG monitoring system.

for troubleshooting their VOD and IP services, and for telcos deploying video over IP services and for broadcast IP contribution feeds."

REMOTE MONITORING

Terrestrial broadcasters' need for centralized monitoring of remote locations has spurred an increase in use of MPEG monitoring gear at the stations. From a centralized NOC (Network Operations Center), one person can drill down and see what's happening at each of a group's transmitter sites, for example.

"Some chief engineers are responsible for multiple stations," Chernock said. "With distributed monitoring, we place nodes at different locations, and the inputs from all the nodes can be checked from any client."

The distributed monitoring system from Triveni Digital consists of two parts. "One is a software piece, the client user interface, where you can select an input, and see red or green lights [to indicate if there is a problem]," Chernock said. "Then you can drill down for more details. This software comes with Streamscope, and runs on any modern computer."

The other part of the system is a computer (server) with Node software. "This also contains the client and runs locally," Chernock said. "You put one of the nodes in each of the locations that you want to monitor, and connect them through a broadband network."

Pixelmetrix uses VNC (Virtual Network Control) for remote access of DVS-

tation. "You can log into each remotely controlled unit and use it as if you were standing in front of it," Dubs said.

Rohde & Schwarz uses both SNMP and VNC for its DVM100/120 MPEG monitoring system. SNMP is used for sending event notification information to a centralized network management system, while VNC allows a fully detailed stream analysis through remote usage of the system's built-in GUI, said Alexander Woerner, manager of market development, Rohde & Schwarz.

Videotek offers the SQM350 module as part of its SQM monitoring system to provide transport stream verification.

In a related trend, broadcasters are demanding more portable MPEG monitoring gear.

At Sencore, "the DTU-225SX FantASI is a portable ASI to USB-2 adapter coupled with the StreamXpert real time MPEG-2 analysis software," Billat said. "This unit is a simple troubleshooting tool that combined with a laptop, for example, provides an easy to use portable MPEG-2 analyzer for use around the studio or at the transmitter."

As MPEG monitoring tools move from specialized to more widespread applications, manufacturers are designing them to be easier to use and easier to interpret data.

"A typical station engineer may not be an MPEG expert," Chernock said. "We visually show people things and take them through where the problems are without them having to understand MPEG."

With mandatory PSIP on the horizon, Chernock predicts an increase in a station's use of MPEG monitoring. "The side effect of this (FCC) ruling is that it will be important for stations to know that they have a good stream." ■

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Celebrating the End of a Curse

Beantown TV crews cover Red Sox victory parade

by John Premack

(Editor's note: Veteran Red Sox fan and WCVB-TV cameraman John Premack covered the Red Sox victory parade in Boston.)

It wasn't until the afternoon after the Boston Red Sox's 86-year championship drought ended in St. Louis that team and municipal officials sat down with corporate sponsors to map out details for what would become the largest public gathering in the city's history.

By the time they were ready to share their plans with area television stations, only 36 hours remained to prepare for wall-to-wall live coverage of this mega event.

Despite our recently gained expertise at televising victory parades and rallies for the Super Bowl champion New England Patriots, it quickly became clear that this celebration would present several unprecedented challenges. At 3.2 miles, the planned parade route was 50 percent longer than the one used for the Patriots' parades. The rally's 10 a.m. Saturday start, coupled with a crowd expected to number in the millions, meant that all transmission vehicles and camera risers had to be in place Friday night.

ROLL OUT THE DUCK BOATS

Pre-rally ceremonies would be held inside Fenway Park, which was closed to the public, but concerns about security and crowd control along the route led planners to embrace the concept of a rolling rally, with no stops or assembly points that would cause people to cluster. Players would ride atop 17 World War II era "duck boats." These eight-foot-high, square-hulled vehicles positioned members of the Red Sox organization where they would be visible from a distance, but not approachable.

Seven area stations—WBZ, WCVB, WHDH, WFXT, WLVI, WMUR and NECN—joined with sports channel NESN and Fox Sports Network to create an ad hoc pool. NESN, which televises regular-season homes games in Fenway Park, would provide a multicamera-switched feed of the pre-parade ceremonies. Seven pool participants were each assigned a fixed position along the route, and WCVB provided a rolling camera from within the parade.

As all pool feeds were to be distributed via satellite, with mobile uplinks located at each camera position, care had to be taken to choose locations that would pro-vide line-of-sight to the necessary slice of sky. The 2 GHz COFDM digital signal from our Roadrunner mobile unit, positioned directly in front of the first duck carrying Red Sox team members, was relayed back to the studio via one of WCVB's regular ENG receive sites and uplinked with our fixed dish. A total of nine feeds on five birds were up at once, using three digital data rates as well as full-bandwidth analog on C- and Ku-band.

Pre-planning also included arranging security for all pre-positioned ENG and SNG vehicles, both to keep them secure overnight and to prevent Saturday's crowds from climbing atop them in search of a vantage point. Ladders were removed or covered with bolt-on panels, and steel barricades were placed around camera risers and vehicles.

Anticipating that cellphone circuits would be unreliable at best and unavailable at worst, we were able to arrange for the installation of a land-line to provide IFB at our most critical field anchor position. We relied on an existing high-power 450 MHz IFB transmitter to support or backstop our other unilateral locations. WCVB's field coverage plan was divided into three elements—pool coverage from

WCVB's Roadrunner 4x4 inches its way in advance of the World Champion Red Sox during the victory parade in Boston. A Sony Mini-DV camera sits atop the mast in place of the usual microwave antenna.

A total of nine feeds on five birds were up at once, using three digital data rates, as well as full-bandwidth analog on C- and Ku-band.

Fenway Park and along the route, unilateral standup locations, and aerials from our helicopter to help fill in the gaps between fixed cameras. We established camera positions inside and outside the ballpark using permanent fiber and satellite for backhaul. Both locations along the parade route relied on ENG microwave circuits.

Coverage from WCVB's NewsCopter 5 became an even more important part of our production plan when, the night before the event, the city announced it was doubling the length of the parade route by sending the amphibious ducks swimming one-and-a-half miles up and then back down alongside the banks of the Charles River. One of the pool uplinks was redeployed to a bridge at the turnaround point, but this still left a significant gap in what the pool would be able to provide.

A crowd estimated at 3.2 million people lined the route by the time the rally rolled out of Fenway Park Saturday morning, with fans standing 20 to 30 deep in many places. The light rain falling since dawn did nothing to dampen their spirits, although it must have caused a quiet curse or two in more than one television control room. With the mist so dense that the upper stories of the Prudential and Hancock towers were obscured, the ceiling was too low for helicopters to fly. The parade was broadcast without any aerial views.

Oh well, that's television… or is it a new curse of the Bambino? Wait 'til next year. ∎

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well as the digital consumer market. Among its topics will be the networked home, participation television programming, download models for the delivery of television and other media, DVD distribution, IP video and "Transforming Television: From Reality TV, HDTV and Interactive TV to PVR TV and VOD TV."

CES conference tracks will focus on digital cable and satellite strategies, wireless technologies, digital rights management, interactivity, microdisplays, optical recording, HDTV, portable video, electronic games, the end of the analog era and a preview of next-generation cable services.

ZONES 'O TECH

To help attendees grasp the vast array of technologies on display, CES organizers have created more than 20 Tech-events and conferences.

For 2005, CES executives have chosen five technologies to watch in the new year. They include media servers, portable

"TechZones offer a compelling display of new trends and technologies within consumer electronics."

—Karen Chupka, CEA

Zones scattered throughout the exhibit spaces. "TechZones offer a compelling display of new trends and technologies within consumer electronics," said Karen Chupka, CEA's vice president of entertainment, innovative gaming, telematics (embedded electronics in autos that connect with external sources) and hybrid white goods (smart kitchen appliances that combine old and new technologies).

Key speakers in the video technologies section of CES will be Judy McGrath, chairman and CEO of MTV Networks, and Mike Ramsay, chairman and CEO of TiVo, Inc.

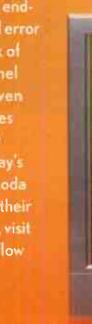Headliners for the full CES event include Bill Gates, Microsoft chairman; Loyd Ivey, chairman/CEO of Mitek Corp.; Craig Barrett, CEO of Intel; Ed Zander, chairman and CEO of Motorola; Carly Fiorina, chairman and CEO of Hewlett-Packard; Rich Templeton, president and CEO of Texas Instruments; Edward Whitacre Jr., chairman and CEO of SBC Communications; and Gary Shapiro, president and CEO of the CEA. ∎

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Raoul Prideaux, Southern Cross Broadcasting
Director of Engineering and Technology

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New HD Servers Search for Right Path

Newest products address software versus hardware, benefits of multiple formats

by Susan Ashworth

SAN FRANCISCO

It's long been a debate between engineers and manufacturers when building technology for professional video equipment: Which road do you take: the software route, or the hardware option? For example, does it make better economic sense to go with easily adjustable programming options via software? Or will the equipment benefit from the higher processing power inherent in sturdy, solid-state hardware components?

To get an answer, there's no better place to look than inside the belly of a video server.

Some of the newest generation of video servers are veering away from proprietary hardware-only innards and are embracing the adaptability of software-based solutions. The overall goal, say engineering experts and manufacturers, is to move away from dependence on hardware-specific functionality and a move toward general-purpose, high-performance computing platforms via software, specifically for encoding and decoding video signals.

Many of the newest generation of servers are also taking the promise of software—with its flexibility and adaptability—and ensuring it meets the biggest challenge of all: that a single box has the capability to handle SD and HD streams in one chassis.

For example, the Nexio HD server from Leitch brings what the company calls the first software-based agile codec for high-definition video to the market. The technology allows the integration of baseband high-definition record and playback directly into Nexio. Software-based processing also allows smooth off-speed playback and high-quality scrub audio.

Leitch first began adopting software solutions through its RAIDSoft technology, a software-based RAID controller that improved reliability and scalability, the company said.

According to Tim Slate, director of product management for video servers for Leitch, the Nexio HD platform provides two channels of HD output, or one channel of input and one HD output in either 720p or 1080i. Other features include decoding support for 4:2:2 profile and support for MPEG-2 main-level, main-profile and main-level; and encoding support for MPEG-2 I-frame at high level and 4:2:2 profile at 50 Mbps.

Leitch's new Nexio HD server is representative of the company's move to software codec technology for HD.

OUT OF THE GATE

Some companies have decided to go with software encoding/decoding right from the beginning. At NAB2005, Video Technics will introduce a next generation HD server that relies on software codecs for encoding and decoding, as opposed to more traditional hardware codec chips and boards.

"There is a flexibility inherent with software codecs," said Mark Rivers, Video Technics president. "And we wanted to be as flexible as possible for our customers with our next-generation product design."

Video Technics' high-def server debut in 2005 will include HD rollouts of the Aprisa and Apella video servers capable of simultaneous SD and HD outputs of the same media files, as well as real-time scalers that will facilitate multiple format encoding for proxy and Web streaming output. The new multichannel HD servers will be compatible with the company's NewsFlow tapeless newsroom systems.

Avid Technology plans to launch an HD server for next year as well.

"When we acquired Pluto, we acquired one of the first HD servers on the market," said David Schleifer, vice president of broadcast product marketing for Avid.

Avid's AirSpeed standard-definition ingest and broadcast playback server platform will be rolled out next year as an HD version, and also will take advantage of software codec technology. While the company's servers have traditionally focused on the end of the production chain, the new AirSpeed HD server will also offer high-quality ingest and playout for both broadcast and post.

Keeping HD and SD functionality in the same platform was a key goal for the new Omneon Spectrum HD, a scalable media server that provides integrated playback of HD, as well as the ability to ingest, store, and play back both SD and HD simultaneously from a single system when configured with other components in the Omneon Spectrum family.

The system handles media ingest via the MediaPort 4010, which combines HD MPEG-2 ingest with MPEG transport stream demux in a single device. The new MultiPort 4002 interface adapter handles HD playout and includes built-in decoding capability for MPEG-2 high definition video.

"The Omneon Spectrum HD gives broadcasters the freedom to choose not just storage capacity and bandwidth, but also the video formats they need, and even to combine multiple formats within one system," said Geoff Stedman, Omneon vice president of marketing.

KEY COMPONENTS

For Thomson, the support of multiple compression formats as well as standard-and high-definition materials was a key component in building the Profile 6G PVS 3500 and PVS 3000 line of servers. The company also built in simplified media management capabilities as well as built-in HD encoders and decoders.

Other features include a 2 GB Fibre Channel storage system; fast bi-directional file transfers between Profile servers; support for the 1080i@50, 59.94, and 720p@59.94 HD formats; and the servers are upgradeable to the Grass Valley Open SAN architecture. The manufacturer has installed systems at NBC, HBO and with the Belo Corp., among others.

Integrating SD and HD into a single system "helps bridge the world of SD and HD for broadcasters," said Ross Summers, director of next generation broadcast products for Thomson. "Whether you're a big or small broadcaster it's a very effective solution."

A key component of the server solutions from SeaChange is the ability to add HDTV functionality as broadcasters need it. The company has long had embraced a "one server, unlimited options" philosophy and the manufacturer put that to work when building the play-to-air Broadcast MediaCluster (BMC), which supports HD and SD MPEG-2 for transmission as well as SD MPEG-1 for online browsing. All files are stored in a single fault-resilient RAID storage system, which allows operators to add HD functionality to the same BMC that provides the SD transmission, as well as benefit from workflow efficiencies.

SeaChange has based its HD solution around an MPEG-2 transport stream I/O card that integrates into either a BMC, such as the MediaCluster 60000 Series, or into individual servers. ∎

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At the core is the economical Broadcast MediaLibrary™ server, providing high-speed Gigabit Ethernet access to all your video material, regardless of image format, compression standard and file type. At the edge is the new software-based MediaClient codec — fusing real-time, broadcast-quality I/O to c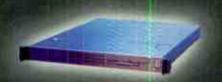entralized storage. From high-def to low-res, all your editors, producers, compositors, renderers and on-air servers, have high-speed gigabit access to the lifeblood of your operation.

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Winter Gives 'Freeze-frame' New Meaning

Shooting in icy weather takes special skills

by Craig Johnston

SEATTLE

There's an old argument over who was the better dancer—Fred Astaire or Ginger Rogers. Some said it was Ginger Rogers, because she had to do everything Fred Astaire did—backwards, wearing high heels.

That same kind of degree-of-difficulty factor can be applied to producing sports programming in winter conditions. Take running cable, for example.

"Keep in mind that when you run cable, you have to get it out of there," said Dave Cooper, vice president of sales, sports for National Mobile Television. "Say you're going to do a weeklong show in the snow. Is that going to be two feet of snow? Three feet of snow? Or is it going to melt and then have ice all around the cable?

"So you've got to think about how you're running the cable, to elevate cable off the ground, to do different things so you've always got access to that cable, or you're not going to get it out."

Cooper, through NMTV, has been involved with ESPN's Winter X-Games since its inception. He's also involved in World Cup Skiing coverage, as well as mainstream sports like NFL games that take on winter sports characteristics late in the season in certain northern cities.

Cooper credits equipment makers with crafting robust cameras that can handle extreme conditions. If you're going to have a problem, he said, it's not going to be the electronics, but rather the mechanics, especially lenses.

CONSIDERING CONDENSATION

"It's a factor with lenses, which will get condensation," he said. "If you have them warm and then take them out in the cold, you're going to develop condensation."

The phrase Cooper used repeatedly was "keeping the temperature as constant as possible" when it comes to avoiding lens condensation problems.

> "I... have to have maintenance people on the truck that can ski to a camera."
> —Dave Cooper, NMT

"Say you bring the handhelds back to the truck at night, you don't want to set them inside a warm truck," he said. "You want to set them in a bay or somewhere that they're going to stay a constant temperature—cool. So you're not taking them into extreme temperature quickly."

Icicles hang from an NMT production truck.

A skiing cameraman uses ESPN's Follow Cam during the 1998 Winter X Games.

That's not to say just let everything freeze.

"At night," he said, "you put heat lamps under the tarps to always keep heat to the equipment so you don't get up in the morning and find that all the zooms on the cameras have moisture in them that froze."

He said that generally a 40 W incandescent bulb will do the trick.

The equipment inside the production truck is better protected, "but once the heat comes, you actually still need air conditioning in the winter," he said.

"A lot of people don't think you need air conditioning in 10-degree temperatures with TV equipment... it still generates enough heat that you still need air conditioning to keep the equipment cool even with those kinds of temperatures."

Cooper said crews for certain winter sports often need special skills in addition to being able to tolerate the cold.

For World Cup Skiing coverage, for example, "you've got to have talented skiers as your cameramen. I also have to have maintenance people on the truck that can ski to a camera. You aren't going to build a walk to every camera location, you have to ski down the hill to the location."

The snow on the ground isn't the only place the white flakes can cause problems. The "Follow Cam" operator, who chases World Cup competitors down the course, relies on digital RF to pass video back to the truck. Too much snow can interrupt that signal, which is why the Follow Cam has a tape-machine backup.

NUMBER ONE ISSUE

Safety is a factor Cooper emphasizes again and again when it comes to winter sports production, and it starts with wearing proper shoes that protect against slipping and falling.

Additional safety measures include clearing the ice off the steps and entrances to the mobile trucks. And there are creature comforts for camera operators.

"We have insulated handles with covers over the handles. We put thermal blankets over the cameras if we have extreme temperatures," he said.

Cooper said that although there is no rule of thumb to add an extra percentage of setup time for winter sports production, it definitely takes longer to set up in extreme conditions. And there are scheduling factors that affect even indoor sports coverage in an extreme climate.

"You have to keep in mind when you schedule basketball games back-to-back, one city to another—am I going to be able to get there? So that's always a scheduling issue come winter, give yourself enough pad so you have enough backup time." ∎

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DIGITAL JOURNAL
Bill Hayes

Examining a 'Switch' to HD
Avoiding vaporware in choosing new HD gear

AMES, IOWA

Over the last few years, IPTV's digital conversion has focused on design, purchase and installation of RF systems. We have not completely taken our eye off creating content, but with limited resources, the federal mandate, and the lack of available grant funds for production equipment, moving the studio transition along has had to wait.

The delay has actually been more of a benefit than a detriment. Early on, we purchased hardware to acquire and edit in HD, so we have begun building a library of HD content and gaining valuable experience in working in the format.

During that same period, real HD production equipment has finally started to show up on the market, although there still appears to be a lot of vaporware and limited selection. We've really noticed this as we began to investigate converting our online production control facility to HD.

And I do have to specify HD and not just digital. There are any number of SD production switchers with various quantities of inputs and M/E's but when looking for HD devices, the field rapidly narrows. We first started looking for HD production switchers almost four years ago and found virtually nothing available. The manufacturers claimed to be waiting for the market to develop, but I wondered how it was supposed to happen with no hardware available.

EVALUATING NEEDS

Our existing online room consists of a Grass Valley 250 production switcher, DPM-700 digital video effects system, Pinnacle still store and a Dubner 30K graphics system. Ideally we plan on replicating this room in HD, which should be doable.

But there are a number of challenges we face. When we initially began discussions with our technical directors,

one of their chief complaints about the GVG-250 was that it only had two and a half M/E's, which at times, limits production capabilities. So we started looking at three and four M/E switchers but quickly discovered that a single M/E on

several of the models we looked at have all the capabilities of our existing 250. Just counting M/E's doesn't really yield meaningful information without understanding the capabilities of the M/E bank and the needs of the facility. To really

IPTV'S control room

make sense out of the selection process, it is essential to let the users evaluate the operational characteristics, layout and ease of use. Stacking multiple capabilities into a single M/E may make great sense in an automated or edit-controlled environment but may be meaningless in a live or live to disk program if those capabilities are buried in layers of soft keys and menus.

One critical thing that the engineers need to be aware of when evaluating the choices in switchers is what capabilities are actually deliverable and what are in development. As we move further and further into the software-driven digital architecture, products are inevitably released to market before the software is finished. This can be absolutely devastating. Being a sports fan, I have loved watching the network sports in HD but I have been surprised by some of the

> **Probably the one area that I am most dubious of is the idea of buying a system for SD with the idea of doing an upgrade to HD.**

glitches that I have seen in what are fairly simple transitions and effects. When I ask about the specific problems I am amazed at how many of them are known software issues that are being worked on. I won't single out any manufacturer because the problem seems to be ubiquitous.

MULTITASKING CAVEATS

This becomes even more critical when looking in depth at the switchers because they are now so much more. When you look at switchers like Grass Valley's Kalypso, Ross Synergy or Sony MVS series, they blend switcher, DVE, still store and more into a single package. For me this is something that really needs to be closely examined. I have never been a big fan of multifunction boxes for a number of reasons.

In many cases, to access the various functions requires either soft switches or a complex control panel that is difficult to use in a live environment. Perhaps even more critical is the impact to the CPU in the switcher that has to manage all of these various tasks. To the best of my experience, no CPU's really multitask; they task switch, albeit very fast, but they are still doing one thing at a time. Now start stacking complex tasks for the CPU to control and the load can increase to the point where the efficiency and the capabilities of the system are
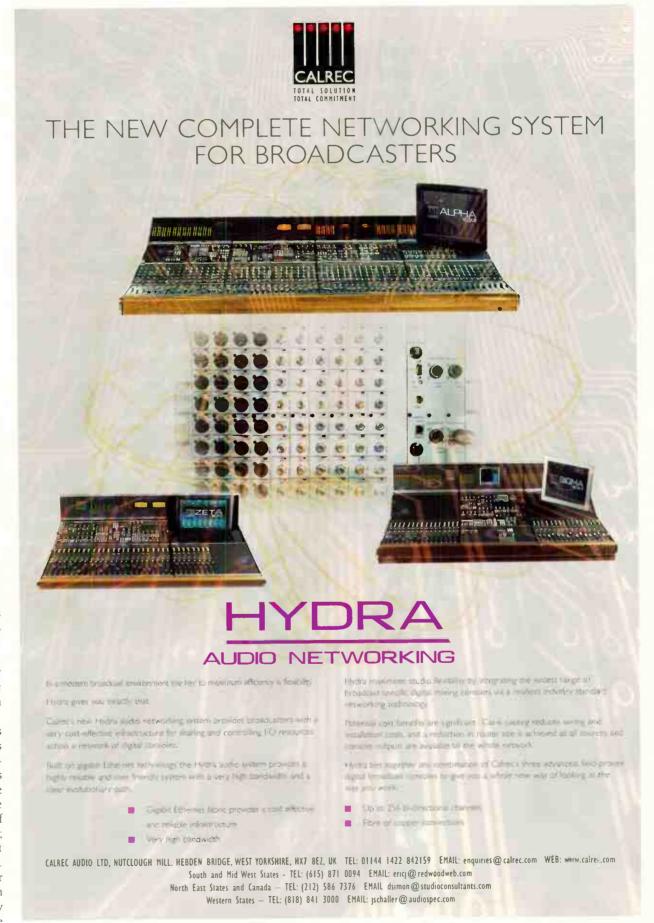
compromised. I am not suggesting that this is the case in the switchers that I mentioned but performance under load is a factor that needs to be measured and evaluated. Sales demonstrations tend to be formatted to show off the capabilities of the switcher in its best light and may mask any flaws; and remember in our area we are looking at HD data rates and not SD.

Probably the one area that I am most

dubious of is the idea of buying a system for SD with the idea of doing an upgrade to HD. Let's face it, we're dealing with digital technology, which at its base unit is a commodity with fluid pricing and power. What are the chances that three to five years from now, there will be an upgrade path for an existing SD switcher that is cost effective and can match the capabilities of a current system? I think it is false economy to

look at SD as a gap filler, thinking that the hardware will be reusable. It also seems self-defeating to say that the local stations don't produce content that merits HD. If we don't think our content merits the highest quality, why would the audience? ∎

Bill Hayes is the Director of Engineering for Iowa Public Television. He can be reached via TV Technology.

BPL Gains Regulatory Momentum

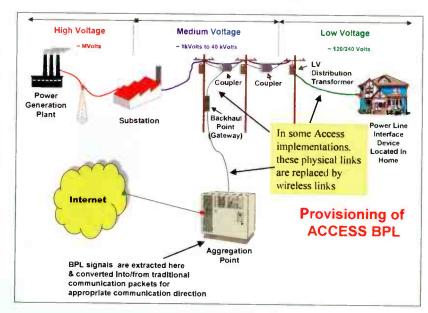## Despite RF concerns, FCC pushes new technology to grow broadband

by John Merli

WASHINGTON

The simple power line, so ubiquitous and so easily taken for granted, is the main artery at the heart of the latest technological Golden Child at the FCC these days. Clearly the commission thinks Broadband over Power Lines (BPL) is an idea whose time has come, even if some financial analysts and ham radio operators disagree. Rarely has the FCC moved with such deliberate speed on any new initiative.

In October, the commission formally issued a BPL Report & Order after deliberating for less than two years.

"This is a high priority here and we believe this technology has great potential to be a third broadband competitor," said Bruce Franca, deputy chief of the FCC's Office of Engineering and Technology. "Chairman Powell and others have said magic things happen when you get to three competitors" in the marketplace.

Provisioning of ACCESS BPL

The basic technology is simple. BPL typically hovers between DSL and cable broadband in download speed. But unlike its two competitors, BPL's symmetrical nature also allows impressive upload speed (sometimes clocking in at 1 Mbps). With the infrastructure of power lines already in place, most BPL schemes today require little more than installing repeaters at transformer boxes and several other adjustments that the American Public Power Association (APPA) said can be done by trained installers in about 15 minutes.

PLUG IT IN, TURN IT ON

Once connected to the customer's system, BPL features a unique wired (yet WiFi-like) roaming option: It can be tapped from any electrical outlet in the dwelling.

Neither Todd nor the FCC seems overly concerned these days about an early flare-up from ham radio operators who were able to demonstrate how BPL interfered with transmissions. Todd said he found "notching" (or deleting) specific frequencies in neighborhoods can easily remedy most interference problems. There apparently have not been any major BPL interference problems with any TV broadcasters thus far. NAB has not formally commented on BPL, according to a spokesman

Although a recent survey from the energy research group Platts concluded that many consumers have a "general mistrust" of public utility companies, David Willis, vice president of Technology Research Services at META Group, believes power companies will not be able to compete for broadband subs for other reasons.

"Telcos are rolling out fiber in their most lucrative markets. Cable providers are adding voice services. A new wireless local loop technology (WiMAX) will make wireless a viable option in the home by 2006. By the time power companies could even build out their infrastructure, the differentiators for broadband providers will be entertainment, mobility and security, not just cheap broadband."

Willis countered that the business case for BPL is not based on consumer demand for broadband, but on the utilities' own needs for better management of the power grid. In fact, new FCC rules are geared to

"Basically, anywhere we have electricity, we have communications."
—Public Utilities Director Allen Todd, Manassas, Va.

"There is a certain ubiquity of the electrical power grid working here," Franca said. APPA says BPL is spreading to mostly smaller markets in Pennsylvania, Ohio, California, Minnesota and elsewhere—especially following publicity about a citywide pilot program in Manassas, Va.

The Manassas project, outside Washington, is contracted to Comtek Inc. of Chantilly, Va. Its various residential and business packages are being marketed to the city's 12,500 residences and 2,500 businesses using DSL-like tactics—touting "always-on"; use of five e-mail accounts; no long-term contracts; 10 MB online hosting and full tech support for $29 monthly.

Manassas Public Utilities Director Allen Todd, who demonstrated the system for FCC officials, said more than one-third of private city dwellings now have potential BPL access, with about 200 homes signing up since it became available in the fall. By early November, there was a waiting list with more than 900 names.

provide double duty for BPL as both a new broadband venue and as a means to upgrade the nation's power grid. Also, the FCC requires a national database of all BPL installations be maintained.

Todd acknowledges that Manassas did not launch BPL solely to fill any broadband void.

"We had no way of monitoring power outages at individual customer levels, and our utilities commission asked if there was a way to monitor such problems," Todd said. "The [BPL] units in the field regulate and report back on power flow, and when [anyone] loses power, we often will know it before they can even report it."
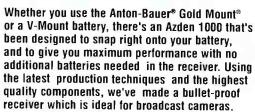
Todd said BPL also provides other services affecting the city's systems of security cameras and traffic lights.

"Basically, anywhere we have electricity, we have communications," he said. "And it seems to me that any 'business' that includes multiple applications like this is a good thing." ■

OVERDRIVE PRODUCTION CONTROL SYSTEM

OverDrive is a powerful production control system that enables touch screen control over devices used in productions such as news, sports or live events. OverDrive integrates with the Synergy SD and MDX series of production switchers, leveraging powerful control interfaces over video servers, VTRs, DDRs, audio mixers, robotic cameras, routers, still stores and more.
www.rossvideo.com/overdrive/
overdrive_overview.html

TALIA NK ROUTING SYSTEM

The NK Series is a new line of compact and cost effective routing switchers. NK routers are available in sizes of 16x16 or 32x32 and in a full range of signal formats including serial digital, analog video, AES/EBU, analog audio and data routing. NK ships with a powerful web browser based configuration system and is available immediately.
www.rossvideo.com/talia/nk/
nk_overview.html

GEARLITE MD

GearLite MD is a line of Multi-Definition (High Definition & Standard Definition) products. These include the DAC-9213 Multi-Definition Digital to Analog Converter, the SRA-9201 Multi-Definition Reclocking DA, and the SEA-9203 Multi-Definition Serial Equalizing Amplifier.

A -PVM version of the DAC-9213 is used specifically for Sony PVM/BVM monitors.

Sony, PVM and BVM are trademarks of Sony Corporation
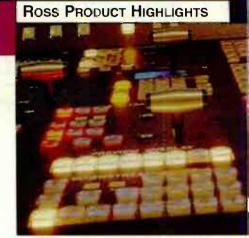http://www.rossvideo.com/gearlite/
gearlite.html

Ross Video Introduces 10 New Multi-Definition Synergy Switchers

SYNERGY MD/MD-X MULTI-DEFINITION PRODUCTION SWITCHERS

The Synergy MD and MD-X series offers models ranging from the compact and powerful Synergy 100 MD single ME switcher to the extra large, hyper powerful Synergy 4 MD-X 4 ME switcher. Synergy MD and MD-X support all popular formats of HD and SD out of the box.

Using the absolute latest technology, these switchers are full of standard features at a price point that puts a multi-definition switcher within reach of a typical mid-market customer.
www.rossvideo.com/synergy/
switchers.html

Plug & Play Goes Into Round Two

This month marks the second anniversary of the digital cable TV plug-and-play pact between cable operators and consumer electronics makers. That agreement resulted in a grand total of 700 digital-cable ready (DCR) sets in American homes by Labor Day 2004, according to a report requested by the FCC.

It has not been an easy process, even to get the first small phalanx of DCR installations. The key ingredient in the agreement is the CableCARD, a device intended to replace set-top boxes.

Early adopters have been troublesome. "Armies of cable engineering personnel, from field technicians to corporate engineers, have continued to spend time troubleshooting and fixing UDCPs [Unidirectional Digital Cable Products] as they appear in consumer homes," the National Cable & Telecommunications Association explained in its report to the FCC. NCTA pointed out problems with early DCR TV sets. It cited one unspecified model in which "the pins in the CableCARD slot inside the TV bend when you try to insert a CableCARD, due to a solder-temperature error in the manufacture of the TV set."

The report said there were "no plans for a recall of this DTV, so the issue has to be handled by a technician in the field."

However, NCTA said cable operators have collaborated with consumer electronics companies "in on-site troubleshooting... although not required under any agreement or order."

The status of unidirectional plug-and-play involves a bit of posturing and a great deal of political positioning, as the cable and consumer electronics industries—along with many new participants—confront the much tougher task of creating an agreement on bidirectional digital cable technology. The negotiations began as soon as NCTA and the Consumer Electronics Association, on behalf of their respective members, signed the unidirectional agreement in December 2002. The FCC approved that pact nine months later.

The current skirmishes about DCR deployments are part of the cable industry's effort to push back the deadline for full nationwide availability of Cable-CARDs, now set for 2006.

During the first half of 2005, the FCC will revisit the viability of that deadline, according to Rick Chessen, head of the commission's DTV Task Force. Chessen cited factors that will affect the timing requirement, such as whether consumers can actually self-install the hardware.

"We want to make it as easy as possible," Chessen said.

He also acknowledged the FCC is "monitoring and encouraging" the talks about bidirectional (i.e., interactive) digital cable services. Those negotiations are being conducted behind closed doors. Chessen said the FCC does not have "any real timetable" yet for coming up with an industrywide agreement.

When talks began, some consumer electronics participants dreamily predicted a one-year process. Cable executives said they envisioned no quick resolution—befitting their desire to maintain control over home equipment.
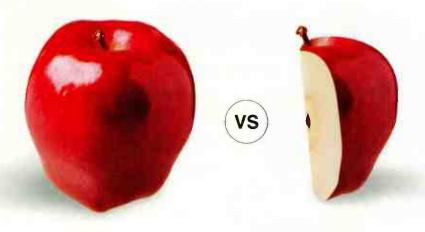
The likelihood of extended bidirectional negotiations became even more evident when Silicon Valley, Hollywood,

NEO ™ [Advanced

NEO — An advanced and integrated platform, designed to grow with your business, offers maximum functionality for analog, digital and high-definition content, allowing customers to quickly benefit from evolving standards and technology. An advanced processing platform, NEO not only hosts core, single-function modules, but also consolidates vital audio/video processing and timing functions on a single "Simplicity" module. New, award-winning, specialty modules have been added to NEO: NEO VR digital video recorder, LogoMotion II branding tool and the NEO SuiteView Multi-Source Display. These applications extend the practicality of NEO beyond traditional, conventional modular applications.

Advanced Applications: Storage, Multi-Viewer, Reference and Time

Digital Video Recorder	DVR-3901	☑	**Digital Video Recorder Module** 1 SDI (with embedded AES) in and out, 1 composite out, 1 AES balanced in and out, 1 monitoring audio out, timecode in and out, Ethernet, RS-422, genlock in
NEO SuiteView [HDTV]	NSV-H4	☑	**Input Module** Quad auto-detecting HD/SDI or composite NEO SuiteView input module
	NSV-S4/-V4	☑	**Input Module** -S4 = quad auto-detecting SDI or composite NEO SuiteView input module, -V4 = quad analog composite video NEO SuiteView input module
	NSV-G3	☑	**Input Module** Triple VGA/DVI graphics NEO SuiteView input module
	NSV-OUT	☑	**Output Module** NEO SuiteView output module with redundant out
[HDTV]	NSV-xxx	☑	**Audio and Control** Please contact Leitch for a list of available options
Reference Products	GPI-3901	☑	**GPI Timecode Module** 2 LTC in, DARS in, AES out, 2 audio out, 6 GPI out
[HDTV]	CSD-3902	☑	**Master Clock Driver Module** 2 LTC out, 1 black burst out with VITC or Tri-Level synchronizer out, NTP, impulse clock, 1 DARS out, 1 black burst in, LTC in, modem
[HDTV]	CSD-3902-SYS-1 CSD-3902-SYS-1E/-1P CSD-3902-SYS-3/-3E	☑	**Master Clock Driver System** Includes 2 CSD-3902-FM, ACO-3901 autochangeover module and NEO frame and external DC supply, 2 LTC out, 1 black burst out with VITC or Tri-Level synchronizer, NTP, impulse clock, 1 DARS out, 1 black burst in, LTC in, modem, -1 = FR-3901 frame, -1E = FR-3901-E frame, -1P = FR-3901-EP frame, -3 = FR-3923 frame, -3E = FR-3923-E frame, CSD-3902-SYS = module set only, no frame
	GPS-3902	☑	**GPS Receiver Kit** Includes antenna, antenna cable, receiver, DC power supply and interface cables
[HDTV]	MTG-3901	☑	**Master Timing Generator Module** 2 LTC out, 4 black burst out with VITC or Tri-Level synchronizer out, NTP, impulse clock, 1 DARS out, 1 black burst in, LTC in, modem
[HDTV]	MTG-3901-SYS-1 MTG-3901-SYS-1E/-1P MTG-3901-SYS-3/-3E	☑	**Master Timing Generator System** Includes 2 MTG-3901-FM, ACO-3901 autochangeover module and NEO frame and external DC supply, 2 LTC out, 4 black burst out with VITC or Tri-Level synchronizer, NTP, impulse clock, 1 DARS out, 1 black burst in, LTC in, modem, -1 = FR-3901 frame, -1E = FR-3901-E frame, -1P = FR-3901-EP frame, -3 = FR-3923 frame, -3E = FR-3923-E frame, MTG-3901-SYS = module set only, no frame
[HDTV]	ACO-3901	☑	**Automatic Changeover Module** MTG-3901 outputs, and auxilary inputs for: 4 BB, DARS, impulse and 2 LTC
	IRB-3901	☑	**IRIG-B/LTC Conversion Module** 2 LTC in, 2 IRIG-B in, 2 LTC out, 2 IRIG-B out
Aspect Ratio Converter	ARC-3901		**Aspect Ratio Converter Module** 1 SDI in, with loop thru, 4 SDI out, SDI preview out, GPI in and out

Advanced Applications: Simplicity Series (Combination Video/Audio)

Composite Decoder and Audio Synchronizer/ Proc/Multiplexer	DAS-3901	☑	**Decoder/Audio Synchronizer** NTSC/PAL in, 4 analog audio in, DARS in, genlock in (loop thru), 1 SDI/NTSC/PAL out, 2 SDI with embedded audio out or 2 AES coaxial out, 2 AES balanced out
SDI/AES Synchronizer/Proc	AVS-3901-B/C	☑	**SDI/AES Synchronizer/Processor** SDI in, genlock in (loop thru), DARS in, 2 SDI out, 2 AES in and out, -B = 2 AES balanced in and out, -C = 2 AES coaxial in and out
SDI/AES and Embedded Audio Synchronizer/Proc	AVS-3902-B/C	☑	**SDI/AES and Embedded Audio Synchronizer/Processor** SDI with embedded audio in, genlock in (loop thru), DARS in, 2 SDI out with embedded audio, 2 AES in and out, -B = 2 AES balanced in and out, -C = 2 AES coaxial in and out
SDI/AES/Audio Synchronizer/ Proc/Multiplexer	AVM-3901-A/-B/-C AVM-3901-B4/-C4	☑	**SDI/AES Synchronizer/Processor and Multiplexer** 1 SDI in, genlock in (loop thru), 1 DARS in, 2 SDI out, -A = 4-channel analog in, -B = 2 AES balanced in and out, -C = 2 AES coaxial in and out, -B4 = 4 AES balanced in, -C4 = 4 AES coaxial in
SDI/AES and Embedded Audio Synchronizer/Proc/Multiplexer	AVM-3902-B4/-C4	☑	**SDI/AES Embedded Audio Synchronizer/Proc/Multiplexer** 1 SDI in, 4 AES in, 1 genlock in (loop thru), -B4 = 4 AES balanced in, -C4 = 4 AES coaxial in
SDI and Embedded Audio Synchronizer/Proc	SFS-3901	☑	**SDI/Embedded Audio Synchronizer/Proc Amp** 1 SDI in, 1 genlock in (loop thru), 2 SDI reclocked out, 4 SDI out

Advanced Applications: HDTV Up/Down Conversion

HDTV Upconverter [HDTV]	HUC-3901	☑	**HDTV Upconverter** 1 SDI in, 2 reclocked SDI out, 4 HD-SDI out
HDTV Downconverter [HDTV]	HDC-3901 HDC-3901-AD	☑	**HDTV Downconverter** HDC-3901 = 1 HD-SDI/SDI in, 4 reclocked HD-SDI/SDI out, 1 GBR/YPbPr or 3 composite out, 1 HD-SDI or downconverted SDI out, 1 HD-SDI or downconverted SDI out with CFID, HDC-3901, -AD = 1 HD-SDI/SDI in, 1 reclocked HD-SDI/SDI out, 1 GBR/YPbPr or 3 composite out or 2 AES coaxial out, 1 HD-SDI or downconverted SDI out, 1 HD-SDI or downconverted SDI out with CFID, 2 AES balanced out, 4 audio out

Advanced Applications: Logo Generators/Keyers

HD Logo Generator/ Keyer [HDTV]	MGI-3901H-RB	☑	**HD LogoMotion Module Set** 1 HD-SDI program in, 1 HD-SDI key in, 1 HD-SDI fill in, genlock in, 4 AES in 4 AES out, 1 HD-SDI program out, 1 HD-SDI key out, 1 HD-SDI preview out 1 HD-SDI clean out
[HDTV]	MGI-3901H-FR1/-FR3	☑³	**HD LogoMotion System** HDTV LogoMotion II with NEO frame, includes MGI-3901H-RB, FR-3901-E or FR-3923-E frame, -FR1 = FR-3901-E frame, -FR3 = FR-3923-E frame
SDI Logo Generator/Keyer	MGI-3901-RB	☑³	**SD LogoMotion Module Set** 1 SDI program in, 1 SDI key in, 1 SDI fill in, genlock in, 4 AES in, 4 AES out, 1 SDI program out, 1 SDI key out, 1 SDI preview out, 1 SDI clean out
	MGI-3901-FR1/-FR3	☑³	**SD LogoMotion System** SD LogoMotion II with NEO frame, includes MGI-3901-RB, FR-3901-E or FR-3923-E frame, -FR1 = FR-3901-E frame, -FR3 = FR-3923-E frame

Advanced Applications: Switching

Video and Audio Switching/Routing [HDTV]	NSM-8X1SHD/ NSM-7X2SHD	☑	**8 x 1/7 x 1 SDI and HD-SDI Digital Video Router** NSM-8X1SHD = 8 SDI or HD-SDI in, 1 SDI or HD-SDI out, genlock in, NSM-7X1SHD = 7 SDI or HD-SDI in, 2 SDI or HD-SDI out, genlock in
	NSM-8X1V/ NSM-7X1V	☑	**8 x 1/7 x 1 Analog Video Router** NSM-8X1V = 8 NTSC/PAL in, 1 NTSC/PAL out, genlock in, NSM-7X1V = 7 NTSC/PAL in, 2 NTSC/PAL out, genlock in
	NSM-8X1AES-B/-C	☑	**8 x 1 Digital Audio Router** 8 AES in, 1 AES out, reference in, -B = balanced in and out, -C = coaxial in and out
	NSM-7X2AES-B/-C	☑	**7 x 1 Digital Audio Router** 7 AES in, 2 AES out, reference in, -B = balanced in and out, -C = coaxial in and out
	NSM-8X1A2-66/-600	☑	**8 x 1 Analog Audio Router** 8 stereo pair in, 2 stereo pair out, -66 = 66 ohm low impedance version, -600 = 600 ohm high impedance version

The 6800+ modular interface platform defines the standard in meeting key needs of professional television applications: breadth of functions, multi-format flexibility, space conservation, and integrated control/monitoring. With over 100 module configurations, 6800+ delivers the broadest range of core distribution and processing functions supporting all signal formats, including HD, in a low-cost and flexible package, ensuring an integrated comprehensive solution that meets your specific needs. Part numbers below that end in "+D" or just "+" use two slots in the frame; those with "+S" use one slot.

Video A-to-D and D-to-A Conversion

Decoder	DEC6800+ (+DM(F) frames) DEC6800+D (+X(F) frames)	✓	**NTSC/PAL to SDI Decoders, 12-bit** 1 composite in, 4 SDI out
Decoder/Synchronizer	DES6800+ (+DM(F) frames) DES6800+D (+X(F) frames)	✓	**NTSC/PAL to SDI Decoder/Synchronizer, 12-bit** 1 composite in, 4 SDI out, 1 audio tracking out
Encoder	ENC6800+ (+DM(F) frames) ENC6800+D (+X(F) frames)	✓	**SDI to NTSC/PAL Encoder, 12-bit** 1 SDI in, 2 reclocked SDI out, 4 composite out
Encoder/Synchronizer	ENS6800+ (+DM(F) frames) ENS6800+D (+X(F) frames)	✓	**SDI to NTSC/PAL Encoder/Synchronizer, 12-bit** 1 SDI in, 4 composite out, 2 reclocked SDI out or 1 reclocked SDI out and 1 audio tracking out
Component A-to-D	ADC-6801[1] (+DM(F) frames) ADC-6801+D[2] (+X(F) frames)		**Component Analog to SDI Converter, 10-bit** 6800 Series module: Component in (G/Y, B/B-Y, R/R-Y), 2 SDI out
Component D-to-A	DAC-6801[1] (+DM(F) frames) DAC-6801+D[2] (+X(F) frames)		**SDI to Component Analog Converter, 10-bit** 6800 Series module: SDI in, Component out (G/Y, B/B-Y, R/R-Y)

Video Synchronization/Processing/Switching

HD Frame Synchronizer [HDTV]	HFS6800+D (+X(F) frames)	✓	**HD Video Frame Synchronizer/Processor** 1 HD in, 4 processed HD out, 2 additional processed HD out or 2 reclocked HD out, 1 audio tracking out
SDI Frame Synchronizer	VFS6800+ (+DM(F) frames) VFS6800+S (+X(F) frames) VFS6800+D (+X(F) frames)	✓	**SDI Video Frame Synchronizer/Processor** 1 SDI in, 1 reclocked SDI out, 3 processed SDI out, 1 audio tracking out
SDI Timer/Switcher	VTS-6801[1] (+DM(F) frames) VTS-6801+D[2] (−X(F) frames)		**SDI Video Timer/Switcher** 6800 Series module: 2 Program in, 2 GPI in, 2x 2 Program out
SDI Router	VSR-4041[1] (+DM(F) frames) VSR-4041+D[2] (−X(F) frames)		**SDI 4x1 Router** 6800 Series module: 4 SDI in, 2 SDI out (same), 2 control ports (local or remote panel)

Audio Conversion/Delay/Synchronization

Audio A-to-D	(both for +X(F) frames) ADC6800+A2BCD ADC6800+A4BCD	✓	**2-Channel or 4-Channel Analog Audio to AES/EBU Converters** 2 analog audio in, 1 each balanced and coaxial AES out 4 analog audio in, 2 each balanced and coaxial AES out
	(both for +X(F) frames) ADS6800+A2BCD ADS6800+A4BCD	✓	**2-Channel or 4-Channel Analog Audio Delay Synchronizers with A-to-D Conversion** 2 analog audio in, 1 audio tracking in, 1 each balanced and coaxial AES out 4 analog audio in, 1 audio tracking in, 2 each balanced and coaxial AES out
Audio D-to-A	DAC6800+BCA2D DAC6800+BCA2ZD (both for +XF frame)	✓	**AES to 2-Channel Analog Audio Converter** 1 balanced/coaxial (selectable) AES in, 2 analog out, Z = 600 ohm
	DAC6800+BCA4D DAC6800+BCA4ZD (both for +XF frame)	✓	**AES to 4-Channel Analog Audio Converter** 2 balanced/coaxial (selectable) AES in, 4 analog out, Z = 600 ohm
AES Delay/Synchronizer	ADS6800+B2D (+X(F) frames) ADS6800+C2D (+X(F) frames) ADS6800+C2 (+DM(F) frames)	✓	**AES Delay Synchronizers, Balanced or Coaxial I/O** 2 each balanced AES in and out, 1 audio tracking in 2 each coaxial AES in and out, 1 audio tracking in

Simplicity (Combination Video/Audio)

AES Delay and Video Synchronizer	AVS6800+B2D (+X(F) frames) AVS6800+C2D (+X(F) frames) AVS6800+C2 (+DM(F) frames)	✓	**AES Delay and Video Frame Synchronizers, Balanced or Coaxial** 1 SDI in, 2 balanced AES in, 2 SDI out, 2 balanced AES out 1 SDI in, 2 coaxial AES in, 2 SDI out, 2 coaxial AES out

Multiplexers (Embedders)

HD/AES [HDTV]	(both for +X(F) frames) HMX6800+B2D HMX6800+C2D	✓	**HD Multiplexers with 2 Balanced or Coaxial AES Inputs and AES Outputs** 1 HD in, 2 balanced AES in, 2 HD out, 2 balanced AES out 1 HD in, 2 coaxial AES in, 2 HD out, 2 coaxial AES out
[HDTV]	(both for +X(F) frames) HMX6800+B4D HMX6800+C4D	✓	**HD Multiplexers with 4 Balanced or Coaxial AES Inputs** 1 HD in, 4 balanced AES in, 3 HD out 1 HD in, 4 coaxial AES in, 3 HD out
SDI/AES	MXA6800+B2D (+X(F) frames) MXA6800+C2D (+X(F) frames) MXA6800+C2 (+DM(F) frames)	✓	**2-Input Balanced or Coaxial AES Multiplexers with AES Outputs** 1 SDI in, 2 balanced AES in, 3 SDI out, 2 balanced AES out 1 SDI in, 2 coaxial AES in, 3 SDI out, 2 coaxial AES out
	MXA6800+B4D (+X(F) frames) MXA6800+C4D (+X(F) frames) MXA6800+C4 (+DM(F) frames)	✓	**4-Input Balanced or Coaxial AES Multiplexers** 1 SDI in, 4 balanced AES in, 3 SDI out 1 SDI in, 4 coaxial AES in, 3 SDI out
SDI/AES with Synchronizer	MSA6800+B2D (+X(F) frames) MSA6800+C2D (+X(F) frames) MSA6800+C2 (+DM(F) frames)	✓	**2-Input Balanced or Coaxial AES Multiplexers with Synchronizer and AES Outputs** 1 SDI in, 2 balanced AES in, 1 audio tracking in, 3 SDI out, 2 balanced AES out 1 SDI in, 2 coaxial AES in, 1 audio tracking in, 3 SDI out, 2 coaxial AES out
	MSA6800+B4D (+X(F) frames) MSA6800+C4D (+X(F) frames) MSA6800+C4 (+DM(F) frames)	✓	**4-Input Balanced or Coaxial AES Multiplexers with Synchronizer** 1 SDI in, 4 balanced AES in, 1 audio tracking in, 3 SDI out 1 SDI in, 4 coaxial AES in, 1 audio tracking in, 3 SDI out
SDI/Analog Audio	(both for +X(F) frames) MXA6800+A2D MXA6800+A4D	✓	**2-Channel or 4-Channel Analog Audio Multiplexers** 1 SDI in, 2 analog audio in, 3 SDI out 1 SDI in, 4 analog audio in, 3 SDI out
SDI/Analog Audio with Synchronizer	(both for +X(F) frames) MSA6800+A2D MSA6800+A4D	✓	**2-Channel or 4-Channel Analog Audio Multiplexers with Synchronizer** 1 SDI in, 2 analog audio in, 1 audio tracking in, 3 SDI out 1 SDI in, 4 analog audio in, 1 audio tracking in, 3 SDI out
SDI/Analog Audio/AES	(both for +X(F) frames) MXA6800+A2B2D MXA6800+A2C2D	✓	**2-Channel Analog Audio Multiplexers with Balanced or Coaxial AES Outputs** 1 SDI in, 2 analog audio in, 1 SDI out, 2 balanced AES out 1 SDI in, 2 analog audio in, 1 SDI out, 2 coaxial AES out
	(both for +X(F) frames) MXA6800+A4B2D MXA6800+A4C2D	✓	**4-Channel Analog Audio Multiplexers with Balanced or Coaxial AES Outputs** 1 SDI in, 4 analog audio in, 1 SDI out, 2 balanced AES out 1 SDI in, 4 analog audio in, 1 SDI out, 2 coaxial AES out
SDI/Analog Audio/AES with Synchronizer	(both for +X(F) frames) MSA6800+A2B2D MSA6800+A2C2D	✓	**2-Channel Analog Audio Multiplexers with Synchronizer and Balanced or Coaxial AES Outputs** 1 SDI in, 2 analog audio in, 1 audio tracking in, 1 SDI out, 2 balanced AES out 1 SDI in, 2 analog audio in, 1 audio tracking in, 1 SDI out, 2 coaxial AES out
	(both for +X(F) frames) MSA6800+A4B2D MSA6800+A4C2D	✓	**4-Channel Analog Audio Multiplexers with Synchronizer and Balanced or Coaxial AES Outputs** 1 SDI in, 4 analog audio in, 1 audio tracking in, 1 SDI out, 2 balanced AES out 1 SDI in, 4 analog audio in, 1 audio tracking in, 1 SDI out, 2 coaxial AES out

Demultiplexers (De-embedders)

HD/AES	**HDTV**	both for +X(F) frames) HDX6800+**B2D** HDX6800+**C2D**	**HD/AES Demultiplexers with 2 Balanced or Coaxial AES Outputs** 1 HD in, 2 balanced AES out, 4 reclocked HD out 1 HD in, 2 coaxial AES out, 4 reclocked HD out
	HDTV	both for +X(F) frames) HDX6800+**B4D** HDX6800+**C4D**	**HD/AES Demultiplexers with 4 Balanced or Coaxial AES Outputs** 1 HD in, 4 balanced AES out, 4 reclocked HD out 1 HD in, 4 coaxial AES out, 4 reclocked HD out
SDI/AES		DMX6800+**B2D** (+X(F) frames) DMX6800+**C2D** (+X(F) frames) DMX6800+**C2** (+DM(F) frames)	**Demultiplexers with 2 Balanced or Coaxial AES Outputs** 1 SDI in, 2 reclocked SDI out, 2 balanced AES out 1 SDI in, 2 reclocked SDI out, 2 coaxial AES out
		DMX6800+**B4D** (+X(F) frames) DMX6800+**C4D** (+X(F) frames) DMX6800+**C4** (+DM(F) frames)	**Demultiplexers with 4 Balanced or Coaxial AES Outputs** 1 SDI in, 2 reclocked SDI out, 4 balanced AES out 1 SDI in, 2 reclocked SDI out, 4 coaxial AES out
SDI/AES/Analog Audio		all for +XF frame) DMX6800+**A2BD** / DMX6800+**A2BZD** DMX6800+**A2CD** / DMX6800+**A2CZD**	**Demultiplexers with 2 Channels Analog Audio and 1 Balanced or Coaxial AES Outputs** 1 SDI in, 1 reclocked SDI out, 2 analog audio out, 1 balanced AES out, Z = 600 ohm 1 SDI in, 1 reclocked SDI out, 2 analog audio out, 1 coaxial AES out, Z = 600 ohm
		all for +XF frame) DMX6800+**A4BD** / DMX6800+**A4BZD** DMX6800+**A4CD** / DMX6800+**A4CZD**	**Demultiplexers with 4 Channels Analog Audio and 2 Balanced or Coaxial AES Outputs** 1 SDI in, 1 reclocked SDI out, 4 analog audio out, 2 balanced AES out, Z = 600 ohm 1 SDI in, 1 reclocked SDI out, 4 analog audio out, 2 coaxial AES out, Z = 600 ohm

Logo Generators/Keyers/PROM Slides

SDI Logo Generator	LGI 6801 (+DM(F) frames) LGI 6801+D² (+X(F) frames)	**SDI Logo Generator/Inserter** 6800 Series module: 1 SDI in, 4 SDI out, 4 GPIs
SDI Keyer	DSK-6801¹ (+DM(F) frames) DSK-6801+D² (+X(F) frames)	**SDI Downstream Keyer** 6800 Series module: 1 Program in, 1 Key in, 1 Fill in, 2 control I/O, 2 Program out
	DSK-6803¹ (+DM(F) frames) DSK-6803+D² (+X(F) frames)	**SDI Downstream Keyer with Preview** 6800 Series module: 1 Program in, 1 Key in, 1 Fill in, 2 control I/O, 2 Program out, 1 Preview out
SDI PROM Slide	VES-6801¹ (+DM(F) frames) VES-6801+D² (+X(F) frames)	**Single-channel SDI PROM Slide** 6800 Series module: 2 SDI out (same), 4 control I/O (XY, RS232, GPI in, GPI out)
	VES-6801-2¹ (+DM(F) frames) VES-6801-2+D² (+X(F) frames)	**Dual-channel SDI PROM Slide** 6800 Series module: 4 SDI out (2x 2), 4 control I/O (XY, RS232, GPI in, GPI out)

Test Generators

SDI	VTG-6801¹ (+DM(F) frames) VTG-6801+D² (+X(F) frames)	**SDI Test Signal Generator** 6800 Series module: 8 SDI out
AES	DAR-6880¹ (+DM(F) frames) DAR-6880+D² (+X(F) frames)	**AES Audio Reference and Test Generator** 6800 Series module: 5 DARS out, 1 Tone out, 1 Silence out, 1 Word Clock out

Fiber Transport

HD/SDI/ASI/ SMPTE310	**HDTV**	HOS6800+**S** (SC connector; +X(F) frames) HOS6800+**FCS** (FC connector; +X(F) frames) HOS6800+**STS** (ST connector; +X(F) frames)	**HD/SDI/ASI/SMPTE310 to Single-mode Fiber Optic Transmitters** 1 HD/SDI/ASI/SMPTE310 in, 2 reclocked out, 1 fiber out
	HDTV	OHS6800+**S** (SC connector; +X(F) frames) OHS6800+**FCS** (FC connector; +X(F) frames) OHS6800+**STS** (ST connector; +X(F) frames)	**Single-mode Fiber Optic to HD/SDI/ASI/SMPTE310 Receivers** 1 fiber in, 3 HD/SDI/ASI/SMPTE310 out
SDI/ASI/SMPTE310		SOM6800+**S** (SC connector; +X(F) frames) SOM6800+**FCS** (FC connector; +X(F) frames) SOM6800+**STS** (ST connector; +X(F) frames)	**SDI/ASI/SMPTE310 to Multi-mode Fiber Optic Transmitters** 1 SDI in, 2 reclocked SDI/ASI/SMPTE310 out, 1 fiber out
		OSM6800+**S** (SC connector; +X(F) frames) OSM6800+**FCS** (FC connector; +X(F) frames) OSM6800+**STS** (ST connector; +X(F) frames)	**Multi-mode Fiber Optic to SDI/ASI/SMPTE310 Receivers** 1 fiber in, 3 SDI/ASI/SMPTE310 out
		SOS6800+**S** (SC connector; +X(F) frames) SOS6800+**FCS** (FC connector; +X(F) frames) SOS6800+**STS** (ST connector; +X(F) frames)	**SDI/ASI/SMPTE310 to Single-mode Fiber Optic Transmitters** 1 SDI in, 2 reclocked SDI/ASI/SMPTE310 out, 1 fiber out
		OSS6800+**S** (SC connector; +X(F) frames) OSS6800+**FCS** (FC connector; +X(F) frames) OSS6800+**STS** (ST connector; +X(F) frames)	**Single-mode Fiber Optic to SDI/ASI/SMPTE310 Receivers** 1 fiber in, 3 SDI/ASI/SMPTE310 out

Distribution Amplifiers

Refer to separate Distribution Amplifier poster

Frames

2RU	**HDTV**	FR6802+**X**	**2RU, open back, with blanks, includes one 6802+PS** (fits optional 6802+PS redundant PSU) For modules with mating back connectors. Up to 20 single-slot modules; up to 10 dual-slot modules per frame, or any mix in between
	HDTV	FR6802+**XF**	**2RU, open back, with blanks, includes fan assembly and one 6802+PS** (fits optional 6802+PS redundant PSU) For modules with mating back connectors. Up to 20 single-slot modules; up to 10 dual-slot modules per frame, or any mix in between
		FR6802+**DM**	**2RU, 10 slot, 100 BNC back, includes one 6802+PS** (fits optional 6802+PS redundant PSU)
		FR6802+**DMF**	**2RU, 10 slot, 100 BNC back, includes fan assembly and one 6802+PS** (fits optional 6802+PS redundant PSU)

Control and Monitoring

Ethernet Control Card	ICE6800+**D**	Fits in FR6802+X(F) frames. Controls a total of 9 frames, FR6802+DM(F) and/or FR6802+X(F), via coaxial connections
Application Software	+**Pilot Lite**	Free software and Resource module controls maximum of 4 frames via coaxial connections. RS232 I/F from host frame to user PC
	CCS **Pilot**	**Control and monitoring software**
	CCS **Navigator**	**Control and monitoring software with customizable GUI**
Control Panel	CCS **RCP 1U**/CCS **TRAX**	**Remote control panel, 1RU / TRAX Router-follow option for RCP-CCS-1U**

Notes: ¹ 6800 Series module. No CCS nor bussed Genlock functionality supported in FR6802+DM(F) frame with this module installed. ² 6800 Series module: Not CCS-compatible in FR6802+X(F) frames. ³Alarm control.

6800+ Model Number Configuration Guide

Frames	Video-only Modules	Video/Audio and Audio-only Modules
FR6802+XF	**DEC6800+D**	**DMX6800+A4BZD**

Frames — FR6802+XF

Back of Frame I/O Configuration
DM = Full Back with 100 BNCs
  - Provides 10 dual-width slots
   with 10 BNCs each

X = No Back (blank back connectors; mating
  I/O connectors provided with modules):
  - Supports up to 20 single-slot modules,
   10 dual-slot modules, mix of single and
   dual-slot modules

Fan Configuration
F = Fan Assembly included
Blank = No Fan Assembly

Video-only Modules — DEC6800+D

Base Module Type, Examples:
DEC = Decoder
DES = Decoder/Synchronizer
VFS = Video Frame Sync
VSD = Video SDI DA
HSE = HD/SDI/ASI Equalizing
   and Reclocking DA
SOS = SDI to Optical Single-mode
   Transmitter

Back Connector Details
Blank = Module only, no back connector
   (for FR6802+DM(F) frames)
S = Module and Single-slot back connector
   (for FR6802+X(F) frames)
D = Module and Double-slot back connector
   (for FR6802+X(F) frames)

Video/Audio and Audio-only Modules — DMX6800+A4BZD

Base Module Type, Examples:
DMX = Demultiplexer
AES = AES Distribution Amplifier
ADC = Audio A-to-D Converter
ADS = Audio Delay Synchronizer
MXA = Multiplexer
MSA = Multiplexer/Synchronizer

Number of Audio Channels and Type
A2 = 2-channel analog audio (stereo)
A4 = 4-channel analog audio (2x stereo)
B or C = 1 AES pair – Balanced or Coaxial
B2 or C2 = 2 AES pairs – Balanced or Coaxial
B4 or C4 = 4 AES pairs – Balanced or Coaxial
Z = High impedance 600-ohm analog audio;
   blank if not applicable
Note: for modules with both analog and AES,
   up to 6 placeholders may be used

Connector Details
Blank = Module only,
   no back connector
S = Module and single-slot
   back connector
D = Module and double-slot
   back connector

Core Processing: A-to-D and D-to-A Conversion

Decoder and Decoder	DEC 3902		NTSC/PAL to SDI Decoder
			1 composite in (loop thru), 4 SDI out
	DES-3902		NTSC/Pal to SDI Decoder/Synchronizer
			1 composite in (loop thru), genlock in (loop thru), 2 SDI out, 2 SDI/composite out
	DES-3901-S		NTSC/PAL to SDI Decoder/Synchronizer (bypass)
			1 composite in (loop thru), 1 SDI in, genlock in (loop thru), 2 SDI out, 2 SDI/composite out, 1 SDI bypass out
Decoder/Synchronizer/ Noise Reducer	DNS-3902		NTSC/PAL to SDI Decoder/Synchronizer/Noise Reducer
			1 composite in (loop thru), genlock in (loop thru), 2 SDI out, 2 SDI/composite out
	DNS-3901-S		NTSC/PAL to SDI Decoder/Synchronizer/Noise Reducer (bypass)
			1 composite in (loop thru), 1 SDI in, genlock in (loop thru), 2 SDI out, 2 SDI/composite out, 1 SDI bypass out
Composite Decoder and Audio Synchronizer/Proc/Multiplexer	DAS-3901		Decoder/Audio Synchronizer
			1 NTSC/PAL in, 4 analog audio in, DARS in, genlock in (loop thru), 1 SDI/NTSC/PAL out, 2 SDI with embedded audio out or 2 AES balanced and coaxial out
Encoder/Encoder Synchronizer	ENS-3901		SDI to NTSC/PAL Encoder Synchronizer
			SDI in, genlock in (loop thru), 1 reclocked SDI out, 6 NTSC/PAL out
Component A-to-D	ADC-3901		Analog Component Video to SDI Converter
			GBR/YPbPr in, synchronizer in, 2 SDI out
Component D-to-A	VSM-3901		SDI DA with NTSC/PAL/GBR/YPbPr, YC Monitoring
			SDI in, 4 SDI out, 1 SDI out/CFID, 1 SDI or NTSC/PAL, 3 NTSC/PAL or 1 GBR/YPrPb/YC out
Audio A-to-D	ADC-3981		GBR/YPbPr Analog Component Video to SDI
			GBR/YPbPr in, synchronizer in, 2 SDI out
Audio D-to-A	DAC-3981		2 AES 4-Channel Analog Audio Converter
			2 AES balanced or coaxial in, 4 balanced analog audio out (4-channel or 2 x 2-channel)

Core Processing: Synchronization/Processing

HD Frame Synchronizer HDTV	VFS-3901H		HDTV Video Frame Synchronizer/Proc Amp
			1 HD-SDI in, genlock in (loop thru), 1 HD-SDI reclocked out, 3 HD-SDI out
SDI Frame Synchronizer	VFS-3901		SDI Frame Synchronizer
			1 SDI in, genlock in (loop thru), 2 SDI reclocked out, 4 SDI out
Audio Synchronizer/ Proc/Delay	AS-3901-B/-C		Audio Synchronizer, Delay, Processor
			2 AES in, 2 AES out, Dars in, -B = balanced in and out, -C = coaxial in and out
	AS-3981-AD		Audio Synchronizer, Delay, Processor
			4 analog audio in, genlock in (loop thru), 2 AES balanced out, 2 AES coaxial out
	AS-3981-DA		Audio Synchronizer, Delay, Processor
			2 AES balanced or coaxial in, genlock in (loop thru), 4 analog audio out

Core Processing: Multiplexers (Embedders)

HD/AES HDTV	MXA-3901H-B4/ C4		Audio Multiplexer
			1 HD-SDI in with 1 reclocked out, 4 AES in, 3 HD-SDI out, -B4 = 4 AES balanced in, -C4 = 4 AES coaxial in
SDI/AES	MXA-3901-B/-C MXA-3901-B4/-C4		AES Audio Multiplexer
			1 SDI in, AES in, 2 SDI out, -B = 2 AES balanced in and out, -C = 2 AES coaxial in, 2 AES coaxial out, -C4 = 4 AES coaxial in, -B4 = 4 AES coaxial in
SDI/AES with Synchronizer	MSA-3901-B/-C MSA-3901-B4/-C4		Audio Synchronizer/Delay/Proc/Multiplexer
			1 SDI in, AES in, 2 SDI out, genlock in (loop thru), -B = 2 AES balanced in and out, -C = 2 AES coaxial in and out, -B4 = 4 AES balanced in, -C4 = 4 AES coaxial in
SDI/Analog Audio	MXA-3901-A		Audio Multiplexer
			1 SDI in, 4 analog audio in, 2 SDI out
SDI/Analog Audio with Synchronizer	MSA-3901-A		Audio Synchronizer/Delay/Proc/Multiplexer
			1 SDI in, 4 analog audio in, 2 SDI out

Core Processing: Demultiplexers (De-Embedders)

HD/AES HDTV	DMX-3901H-B4/-C4		HDTV 4-Channel AES Multiplexer
			1 HD-SDI in, 1 HD-SDI reclocked out, 1 DARS in, 4 AES out, -B4 = 4 AES balanced out, -C4 = 4 AES coaxial out
SDI/AES	DMX-3901-B/-C DMX-3901-B4/-C4		AES Audio Demultiplexers
			1 SDI in, 2 reclocked SDI out, AES out, -B = 2 balanced AES out, -C = 2 AES coaxial out, -B4 = 4 AES balanced out, -C4 = 4 AES coaxial out
SDI/Analog	DMX-3901-A		Audio Demultiplexers
			1 SDI in, 2 reclocked SDI out, 4 analog audio out

Core Processing: Distribution Amplifiers

HD/SDI/ASI HDTV	HSE 3901		HDTV/SDI Relocking Distribution Amplifier
			1 SDI/HD-SDI/DVB/ASI in, 8 SDI/HD-SDI/DVB/ASI out
SDI/ASI	VSE-3901		SDI/ASI Reclocked DA
			1 SDI/ASI in, 8 SDI/ASI out
Video Monitoring	VSM-3901		SDI DA With Composite Monitoring Outputs
			1 SDI in, 4 EQ/reclocked SDI out, 1 EQ/reclocked SDI with CFID out, 1 EQ/reclocked SDI out or composite out, 1 GBR/YPaPr/YC out or 3 composite out
AES	AES-3981-B/C		AES Audio DA
			1 AES in (loop thru), 8 AES out, -B = AES balanced out, -C = AES coaxial out
Analog Video	VEA-3901		Analog Video DA
			1 composite (loop thru) in, 8 composite out
Analog Audio	ADA-3981-66/600		Analog Audio DA
			1 stereo input, 4 stereo output, -66 = 66 ohm low-impedance version, -600 = 600 ohm high-impedance version

Frames

1RU HDTV	FR-3901		1RU NEO Frame, 4 modules per frame, includes 3901AIC alarm interconnect module
	FR-3901-E		1RU NEO Frame, 4 modules per frame, includes 3901RES-E communication resource module
	FR-3901-EP		1RU NEO Frame, 4 modules per frame, includes 3901RES-E communication resource module and LCP-3901 local control panel
3RU HDTV	FR-3923		3RU NEO Frame, 12 modules per frame, includes 3901AIC alarm interconnect module, optional 3923PS redundant PSU
	FR-3923-E		3RU NEO Frame, 12 modules per frame, includes 3901RES-E communication resource module, optional 3923PS redundant PSU

Control and Monitoring

Frame Control Module	3901RES-E		Ethernet communication resource module
Application Software	CCS Pilot		Control and monitoring software
	CCS Navigator		Control and monitoring software with customizable GUI
Control Panel	CCS-RCP-1U/CCS-TRAX		Remote control panel, 1RU / TRAX Router-follow option for RCP-CCS-1U

MEDIA SERVER TECHNOLOGY **Karl Paulsen**

The Evolution of the Universal Serial Bus

Portability is becoming a driving force in both consumer and professional media systems. The implementation of videoconferencing, videophones, Webcams and transportable hard-disk devices has given rise to widespread adoption of the Universal Serial Bus (USB).

The first USB standard was introduced 1995 by Intel, Compaq, Microsoft and several other IT computer companies. USB x, an external bus standard, supports data transfer rates of 12 Mbps and is capable of supporting up to 127 peripheral devices. The early USB implementation is generated USB 1.0 and USB 1.1.

With the exception of the newest USB revision, 2.0 OTG ("On-The-Go") support, USB is essentially asymmetric and supports the hot-plugging of all its peripherals. Peripheral devises may also rely on the power delivered through the bus (bus-power).

The earlier specification, USB Version 1.1, supports speeds of 1.5 Mbps to 12 Mbps, and is suitable for low-speed devices, such as HIDs (mice and keyboards) up through medium-speed devices, such as 10 Mbps adapters.

In 2001, a team from Compaq, HP, Intel, Lucent, Microsoft, NEC and Philips introduced USB Revision 2.0. It added a higher speed of 480 Mbps, retaining the legacy low-speed USB 1.1.

USB 2.0 is suited for multiple large transfers for devices such as MP3 jukeboxes and Webcams—as USB video. While the design data rate for USB is 480 Mbps, a device's signal at 12 Mbps for high-speed and 1 5 Mbps for low-speed devices uses a 1.5 Mbps subchannel. Adapters are available that allow USB to interoperate with EIDE, SCSI-2 and Ethernet.

CABLING, CONNECTORS & HUBS

By definition, an "A-device" attaches the A-end of the cable and is a downstream port; the "B-device" attaches to the B-end of the cable and is an upstream port. The Type A USB connector is recognized by its flat slot characteristic, generally found on the host end; the Type B connector is more square and generally found on the peripheral end.

USB 2.0 did not require that cables be changed; however, lower-quality cables that barely handle USB 1.1 should not be expected to handle USB 2.0. New "mini-B" cables can help eliminate the need for proprietary connectors on many small USB peripherals, yet some report problems with long USB cables, especially with adapters.

USB 2.0 hubs support high-speed devices, whereas the older USB 1.1 hubs did

Bus Description or Trade Name	Data Rate
Standard Parallel Port	115 kbps
Original USB 1.x	12 Mbps (1.5 Mbps)
ECP/EPP Parallel Port	3 Mbps
IDE	3.3 to 16.7 Mbps
SCSI-1	5 Mbps
SCSI-2 (Fast & Fast Narrow)	10 Mbps
Fast Wide SCSI	20 Mbps
Ultra IDE	33 Mbps
Wide Ultra SCSI (Fast Wide 20)	40 Mbps
Ultra2 SCSI	40 Mbps
IEEE 1394	12.5 to 50 Mbps
Hi-Speed USB 2.0	480 Mbps (60 Mbps)
Wide Ultra2 SCSI	80 Mbps
Ultra3 SCSI	80 Mbps
Wide Ultra3 SCSI	160 Mbps
FC-AL Fibre Channel-Arbitrated Loop	100 to 400 Mbps

Bus data rates for common computer and data peripheral interfaces

not. Connection of USB 2.0 peripherals to USB 1.1 hosts and hubs will work at 12 Mbps but not at 480 Mbps. The high-speed hubs all include transaction translator support that helps prevent full- and low-speed devices from wasting USB bandwidth.

To achieve high-speed performance, an updated host controller that supports USB 2.0 high speed through the Enhanced Host Controller Interface (EHCI) standard is required.

The EHCI specification is a licensed contributor's agreement. It includes a description of the hardware/software interface between system software and the host controller hardware. The specification is intended for hardware component designers, system builders and software developers. It addresses such issues as system power management, robust solutions to legacy USB 1.1 host controllers, minimization of hardware complexities and support for 32- and 64-bit addressing.

USB can be either of bus-power (B-devices that draw power from the USB cable) or self-power. Power levels are characterized as either high or low. High-power B-devices consume more than 100 mA operating current; the downstream ports of high-power A-devices can source 500 mA sustained and can provide at least 4.75 V on the bus. Low-power B-devices consume 100 mA or less operating current; and a low-power A-device is a downstream port that is guaranteed to source only 100 mA sustained.

Self-powered hubs and all root ports must offer high-power downstream ports. The USB 2.0 On-The-Go specification allows devices to be either high or low power.

ON THE GO

USB 2.0 OTG, a supplement to USB 2.0, supports point-to-point peer-style hookups for USB devices typically not used with a PC host, such as cell phones with direct-to-printer support, keyboard-to-PDA, digital cameras, MP3-to-MP3 players or other devices that rely on the new USB mini-connectors and support battery-friendly low-power operation. The supplement in OTG defines a new dual-role type of peripheral that can become a low-power USB host when you connect it to another peripheral.

Most OTG-capable peripherals will have special mini-AB sockets that accept either the mini-B peripheral jack at one end of a USB cable or the mini-A host jack at its other end.

The concept is that if you use the peripheral end, they start out as a peripheral; use the host end, they start out like a USB host. Devices take on roles, but because of the dual-role capability, and with an optional OTG Host Negotiation Protocol (HNP), the wrong device—which might have been initialized as the host—can be switched without forcing the cables to be switched around.

SPLIT TRANSACTIONS

Disk interface technologies support concurrent requests to different devices, as does USB. These requests are split into a start phase that then can disconnect and later reconnect for a complete phase. This sort of time-sharing scheme allows the bus to be used for other purposes, such as for slower I/O completes, similar to when a disk drive is seeking and reading several sectors; or as in USB, for 1.5 Mbps mouse-motion events.

When a USB 2.0 host is talking to a USB 1.1 device, it uses a companion controller, which makes it behave as a USB 1.1 host.

In a USB 2.0 hub, a transaction translator is employed. Hosts talk to the translator at high speed, with the translator performing a full- or low-speed I/O to the USB 1.1 device. The translator buffers data in either direction and later returns the results to the host at high speed. Only a single translator is permitted in a hub, or one per port. However, with just one translator, a hub can support as much bandwidth as the USB 1.1 host permits.

This split transaction technology allows applications, such as full-speed Webcams and disk-drive interfaces, each using 10 Mbps of I/O, to operate at the same time.

1394

IEEE-1394, also known as FireWire, is a bus technology with bandwidths of between 400 and 1,000 Mbps. IEEE-1394 can handle up to 63 units on the same bus and is also hot-swappable. While one might think these two serial busses seem similar, IEEE-1394 and USB are intended to fulfill different market and cost requirements.

USB is considerably less expensive than IEEE-1394, the latter having the potential to move more data in a given amount of time. IEEE-1394 has a more complex protocol and signaling rate and is best-suited high-bandwidth entertainment applications.

COMPATIBILITY

From a compatibility perspective, the USB Implementers Forum Inc. (USB-IF), established in 1995, supplies a certified logo for products that demonstrate significant compliance to the USB specification.

The USB-IF does not endorse specific products, but those sporting the logo are good choices to minimize the risk of compatibility problems.

USB is most appropriate computer peripherals such as mass storage, audio/video, scanners, printers and keyboards. Still, with the proliferation of small portable disk drives for data exchange, USB interfaces may someday alter the complexion of those small form-factor image-capturing and storage devices for both news and field acquisition. ■

Karl Paulsen is vice president of engineering for AZCAR. Contact him at karl.paulsen@azcar.com

> **The USB 2.0 revision did not require that cables be changed; however, lower-quality cables that barely handle USB 1.1 should not be expected to handle USB 2.0.**

TECHNOLOGY CORNER   Randy Hoffner

Achieving Full-Res HD With the 2K Projector

One of the nuggets of accepted wisdom in the early days of HDTV was there were few, if any, devices available that could display the full resolution of a 1920 x 1080 (either I or P) HD source. This nugget was true then, but, like many truths of those days, it is not true today.

Several types of displays that may be purchased today have this capability, including CRTs and LCDs. It is ironic that until late 2003, the advanced displays used for the demanding digital cinema application did not have such resolution capability.

Until that time, the DLP (micromirror) digital cinema display had a pixel count of 1280 x 1020. Having said that, we do not recall any complaints about the resolution of digital cinema, even though the screens used to view it can get very large. It is also noteworthy that 1280 x 1020 represents an aspect ratio of about 1.26—far closer to 4:3 than to 16:9. This means that for most cinematic features made in recent decades, produced with the intention to be projected at an aspect ratio of 1.85—and for HDTV, with its 1.78 aspect ratio—some of the display's inherent vertical resolution capability was lost. When 'Scope features are projected, they use even less of the total vertical line count.

MICROMIRRORS

Reviewing, we know that DLP projectors use semiconductor devices whose pixels are micromirrors—tiny, hinged mirrors that may be dynamically toggled between two positions. In one of these positions, a mirror reflects light from an external source so that it passes through a lens assembly that collects it, focuses it and projects it onto a display screen.

In the other position, the mirror reflects the light into a light-absorbing medium. With respect to the display screen, the light from a mirror is either on or off, making such a projection device binary in nature. Because this binary mirror can only assume one of two positions, it is incapable of generating an analog grayscale, so a grayscale is digitally synthesized by vibrating the mirror on and off at a frequency many times higher than the frame rate of the projected video material.

In this way, the duty cycle, or the on-time of the projected light beam per unit of time, may be controlled, which is perceived by the human eye as a grayscale. One of the side effects of this high-frequency switching mode is the threshold of perception of large-area flicker is greatly exceeded, so 24 fps material may be projected at its native format, rather than each frame being double-shuttered, as must be done when 24 fps film is projected.

ENTER THE BLACK CHIP

Late last year, Texas Instruments, the developer and sole manufacturer of DLP micromirror display chips, introduced the 2K "black chip" for digital cinema projection, and several companies are licensed to manufacture projectors using them. The 2K chip, as its name implies, has 2,048 horizontal mirrors and 1,080 vertical rows or lines, which permits mapping 1920 x 1080 HD images directly onto the pixel array. (We note that a few extra horizontal pixels in a line are not used.) This makes these chips ideal for displaying 1920 x 1080 x 24p video and, as previously mentioned, because the mirrors in DLP chips are strobed at a high frequency, such images may be projected at true 24 fps.

Because these devices are designed for professional use, they are used in a three-chip configuration—one each for red, green and blue light, rather than in a single-chip configuration with a spinning color wheel. The three-chip configuration, which reduces the possibility of crosstalk between colors, plus the "black chip" enhancements (not new with the 2K chip), improve the contrast ratio that may be achieved with these devices to a claimed 1500:1.

One of the inherent problems with DLP projection engines is a difficulty in achieving true blacks, a problem caused by stray light leakage within the semiconductor device. The black chips address the internal light leakage problem, and this, with the three-chip configuration, produces a much better black than may be achieved otherwise.

CLEANER PICTURES

DLP projectors, like all other discrete-pixel devices, must be driven with progressively scanned signals. This fits well with using them to project 24p video

The 73-pound Texas Instruments DLP cinema projector head

images. Also, the combination of high resolution and progressive scanning along with the freedom from the in bounce-and-weave that is introduced by even the best film projection systems makes such images stunning, even at very large screen sizes.

It is, of course, possible to use them to project 1080i material, but 1080i material must be de-interlaced before being used to drive the projection engine. Interlace artifacts are, of course, not reversible, so they will still be present after de-interlacing and they will not be subtle on a 25- or 30-foot-wide screen.

When viewing 24p images sourced either from film or 24p video, it is quite apparent that the 1920 x 1080 x 24p scanning format is well able to convey extremely high-quality images. We have reached the point at which full-resolution HDTV signals may indeed be displayed, and at a large size. At the outset of HDTV broadcasting in the United States, one HD pioneer said that the HDTV we are seeing now is the worst HDTV we will ever see. That observation has certainly been borne out. ∎

Randy Hoffner is manager of technology and strategic planning at ABC, New York, N.Y. The views expressed in his column are his own and not necessarily those of ABC. Write to him c/o TV Technology.

The three-chip configuration...

plus the "black chip" enhancements improve the contrast ratio that may be achieved with these devices to a claimed 1500:1.

INSIDE PRODUCTION Walter Schoenknecht

DVD Authoring: Driven to Abstraction

You may think you're in control of your DVD authoring, but you're not. Trying to choose the specific programming actions of your DVD authoring software is a lot like the steamship captain yelling, "Ahoy, engine room! Reverse all engines!" into the blow tube as the iceberg looms ever closer. You can make a specific request, but you can't be sure how well it will be accomplished.

LEARNING A NEW MEDIUM

Way back when DVDs were a novelty, there were relatively few ways to author a project. They all invariably involved buying purpose-built hardware, learning how to hand-code the structure and parameters of a disc, and in the process, spending a boatload of money.

If you were actually one of the wizards who could program the operations and actions of the disc, you were indeed a valued professional. You alone could rewire the inner workings of the disc's content, jumping from menu to track at will, streamlining and tweaking at every step. But that was then.

Today, many of our clients' projects are delivered on DVD, and I have no doubt that in the near future, DVDs will account for nearly all of our media deliverables.

We couldn't afford to send all our work outside for authoring, mostly because our competitors were burning their own titles, albeit simple and clunky ones. To remain competitive, we needed to become authors. And so we found ourselves jumping headfirst into an alien technology, claiming expertise to the clientele, but in reality, barely treading water.

Like many folks, we got our first requests for DVD deliverables at about the same time that Apple released DVD Studio Pro (DVDSP) Version 1. This first version was strictly a nuts-and-bolts util-

ity with a little drag-and-drop functionality, but not much else. Still, a program that gave "civilians" the ability to author DVDs without learning Video Title Set architecture was big news, and I willingly invested the time to learn the new app.

Little did I know that Apple already had a team hard at work that would democratize DVD creation. DVD Studio Pro 2 was as unlike its predecessor as any update we've ever seen and, unfortunately, indecipherable to a user of "old-fashioned" DVDSP1.

A similar undertaking was in full swing over at Adobe as well, where the DVD gearheads were busy hot-wiring their own authoring app.

Adobe Encore DVD would combine Adobe's various core technologies—editing from Premiere, motion and compositing from After Effects, and, of course, the Photoshop engine—with the media processing and handling routines resident in Windows XP. The result was elegant and powerful. Like DVDSP, Encore will convert and compress video and audio files in the background, while more creative thoughts are being thunk.

Similar, too, are the product families' integrated workflow. A project begun and edited in Premiere Pro or Final Cut Pro can be seamlessly handed off to the related DVD authoring solution.

There's no such thing as a free lunch, so they say, and it wouldn't be logical to expect that this relatively easy authoring

experience came with no strings attached—requests and commands, represented by dragging and dropping and clever icons, are translated into that arcane DVD code by a software engine generically known as the "abstraction layer."

Abstraction? Yes, and it does exactly that. This part of the application tries to abstract, or discern, your intentions regarding the DVD's action and interaction, and spews out programming code of its own based on its best guesses. From a software engineering point of view, it's nothing short of brilliant, and it empow-

> **I have no doubt that in the near future, DVDs will account for nearly all of our media deliverables.**

ers thousands of noncoders to create professional-looking projects.

But behind every silver lining, there lurks a big ole' thunderhead just waiting for the right moment. For us, the downside of the abstraction layer became obvious at the worst possible moment—right in the middle of a DVD series for a major textbook publisher. The companion DVDs they hoped to create needed elaborate, nested menus to access a broad assortment of alternate clip versions, and menu latency, whether real or perceived, became a hot button for them. Even worse, they expected that classroom teachers had never seen DVD players before, and insisted on pressing every button on the remote, repeatedly and in random order, during the approval test-

ing of our first few titles. We were in trouble, and we knew it.

Ours is an ingenious and entrepreneurial industry, and at least one enterprising individual had already anticipated our need. I chose to subscribe to a paid Internet forum run by DVD expert Trai Forrester, which offered two prime benefits—the ability to trade posts with, and get answers from, experts and fellow flunkies alike; and of even more value, access to several software tools authored by Forrester and his associates. These programs figuratively "pry open the hood" of your completed DVD build and allow modifications and rewiring. Using these tools (and a lot of forum advice), I was able to solve problems and put my project back on track.

NOT FOR EVERYONE
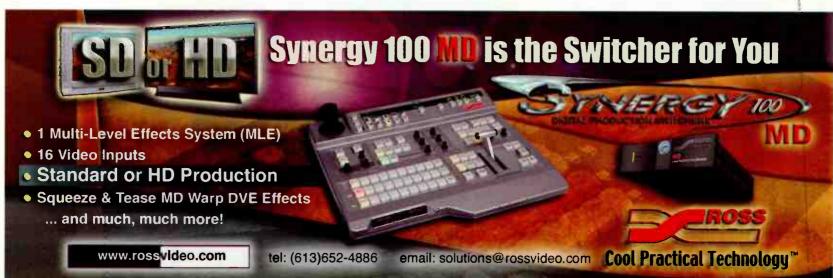
One revelation I gleaned from Trai's group was that DVDSP3's abstraction layer routinely embeds all menu information in a data cluster near the top of the disc rather than in the data nearest the current track being played. This means that the player needs to scrub back up to the top whenever the user attempts to interact with a menu, and that means delay. Trai's tricks let you change that scenario, if it's called for.

To be fair, using Trai's biggest gun—TFDVDEdit2—is no stroll in the park. Before you can change a parameter, you have to know what it means; TFDVDEdit's documentation, supplemented by a library of posts and papers, can steer you to the right area. But a little hard work is worth a superior result, and this workflow—an easy authoring program like Encore or DVDSP—followed by some thoughtful tweaking, seems preferable to coding the whole project by hand and looking for bugs.
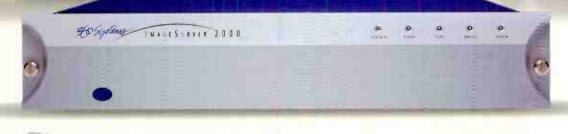
For the vast majority of users, Adobe Encore DVD and Apple DVD Studio Pro 3 hold more firepower than they can ever use. But for those of us whose clients demand another level of perfection, there's a need to journey beyond the abstraction layer, however perilous that may seem. ∎

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

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NET SOUP — Frank Beacham

Net Update: More Lawsuits; New Journalist Tools

Photo: Steve Jordan

Several significant Internet trends are playing out at the end of 2004. As it becomes clearer that broadband is developing into the next big media distribution system, showdowns between large content owners and Net users are escalating and getting nastier.

Now, Hollywood's major motion picture and television studios have joined music companies in suing Internet users over downloading. It's a move that could have major implications for television broadcasters as they migrate to the digital era.

The lobbying organization for Hollywood's seven major studios announced its members decided on the aggressive legal strategy after concluding that music companies suffered financial consequences because they waited too long to combat file sharing.

"If we didn't act now, this behavior would become more and more common in American life," said Dan Glickman, according to The New York Times. Glickman, who was secretary of agriculture in the Clinton administration, is the new Jack Valenti at the Motion Picture Association of America (MPAA).

Here we go again. Since September 2003, the music industry has sued 6,191 individuals, according to the Recording Industry Association of America (RIAA). A new round of litigation, filed in late October, targeted 750 computer users across the nation, including 25 students at 13 universities.

Next on the RIAA hit list, according to the group, is digital radio. Without copy protection, music fans could cherry-pick songs off the air and redistribute them over the Internet, the group said.

WHERE'S THE BEEF?

So what's wrong with this picture? First, there's little real evidence that the recent financial problems of the music industry have much to do with Internet downloading. Second, the lawsuits—a controversial tactic that pits an industry against its own customers—have done little to stop, or even slow, file sharing.

Peer-to-peer (P2P) traffic has not declined, despite the music industry's aggressive pursuit of file sharers, according to a recent study from the University of California at Riverside and the Cooperative Association for Internet Data Analysis.

"In general, we observe that P2P activity has not diminished," the study concluded. "On the contrary, P2P traffic represents a significant amount of Internet traffic and is likely to continue to grow in the future, RIAA behavior notwithstanding."

MOBILE PHONE ENG

In an earlier column, we noted the BBC's experiment with cellular picture phones for newsgathering. Now comes word of a mobile phone scoop.

Amsterdam's De Telegraaf daily newspaper, with a circulation of close to 800,000, recently published a picture of the dead filmmaker and columnist Theo van Gogh, who police say was probably killed by an Islamic militant.

Passerby Aron Boskma took a picture with his mobile phone at the scene of the crime in Amsterdam. News photographers arrived after the body had been covered, leaving Boskma's picture the only one showing knives plunged into Van Gogh's body.

"This picture was the story. There was a discussion if we should use it, but everyone who would have had this picture would have published it," Telegraaf Photo Editor Peter Schoonen told Reuters.

ANP, the Dutch news agency, receives camera phone pictures through a collaboration with Internet news Web site www.Nu.nl, which offers money and prizes to amateur photographers who send in pictures.

In Japan, where many people own camera-equipped cell phones, it has become common to sell pictures to television stations and other media outlets. Many phones take motion video as well as still images.

NEW TOOLS FOR THE WIRED HACK

An offshoot of the popular iPod music player has been the rapid development of miniature hard drives. Smartdisk's new 20-Gb, USB 2.0 FireFly, at only 3.3 ounces, is one of the smallest and most portable data storage devices available.

It's perfect for the traveling journalist. No AC adapter or special software is needed. Just plug it into a USB port on a Mac or Windows machine, and its contents appear on the screen. Clean, simple and very rugged ($190, at www.smartdisk.com).

A standout new tool that's ideal for mobile journalists is AlphaSmart's Neo, an ultralightweight writer's laptop with full-size keyboard and—get this—an extraordinary 700 hours of operation

The 20 Gb, 3.3 oz. Smartdisk FireFly

on three AA batteries.

Weighing two pounds, the instant-on Neo is so rugged it's virtually bulletproof, and so simple to operate that the learning curve is almost nonexistent. Word-processing with spellcheck, thesaurus and other writer's tools is built into ROM.

The Neo's files, which are each assigned a hard button for quick access, can be transferred via USB on a Mac or

> ## Lawsuits—a controversial tactic that pits an industry against its own customers—have done little to stop, or even slow, file sharing.
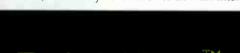
Windows PC at the push of a single button ($249, at www.alphasmart.com).

Finally, Apple's new Airport Express is perfect for anyone who needs to create an instant WiFi network on-location. About the size of a small AC adapter, it packs Internet sharing, wireless 802.11g networking, audio, printing and bridging capabilities into a single device.

It works with all WiFi-compatible computers, has a 150-foot range that can be extended by bridging multiple units, and can handle up to 10 uses on a single instant network ($129 at www.apple.com). ■

Frank Beacham is a New York City-based writer and media producer. Write to him in care of TV Technology.

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RF TECHNOLOGY   Doug Lung

DTV Transition Discussed At IEEE BTS 2004

L ast month, I reviewed a petition by Hammett and Edison for reconsideration of the FCC's Second DTV Periodic Review Report and Order. The petition pointed out errors in predicted coverage and interference due to the FCC treatment of Longley-Rice error code 3 (KWX=3) cells and the default antenna elevation patterns that didn't reflect the large amounts of electrical and/or mechanical beam-tilt often used at high-elevation sites. I discussed this with other engineers at the IEEE Broadcast Technology Symposium in Washington, D.C., in October.

ADJUSTING FOR ELEVATION

Antenna design engineers I talked with thought it would be possible to come up with a formula to calculate a generic elevation pattern based on antenna elevation gain that could then be shifted to account for different values of electrical beam-tilt. Other discussions indicated a simpler approach might be easier to implement and still provide a significant improvement over the limited OET-69 Table 8 patterns. This approach would add elevation patterns to reflect the use of low-gain and medium-gain antenna patterns, and again offset them to reflect the use of different amounts of electrical beam-tilt.

Before anyone gets upset at the idea of adding elevation patterns to OET-69, I should note that the FCC did just that in its Digital LPTV Report and Order, which doubled the relative field values of the Table 8 patterns, truncating them at 1.0 for LPTV stations in OET-69 studies. Because the LPTV antenna-relative field at all depression angles will be equal to or higher than those predicted using the original OET-69 Table 8 elevation patterns, predicted interference based on D/U ratios will be affected.

CHANNEL ELECTION

IEEE tried something new at its Broadcast Technical Symposium this year—a Wednesday evening session that featured a panel discussion on DTV repacking transition issues. It was led by Bill Meintel, who played a key role in developing the software used to determine DTV coverage and interference. The panel included Victor Tawil, senior vice president of MSTV, consulting engineers Charles Cooper and Dennis Wallace, and Keith Larson from the FCC. While many questions dealt with unusual conditions related to specific stations, some were of general interest.

FCC DTV software was discussed—one person asked what variations the FCC would accept in grid size. Larson said up to 1 km, but to generally use the OET-69 parameters (2-km grid with 1-km terrain extraction). LPTV stations would have to make the adjustment to the Table 8 pattern I mentioned earlier. When asked if new software was coming for DTV, Larson indicated a new implementation was needed, but the FCC had to modify the OET-69 first.

Protected coverage was a hot topic; of particular interest were stations that received a 1,000 kW UHF facility in the DTV Table of Allotments that was smaller than their VHF Grade B coverage area.

Tawil said MSTV fought to have the VHF Grade B coverage area protected, but the FCC said the authorized facility as constructed at UHF would determine the baseline coverage. Meintel said stations could apply for a larger facility later.

One problem for some VHF stations with nondirectional antennas is that they received a directional pattern for their UHF DTV allotment. Replication coverage will be based on this directional pattern. Tawil said MSTV has recommended the FCC give stations the option to go back to their NTSC pattern if they return to their VHF channel.

The strict 0.1 percent threshold for increased interference to other DTV stations was explained. Tawil said the 0.1 percent threshold applied only to the channel-election process. After that, the 2 percent new interference and 10 percent total interference thresholds will

Plug

satellite carriers and the broadcasting industry joined the cable/consumer electronics talks. Representatives from the Motion Picture Association of America, NAB, various computer and software suppliers plus other copyright and retransmission-minded participants have swelled the group's size to 90 "interested parties" at some sessions.

That kind of mob assures volatile disagreements about copy protection, privacy service responsibilities and other factors in the complicated interactive architecture.

Although negotiators are obeying their self-imposed gag order about revealing progress, a few fundamentals have seeped my way.

One negotiator whispered to me, in a mixed metaphor, that talks are "fruitful," but moving at "a snail's pace." Issues such as selectable output control, down resolution and other barriers from earlier talks have resurfaced, as content companies seek to assure that future bidirectional devices protect and present content as creators intended.

To further complicate negotiations, separate factors are taking shape that will change the digital delivery landscape. Most notably, the largest cable operators have quietly developed a Next Generation Network Architecture (NGNA) for future cable infrastructure. NGNA emerged during the past year from an independent working group controlled by Comcast, Time Warner Cable, Cox and other large cable operators. It has now been turned over to CableLabs and is tightly under wraps.

Since many of the same cable, electronics and computer companies involved in the bidirectional plug-and-play negotiations are also working on the NGNA format, it is easy to expect an overlap in the joint process. NGNA is not under FCC supervision at this time, and it's not clear how it will affect future home DCR deployments.

Some elements of the current NGNA vision may never take shape. If the NGNA structure is too complicated or expensive, it may hinder rather than enhance the consumer experience.

One confidante involved in several current technology initiatives looked beyond the current plug-and-play discussions. He suggested that conflicting industries' interests and advancing technology assure that there are likely to be Round Three, Round Four and maybe Round Five of the plug-and-play negotiations.

He did not sound too enthusiastic about sitting at an even larger negotiating table to get through whatever those talks would seek to accomplish. ■

Gary Arlen is president of Arlen Communications Inc., a Bethesda, Md., research firm that has tracked the convergence, emergence and divergence of media technology since the days of two-inch videotape. He can be reached at Garlen@columnist.com.
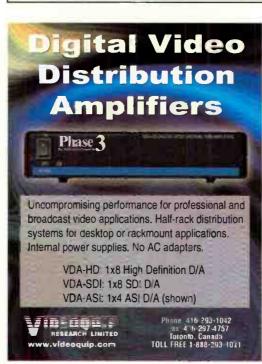
World Radio History

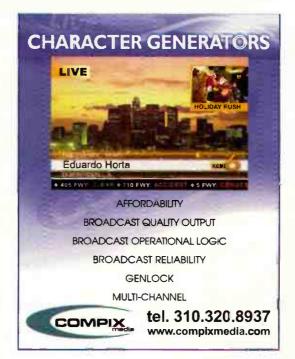# PRODUCTS & SERVICES SHOWCASE

INSIDE AUDIO — Dave Moulton

The Truth About Stereo for TV

This column will be devoted to the basics of stereo for video, as part of my series on "the basics." Interestingly, stereo still isn't all that well understood in the video world. For the record, it is a powerful audio attribute that should neither be ignored nor carelessly used.

WHAT STEREO IS

Stereo refers to the practice of presenting audio information from two channels, usually both derived from separate microphones operating simultaneously in the same space. These two audio channels, when played back by matching loudspeakers and perceived by humans, yield a wonderful sensory quality of an alternative space and palpable "presence" in recordings, as well as quite remarkable and enjoyable "phantom images."

At the same time, a stereophonic presentation tends to mask defects in loudspeakers and the audio playback chain.

These features add up to an audio modality that humans really enjoy. We do this intuitively, without really being aware of the stereophony as such. All we know is, "the music sounds really good." This attribute of stereo makes it a very powerful tool for audio engineers to improve audio quality.

The use of stereo in television is somewhat constrained. Most televisions have mediocre speakers that are poorly placed and underpowered for the purpose of generating compelling illusions. In my book, "Total Recording," I characterize the domestic stereo television as a boombox with video monitor added.

Meanwhile, the nature of television programming mitigates the elaborate production stereo detail work that we make so much of in music recording and production. As I noted last month in my column on reverb, all voice work tends to be bone-dry mono, and we have made it an aesthetic principle to not recover and transmit the acoustic ambience of the set in which a production is shot.

Further, from film practice, we have learned to not have voice-tracks bounce from left to right and back as the talent moves or as conversation takes place. That audio-source motion is distracting and even more troublesome when we cut from one camera to another.

The net result of this is that stereo is usually limited to, A) music beds, B) ambience for sports events, and C) the occasional live music-based production show. In short, stereo is used as an enhancer, a sonic perfume if you will, to sweeten production values but not to add realism or definition.

DOES STEREO TV WORK?

I personally think this sort of ersatz stereo works quite well, so long as we don't expect too much from it or invest it with mystical values. The music beds and occasionally poignant or dramatic stereo ambiences are quite entertaining, and they seldom mess anything up. Film and DVD sounds pretty good and there are few annoyances. Meanwhile, it's simple and cheap to produce.

The secret here is not to expect too much and buy into the idea of spatial reality being represented by stereo, with all the attendant confusion and complication that entails. If we keep it simple and just use it as a perfume that underlies a mono presentation, it's hard to go wrong.

MONO COMPATIBILITY

The one wrinkle in the ointment is mono compatibility. For a variety of technical reasons, it is often necessary for a stereo signal to be "summed" to mono, which is to say, the left and right channels are mixed together to yield a single monaural signal.

This happens automatically in any legacy TV or small mono TV set; it is not under the control of anybody in the production chain. Therefore, it is essential that the audio sound good in both stereo and mono, simultaneously and all the time.

This can present a problem. One of the more powerful ingredients in stereophony has to do with small time differences (from 0.1 to 35 milliseconds) between channels. When used well, these delays can add a powerful sense of spaciousness to the recording.

However, when summed to mono, such delays result in a very annoying timbral coloration called "comb filtering," which strongly detracts from the audio quality. Mostly, we've learned how to head it off, but I still occasionally hear it in some NFL and other sports broadcasts, where crowd noise is picked up by two or more mics some feet apart and inadvertently summed to mono, or else some time offset is happening to one of the stereo channels down the processing path.

The solution to this problem is to stick to coincident stereo microphone configurations and to carefully maintain the integrity of the stereo audio signal pair during transmission. Good housekeeping, as my mother used to say. That's all it is.

WHAT DOES IT ALL MEAN?

Stereo can be your friend. Without causing much trouble, it can easily enhance your productions. Use it in music beds for occasional ambience (when you add reverb, for instance), and in real musical and dramatic productions, where it is a key element.

Pay attention to the stereo quality of your music beds, learn to hear the difference between stereo and "summed-to-mono," and reap the benefits that stereo will bestow on your productions. Don't get caught up in worrying about realism. Don't try to make stereo happen in ENG or documentary production, except where it is really called for.

Next month, we'll end this Basics series with a similar look at multichannel production. Uh-oh!

Thanks for listening. ∎

Dave Moulton is either on the left or on the right. Sometimes he's even a phantom image! You can complain to him about anything at his Web site, www.moultonlabs.com.

DTV

return. The reason new interference was restricted to 0.1 percent was to prevent aggregation of interference. Even if there are many new interference cases, the total increase in interference should remain under 2 percent.

There were also some questions about what the protected coverage would be if a station couldn't build out full replication facilities due to available antenna height or the use of a directional pattern.

The response from the panel was that once the new table was created, the existing DTV allocations would disappear and the new allocations would be based on what was constructed or authorized. This was clarified in the NAB/MSTV Digital Decisions Webcast Nov. 4. FCC staff said they would consider protecting replication coverage in some cases where stations could not construct full replication facilities due to, among other things, limits on tower height or tower structural limits.

This could help those VHF stations that A) are allotted a 1,000 kW UHF replication facility at the same height as their analog antennas; B) have DTV antennas mounted below analog antennas, and C) cannot increase power to offset the resultant reduction height.

IMPULSE NOISE & LOW VHF

Charles Einolf presented a paper he wrote with Victor Tawil on the "Impact of Impulse Noise on DTV Reception at Low VHF." This paper is on the IEEE 2004 Broadcast Technology Symposium CD.

While I haven't seen any details on how to purchase the proceedings, copies may be available. Visit *www.ieee.org/bts* for information and contact information.

Einolf researched noise levels at low-VHF frequencies and concluded that the median noise from man-made sources could add 20 to 30 dB of noise within the low-VHF channels. However, the planning factors the FCC used assume only an additional 5 dB for "environmental noise" on low-VHF channels. Several tests have been done over the past 10 years with DTV on low-VHF channels, and while the results differed depending on the location, it was clear noise would be a problem in many locations.

In the Cleveland tests, the receiver was found to have a major effect on reception, with one receiver having a failure rate of 17 percent while another had a failure rate of 56 percent. This difference did not seem to carry through in the other tests. COFDM did worse than 8-VSB in this test.

In Las Vegas, sites were selected where high-line noise was expected— near high-tension lines or substations. Two types of receivers were used. Five of the 20 sites measured showed some noise impairment to NTSC Channel 3, but it did not affect reception of the DTV signal on either receiver. It was suggested these very positive results could be attributed to the moderately high signal levels on DTV Channel 2 and the age and proper maintenance of the power grid there.

The results in Chicago were not as good. Fourteen of 15 sites showed some impairment from noise. At five sites with medium to high levels of noise, DTV reception could not be achieved on either of the two receivers.

Einolf and Tawil concluded that current DTV receiver technology could provide low-VHF reception under light- or medium-impulse noise conditions. The paper states, "It is possible that impulse noise, in many locations, may render the low-VHF channels undesirable for digital television."

I'll have more information on the topics presented at the IEEE Broadcast Technology Symposium next month. ∎

Your comments and questions on any RF topic are always welcome. Drop me an e-mail at dlung@transmitter.com. Your question may become the basis for my next RF Technology column!

LET THERE BE LIGHTING **Andy Ciddor**

Building a 'Rock Solid Ethernet'

Building, configuring and troubleshooting Ethernet networks in a production environment is imperative as we migrate from traditional technology-specific data formats to commodity IT protocols.
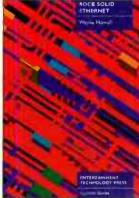
For an industry that still hasn't assimilated the relatively forgiving DMX512 protocol—even 18 years after its introduction—a book with insights into building Ethernet networks is welcome. "Rock Solid Ethernet" from Wayne Howell is aimed squarely at those of us who have to design, build and maintain production-grade Ethernet networks. Howell, the brains behind Art-Net, the DMX-over-Ethernet protocol adopted by more than 40 lighting companies, is keenly aware of the demands of our industry.

"Rock Solid Ethernet" is not aimed at lighting exclusively. It's applicable to audio, automation, pyrotechnics, video, projection control, communications, fountains, show control, MIDI, atmospheric effects or whatever else may be pumped across an Ethernet network.

This book takes the adventurous approach of trying to be all things to all people. At one end of the spectrum are introductory sections targeting readers who have no network experience. At the other end are sections intended for those with comprehensive backgrounds in electronics and computer technology. Howell attempts to provide would-be Ethernet experts with all the resources they could possibly need on the path to enlightenment.

Content ranges from selecting cables, plugs, wiring schemes and network interfaces to finding the most appropriate wide area network protocol, network hardware and packet-sniffing software. There are historical notes, as well as crash courses in network topologies, protocols, design and troubleshooting, an exces-

"Rock Solid Ethernet" by Wayne Howell

sively thorough glossary, instructions on making Ethernet cables, a list of major standards documents for Ethernet and the Internet, an overview of other data protocols and a survey of some Ethernet software and equipment (with emphasis on products from Howell's own company, Artistic Licence).

Without doubt, "Rock Solid Ethernet" contains a vast amount of knowledge, but occasionally falls short on sufficient explanations on how to use that knowledge. Although I have more than 20 years of experience with computers and networks at many levels, I found much of interest in this book. I also found some of the information to be delivered in a sequence and style that may baffle less knowledgeable readers.
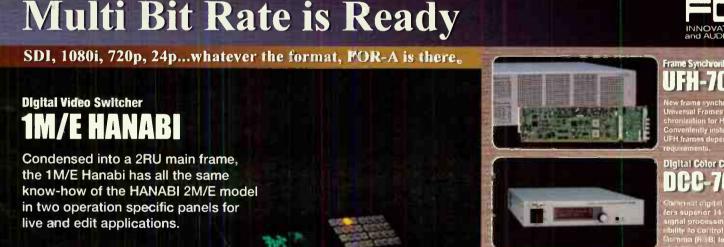
Howell clearly has formidable passion and knowledge about Ethernet and how

to use it in entertainment production. It is unfortunate that Howell's material has not been treated with as much care as he has shown for its content.

SHIP TO SHORE

The quality of the typesetting and proofreading is disappointing. While it is understandable that a proofreader who is unfamiliar with the material could let "pier-to-pier network" slip past, there is no excuse for the substantial number of missing periods and spaces. I also have the impression that Howell did not have the opportunity to work closely with an editor to develop this extensive body of information into a flow more comprehensible to the networking novice. Given that the publisher, Entertainment Technology Press, takes pride in using modern printing technologies to run a "print-on-demand" operation, I look forward to seeing these shortcomings rectified in the next print run.

Adam Bennette's pamphlet, "Recommended Practice for DMX 512," has been of great service to the lighting industry over the last decade, but I suspect "Rock Solid Ethernet" will usurp it as the most referred-to technical handbook in the forthcoming decade. ∎

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.

Sundance Preps KENS for Digital Future

by **Frank Peterman,**
Director of Engineering; and
Richard T. Barton,
Assistant Chief Engineer
KENS-TV

SAN ANTONIO, TEXAS

KENS has been serving this community since 1958.

In 1982, the station moved to a beautiful facility on a hill overlooking downtown. From this vantage point, KENS has become a local leader in news and information, providing the only seven-day-a-week morning news coverage in town.

As the station moves into the digital age, the engineering department has taken great strides to provide each department with the necessary technology and training. At KENS we have taken a slightly different approach than most by not having a separate information technology (IT) department.

Instead we integrated our IT functions into the engineering department and ensured that every technician is capable of installing and troubleshooting computer and network related issues. As more and more television systems become PC-based, we believe that there will be still less separation between TV and PC roles.

TWO REASONS

Our move to an automated master control and satellite capture system was prompted from two different fronts. First, as a Belo-owned station, our corporate headquarters has a strong desire to standardize and centralize.

Second, KENS needed to upgrade its facility and move to digital technology. The installation of Sundance Digital's Titan automation package is a great first step along the path to satisfying our requirements. Additionally, this system will be able to migrate to HD when it becomes necessary.

At present, we use Titan as a stand-alone unit running our analog broadcast, plus a simulcast on our digital channel. The system, however, is scalable and has the capability to control hundreds of channels and manage multiple channels remotely. These features will provide for a smooth transition to centralcasting.

Our Sundance Digital Titan configu-

Jose Ortiz, an engineering operator with KENS, reviews the station's Sundance Titan playlist.

ration includes three prep stations: one for creative services and two for engineering-based operations. This includes Sundance's Intelli-Sat broadcast record manager to facilitate recording feeds and TitanSync for redundancy.

We also use Sundance's WebInventory and ProgramView software to view and trim low-res content. This lets Belo personnel at the Dallas headquarters browse our media and view low-res proxies.

Titan also integrates tightly with Business Technology's (BTi's) Attendant Solutions system. The result is an automated process for controlling on-air delivery of a variety of emergency bulletins and breaking-news information.

The latest addition to our Titan system is Sundance's Digital Delivery Management System (DDMS), which allows us to move content directly from the PathFire DMG server to our servers for play to air. Shows are automatically segmented, eliminating the need for manual operation. We also interface with TeleStream's Traffic Manager to move content onto our servers and update the Sundance database.

FIRST TRY: TERRIBLE

Change is always a dreaded thing and the move to an automation system at KENS had been tried before with another automation vendor. The results were terrible.

In contrast, installation and commissioning of the Sundance system was not without its bumps, but overall it went

well. Some equipment had to be replaced due to infant mortality and shipping damage. There was also a learning curve involving problem response, and we needed to learn the difference between a critical failure requiring tech support and

what could be fixed by a simple restart of a system or application.

The impact of the automation system has been felt most by our engineering operators, who have had to change 15 years of habits overnight. The functions have changed from actively pushing buttons to get the product to air, to prepping the product prior to airing. A good operator can spend the first part of his shift prepping all the segments that will air and then have time to devote to other requirements, thus covering more than one area of responsibility with a single person.

Overall our experience with Sundance has been very positive, but we must stress that planning and coordination is paramount to a successful outcome. ■

Richard T. Barton is the assistant chief engineer and Frank Peterman is the director of engineering for KENS-TV. The authors can be reached at rbarton@ kens5.com and fpeterman@kens5.com. The opinions expressed above are the authors' alone.

For more information, contact Sundance Digital at 972-444-8442 or visit www.sundancedigital.com.

BUYERS BRIEFS

Proximity Corp. is a media-asset management and production-workflow software provider. The company's flagship product Artbox lets users drag-and-drop a new asset into the system straight from the desktop, transcode on-the-fly, transfer across multiple devices such as NLEs, automation, broadcast servers, newsroom systems and archive solutions.

Other features include a workflow order management solution that lets users assign, track and deliver content across multiple locations in a "hub-and-spoke" scenario. The codec-agnostic system provides automated proxy generation, proxy editing, EDL generation, project management, DRM, frame grabbing and NLE integration.

For more information, contact Proximity at 646-452-5820 or visit *www. proximitygroup.com.*

The MassStore system from **Masstech Group** is an end-to-end archive and asset management solution for professional broadcast environments, providing more than 100,000 hours of nonlinear audio/video storage with content management and tracking. The system interfaces with existing station automation systems, video servers and archives, while providing an asset management core for single- and multi-channel environments.

All material within a facility, whether on video servers, intermediary RAID cache, data libraries, or even on media storage shelves, is constantly tracked by MassStore and made available for playout automatically as needed.

For more information, contact the Masstech Group at 905-886-1833 or visit *www.masstechgroup.com.*

WSKY Ramps Up With Matco

by Tom Powers
Operations Manager
WSKY

HAMPTON ROADS, VA.

When WSKY began broadcasting in September 2001, our challenge was to build a full-power, analog station on Channel 4 from scratch. We would need a full complement of quality broadcast equipment that was easy-to-use, cost-effective and easily maintained.

Prior to going on air, we determined that automation was going to be essential to our success. As a relatively small facility, we were very conscious of cost as well as ease of operation.

At the same time, WSKY serves viewers in the 41st television market and we were unwilling to sacrifice operational features or reliability by purchasing an inappropriately inexpensive product.

We found the automation systems from Matco would meet our needs at a fraction of the cost of other systems. The MA-204B, which we have used since we

Tom Powers takes a moment to check the playlist on WSKY's Matco MA-204B automation system, which controls a Matco MA-600 MPEG-2 server.

went on air, handles automation control and is capable of growing with the station.

Our long-term goals included a total transition to server-based operations. This was a factor in selecting Matco, as we believe obtaining automation and servers from a single vendor is an attractive option. We have just completed

installing our second Matco MA-600 MPEG-2 video server, which the MA-204B will manage for us. The operator's view of master control will change little with servers, as the automation system handles servers and VTRs with equal ease. This made the transition to servers much easier.

EXCELLENT RELIABILITY
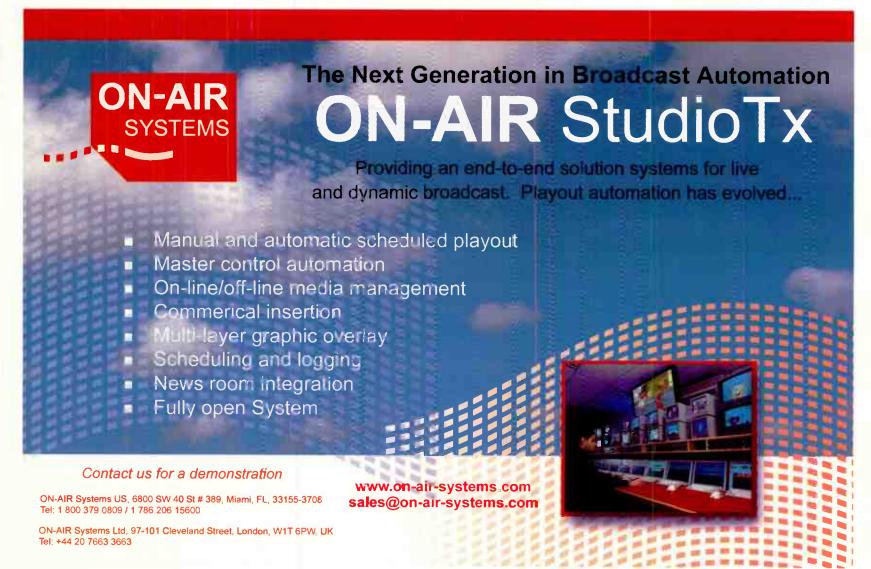
Since we began automating our operations, we have found that the MA-204B has handled all the tasks we've asked of it and its reliability has been excellent. When the need arises to accommodate something unusual, we call Matco for assistance. The company has been supportive and is always ready to talk us through challenges.

One especially nice benefit results from Matco's size. When we need to call, we're not talking to someone different each time. The company's staff remembers what we've discussed and what equipment we have. Because of this continuity, calls are quickly resolved and downtime is minimized.

We look forward to continued smooth operations and expect to use Matco products to facilitate our growth. ∎

Tom Powers is operations manager for WSKY (SKY4) and can be reached at tom@wsky4.com. The opinions expressed above are the author's alone.

For more information, contact Matco at 800-348-1843 or visit www.matco-video.com.

USER REPORT

Leightronix Controls Hospital Video
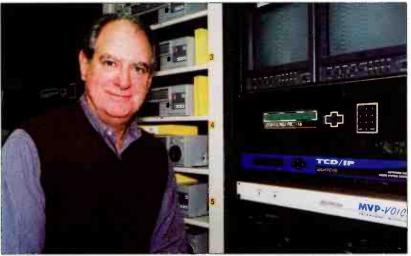
by Fred Mirliani
Director, Multimedia Services
Children's Hospital

BOSTON

I've been director of this department long enough to remember when it was primarily a black-and-white photographic lab that included a couple of overhead and 35mm projectors, a seldom-used PC loaded with "Harvard Graphics" and a master-antenna system that—on a good day—pulled in five local channels.

The department was located in the basement (where else) of an early-20th-century nursing school located across the street from the hospital's main entrance. The hospital was on track to implement a hospital-wide integrated, client-server architecture information system and my job was to transform the technology of the hospital's photography/audio visual department from analog to digital and upgrade its in-house television network to be more responsive to the needs of its patients and staff.

Children's Hospital Boston is located in the heart of the Longwood Medical Area, in the shadow of Fenway Park, home of the Boston Red Sox. The hospital is a 325-bed comprehensive center for pediatric health care and is the primary pediatric teaching hospital of Harvard Medical School and home to a large pediatric research facility.

Fred Mirliani uses Leightronix automation and servers to provide scheduled and on-demand video for Children's Hospital, Boston.

The research community, medical staff, hospital management and the patients presented a particular set of challenges in providing relevant programs through the hospital's cable network. We used a variety of approaches, depending on the audience and confidentiality of the material.

For example, medical instruction held in the hospital's auditorium is routed into our broadband system on a scrambled channel. When popular performers put on shows in the Patient Entertainment Center, we route the live feeds to the non-ambulatory patients on an open channel.

These two sources were easily patched through an analog patch panel. However, when the program sources expanded to include surgical rounds, anesthesia rounds, off-site feeds from a satellite dish as well as microwave feeds of live lectures from Harvard Medical School, it became necessary to look for a solution that would automatically route and schedule all the various programs.

To handle the routing and scheduling, we purchased Leightronix routing, scheduling and server products. The Pro-16 was an ideal choice and, through its PRO-BUS machine control, we were able to schedule playbacks, recordings and routing through its 16x4 matrix. No more manual patching of signals—routine feeds could be scheduled and controlled by a PC.

When the nursing department asked for its own patient education channel and pastoral care asked for spiritual and relaxation channels, and the emergency department asked for a way to provide video-on-demand in situations when the ER was overcrowded with patients and their families, we again expanded with Leightronix products.

This time help came in a new line of IP-network-managed video system controllers, Plus Bus interfaces for DVD players and a series of digital video recorders. At the heart of this new system is the Leightronix TCD/IP, a network-managed video system controller.

MANAGED FROM A PC

Through Leightronix's WINtcd network access software, I now manage the headend from my PC. For example, recently I loaded three DVD players with patient education programs on asthma, eating disorders and smoking, while a VCR handled on-demand playbacks of a program on weight control.

A VIDEO A DAY...

From my PC, I recorded the programs onto Leightronix TCD R/P digital audio/video recorder and scheduled them to play on the patient education channel at specific times. Now a nurse tells a patient with asthma that the program will be on the hospital's cable network Channel 26 at 1:30 p.m., 4:30 p.m. and 9 p.m. The programs are automatically and dependably viewed at scheduled times, and the nursing staff is very pleased with its capabilities.

In my tenure at Children's Hospital, we have chased technology and adopted what we needed to provide our services. The smell of stop bath is gone; my photography staff uses digital technology exclusively in photographing patients. Overhead projectors and 35 mm projectors have been replaced by laptops and LCD projectors, and the hospital's cable television network now carries 47 channels.

This includes local origination channels that, thanks to the Leightronix line of digital video and control systems, I can manage from my PC with feet thankfully propped up on my desk. ∎

Fred Mirliani is the director of multimedia services for Children's Hospital, Boston. He can be reached at fred.mirliani@childrens.harvard.edu.

For more information, contact Leightronix at 800-243-5589 or visit www.leightronix.com.

BUYERS BRIEFS

Blueline Technology specializes in providing custom, open-architecture solutions for processing, automating, archiving and managing data. The company's automation software simplifies the process for transferring tape-based video-to-video servers for easy access. The new SM 2.3 StationMaster Media Management product allows integrated database management and device control for single- or multichannel television, enabling interfacing with the database and operating system of your choice.

The Blueline Media Archive and Retrieval System (MARS) is a system that includes media asset manager, DVD library, and library management software that can handle archiving jobs up to 5,546 GB (5.5 TB).

For more information, contact Blueline Technology at 888-905-2583 or visit *www.bluelinetech.com*.

DaletPlus News Suite from **Dalet Digital Media Systems** places workflow and production tools in a single interface. DaletPlus ingest, editing, playout and archiving functionality can be tailored to meet a newsroom's specific needs and the system's asset management platform provides enterprise-wide content searching, browsing and retrieval of media.

DaletPlus News Suite components include a newsroom computer system that integrates video and text, an asset management and archiving facility built specifically for news, and control of ingest and playout. Additional features include desktop editing at either high or low resolution, and multisite production that links multiple stations and remote journalists to media libraries and rundowns.

For more information, contact Dalet at 617-817-6595 or visit *www.dalet.com*.

Encoda Systems' D-Series automation system provides scalable content management and delivery for multichannel content management. The D-Series is configurable to support a wide range of workflow requirements.

D-Series Version 4 with Open Source Linux 2.6 provides the same advantages offered to the larger multichannel environments at lower cost. Version 4 is targeted at customers with fewer channels, yet still has the same mission-critical requirements for reliable on-air performance.
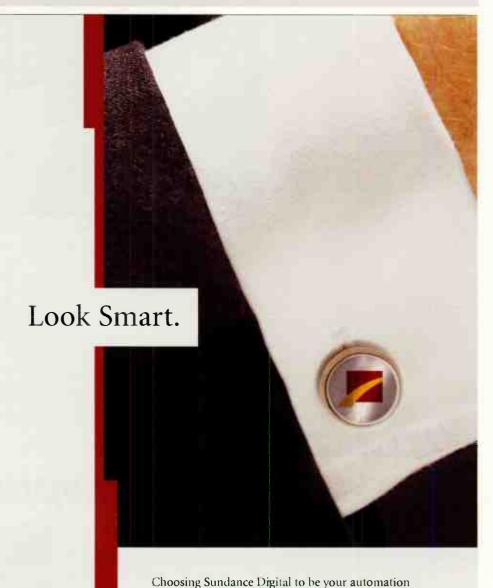
For more information, contact Encoda Systems at 303-237-4000 or visit *www.encodasystems.com*.

QTX from **Autocue** is a multichannel, master automation system that allows scheduling and transmission control for any terrestrial, cable or satellite broadcast operation. The system allows for flexible deployment of scheduling and control functions, with real-time automation information available at every workstation.

A QTX module running under Windows NT/2000 provides overall control for single-channel transmission and additional channels simply require their own additional. QTX provides control of video servers, CGs, still-stores, DVEs, switchers and routers using direct serial connection, network connection or GPI triggering.

For more information, contact Autocue at 704-377-1496 or visit *www.autocuesystems.com*.

Harris Supports Growth at HBO

by Elmer Musser
Vice President of
Broadcast Engineering
HBO

HAUPPAUGE, N.Y.

HBO is America's most successful premium television network. From blockbuster films, HBO Films presentations and original series to documentaries and concert events, the list goes on. Then there's boxing. With the addition of Cinemax, we have 38.8 million subscribers in the United States alone.

For the past 17 years, I've been part of the automation decisions at HBO, including my involvement from network design to installation and rollout. HBO uses Harris automation and the company has become a partner, offering everything "under one hood" and keeping pace with our innovation and expanding footprint.

Needless to say, it's paramount that we work with technology that's sophisticated, fault tolerant, and scalable. The lay of the land at our New York facility explains why.

We have two control rooms: one for HBO and one for Cinemax. In the HBO

Operations Technician Mike DeStefano (l) and Program Supervisor Tom Waddell keep an eye on the master control room for HBO.

control room, we've dedicated one person to monitoring the automation of seven SD feeds (HBO, HBO2, HBO Signature, HBO Family, HBO Comedy, HBO Zone, HBO Latino), and HBO HDTV. On the Cinemax side, one person is responsible for monitoring the automation of eight SD feeds and one HD feed.

We also have four ingest channels, caching customized pull lists that con-

veniently show only the clips missing in video servers assigned to that list. Finally, we have two channels of HBO on Demand. Two assistant directors support the watch in control rooms and perform other duties.

More than 16 device servers, Harris ADC-100 series, were purchased and deployed across these operations, and the benefits have been cost reduction,

reliability and simplified expansion.

LIVE-EVENT AUTOMATION

We're also automating many of our live-event functions. The process is very much like an exercise in advanced cut-and-paste, where we break from our pattern of movie, interstitial, movie, interstitial.

In such cases, the ADC system is automating three streams: Break away from our scheduled West Coast programming, join the East Coast with the live event and then resume with the West Coast line up.

Automation is also supporting our disaster recovery preparations. As a 24/7 operation, we need to be ready for circumstances that render our Network Operation Center (NOC) facility inaccessible.

To that end, we designated HBO Studio Production as our recovery location in New York. Automation takes the same processes from our NOC to this location, supporting disaster recovery. ∎

Elmer Musser is vice president of broadcast engineering for HBO and can be reached at elmer.musser@hbo.com. *The opinions expressed above are the author's alone.*

For more information, contact Harris Broadcast at 513-459-3400 or visit www.broadcast.harris.com.

Florical Makes It Happen for WKBN

by Thomas A. Zocolo
Chief Engineer
WKBN, WYFX-LP, WFXI-CA

YOUNGSTOWN, OHIO

Our main station, full-power CBS-affiliate WKBN, has been a fixture in this area since it went on-air in January 1953. In 1998, our parent company, Piedmont Television Holdings, decided to add a low-power Fox station to our market, WYFX-LP/WFXI-CA.

We were charged with getting the new station on-air from our existing facility with a minimum of new resources. It had to be completely independent of WKBN and we knew this would require a high degree of automation.

We looked carefully at all automation companies. Despite the fact that WKBN used another automation vendor, we decided on Florical because our parent company had used Florical to automate another facility in North Carolina with similar short notice. We felt confident that Florical could do the job.
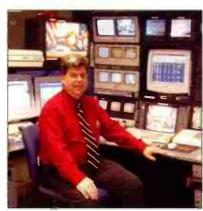
We purchased a 16-hour HP/Pinnacle MediaStream video server and six Panasonic DVCPRO tape decks. We used Florical's AirBoss for the play-to-air automation, SpotCacher for video server management and ShowTimer for recording from satellite. Our little Fox project was truly a "one man band" that just kept on playing.

After three years of a seamless Fox operation, we decided it was time to update the CBS operation by replacing our old Betacart system with a video server. We also wanted to combine the operations of the two stations into a common master control for more efficiency.

BIG DECISION

Since the CBS affiliate was already using a competitor's product, we had a big decision to make: Florical or the other guys. Not only was Florical's product less expensive, I believe it provided greater functionality and was more scalable.

We also chose Florical because of the

Thomas Zocolo uses Florical automation to control three stations.

company's eagerness to work with us. Its staff understood what we were trying to do and had the products to make it happen.

Today we have two AirBoss systems controlling our program channels, two Pinnacle MediaStream video servers, Bosch (now Thomson Grass Valley) and Leitch on-air switchers and Leitch Logo-Motion logo insertion devices. The old

SpotCacher system has been replaced by MediaMaster, which manages both program and commercial content in our two Pinnacle video servers.

MediaMaster ensures content needed for air is in both the primary and backup servers. ShowTimer controls four satellite dishes using ComTech EC8 controllers, eight Agile-Omni 830 satellite receivers and an SDI router feeding six ingest record channels on the primary video server.

The Florical system has served us well and the company's customer support has been excellent. I have always been able to reach a competent support person, yes, even once in the middle of the night. ∎

Thomas A. Zocolo is the chief engineer for WKBN-TV and WYFX-LP/WFXI-CA, and can be reached at tzocolo@wkbn.com. *The opinions expressed above are the author's alone.*

For more information, contact Florical at 352-372-8326 or visit www.florical.com.

NTD Takes Chinese On-Air

by Russ Siew
Chief Engineer
New Tang Dynasty TV

NEW YORK

New Tang Dynasty TV (NTD) is a 24-hour independent TV network for Chinese-speaking audiences. The network was established in February 2002, with a mission to serve and benefit the global Chinese community.

In July 2003, NTD began broadcasting outside the United States to Europe, Asia, Australia and Taiwan. Today it broadcasts by a mix of satellite, Internet and cable TV, with a range of programs in Mandarin, Cantonese and English.

Programming includes worldwide news coverage, cultural variety shows, education, sports, business and family-oriented entertainment. Last year, NTD won awards from the Columbus International Movie Festival for producing two movies, "The Legend of Lily Ye" and "False Fire." This year, the network won nine Best Feature Film and other awards for producing the movie, "Sandstorm."

In 2003, we decided to upgrade our playout operations from traditional tape-based equipment to an all-digital process. With news production being such an important part of our schedules, the news team wanted to simplify its workflow while introducing a more flexible way of working and responding to incoming news stories.

MULTILINGUAL NEWS

NTD broadcasts 30-minute news programs—seven times a day in Mandarin, twice in Cantonese and once in English.

News comes from international and national sources, including media agencies and from our own global reporting network.

We currently have more than 50 news-reporting stations worldwide. We needed a playout system that was not only compatible with our existing Matrox-based nonlinear editing systems, but that would also streamline the management of various news sources while saving on manpower.

We chose a file-based broadcast

Russ Siew checks the status of NTD's broadcast on the On-Air Central automation system.

automation system from London-based On-Air Systems. The On-Air system, On-Air Central, is a suite of software modules that can be integrated according to a broadcaster's requirements to provide an end-to-end playout solution. It automates most of the normal processes from program ingest, through scheduling and playout, to logging and report generation.

On-Air Central provides NTD with a versatile and affordable solution in one integrated environment. It is compatible with MPEG and DV formats and is connected to the editing systems and video servers on the Gigabit Ethernet network.

DRAG-AND-DROP

On-Air Central allows us to manage the various news feeds and other programs using drag-and-drop technology to build up the playout list as required. It also provides the level of flexibility required to handle last-minute changes in the rundown order.

Being based on Microsoft Windows and using standard hardware components, On-Air Central is cost-effective, easy to learn and easy to operate. This means that manning levels are kept to a minimum, as no more than two operators per shift can oversee the playout process. ∎

Russ Siew is the chief engineer for New Tang Dynasty TV and can be reached at russ.siew@ntdtv.com. The opinions expressed above are the author's alone.
For more information, contact On-Air Systems at 800-379-0809 or visit www.on-air-systems.com.

USER REPORT

Crawford Encompasses With OmniBus

by Michael Connell
Director, Advanced Technology
Crawford Communications

ATLANTA

As director of advanced technology at Crawford Communications, I am responsible for system design and workflow integration at the company's satellite services facility in Atlanta. From this facility, Crawford Satellite Services provides network origination and playback, domestic and international satellite transmissions, fiber optics, and studio and remote video production to its broadcast clients.

Client demand for these services has risen steadily in the past year; in response, we launched a project that would enable us to expand our tape storage and network playout capabilities through greater automation and integration of broadcast equipment and media management systems.

Our design team named the project "ENCOMPASS" (ENCOde, Manage and

Broadcast engineer Rick Cerney monitors Crawford Communications' 40-channel network origination ENCOMPASS playout.

Protect your Assets). The goal of ENCOMPASS was to consolidate our many control rooms and workflows into one unified, server-based system for improved resource sharing, better overall broadcast services and—of course—cost savings. To tie our technical operations closer together, we selected OmniBus Systems' Colossus multichannel automation system.

The ENCOMPASS project was completed in May 2004. Schematically, Colossus is situated at the center of a newly integrated automation, storage and playout system that lets us store and track a larger volume of client assets and work more efficiently with those assets. Because Colossus automation is a highly scalable solution, it will accommodate the expansion of our channel output as our client base and its playout needs continue to grow.

AN IT MODEL

Every product included in ENCOMPASS is able to operate according to standard IT data practices rather than traditional broadcast practices. Vendors involved in the project worked with our team to create a dynamic, interactive system, using some custom "glue" to provide seamless integration of off-the-shelf equipment. This cost-effective solution gave us the opportunity to use best-of-breed products to meet our needs.

Colossus was a clear choice for us because we could use the system to leverage existing equipment for greater efficiency in bringing media assets to air, which in turn helps us to deliver better and more diverse services to our clients. Furthermore, our operators find that the system's intuitive online interface supplies a simple and streamlined means of managing media.

At Crawford, Colossus controls Omneon, Pinnacle, and SGI video servers, an SGI shared-storage management system, and interfaces with five different traffic systems for playout of 37 redundant channels. OmniBus device drivers control traditional equipment while bridging the gap between video, audio, Internet and data-streaming applications.

Our media archive includes a data storage robot from SpectraLogics that uses Sony SAIT data tape drives. Shelved tapes are tracked with an network library system database, which has been integrated with the Masstech asset management system to simplify operations and reduce playout errors.

We were able to use ENCOMPASS to improve key processes such as ingest, which we now tailor to meet specific client requirements. We ingest content into our storage system at the appropriate resolution, with a redundant copy automatically generated by the SpectraLogic data-tape robot.

In the past, tape duplication had consumed many thousands of hours and led to generation loss. A new proxy generation system allows each client to view its entire media library online via the Internet.

The automation of our satellite services division has had an impact on virtually every aspect of our business. By relying on an IT-oriented workflow under the control of OmniBus' Colossus automation, we realize greater efficiencies in our day-to-day operations and are ready to meet the increasing demand for high-quality broadcast production and playout services. ∎

Michael Connell is the director of advanced technology for Crawford Communications and can be reached at mconnell@crawford.com. The opinions expressed above are the author's alone.

For more information, contact OmniBus Systems at 303-237-4868 or visit www.omnibus.tv.

REFERENCE GUIDE

The Reference Guide is a selected sampling of current products. Specifications and prices are supplied by the manufacturer and are subject to change without notice.

TRAFFIC & BILLING SYSTEMS

MANUFACTURER	MODEL	SINGLE OR MULTICHANNEL	PLATFORM	TYPE OF NETWORK	SOFTWARE/HARDWARE INTERFACES	MAX. NO. OF TERMINALS	SPECIAL FEATURES	PRICE
Encoda Systems 303-237-4000 www.encodasystems.com	Broadcast Master	Both	Win XP, NT, 2000; Citrix	LAN/WAN	Most automation vendors; Spotdata	Unlimited	End-to-end sales, traffic and billing; program mgmt, media library mgmt	Call for pricing
GI-AD 212-779-2580 www.gi-ad.com	NetPlanner 2005	Multi	Win XP, 2000, 2003 Server	Internet or Intranet	Various HW/SW, import/export functions, XML, Excel, QB	Five to unlimited	Commercials mgmt, monthly program manager	$5,000 (Net Planner five licenses)
Pilat Media 877-873-4267 www.pilatmedia.com	4.09	Multi- or single-channel	Oracle Enterprise 9i, Unix, Linux, Win	Any	Automation, ratings providers, rep., agencies, EPGs, subtitling, mgmt system, conditional access	Unlimited	Fully integrated broadcast including sales, traffic, proposals, finance, AR, log mgmt	Call for pricing
Summit Software 970-385-4411 www.summitsoftware.com	N/A	Both	Win, Dos, Linux Linux servers	Win,	Novell orTVScan, Maxagrid, Spotdata, interfaces with most automation systems	Virtually Unlimited	Real-time scheduling and inventory reporting, runs multiple TV radio and cable operations	Call for pricing
VCI Solutions 413-272-7200 www.vcisolutions.com	STARS II	Both	Win NT	Ethernet LAN/WAN	OneDomain, Peter Storer, Deal Maker, Maxagrid, all types of automation	No defined limit	Central-and multicasting channel ops, seamless sales, traffic and accounting workflow	Call for pricing

NEWSROOM AUTOMATION

MANUFACTURER	MODEL	CAPACITY	PLATFORM	NUMBER OF SEATS	TYPE OF NETWORK	MACHINE CONTROL	SPECIAL FEATURES	PRICE
Associated Press 202-736-1100 www.enps.com	ENPS	Depends on computer	Win	More than 29,000	LAN/WAN dialup	Third-party and cusom	Supports 64 high-speed newswire feeds, multiple language support, up to 100 locations	Call for pricing
Autocue 704-377-1496 www.autocuesystems.com	QSeries	Scalable system dependent on HW, no theoretical limit	Win	Unlimited	Fibre Channel fast/Gigabit Ethernet, LAN/WAN, dialup	Fully integrated automation sofware	All Unicode 2.0-compliant languages supported, modular, scalable	Call for pricing
Avid Technology 978-640-3372 www.avid.com	Unity for News	7.3 TB per system	Win, Mac	More than 200 at 25 Mbps	Fibre Channel, Ethernet	Supports OmniBus automation	Supports all Avid editing products, repurposed video for Web streaming	Call for pricing
Comprompter 608-785-7766 www.comprompter.com Newsroom	NewsKing Electronic	Depends on server	Win	N/A	Ethernet, LAN/WAN, IP dialup	Integrated high-level control	Suports most broadcast devices from any vendor, multiple wire feeds	Call for pricing
Dalet 212-825-3322 www.dalet.com	DaletPlus News Suite	Depends on video server choice	Win	Up to 1,000	Ethernet	VDCP, RS-22 Grass Valley AMP	Bidirectional communication between Dalet Newswire	Call for pricing
Quantel 203-972-3199 www.quantel.com	SQServer for News and Sports	Scalable ports, storage, seats; No theoretical limit	Win	Unlimited	Gigabit and fast Ethernet	CORBA native, MOS control RS422 translator	Fast to air. No copy required. Server plays composition live to air. No push, no flatten required.	Starts at $300K
Video Technics 404-327-8300 www.newsflow.tv	Newsflow NAS/SAN	Scalable	Win, Mac	More than 120 at 25 Mbps	Fibre Channel, Ethernet	VDCP, Avid Device Mgr. Apella VPI	Open architecture supports multiple NLE systms with Open DML, QuickTime	Ingest, Edit, Playout system starting under $50K

Crispin Automation

Crispin Corp.

312 W. Millbrook, Suite 113
Raleigh, N.C. 27609

The following is a compilation of opinions solicited from users of the month's featured product, as well as general specifications and other pertinent information.

KEY FEATURES • • • • • • • • • • • • • • • •

- On-air automation
- Ingest and playout modules
- Products tailored for specific servers
- Modules for dubbing, archiving and browsing media

USER	Steve Smith Liberty Corporation 864-241-5454	Henry Boze Jefferson-Pilot Communications 804-230-2769	Carl Guffey WDBJ 540-344-7000	Dan Henry Paramount Pictures 323-956-4930
WHAT MODEL(S) DO YOU HAVE?	Entire product line (14 stations)	Entire product line (3 stations)	Several products	Several products
HOW IS IT USED?	On-air & multicast automation	On-air automation	On-air & multicast automation	Playlist to air
HAS IT PERFORMED AS EXPECTED?	Yes	Yes	Yes, after startup was complete	Yes
WHAT FEATURES DO YOU LIKE THE MOST?	Functionality; operator focus	Scalability and configurability	Powerful and scalable	Interoperability with Grass Valley Profile servers
WHAT FEATURES DO YOU LIKE THE LEAST?	None	None	Can't yet handle "catch" servers	None
HOW LONG HAS IT BEEN IN SERVICE?	Four years	Five years	Six months	Six years
HAVE YOU HAD ANY EXCESSIVE MAINTENANCE PROBLEMS?	Nothing significant	No	No	Some startup configuration issues
HOW WOULD YOU RATE THE MANUFACTURER'S SERVICE/SUPPORT?	Excellent	Excellent	Outstanding	Responsive
WHERE WAS THE EQUIPMENT OBTAINED?	Manufacturer	Manufacturer	Dealer (TGS)	Manufacturer
WHAT WAS THE DECIDING FACTOR FOR YOUR PURCHASE?	It worked out of the box	Affordable; scalable; easy to use	Met our needs; company is nearby	Met our needs

For more information, contact Crispin at 919-845-7744 or visit www.crispincorp.com.

COMPANY PROFILE

IBIS Moves Beyond Broadcast

by Lauren Evoy Davis

Integrated Broadcast Information Systems (IBIS) created the ingest and playout tool that is the ubiquitous companion software application shipped with many video servers.

The founders of the station automation provider—formed in 1990—put together the first integrated end-to-end newsroom application in Europe for Channel 4 in the United Kingdom, according to Andrew Winter, IBIS sales and marketing director.

IBIS produces combined-planning, scheduling, media management, rights management, playout and commercial air-time management equipment.

IBIS was born out of British Satellite Broadcasting, which became BSkyB after media mogul Rupert Murdoch—owner of Fox News Channel—purchased the company.

Winter said that when Murdoch bought that multichannel bouquet and shut it down—because he wanted the movie rights, rather than the actual platform—the founders of IBIS—John Haselwood and Alan Hill—who were working for BSB, left to start their own company.

The first product that IBIS produced was Landscape, the station-automation platform that the company still markets. Landscape performs single- or multichannel playout, multiple device control, reactive news channel playout, timeline display, centralcasting and narrowcasting.

Winter described Landscape as a single-channel playout device that has grown to handle multichannel tasks.

S4C, based in Cardiff, Wales, was the first customer for IBIS and the station still uses Landscape for its analog and digital needs.

As the market moved from Flexicart and taped-based playout to video servers,

Above: Screen shot of IBIS 4 channel station automation playout system.
Right: M1 in Kyiv, Ukraine uses IBIS Live Tx system to produce live-to-air graphics.

IBIS developed a range of newsroom and sportsroom applications.

IBIS CoreTx is a go-between for video servers from different manufacturers and for legacy systems to connect to newer servers.

IBIS LiveTx ingests content through ServerLoad—used for processing sporting events—and is matched up with scheduled events from IBIS PreCue, designed to handle scheduling, library and electronic program guide (EPG) management. During transmission, all metadata is made available to the Landscape automation controller.

IBIS SprintTx is used for both news

IBIS Inc.
263 Tresser Blvd.
1 Stamford Plaza, 9th Floor
Stamford, Conn. 06901

Tel: 1-877-541-IBIS (4247)
Fax: 203-564-1402
www.ibis.tv.com

World Radio History

and sports, providing acquisition, management, shot selection, playout, and archiving of video server content. One high-profile customer is Channel 7 Network in Australia that uses SprintTx and ServerLoad to ingest content into its Quantel SQ servers.

After developing business relationships with Sony, Quantel and Grass Valley, IBIS was tapped to write a companion tool to go with most video servers for ingest and playout.

"Every Clipbox thereafter was sold with an IBIS application to allow the purchaser to ingest material, look at it and play it out. Very neat," Winter said.

In 1998 IBIS worked with CNN SI, creating an application that helped users grab sports highlights.

"We're quite good at manipulating a video server and getting it to do clever things and that's become one of our USPs [unique sales points]," he said.

Winter said that he knew the company was successful when he and others were invited to the Technical Emmy Awards in 2001 to be a party to Kevin Ivey—head of technology at CNN—receiving an Emmy for the complex automation installation at CNN SI.

"It was a really nice moment," he said.

IBIS products are now moving outside of traditional TV, and moving toward post production environments.

BUYERS BRIEFS

BlackMagic from **BlackBall** is a media asset management solution that works with all rich-media file types. The PC-based software provides storage, search and retrieval for a wide range of media file types. The product uses BlackBall's Rich Media File System and does not require a database or database license to deploy and function. It is simple enough to be deployed in just minutes.

For more information, contact BlackBall at 858-623-9400 or visit *www.blackball.us.*

DAX from **DAX Solutions** is a secure, Web-based asset management tool for audio and video media. DAX features video-on-demand access to media elements and rich media content generated throughout the course of a production. The software contains collaboration tools that work in both DVD- and VHS-quality video, and is compatible with the requirements of film studios and broadcasters.

For more information, contact DAX Solutions at 310-478-6644 or visit *www.daxsolutions.com.*

"We have been looking outside the television world because convergence is here, isn't it? We have converged," Winter said, pointing out that other corporate clients also need to manage audio and video data.

Winter said people now realize that data is data, and it doesn't matter that it's video and audio. It could be in the banking industry—the same rules apply.

"We've got to look beyond the broadcast market," Winter said.

"We're quite well known for doing custom work... maybe taking projects that other automators don't want to, because they don't see them as being highly valued. We see them as being a challenge and we enjoy doing them," he said.

The 35-person company has two U.K.-based offices, a U.S. office in Stamford, Conn. that opened in April and one in Australia.

"We're lean and mean, which means we can be quite reactive," he said.

A little under half the company's business is done in the U.K, and the rest is mostly split between the United States, Australia and the Middle East.

Customers include ESPN, Fox News, Channel 7 Australia, BBC, Austria TV, Travel Channel, Non-Stop TV, Emirates Media and also Sky Italia. ■

PRODUCTS & SERVICES SHOWCASE

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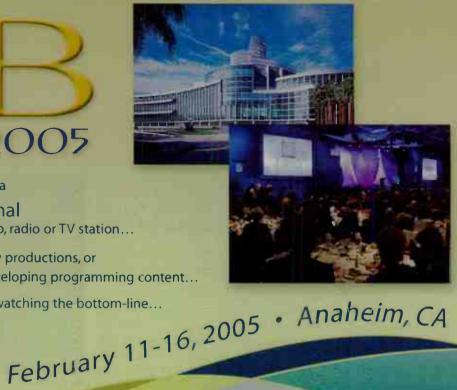
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New this year — the NRB TECH LAB! No one brings together equipment manufacturers for side-by-side demonstrations like you will see in the NRB TECH LAB! Participate in four days of hands-on product demonstrations and technically oriented seminars, in partnership with noted systems integrator TV Magic. You'll have access to top-tier manufacturers like Panasonic, Sony, Grass Valley, Apple, Yamaha and many others. See side-by-side comparisons of cameras, video editing suites, and other system components that will enhance your own facility and bring you up to par with today's demanding production requirements. This lab will help you make the best choices for your media production. In the words of a leading ad campaign…it's priceless!

Here's a sneak preview of the seminars that will be offered at NRB's Tech Lab:

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- Robotic Camera Systems
- What Can Fiber Do For You?
- SD vs. HD in Production
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- XDCam Tapeless Format
- Archiving Solutions
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- DVD Authoring Choices
- 24P Production
- P2 Tapeless Format
- Display Technologies
- Graphics for HD
- Yamaha Consoles
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- Audio for HD
- Digital vs. Analog Audio

INN!VATION
E X C H A N G E
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Check off all your ministry needs at NRB's award-winning exposition where nearly 300 vendors will showcase their wares on 140,000 square feet of exhibit space. With companies such as Armstrong, Baker Publishing, Harris, Inspiration Networks, Nelson Ministry Services, Panasonic, Ross Video, and USA Radio Network, you will discover the instruments you need to fine-tune your ministry.

Showcase Your Company at NRB 2005

It's not too late to highlight your company's products and services to thousands of NRB 2005 convention-goers. Contact Steve Cross at 703-331-4518 or scross@nrb.org to ask about your opportunities to participate via sponsorships, exhibit space, affiliate events, and advertising.

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Have you ever attended a lecture and been frustrated because one hour is just not enough time to really understand a subject? Then Anaheim is the right place for you! Each year NRB hosts full day "Boot Camps" that dig deeply into the details of a subject that you need to know more about. Topics this year include:

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Church Media: *Digital Storytellers – The Art of Communicating the Gospel in Worship*

TV: *The Face Of the Future: A Producer's Look At High Definition Television*

Internet: *Effectively Planning Your Use of the Internet for Ministry*

Educational Sessions

All day Monday and Tuesday you will have over 40 educational sessions covering a wide spectrum of topics to sharpen your skills and knowledge in communications. Here is just a brief sampling of what we have in store for you:

- **Digital Update: Anticipated or Feared?**
- **Maximizing the Combination of Programs and Music**
- **What Christian Radio Can Learn from Public Radio**
- **A Copyright Primer…Understand Copyrights and Licensing for Church Media Producers**
- **FCC Compliance: Avoiding Fines – Avoiding Jail**
- **Video Directing Techniques for IMAG and Broadcast**
- **One Person, One Camera, Unlimited Possibilities: The Power of Documentary Production**

For further details or to register, visit **www.nrb.org** or call **703-330-7000**

USER REPORT

MicroFirst Takes Control at WLVT

by Paul Keller
Director of Engineering
WLVT

BETHLEHEM, PA.

WLVT has been using the MicroFirst digital automation system (DAS) since 2000. We started our DTV migration and needed a traffic and automation system that could handle multicast programming and an ever-growing recording schedule.

The system we had until then was PC-based, running OS/2 with multiport serial cards for machine control. It was a flexible system but subject to the vagaries of the computer marketplace, particularly since IBM dropped OS/2 as a product.

We decided to go with a MicroFirst system, as we were impressed with the company's experience building device interfaces. Further, the approach that MicroFirst took to full-blown automation seemed to best fit our needs.

The MicroFirst MPC 1600 and 3200 are built from the ground up for real-time, mission-critical operations. The MPC 1600 and 3200 are 1 RU boxes with either 16 or 32 serial ports for machine control. Each port can be software configured for RS232 or RS422/485 operation.

Ethernet is used to connect to the traffic system with Windows workstations that serve as the operator interface. The internal clock can be locked to SMPTE time code or an NTP server.

Programs and data are stored on RAM and flash memory, with program backups, schedules and event logs stored on a 30 GB hard drive. Depending on the software, the MPC

Paul Keller checks the operation of WLVT's MicroFirst automation system.

can function as an Automation Processor or a Port Expander allowing systems to be built with anywhere from 16 to 320 control ports. Redundant systems with automatic changeover can also be built.

PROVIDES MANY FUNCTIONS

The system provides functions such as schedule import/export, editing and event monitoring with alarms and manual override, as well as machine control. Up to 10 workstations connect to an automation processor simultaneously.

All workstations have full functionality, no matter where they are on the network. I can connect from home and view the running schedules, as well as start a server playout and switch it to air before.

The system has extensive schedule flexibility that keeps track of what individual devices are doing. For example a tape deck can be used to play a program to air, record a network feed and then be used to ingest promos into the server. Conflict checking warns if different schedules want to use the same resource at the same time.

The system is smart enough to tell that if a satellite channel can play to air and be recorded without creating a conflict. Besides conflicts, operator alarms are generated for dead air, overlaps, missing clips, device playout failures and loss of remote control.

MIMICS THE FRONT PANEL

The machine-control program for manual control of devices is set up so that the control panels mimic the front panel of the device, which uses more screen real estate but makes for intuitive operation.

MicroFirst is a great company to work with and many product features were suggested by users. Need to control a device that is not on the list? MicroFirst will develop it.

When we were testing the system, we told the company what worked and what didn't meet our expectations. MicroFirst looked at what was going on, made changes and either downloaded them into our system or gave us a Web page for the updates.

This is a flexible system at a great price. ∎

Paul Keller is director of engineering for WLVT and can be reached at paulk@wlvt.org. The opinions expressed above are the author's alone.

For more information, contact MicroFirst at 732-522-3532 or visit www.microfirst.com.

USER REPORT

Turner Turns to Pro-Bel

by Jack Gary
Director, Projects and Integration
Engineering
Turner Broadcasting

ATLANTA

I head a group of six project engineers and four system administrators. The division is responsible for overseeing all new services and adding new functionality to any of our 25 on-air signals.

For example, in a requirement for a new control room we do the preliminary design, work with systems integrators to get bids, review the bids and put the work in place. This is very much an ongoing situation with a facility of this size and we always have something going on.

Turner Broadcasting System (TBS), a Time Warner company, is a major producer of news and entertainment around the world and a significant provider of

programming for the basic cable industry. Network Operations, located at Turner Entertainment's Techwood Campus Headquarters in Atlanta, is the primary broadcast transmission facility, handling 24 cable television feeds from six networks and one over-the-air feed.

In May, we launched TNT in HD. TNT has been on-air for nearly 16 years and we have East Coast and West Coast feeds in SD that are now replicated in HD. The market is beginning to support HD services and we wanted to get an HD signal in front of viewers. It was the right time to do it.

Pro-Bel's Sextant automation technology was chosen by Turner Entertainment Networks to control TNT in HD's ingest and on-air playout. We have been using Pro-Bel automation to support 23 services directed at North and South America. All but one of these services run parallel chains of automation so that if one fails, we are able to immediately switch to another.

Jack Gary (l) uses Turner's Pro-Bel Sextant to check TNT in HD.

THE BIG SWITCH

This is also the case with the Sextant technology for TNT in HD. We have two systems installed and at the end of the chain there is a switch; a master-control operator can push a single button and switch from the "A" chain to the "B" chain in the event of any problem. TNT in HD is entirely automated, so the automation technology selected is clearly of the utmost importance.

Pro-Bel's Sextant controls a Quartz HD master-control switcher, Pinnacle servers, Clyps HD stillstore from Chyron and Leitch HD Logomotion. In the unlikely event of simultaneous failure of both servers, we can switch to tape using Sony's new SRW format.

We have deployed Pro-Bel automation technology throughout this facility and, including the test and training control rooms, we have more than 45 Pro-Bel automation-controlled program paths. Pro-Bel was the logical choice for TNT in HD, as consistency is very important in a facility as complex as the one here at Turner Broadcasting. ∎

Jack Gary is the director of projects and integration engineering for Turner Broadcasting and can be reached at jack.gary@turner.com. The opinions expressed above are the author's alone.

For more information, contact Pro-Bel at 888-847-7623 or visit www.probel.com.

Ross Makes News for Barrington

by Keith Bland
Sr. Vice President for Acquisitions and
Development
Barrington Broadcasting

HOFFMAN ESTATES, ILL.

Barrington Broadcasting is a small company established in 2003 with the purpose of acquiring and operating small to mid-sized network affiliated television stations.

The group currently owns three stations: WHOI (ABC) in Peoria, Ill., WEYI (NBC) in Flint, Mich., and KHQA (CBS) in Quincy, Ill. It recently announced an agreement to purchase KRCG (CBS) in Jefferson City, Mo., and has a construction permit for a station in Bay City, Mich.

When we began to investigate ways to improve efficiencies in producing multiple daily newscasts, we became aware of Ross Video's OverDrive product. Over-Drive provides a robust interface between the stations' newsroom computer systems and major production components such as the Ross Synergy digital production switcher, video servers, robotic cameras and audio mixers.

Through the use of the MOS protocol, journalists and producers insert vir-

tual objects into a newscast rundown representing all machine-control events such as camera shots, audio mixes, graphics, video events and switcher transitions. The OverDrive system interprets these high-level objects and translates them into machine-specific commands to be triggered by the director at the appropriate point in the show.

We followed the development of production

Rick Jarvis controls a news broadcast at WHOI using the Ross Video OverDrive system.

automation assist systems for several years and were reluctant to implement such a system until now. Some of our concerns centered on the all-in-one black-box hardware configuration that some systems used.

With OverDrive, we achieved comparable operational efficiencies while keeping the usual complement of broadcast components. This means that we can still operate the traditional way, if necessary.

We were surprised to find that, although the implementation of the Over-Drive system required us to purchase new Synergy 3 digital production switchers,

robotic camera systems and MIDI-controllable audio mixers, the total project hardware costs were substantially less than the alternative system.

Admittedly we were very nervous about what problems might be uncovered in our first two installations of Over-Drive. However, those concerns were tempered by our long experience with Ross Video's dedication to customer support, having dealt with the Ross team for years on its switchers and terminal gear products.

Although we did encounter various issues during the installation and inte-

gration phase of these projects, the Ross development and technical support teams were completely responsive to working through the problems and solving them. The benefit is that many of our stations' suggestions for changes and improvements are incorporated in the next software revision, which is scheduled before the end of 2005.

In addition to the OverDrive system, these projects also involved the implementation of new newsroom computer systems and conversion to a tapeless editing and playout workflow.

Barrington Broadcasting worked with Ross Video as well as Avid, Telemetrics, the Associated Press, Yamaha, Chyron and Roscor in the conception and execution of this complex project. All the vendors, as well as our stations' remarkable technical and news staffs, worked tirelessly to make this first-of-its-kind newscast production system a reality. ■

Keith Bland is the senior VP of acquisitions and development for Barrington Broadcasting and can be reached at kbland@barringtontv.com.

For more information, contact Ross Video at 613-652-4886 or visit www.rossvideo.com.

DTG Brings XDS to QNI

by Brady Dreasler
Director of Capital and Engineering
QNI Broadcast

QUINCY, ILL.

I oversee several aspects of 12 television stations, two radio stations, two newspapers and a video production company, with operations generally throughout the Midwest. We selected Digital Transaction Group's Airo broadcast automation product for our station group and installed the system in September 2004.

For some time it was clear that control room and automation upgrades at all QNI stations were necessary. The group has used automated on-air playback systems since the early 1990s and, at varying levels, program content acquisition automation.

Our stations were equipped with mostly Odetics-based systems and the group spent a lot of time evaluating automation systems, servers, distribution and control equipment, beginning in 2000. With the required purchase of

DTV transmission gear, we decided to let automation, video server, and distribution gear technology mature a bit. The benefits of this approach were less costly servers and better conversion and distribution gear with IT-based control and reporting systems.

The first QNI station to install the latest Airo XDS software was WGEM in Quincy, Ill. The station project team of Jim Lawrence, Jay Sade and Brent Clingingsmith collectively has nearly 100 years of broadcast experience and understand the implementation process and complexity. Additionally, part of the project was to standardize and renovate our master control to better serve the new video server-based infrastructure.

LOOKING FOR STABILITY

The main criteria we were looking for in automation systems were stability, familiarity, rich feature set and the ability to take part in future system development. The automation system was only one part of a major upgrade that also included Omneon servers, Leitch switching and Miranda conver-

Jim Lawrence (l) and Brady Dreasler use DTG Airo automation at QNI.

sion, distribution and monitoring gear. Our goal was automation of the complete broadcast process from end-to-end with little intervention and only monitoring oversight.

Our original plan was to commission three systems at WVVA, Bluefield, W.Va., WSJV, South Bend, Ind., and WGEM in late summer with completely standardized systems. However, due to equipment delivery delays and the onset of a heavy political advertising season, the WGEM system was commissioned in early September and

WVVA and WSJV planned in early December.

Operators versed on the older Odetics Version 6 software had little trouble understanding the new Airo XDS after training. As with most major projects that include process changes and multiple equipment vendors, it took a couple weeks to get the systems operating smoothly.

Overall I think moving from a tape and server based system to a complete server IT based system will only bring benefits to the company in the form of more efficient operations, ability to easily manage multiple channels, standardized station systems and an infrastructure that will serve us well for years to come. ■

Brady Dreasler is the director of capital and engineering for QNI Broadcast and can be reached at bdreasler@qni.biz. The opinions expressed above are the author's alone.

For more information, contact the Digital Transaction Group at 800-243-2001 or visit www.dtgtv.com.

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AUDIO PRODUCTION

Want to Sell

Mackie 1604 ProVLZ, $850; Sony MXP-744, BO; Sony PCM-7050 DAT, $3995; Digidesign 888, $800; Bittree & ADC audio & video patch panels from $450; Stantron 45RU racks from $450; Emcor Series 10 40RU racks from $450. 818-788-4700 or www.tvprogear.com.

CAMERAS

Want to Sell

Panasonic F250B w/AG7450, case, chrgr, tripod plate, lw hrs, $950. 260-483-1102 x.201 or drxtv@comcast.net.

Pansonic AJ-D900WAP DVCPRO P camera, $12000; Panasonic AJ-D90 DVCORI 50 dockable rcdr, $5000; Sony DSR-500WS w/o lens, BO. 818-788-4700 or www.tvprogear.com.

Sony DXC537A w/PVV1A

Betcam SP camera, incl Sony case, xlnt cond, lw hrs, $3700. The Video Group, 817-891-8080.

CAMERA ACCESSORIES

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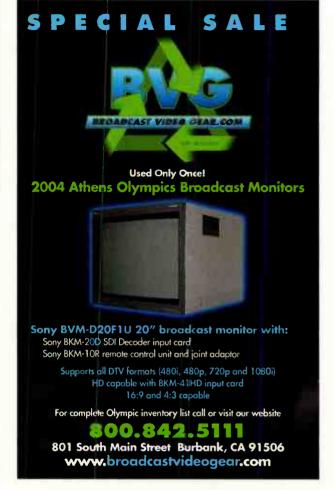
Sachtler Video 14 tripod w/floor spreader, $850; Anton Bauer LSQC chrgr, $100; O'Connor tripod flight case, $50; Sony CMA-8 camera adapter, $60; Ikegami heavy-duty flight case for CCD-770 on casters, $100. 260-483-1102 x.201 or drxtv@comcast.net.

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(7) Chyron Max, $4200/ea; Chyron INFINIT! 040 process, $3500; Chyron CODI, $3500; Sony EVO-9720 Hi8mm edit system incl source VTR & edit VTR, in original box w/remote, $950. The Video Group, 817-891-8080.

Avid Adrenaline, new, $21000. 818-788-4700 or www.tvprogear.com.

EDITING EQUIPMENT WTS (Cont.)

Panasonic AG-A650 edit cntrlr w/cables, $60; Sony RMM-504 edit cntrlr rack mount, $40. 206-483-1102 x.201 or drxtv@comcast.net.

Panasonic AJD LT-75 DVC-Pro laptop editor, like new, lw hrs, not a scratch on it, replaced w/NLE, $10000. 408-554-4920 or cgower@scu.edu.

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SIGNAL PROCESSING

Want to Sell

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SWITCHERS

Want to Sell

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SWITCHERS (WTS) Cont.)

Grass Valley 200-2, fully loaded, $8000; Miranda Digipath 16x16 DV router w/remote panel, $4900; Leitch 4x4 MB routers, $175; GVG Ten X, $800; Kramer 5x4 A/V switchers, $475. 818-788-4700 or www.tvprogear.com.

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Do you have old but usable television equipment? Would you consider donating it to VTTV Student Television? Your donations are tax deductible & help up & coming TV production students, if interested, please contact vttv_donations@vt.edu or check out our website at http://www.vttv.vt.edu.

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Tektronix 1760, $3000; Tektronix 1750 wfm/vector component, $2000; Tektronix 1740, $1750; Tektronix 1735 PAL waveform monitor, $1200; Tektronix 1720 & 1730 combo w/case, $1750; Tektronix 764 digital audio monitor, $2750; Tektronix 300a wfm component & composite, $1000; Leader 5872 wfm/vc, $1950. 818-788-4700 or www.tvprogear.com.

Tektronix rack mount for (2) 1720, 1730 or any other 1700 Series waveform or vector monitors, like new, $100; Tektronix 149A NTSC test signal gen, $400. A Martin, 218-765-4321.

TEST & MEASUREMENT

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TRANSMITTERS-Used transmitters from Harris, Acrodyne, RCA, Emcee, TTC. Antennas, microwave, feedline, etc. See transmitterwarehouse.com or call 954-792-7207.

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VIDEO TAPE TRANSFER

VTRs/VCRs /RECORDING MEDIA

Want to Sell
(17) Sony DVR-20, $2100/ea; (30) Sony DVR-10, $1200/ea; (2) Sony BVW-75P, $5700/ea; Sony BVW-35 Betcam SP portable, $1800; Sony VO-9800 w/TC, $900. The Video Group, 817-891-8080.

Sony UVW-1800, $5000; Sony PVW-2800, $5500; Sony BVW-70 from $5500; Sony BVW-75, $6000; Sony BVW-65, $2500; Sony BVW-60 from $2500; Sony PVW-2600, $2500; Sony DSR-1800, $8500; Panasonic AJ-D950, $8500; Panasonic AJ-D750, $4990; Sony VO 9850 w/timecode, $1200; Sony VO 9800 w/timecode, $1200; Accom WSD Xtreme, $4995. 818-788-4700 or www.tvprogear.com

Associate Director of **Engineering:** America's No. 1 non-profit innovator and home of the Jerry Lewis Labor Day Telethon – needs an associate director of engineering. Successful candidate will have working knowledge of digital and analog technologies, computer integration and networking in a full service production and post production facility. This is a hands-on position. Minimum 3-5 years experience (post production facility preferred). Super team; great SW climate; benefits; some travel. E-mail resumes to pburns@mdausa.org; fax to (520) 529-5382; or mail to MDA, Human Resources, 3300 E. Sunrise Drive, Tucson, AZ 85718-3208.

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Miller Camera Support is a company with 50 years experience in the manufacturer of fluid heads and tripods for portable video cameras.

Our US office is located in Cedar Grove, New Jersey.

Miller is expanding its US sales operation and requires a television broadcast orientated sales executive with a proven track record to assist in developing sales across our national dealer network and growing customer base.

The position, demands a person who will create new opportunities and expand market share in a competitive sales environment. Regular interstate travel to customers including tradeshows and exhibitions is integral to the position, as is the ability to demonstrate products to TV network and government professionals at engineering, operational and management levels.

Previous experience in a similar role with a television equipment manufacturer or reseller is a distinct advantage, as is operational knowledge of the industry. However a candidate with proven sales performance in a technology-related national sales environment would also be considered highly.

A competitive package with excellent benefits makes this a highly attractive offer.

Please forward your expression of interest and resume to:
greg.neal@miller.com.au

The NY Times calls NYC TV a "civic-minded MTV". We are one of the most innovative and creative media services enterprises in the United States. Situated in the heart of America's media capital, NYC Media Group oversees five cable channels, a Broadcast Channel and FM Radio station, Emergency Communications, as well as a host of other advanced media applications and services in NYC DMA

WE ARE SEEKING FOR THE FOLLOWING PROFESSIONALS:
Multiple Engineering Positions $90K+

Maintain broadcast equipment at a multi-channel, hybrid analog, digital, and network broadcast facility. Mac knowledge is desirable. Perform assignments thoroughly, looking for creative solutions. Proactive approach and Teamwork are #1. Advanced degree in Engineering or equivalent experience with related equipment, plus knowledge of NTSC and HD video formats, Windows, Apple, and Unix-type operating systems, automation systems is required. Familiarity with Panasonic DVC Pro equipment; analog/digital video/audio, video compression; satellite transmission and cable/fiber distribution, is necessary, as well as, minimum 5 years engineering experience and 10 years related experience.

Lead Technician $50k+

Support our engineering staff. Position maintains/repairs broadcast/IT equipment and networks. Supports Engineering department and maintains station connectivity to outside world via signal fiber, ATM, TELCO, satellite, etc. A minimum of five years experience in television, including troubleshooting, preventative maintenance, and component level repair of radio equipment and studio systems is required; familiarity with DVC-Pro tape machines, Beta-tape equipment, switchers, ENG equipment, servers, transmitters, as well as PC/Mac computers, network, and telecom equipment is necessary. Exceptional PC/Mac skills; Ability to read VU meters, waveform monitor & vectorscope, and set proper levels. Understanding of MPEG-2/4 encoding; relevant experience with digital video compression/encoding techniques. Ensure 24x7x365 support for all technical areas of organization. Demonstrated expertise in analyzing and solving complex technical problems; self-starter and proactive.

Master Control Executive Manager $70k+

Oversee multiple master control locations covering both cable and broadcast channels. Handles real-time operational issues as they occur daily in this multi-faceted operation. Assist with development of training curriculum and implements operational procedures. Interfaces with network operations counterparts, library, traffic, scheduling and engineering. Familiarity with encoding & uploading spots into digital system as well as digital and analog automation systems is required. Experience managing in largely horizontal organization. Hands-on experience with television video equipment including VTR's and AV monitoring gear. Ability to read VU meters, waveform monitor & vectorscope, and set proper levels. Understanding of MPEG-2/4 encoding; knowledge of all Windows applications (strong EXCEL/ACCESS skills). Ability to work under tight deadlines. College degree in related area plus minimum four years of experience in television, two in a control room environment.

Due to the nature of our operation, it may be required to work on weekends and/or evenings.

Excellent Comprehensive Benefits Package

Submit resume indicating title of position to:
NYC Dept. of Information Technology and Telecommunications (DoITT)
Recruitment Office, 75 Park Place – 9th Floor, NY, NY 10007
or e-mail: tv@doitt.nyc.gov

Visit us at www.nyc.gov/tv/jobs for more information
regarding these positions and other career opportunities.

We are an Equal Opportunity Employer

ADVERTISERS INDEX

While every care is taken to ensure that these listings are accurate and complete TV Technology does not accept responsibility for omissions or errors.

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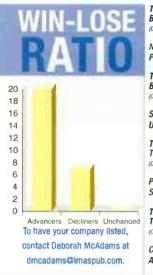Fax: 1-708-301-7444
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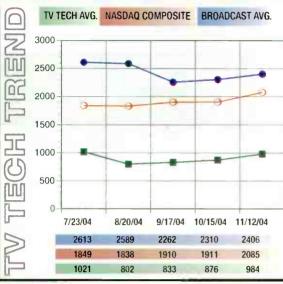Fax: 1-703-671-7409
cfreeland@imaspub.com

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WENGONG WANG
+852-2787-4727
Fax: +852-2787-4041
wwg@imaschina.com

WIN-LOSE RATIO

TOP ADVANCERS BROADCAST STOCKS
(Oct. 29 – Nov. 12)

Nexstar + 12.48%
Paxson + 8.20%

TOP DECLINERS BROADCAST STOCKS
(Oct. 29 – Nov. 12)

Sinclair - 4.43%
Univision - 3.33%

TOP ADVANCERS TV STOCKS
(Oct. 29 – Nov. 12)

Pinnacle + 27.47%
SeaChange + 14.50%

TOP DECLINERS TV STOCKS
(Oct. 29 – Nov. 12)

Ciprico - 12.13%
Avid - 0.11%

TV TECH AVG.   **NASDAQ COMPOSITE**   **BROADCAST AVG.**

	7/23/04	8/20/04	9/17/04	10/15/04	11/12/04
	2613	2589	2262	2310	2406
	1849	1838	1910	1911	2085
	1021	802	833	876	984

TV Tech STOCKS as of Nov. 12

Company Name	52-Week Range	Oct. 29	Nov. 12	% Change
Avid	38.43 - 55.42	52.95	52.89	-0.11%
Ciprico	3.15 - 7.21	4.45	3.91	-12.13%
Harmonic	4.86 - 13.75	8.32	8.77	5.41%
Harris	36.34 - 63.87	61.53	65.59	6.60%
Leitch	4.43 - 10.19	9.1	9.91	8.90%
LSI Logic	4.01 - 11.5	4.55	4.88	7.25%
Pinnacle	3.25 - 9.91	4.66	5.94	27.47%
S-A	24.61 - 38.59	27.39	30.12	9.97%
SeaChange	11.22 - 21.88	17.04	19.51	14.50%
Tektronix	25.10 - 35.00	30.33	33.09	9.10%

Broadcast STOCKS as of Nov. 12

Company Name	52-Week Range	Oct. 29	Nov. 12	% Change
Acme	5.60 - 10.21	5.67	6.07	7.05%
Belo	18.00 - 29.90	23.25	24.23	4.22%
Emmis	17.40 - 28.65	18.7	19.36	3.53%
Entravision	6.85 - 11.67	8.05	8.32	3.35%
Fisher	45.02 - 52.50	47.05	49	4.14%
Gray	11.20 - 16.22	13.28	12.91	-2.79%
Hearst Argyle	22.57 - 29.25	26.06	25.79	-1.04%
Nexstar	6.54 - 14.50	7.29	8.2	12.48%
Lin TV	17.43 - 27.49	18.18	18.12	-0.33%
Paxson	0.90 - 6.07	1.22	1.32	8.20%
Sinclair	6.12 - 15.43	7	6.69	-4.43%
Liberty	38.50 - 51.79	40.43	42.64	5.47%
Univision	28.38 - 40.05	30.96	29.93	-3.33%
Young	9.29 - 22.52	11.5	11.89	3.39%
Tribune	39.20 - 53.00	43.2	43.95	1.74%
Meredith	47.54 - 55.94	49	52.38	6.90%
EW Scripps	45.16 - 54.65	47.72	48.24	1.09%

COMPANY FOCUS
Chyron Posts Q3 Profit

MELVILLE, NY

Chyron reported $6.3 million in total revenue in its third quarter fiscal report, ending Sept. 30, 2004, up 70 percent from $3.7 million during the same period last year. Total revenue during the first nine months of 2004 was $16.9 million, a $2.9 million increase compared to the same time last year. Gross margins increased 60 percent, up from 54 percent during the same time last year. The increase was attributed to a boost in software sales and the elimination of intangible assets amortization incurred in 2003.

Net profit from continuing operations was $0.3 million or 1 cent per share, up from the net loss of $1.5 million or 4 cents per share for Q3 2003. Net profit during the first nine months of 2004 was $0.2 million, or 1 cent per share, compared to last year's net loss from continuing operations of $1.8 million, or 4 cents per share. The $1.8 million loss included a $0.6 million write-off during Q3 2003 of an investment in and note receiveable from a former subsidiary company and also a $0.2 million loss in Q1 2003 from impairment of marketable securities.

"2004 is very much a transitional year in which, I believe, we have successfully laid the foundations for sustained recovery and the emergence of Chyron as a leading supplier in the field of high quality software-based real-time graphics creation and graphics content management tools," said Michael Wellesley-Wesley, president/CEO of Chyron. He also cited the company's recent launch of its ChyTV product line targeting the dynamic digital display and security alert sectors as another potential market opportunity for Chyron.
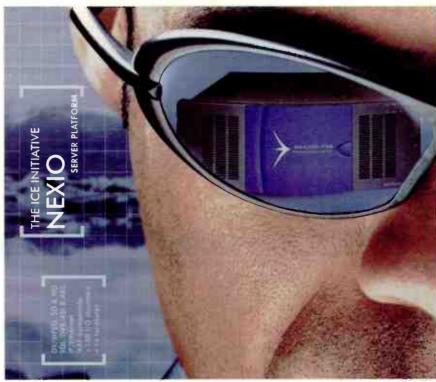
Lauren Evoy Davis

If Only Everything In Broadcasting Could Work This Efficiently.

MANAGE   CONTROL   MOVE   GO LIVE!

Here's a switch — turn complexity to simplicity in ingest-to-broadcast workflow. The Harris Resource Suite provides a complete set of integrated automation tools that deliver true productivity improvements. From process and asset management to workflow control and movement, the HRS tool set offers simple, intuitive resources to simplify management of the broadcast process. Through pre-defined business rules and links between traffic and master control, we make workflow

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FOR INGEST-TO-BROADCAST WORKFLOW MANAGEMENT

smooth and seamless. And whether it's automating labor-intensive processes, originating live products outside of master control or seamlessly sharing assets throughout your enterprise, HRS helps to take your organization to higher levels of efficiency in the competitive broadcast environment. So turn on a whole new world of productivity with the Harris HRS.

For more information about the ever-efficient Harris Resource Suite, call **1-408-990-8200,** or visit us on-line at **www.broadcast.harris.com/automation.**

www.broadcast.harris.com

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