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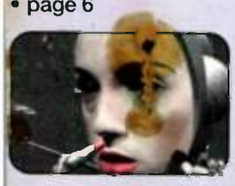
VOLUME 25, NO. 16 • JULY 25, 2007

WHAT'S INSIDE



'New' Newseum Takes Shape

D.C. museum to boast advanced broadcast production facility

by James E. O'Neal

WASHINGTON

Just behind the seven-story high stone engraving of the First Amendment, there's a frenzy of activity. Lights are being hung, soundproofing is being installed, welds are ground down and paint sprayed—all necessary items that must be crossed off the list to prepare one of the largest audio/visual facility projects in the country for its debut. The location is 555 Pennsylvania Avenue and the project is the Freedom Forum's Newseum.

The first and most lasting impression that one comes away with in visiting the Newseum is the colossal nature of this undertaking. The facility will occupy a quarter of a million square feet of the half-city block-sized building taking shape here. It's a

NEWSEUM, PAGE 24

À la Carte on the Menu Again

Groups gunning for cable concessions

by Sanjay Talwani

WASHINGTON

For many years, the cable industry has bundled its channels together in tiers, delivering audiences to many channels they never knew they needed and irking some consumers by making them pay for channels in packages whether they want them or not.

Year after year, the industry has successfully maintained this programming cross-subsidy—necessary to bring in new channels with the kind of boost they'll need to get going, the industry says.

This year may be no different for the advocates of so-called à la carte cable pricing as they face an admittedly uphill battle to move legislation in Congress. But even if advocates fail, they may succeed in pushing the issue to gain some concessions from the cable industry.

"The cable industry is one of the most entrenched lobbies in Washington," said Dan Isett, director of corporate and government affairs for the Parents Television Council, which has been trying various tactics over the years to highlight the issues of indecency and obscenity. "But the overwhelming sentiment among the American people is that something needs to change here, that the status quo isn't working for them."

This year the à la carte issue is suspended in the Family and Consumer Choice Act, which may or may not ever get a vote or hearing in committee. The bill would force cable operators to do one of three things: agree to submit to the same FCC obscenity and indecency regulations as their broadcast counterparts; offer a "family tier" of programming; or offer an à la carte pricing scheme for viewers through an opt-out mechanism for channels the viewers refuse.

Rep. Dan Lipinski (D-Ill.) introduced the bill, but without the blessing of Rep. Ed

À LA CARTE, PAGE 8

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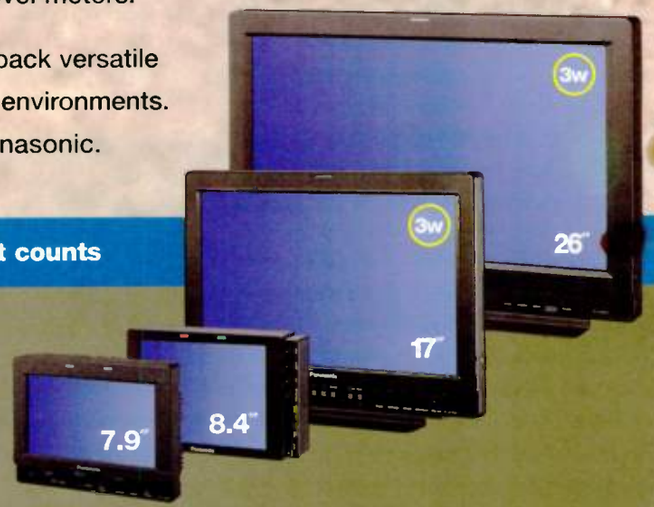

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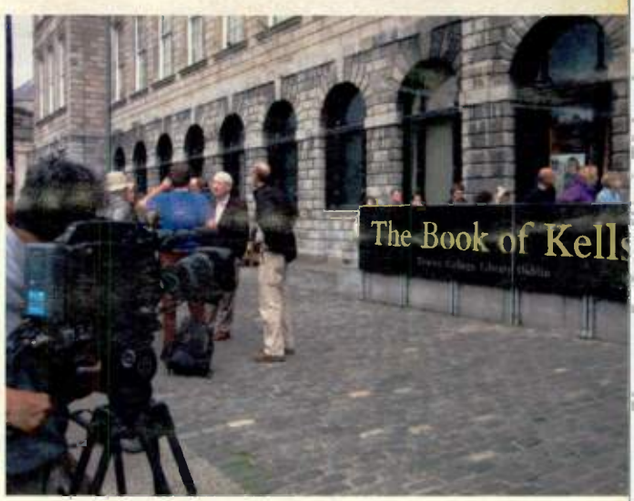

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Mark Turner
Count on IT

"Check, check, can you hear me?" If you've ever been to a meeting where a PA system was being used, chances are it started with those words. Once everyone assures the person speaking that the technology is doing its job, the meeting begins and nobody... p. 28

Gary Arlen
Tuning In

Video delivery was the talk of the NXTcomm telco convention in Chicago last month, with the keynoting CEOs of Verizon and AT&T describing their visions of television service via their expanding wireless and wired networks. Since dozens of vendors... p. 30

Craig Johnston
Production Manager

This may sound suicidal for a production manager, but I used to like sitting in the news director's office with the man himself, watching the evening's newscast. I didn't do it five, six, or seven nights a week, but I was usually glad when I did it. For one thing... p. 34

FROM THE EDITOR

Looking Overseas

As the countdown to the Feb. 17, 2009 analog shutoff continues, concerns grow about whether viewers will be ready when the transition takes place. Public education campaigns are being prepared and financed in both the public and private sector. Of course, the United States is not the only country dealing with the digital transition; the U.K., which hopes to wrap up its transition by 2012, plans to shut off analog in certain communities later this year.

The country is less than 100 days away from its first termination of analog broadcasts, as residents of Whitehaven, Cumbria prepare for an early analog shutoff in October. All eyes will be on this small community of approximately 25,000 households to see how viewers react to the changeover. Fortunately, according to a recent survey by Digital UK, the organization implementing the switch, 96 percent of the residents were aware of the switchover and three-quarters have already converted to digital.

When you consider that the majority of the American public is still unaware of the analog shutoff, a 96 percent awareness factor is incredible. Earlier this year, Digital UK sent letters explaining the transition to every household in the area, and it has launched a TV and radio campaign as well.

Similar measures are planned for the U.S. transition, but there's still some debate about whether the FCC or the NTIA will take the lead. This has to be settled soon, because either way, it will require an unprecedented government-industry partnership to ensure that no analog TV goes blank the morning of Feb. 18, 2009.

* * *

In 1976, Steve Dana founded IMAS Publishing with the launch of Radio World. In 1983, **TV Technology** was born. For more than 30 years, Steve has led IMAS Publishing with a passion for broadcasting; since arriving at **TV Technology** in 2001, I've had the privilege to get to know and learn from his knowledge of the industry. As Steve moves on to other endeavors, **TV Technology** wishes him the best and a big thank you for providing the opportunity to serve as the industry's best source of broadcast technology.

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

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

Why Not Broadcasters?

Dear Editor:

I travel a bit, doing systems integration work. When I travel, I sometimes listen to C-SPAN. In late June, I listened to a session chaired by Sen. Dan Inouye, and the matter of discussion was the highly vaunted auction of a 24 MHz slice of spectrum following the inevitable demise of analog television in the United States.

All of the people testifying, to a person, were talking about the advantages of a "nationwide, interoperable, unregulated," etc., "broadband public safety communications system."

I am concerned about this. I realize, as anyone must, that the issues promoted by these well-intentioned people are valid and reasonable. Anyone can make the leap of faith that, given sufficient freedom, public safety communications systems could be the admiration of the free world. The issue that I don't understand is really simple. I don't understand why it has to be these 24 MHz of spectrum.

Let me suggest something nobody has ever even suggested, except myself at an earlier date:

Given: There will be a large number of DTV and HD Radio facilities out there once the digital transition is in place.

Given: None of these facilities will be using all of their available bandwidth for technical reasons.

Noted: There was once a service known, depending on the frequencies to be considered, as ITFS or MMDS. These facilities bore a great deal of resemblance to an analog version of ADSL, because there was a narrow return channel for each outbound channel.

Suppose: All DTV stations and all HD radio stations were allowed to utilize a portion of their surplus bandwidth in support of public safety communications.

Advantages immediately available:

1. All transmission plants will be in place at the time of the transition.
2. All owners of stations will be interested in supporting their mandate to serve the public interest, convenience, and necessity, (remember this? It used to be why the FCC existed).
3. All transmission plants will have antennas and transmitters that cover huge geographical areas, and whose coverage will be easy to document.
4. All transmitter plants will be constructed so as to maximize the number of households served by the primary signal.
5. All transmitter plants will be equipped with antennas that can receive adjacent channels very well.
6. DTV plants and HD Radio plants will have no technical issues with carrying public safety communications signals within their bandwidth.

Suppose a scenario existed wherein public safety communications could be carried by notoriously reliable television station transmitters equipped with the capability of receiving lower bandwidth communications from mobile or portable public safety communications systems. There really is no technical barrier to this. There is only a barrier because of a pre-existing predeliction to assume that government assistance (meaning money) is necessary, and that no broadcaster could possibly partner with public safety.

If such a scenario could be considered, a national system of public safety communications would be a matter of writing software that would work with hardware that communicated in conjunction with hardware that either exists or nearly exists.

And by the way, this scenario could also replace the attractiveness of Broadband over Power Line (BPL) technology. Curiously, the greater the population density, the greater the number of televison (or DTV) stations could offer a few bits and bytes to support this. Further, the natural diversity of television operations affords significant protection against total loss of a communications system serving a specific geographic area.

Tom Norman, CPBE
Centennial, Colo.

TV TECHNOLOGY

Vol 25 No 16 July 25, 2007

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TV Technology Founded by Stevan B. Dana

TV Technology (ISSN 0887-1701) is published semi-monthly with additional issues in April and May by NewBay Media LLC, 5827 Columbia Pike, Third Floor, Falls Church VA 22041. Phone: 703-998-7600. FAX 703-998-2966. The international edition is published monthly along with the month's second domestic edition. Periodicals postage paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send address changes to TV Technology, P.O. Box 1214, Falls Church VA 22041.

For address changes, send your current and new address to TV Technology a month in advance at the above address. Unsolicited manuscripts are welcome for review; send to the attention of the appropriate editor. REPRINTS: Reprints of all articles in this issue are available. Call or write Emmily Wilson, P.O. Box 1214, Falls Church, VA 22041. (703) 998-7600 ext. 148 Fax: (703) 998-2966. Member, BPA International.

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Expanding Boundaries at SIGGRAPH 2007

Annual graphics confab gives stamp of approval to otherworldly technologies

by Susan Ashworth

SAN DIEGO

Mix together a dose of animation, a helping of technology and a dab of experimental art—sometimes in the weirdly unexpected form of a robot being controlled by light projectors—and you've got a feel for a day at a SIGGRAPH convention.

Just walking the show floor seems to put you in an otherworldly space with college students in one corner scrambling up a digitized rock-climbing wall, and lights reminiscent of the aurora borealis lighting up the ceiling in another.

IP MARKETPLACE

The mix of the bizarre and the bewildering is more than a treat for the senses. The goal of the annual SIGGRAPH convention is to cull together the brightest on-the-cutting-edge artists and engineers in the industry to showcase just how art, animation and technology of the future may converge.

The convention will bring together an estimated 25,000 computer graphics and interactive technology professionals to San Diego from August 5-9. This year, the convention will showcase many of those ideas in a revamped lineup of sessions and new co-located events designed to give attendees and even-wider glimpse of what lies ahead.

One major change this year is the decision to widen the scope of SIGGRAPH, said Joe Marks, conference chair of SIGGRAPH 2007 and a vice president at Walt Disney Animation Studios. That has meant changing the way that projects were selected this year, he said, by moving beyond just the jury process—by which a group of individuals votes on an exhibit—and handpicking unusual submissions that might not otherwise have made the cut. This will make for a SIGGRAPH with a broader scope, with exhibits that often don't fit neatly into a defined parameter. And that's exactly what officials at this year's SIGGRAPH want to see.

With expanding boundaries comes other difficulties: namely that one specific speaker isn't able to adequately address the burgeoning scope of the convention. This year SIGGRAPH will bring in three keynote speakers instead of just one, including a graphic novelist, a videogame developer, and a physician known for research in neurology and visual perception.

SIGGRAPH is also introducing a new program feature and, surprisingly, whether it succeeds or fails isn't the issue, say officials.

This year the convention is sponsoring a gathering place called the Intellectual Property Marketplace, a program designed to put designers and investors in the same place at the same time. The goal is to allow inventors and owners to list licenses and sell ideas to the computer graphics community, a rare but valuable opportunity that SIGGRAPH hopes attendees take advantage of.

But it will be news enough to see if the process itself is successful. "There has not been an effective mechanism to connect those who develop or own intellectual property—such as patents, blueprints and copyrighted material—with those who want to exploit it commercially," Marks said. "IP Marketplace is a cutting-edge, experimental program that will provide such a mechanism for the SIGGRAPH community."

The IP Marketplace is designed to address industry needs that are not currently being met, Marks said. "Our hope is that the SIGGRAPH IP Marketplace will facilitate inventors and entrepreneurs working together to develop new products and services. What you see in IP Marketplace this year may be the basis of products you will see in the SIGGRAPH Exhibition a few years from now."

THE COOLEST STUFF

SIGGRAPH 2007 also returns with the features that have made it a memorable convention, such as the Emerging Technologies exhibit, which will feature 23 installations highlighting dramatic and cutting-edge technologies that may someday emerge in everyday life, from the TransPen and MimeoPad, a drawing tool that allows individuals to transfer a digital image onto a piece of paper just by simulating a rubbing motion, to the Gravity Grabber, a technology that helps simulate a virtual object's weight.

"The Emerging Technologies program provides a unique look into the future capabilities of computer animation technologies in very practical, everyday environments," said John Sibert, Emerging Technologies co-chair. "This year's selection of technologies explores how advanced computer technology significantly impacts human interaction."

SIGGRAPH is also unique in that it devotes considerable space to the Art Gallery, a collection of animations and wall-based pieces from 135 artists and animators. With this year's theme of "Global Eyes," the gallery will also include a special collaboration with ISAST Leonardo, an organization that serves the international arts community.

The convention will also feature a span of special sessions and paper presentations from some of the year's more popular animations, such as "Happy Feet: Thawing the CG Pipeline" and "Shrekology, the History of an Ogre."

The special sessions provide a unique perspective on the computer graphics industry, said Jerome Solomon, SIGGRAPH 2007 Special Sessions co-chair, who works his day job at Industrial Light & Magic. "In each session, industry experts will define their vision for the future and discuss how to reach it."

The SIGGRAPH Papers program will again be on tap, allowing attendees to hear about the latest scholarly work in core areas of modeling, animation, rendering and imaging, as well as visualization and applications of computer graphics.

Other unique offerings include the quirkily named FJORG!, a 32-hour round-the-clock computer graphics animation contest in which 16 teams com-

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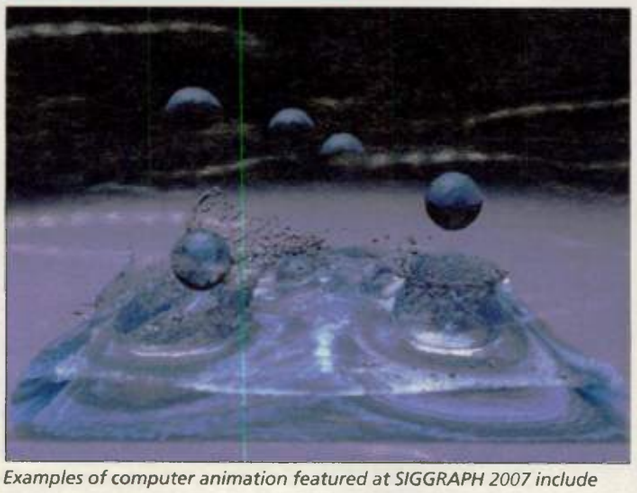
"This year's selection of technologies explores how advanced computer technology significantly impacts human interaction."

—John Sibert, Emerging Technologies co-chair, SIGGRAPH



Examples of computer animation featured at SIGGRAPH 2007 include (clockwise from top): "Space," by Sang Yeong Jeong from NC Soft; "Samurai Monster," by Grace McNamee from Sprite Animation Studios, and "Physics on GPUs," by Takahiro Harada from the University of Tokyo.

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NCTA Touts OpenCable Advances

Apps of the future showcased on Capitol Hill

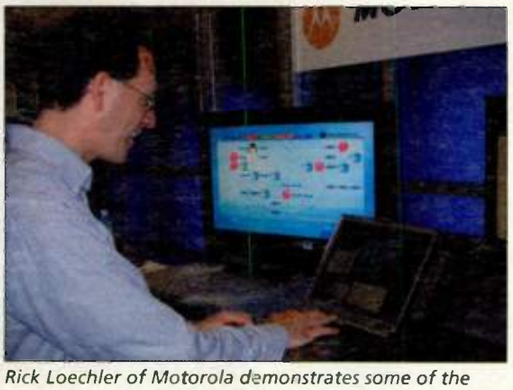
by Sanjay Talwani

WASHINGTON

The cable industry has a vision for its future: highly personalized viewing of thousands of programming options; "wideband" data rates of 100 Mbps—20 or more times today's broadband connections; and an environment for innovation that will bring an explosion of new applications.

And in case you didn't believe the cable industry, Intel and Microsoft have signed on to develop technologies related to the OpenCable Platform, middleware that enables a write-once, run-anywhere environment for the new software behind tomorrow's interactive features. At a cable industry event highlighting OpenCable in late June, Intel announced it will work with industry consortium Cable Television Laboratories (CableLabs) to support OpenCable in new system-on-a-chip processors, and Microsoft demonstrated a Windows Vista PC with an OpenCable unidirectional receiver, which can display high-definition cable content on a computer monitor or HDTV. The software giant plans to expand into bi-directional cable services.

Some industry execs compare OpenCable on the set-top box to Java on the cell phone (and 2 billion others worldwide), where applications have rapidly developed in recent years. A nationwide middleware platform would help the industry move past its current tangle of boxes and technologies across 7,000 cable systems, many developed independently over the past three decades using whatever technology happened to be available.



Rick Loechler of Motorola demonstrates some of the company's programs for developing OCAP applications.

"That lack of interoperability between systems, that lack of standardization between the components of our cable systems, is a big competitive disadvantage to the cable business," said Kevin Leddy, senior vice president for strategy and development at Time Warner Cable.

A typical Time Warner system deploys about 15 different cable boxes, with different software stacks in each cable system depending on the cable operator—different software for video-on-demand, billing, navigation, and so on. It takes work to get it right on every box in every system, and third-party developers have to be careful.

"We need to get away from that level of complexity," Leddy said.

OPENING CABLE

That's the purpose of OpenCable, and the set-top box makers, programmers, cable operators—along with a slew of hopeful software developers—figure the platform will help them compete with fresh technologies like the fiber networks being developed by the telcos.

At the NCTA event, Motorola showed off plug-ins for building OpenCable applications. Scientific-Atlanta demonstrated multiple devices driven by a set-top box with OpenCable—putting photos from the hard drive onto the television, for example, and playing video on different devices around the home.

Software developers see an opportunity and the promise that a great new application could wind up on tens of millions of boxes.

Many initial OpenCable applications are simply OpenCable versions of existing products, so much of the changeover is transparent to consumers. Several companies have souped-up electronic program guides with more user control over appearance and searches.

Programmers would love more

OPENCABLE, PAGE 14

À la Carte

CONTINUED FROM PAGE 1

Markey (D-Mass.), chairman of the House Subcommittee on Telecommunications and the Internet, the bill may languish. A Markey aide said he hadn't taken a position on either the bill or à la carte pricing.

Jason Tai, Lipinski's, chief-of-staff, said conversations are continuing with Markey and Rep. John Dingell (D-Mich.). A similar bill was introduced last year, but Tai said the different makeup of Congress and popular demand give the bill a better chance this year. "There seems to be a groundswell of support, at least from [Lipinski's] own constituents," Tai said.

One the one hand, the bill seems like a great issue for politicians: They can fight for decency while standing up to the major cable corporations and programmers. It's a good issue for Democrats like co-sponsor Rep. Heath Shuler, a freshman from a conservative North Carolina District.

Yet even endorsements from both PTC and Consumers Union may not be enough to fight cable. NAB, which has some members who are also cable operators, hasn't taken a position. And cable interests have given plenty of campaign cash to Markey, Dingell, and Rep. Fred Upton (R-Mich.), who ran the telecom subcommittee when the Republicans were in charge.

Isett notes that even if the bill dies, elements of it could live on or find new life on other bills later. He said PTC would prefer voluntary action from the cable industry over a government mandate, and he's open to any of a number of possible actions that might clean up cable.

OVERTURNING THE CARTE

Opponents and proponents agree that à la carte pricing would have major disruptions of some deep-rooted business relationships. The à la carte regime in the Lipinski bill would give viewers who opt out of a channel a refund equal to the fee the MSO pays the programmer per viewer. Presumably, this fee would have to be renegotiated.

Price discrimination against small, independent cable operators would make them suffer even more than their large counterparts, according to the American Cable Association, because the big operators get better deals on content. "The wholesale price differentials have little to do with differences in cost, and much to do with disparities in market power," the ACA said in an FCC filing.

The ACA has also claimed that technology costs make pure à la carte a financial impossibility for ACA members, but the industry's recent celebration of OpenCable middleware, a platform for write-once, run-anywhere interactive applications, casts doubt on the its professed inability to operate à la carte systems.

Anti-indecency warriors have tried various tactics over the years to attack indecency. They've fought media consolidation on the grounds that local owners are more responsive to local community standards, and they succeeded in raising the fines for broadcasters found liable by the FCC—although a federal appeal court on June 4 ruled that the FCC had overstepped its bounds in punishing Fox for "fleeting expletives."

Although FCC Chairman Kevin Martin has called for à la carte, many members of Congress are fighting hard to defend broadcasters, cablers and advertisers, and to place more of the onus for children's viewing on the parents. In a June hearing while Markey complained about held on the problems of childhood obesity and too much junk food on television, Upton praised the efforts of Kraft, Kellogg, and Viacom.

The owner of Nickelodeon and many other channels had impressed Upton with its kid-friendly initiatives, like licensing its cartoon characters on healthy foods and sports products, and for a voluntary "dark day," when the channel bore only a message urging kids to go outside.

Upton also credited the legislation he sponsored, raising fines for broadcasters, for a more family-friendly environment. "Since my bill was signed, broadcasters across the country got the message and they now think twice about pushing that envelope," he said. "The race to the bottom has ended."

Isett questions that celebration, claiming that a five-minute video of material culled from basic cable was enough to turn the stomachs of the Senate Commerce Committee at a June hearing.

In late June, the cable industry produced a letter from 100 programmers opposing à la carte—although most of the networks are owned by the same few giant corporations. Isett scoffs at the letter, calling it a drive by the entrenched channels and networks to stay entrenched in the face of increased public discontent.

"I think there's no question that there is growing momentum on behalf of consumers and families to grant them cable choice," he said. "And that's despite enormous amounts of resources and money being spent by the cable industry to maintain the status quo. Tens of millions of dollars they're spending, just to thwart the will of their own consumers." ■

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Is MPEG-2 Dead?

Vendors tout advantages of MPEG-2 Long GOP and AVC Intra

by Heath Firestone

FALLS CHURCH, VA

The recent introduction of newer, more efficient codecs in the professional marketplace has prompted debates over the future of MPEG-2. While there is no doubt that newer codecs will eventually edge out their older counterparts, the real question is which ones, and when.

Panasonic, for one, has been moving to MPEG-4 for some of its professional gear. "[Panasonic is] incorporating AVC Intra [MPEG-4 Part10 H.264 I frame] in our next generation of professional cameras, but not exclusively," said Bob Harris, vice president of marketing and product development for Panasonic Broadcast.

While the company intends to allow switchable recording from 50 Mbps AVC Intra, and eventually 100 Mbps AVC Intra, they will still offer their traditional DVCPRO-HD codec on the same cameras. Harris says that with AVC Intra 100 Mbps, they are achieving D5 quality.

Although the newer codecs have more advanced and efficient compressions algorithms, there are still several drawbacks. Currently the main problem with trying to incorporate newer codecs comes primarily from the hit in performance since it requires considerably more processing power, as well as issues with compatibility with existing editing systems. There are consumer cameras on the market that already record to AVC HD, (the Long GOP version of MPEG-4 H.264). The problem is that most editing applications won't even read the files, much less allow users to work in a native AVC HD environment, which means that users have to go through a workaround even to edit footage captured to this format until it is supported natively.

DEVIL IN THE DETAILS

Sony has opted to stick with MPEG-2 for their next generation of XDCAM50 cameras because the format still holds several advantages over its newer cousin, according to Hugo Gaggioni, chief technology officer/vice president for Sony Broadcast. "MPEG-2 is very efficient, and can be encoded using software only, but MPEG-4 is still a few years away from being able to be decoded without hardware acceleration." MPEG-2 also has the advantage of having legacy support in all professional editing programs.

The reason for confusion about this issue is in the details. There are claims that MPEG-4 is three times more efficient than MPEG-2, but this number actually varies depending on the data rate. At lower data rates, to get comparable quality with MPEG-2, considerably more bandwidth would need to be allocated than with MPEG-4. At higher data rates, it is more difficult to differentiate between the quality differences. "There is a fair amount of misinformation in the market about compression systems," Gaggioni said, adding that although at lower data rates, MPEG-4 may have substantial bandwidth advantages, at higher data rates, there is a rolloff.

For example, Gaggioni says, "it would take a 40 Mbps MPEG-4 video to match the quality of a 50 Mbps MPEG-2 Long GOP video." Better quality gains can be achieved using Long GOP versus Intra frame compression, resulting in 3x compression boost, according to Gaggioni, making 50 Mbps Long GOP MPEG-2 material equal in quality to 150 Mbps MPEG-2 Intra.

While there is no debate that MPEG-4 is more efficient than MPEG-2, and can provide a better looking image than MPEG-2 at the same data rate, that difference becomes less discernable at higher data rates.

Al Kovalick, a strategist for Avid Technology, is a key contributor to SMPTE's VC-3, standardization process, which is near completion. VC-3 is compatible with Avid's DNxHD codec, which the company developed for the purpose of providing a high-quality codec designed for editing.

"Avid developed DNxHD to provide a reasonable compressed HD editing solution which would provide very little loss in quality while providing maximum performance," Kovalick said. To achieve this, Avid went with a DCT-based algorithm, (DCT, or discrete cosine transform, is used by both MPEG-2 and MPEG-4), Intraframe compression at data rates of 150 and 220 Mbps. This provides very good quality video with minimal loss in recompression, while not taxing the processors too heavily when decoding. Intraframe compression is ideally suited to editing as it doesn't have to reconstruct the B and P frames, which requires more processing.

Kovalick admits that there is a point at which each of the codecs is nearing visually lossless quality, at which point it becomes difficult to really claim that one codec is far superior to another. Though difficult to define exactly where that point of visual differentiation is reached, the threshold for 8-bit 1920x1080 HD seems to be around 150 Mbps Intraframe for MPEG-2, hence Avid's 145 Mbps version of DNxHD. This should translate to 50 Mbps Long GOP MPEG-2. With AVC Intra, the 100 Mbps version should easily fall into this same category of being at a quality at which differentiation becomes considerably more difficult, but at which the quality should be very impressive.

Sony says MPEG-2 Long GOP can achieve better quality over AVC-Intra...

...while Panasonic says integrating AVC-Intra in some of its professional camcorders can achieve D-5 quality.

CODEC FLEXIBILITY

Alan Keil, vice president and director of engineering for Ikegami said that the company's Editcam—which Ikegami jointly developed with Avid—is aimed at "high-end production with mild compression," and currently uses 145 Mbps DNxHD, with plans for 220 Mbps DNxHD for future versions.

The flash memory-based field and studio ENG camera system which Ikegami is developing with Toshiba will employ software-based codecs, allowing them to be flexible with their codec offerings. Keil said that they "won't jump into MPEG-4 yet," initially planning to incorporate MPEG-2 in two varieties: 50 Mbps Long GOP and 100 Mbps Intra, with other codecs available in the future.

Even though MPEG-2 isn't going away anytime soon, there are certainly differing views on the best method for each company to focus their development efforts. Sony recognizes that although MPEG-2 is an older and less efficient codec, it still produces a very good quality image at the data rates they offer. They have also embraced a more efficient version of the codec, and point out that the processing requirements for the codec can be done without hardware acceleration on current computers.

From an editing standpoint, this can be a critical requirement since during the editing process at any given time, more than one stream of video may be going through the decoding process simultaneously. The amount of processing required can mean the difference between real-time performance or long render waits, although Long GOP does require more processing power to decode than its Intraframe counterpart.

MPEG-2 is the technology behind DVDs, HDV, and XDCAM, none of which are in any danger of becoming obsolete any time in the near future. So, clearly MPEG-2 is neither dead, nor are its days numbered.

There are, however many new competing codecs which are gaining ground in the industry, which are more efficient and offer other advantages, among them, H.264 (AVCHD and AVC-I), DNxHD, JPEG2000, Red Code, and ProRes. Each codec has distinct advantages, but being new to the field, they still suffer through some early stumbling blocks. As exciting as these new codecs are, none promise to spell the end of MPEG-2 anytime soon. ■

Heath Firestone is producer and director and owner of Firestone Studios LLC. He can be reached at Heath@FirestoneStudios.com

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Kodak Imager Yields More Sensitivity

Bayer pattern updated to allow more light

by Craig Johnston

ROCHESTER, NY

One constant challenge for video camera makers has been sensitivity, the ability to capture a quality, or at least usable image in low-light conditions.

Techniques such as amplifying the gain in a sensor to up its sensitivity, have usually come at the expense of increased noise or a lower resolution image. Videographers have had to accept that image degradation because a bad picture was often better than no picture at all.

However, Eastman Kodak has introduced what it terms a next generation color filter pattern that it claims will increase imager sensitivity by two to four times, a one or two *f*-stop advantage, with no image degradation.

FRONT FILTERING

Color cameras, video or still, whether single or three-imager models, have long divided an image into the three additive primary colors, red, green and blue. Pixel information from each of these colors was used to determine the colors (chrominance) in the image, and weighted information from all three green imagers was also used to determine the brightness (luminance) of the image.

But dividing the image into the three primary colors required filtering in front of the pixels, which was like putting sunglasses on them. Filtering lowered the overall amount of light reaching the pixels.

To understand Kodak's new technology, it's helpful to understand that current video cameras commonly arrange their pixels in the Bayer pattern, invented by Kodak's Dr. Bryce E. Bayer in the 1970s. Bayer used twice as many green pixels as red or blue ones in order to mimic the human eye's greater resolving power with green light, (Fig. 1). The new Kodak technology substitutes half of Bayer's filtered pixels with unfiltered, or polychromatic pixels. Of the remaining pixels, half are green filtered, with one-quarter each red and blue filtered.

"Because there's no color filter associated with panchromatic pixels, more light goes into them and they're able to detect more of the photon that come through the lens," said Mike DeLuca, product marketing manager for Kodak's Image Sensing Group.

The unfiltered pixels supply luminance information, and the red, green and blue filtered pixels supply color information. DeLuca said it wasn't as easy as adding the polychromatic pixels and pushing the product out the door. "There are about 15 patents we've applied for, that cover not only the clear pixels, but the specific patterns [the pixels are placed in] as well as for the software."

While the clear pixels allowed more light to enter, one of the challenges Kodak faced was increasing sensitivity of the remaining color filtered pixels. This was done by using software to combine pairs of like color filtered pixels together, (Fig. 2). "We end up with a lower resolution color record," said DeLuca, "but we use that for the chrominance part of the image, which your eye is not as sensitive to."

FOUR-IMAGER CAMERAS?

DeLuca said the new panchromatic pixel technology will work equally well on CCD and CMOS sensors. He said one of the appeals of the CMOS sensors is their ability to carry other processing circuits in addition to pixels.

"In the future we have an opportunity to take [our] software and put it directly on a CMOS chip, so that one chip not only would have a sensor with these patterns on it, but also have the right image processing software on it, to be able to provide [the finished color picture] as a final product directly off the sensor."

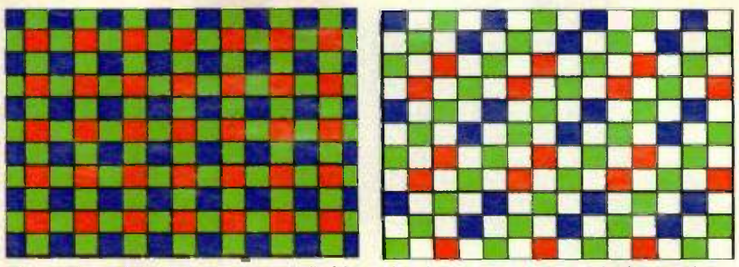

Fig. 1: The original Bayer pattern (left) used twice as many green pixels as red or blue ones in order to mimic the human eye's greater resolving power with green light. The new Kodak technology (right) substitutes half of Bayer's filtered pixels with unfiltered, or polychromatic pixels. Of the remaining pixels, half are green filtered, with one-quarter each red and blue filtered.

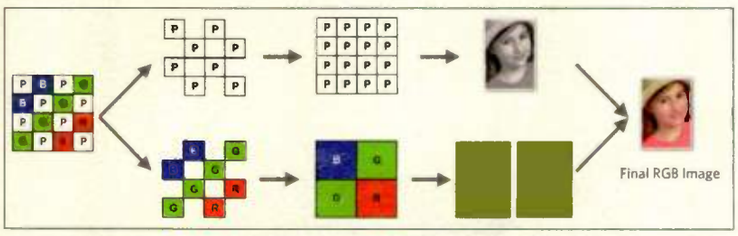

Fig. 2: While clear pixels allowed more light to enter, one of the challenges Kodak faced was increasing sensitivity of the remaining color filtered pixels. This was done by using software to combine pairs of like color filtered pixels together.

As noted earlier, tests that Kodak has done pitting a sensor employing the polychromatic pattern against a comparable sensor employing the Bayer pattern show the polychromatic technology yields from two to four-times more sensitivity. This not only allows imaging in lower light, but use of higher shutter speeds to freeze a moving subject.

While the tests that Kodak has done to this point with the technology have been in the still photography application, DeLuca said there is no reason it would not work equally as well for video.

Does this forbode the appearance of four-imager video cameras (RGB-P)? "I'll be honest," said DeLuca. "I don't know what to think in terms of a four-imager camera, and I don't know what work, if any, our guys have done about that."

But a four-imager camera is not unprecedented. Alan Keil, vice president and director of engineering for Ikegami, pointed out that one of Ikegami's first high-definition CCD cameras had two green imagers offset one-half pixel-width in order to gain resolution.

"At that juncture the highest pixel count was 1.2 or 1.4 million pixels [on a sensor], and we felt that was insufficient," Keil said. "So we used the dual-grid approach to match the performance of the previous tube-based HD camera."

Keil said the Ikegami-built camera that NHK used for its Ultra-HD exhibition seen at the past two NAB conventions also uses two offset green imagers to achieve its 16-times HD resolution.

And looking into television's deep past, in their early color camera development, both GE and RCA built four-imager tube cameras in which one tube was used for polychromatic pickup, and the other three for red, green and blue.

DeLuca said the first of these next-generation imagers will be available for manufacturers to test in early 2008. But he cautioned against looking for them in professional gear right away. "Our initial target here is for consumer markets, for camera phones, digital still cameras and large markets such as that," he said.

Still, it would seem that professional video camera makers could benefit from the increased sensitivity of Kodak's polychromatic pixel pattern technology, particularly with the low light challenges presented by the smaller imagers some manufacturers have deployed in their new HD camcorders. It wouldn't be the first time professional camcorders picked up technology first introduced for consumer equipment. ■

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LED Lighting Comes of Age

Compact size, low power consumption help drive technology advances

by John Sharaf

LOS ANGELES

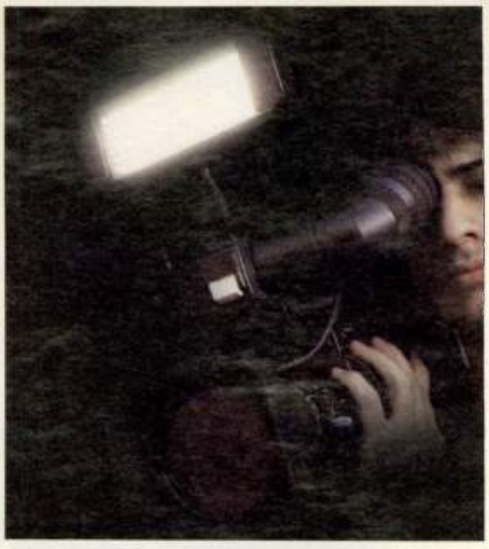
The television industry can barely catch its collective breath with all the recent advances in digital and high definition equipment, but perhaps little noticed are the advances in the related field of entertainment lighting technology.

In particular is the coming of age of LED lighting, based on the success and the economy of scale that this technology is having in the automotive, architectural and digital signage industries. Many of these new and innovative lighting instruments share the qualities of small size, high efficiency, low-power consumption and brilliant and accurate color reproduction.

LITEPANELS

It's only been a few years since Litepanels was the first to market with their MiniPlus system of LED units, which have become popular with ENG crews. At first their line consisted of only a daylight-balanced, wide-angle on-camera light that was supplied with stick-on gels to adjust to tungsten color balance and a built-in dimmer to control the intensity. To this original product they've added a spot design and also a native tungsten-balanced unit and more recently they've introduced two LED ring lights that also mount directly to the camera.

Completing their current catalogue is a larger 1x1-foot panel light that can be grouped together with optional brackets to make either a larger 2x2-foot or 4x4-foot unit which the company says has the output of a 4000 W light (with the wide units) or an 8000 W light (with the spot units), yet draws only 6.5 amps at 120 V AC. One other unique feature of these lights is that the LED globes can last up to 100,000 hours, thus helping to amortize their higher cost versus more conventional lights by saving in globe replacements. The thin profile of these lights makes them very useful in small sets and practical locations and optional batteries that attach to the back of the lights eliminate any cords when that would be helpful.



Litepanels MiniPlus

ELEMENT LABS

Element Labs, another established LED lighting manufacturer, introduced its Kelvin line of film and video lighting instruments at NAB in April.

Previously their larger LED light units had been used in theatrical and

OpenCable

CONTINUED FROM PAGE 8

control over the new features and are working to connect their content with the new environment. The Weather Channel will empower viewers to bring in the info they want when they want it; a person wanting a five-day forecast in a particular city, for example, could just navigate to it about the way one does now on the Internet, instead of waiting for the local forecast to come around on the television.

SWITCHED DIGITAL VIDEO

To get all that individualized data to millions of viewers, cable bosses also touted Switched Digital Video (SDV), which enables many more channels that the industry now offers with its one huge bundle of data.

Unlike the traditional "broadcast" model of cable, which sends all the channels—popular or not—to every viewer, SDV would "broadcast" the more popular channels to every home, but certain lower-use channels would only come to the viewer that requested it, almost like a video-on-demand program.

"When you're offering a lot of channels, they're not all being watched," said Fred Allegrezza, advanced technology consultant with Motorola Connected Home Solutions. With SDV, the system dynamically switches what is sent to a neighborhood as viewers change channels. The result is fewer "lost bits," SDV boosters say.

Allegrezza figures it could enable as many as 1,000 channels. Marc Coblitz, senior vice president for strategic planning at Comcast Corp., said SDV was at the very core of a shift going on inside the company's cable plants.

The challenge is changing the channel quickly, since the channel-changing request goes all the way to the cable headend, not just to the set-top box. But Allegrezza said that time delay is shrinking to an even quicker switch than regular digital cable's delay, in some cases.

Allegrezza said SDV is running in a few markets, and he predicts major deployments in 2008.

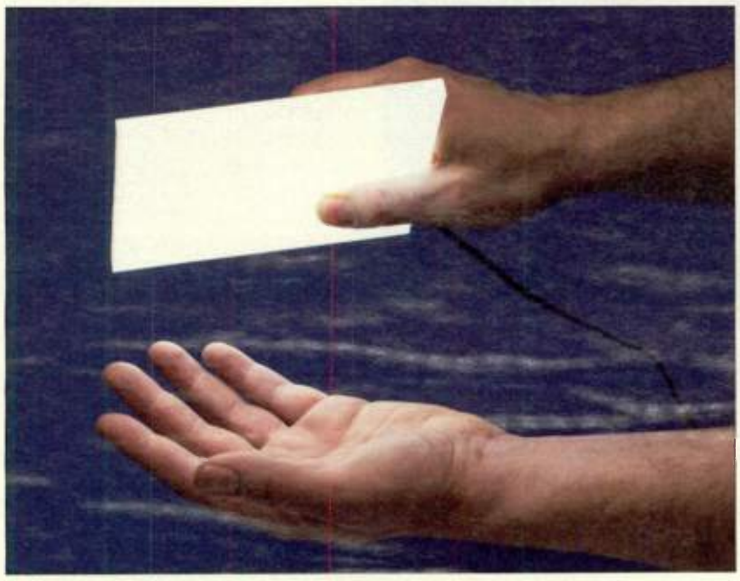
The OpenCable showcase took place at the Capitol Hill office the NCTA moved into last September.

NCTA chief Kyle McSlarrow said it's important Washington understands what cable is doing and that it doesn't need its bandwidth consumed by new regulatory burdens or must-carry requirements for broadcasters' full lineup of digital channels.

"The policy message is making sure that they understand these pieces all connect to one another," he said. "We're trying to connect the dots that way." ■

music venues by the likes of Madonna, Prince and even at the Grammy awards show as illuminated set pieces. Their products are distinguished by combining red, green and blue LEDs that can be adjusted by a wireless remote controller (like a television channel changer) to be daylight or tungsten presets or any other color for that matter. So in addition to never having to buy another globe (they claim a 30-50,000 hour life) you might never have to buy a color gel again.

Element calls this "digital gelling" and their line presently consists of a small brick unit, appropriate for on-camera use or for hiding in small areas such as one might need for product photography or in a car interior. A larger four-foot-long classic softlight unit known as the "Kelvin Bank," puts out 640 footcandles at 3.3 feet while drawing only 256 W, and would be appropriate for portraiture or even set lighting. According to Element, these units maintain a very high color rendering index (CRI) of 95 between 3200 and 6500K resulting in a quality of light very similar to a tungsten source, which scores a perfect 100 on the index.



Rosco LitePad "Everywhere Light"

KINO FLO

Last month, Element Labs inked a deal with Kino Flo, a Burbank, Calif.-based developer of professional lighting systems, to rent Element's LED technology to the professional lighting industry. Kino-Flo, which originally introduced color correct photographic quality fluorescent lighting, also has ventured into the LED arena with their Koloris line of cool-lighting fixtures.

Designed to add up to 1.6 million colors to the TV or movie set, they can even be attached to the industry-standard DMX dimmer control to add the illusion of movement to the color effects. Koloris comes in two sizes, either 25 or 50 W and connects to a four-channel control panel, and they can be arranged in long rows as if a single unit.

In response to customer requests for super thin and low profile units like the LED lights already mentioned, Kino Flo has also introduced another new instrument it calls "Barfly." This 2.5-inch- deep light promises more lumens per square inch than any other color correct fluorescent on the market and comes in both a 100 and 200 W version.

ROSCO

Another notable advancement, while not an LED unit per se is the Rosco LitePad "Everywhere Light." It is only 1/3 of an inch thick and comes in sizes ranging from 3x3 inches to 12x12 inches and can be hidden almost anywhere that a larger, more typical fixture would never fit, such as in a door jam or on a mirror. It can also be mounted on a dark stairway floor backstage to be used for safety illumination so talent or technicians can see where they're going. This unit also promises long life in the neighborhood of 70,000 hours and burns at a bluish 7000K color temperature.

While I still use conventional lighting instruments like my Mole Richardson 200 W Minis and 1000 W babies that haven't changed in their design for 30 years or more, I find these new innovations and advances in lighting technology very exciting and by adding them to the lighting repertoire I feel that their use can't help but rejuvenate and invigorate the modern lighting director's work and make everyone look good.

John Sharaf is a cinematographer and lighting director in Los Angeles and has worked in the film and television industry there for 25 years. ■

SES Americom, Hiwire Test Mobile TV

Vegas market trial uses DVB-H

by Claudia Kienzle

LAS VEGAS

Hiwire LLC and SES Americom have recently completed technical tests for a Digital Video Broadcast-Handheld (DVB-H) mobile TV service.

With the initial testing completed, Hiwire and SES Americom are now launching a six-month-long market research testing phase, with 200 trial participants using the service and sharing feedback about their technical and entertainment experience.

While T-Mobile is participating in the Las Vegas trial, there are no plans yet for a formal commercial market roll-out. However, the plan is to find a wireless provider or television entertainment company willing to brand the service and market it nationwide.

As a wholly owned subsidiary of Aloha Partners in Providence, R.I.—the largest owner of 700 MHz spectrum in the United States—Hiwire LLC was formed to develop and deploy a mobile television service that would monetize Aloha Partners' spectrum. SES Americom, an SES Global company headquartered in Princeton, N.J., is contributing the use of its large fleet of satellites and IP-Prime end-to-end IPTV service.

TV ON CELL PHONES

Hiwire's mobile TV programming originates from SES Americom's IP-Prime IPTV broadcast center in Vernon Valley, N.J. At this facility, SES Americom ingests hundreds of channels of HD/SD programming, and from there 24 channels are fed to the middleware system that provides the conditional access, encryption, and encoding and other processes needed to convert the programming to the DVB-H standard for the Hiwire mobile TV trial.

Hiwire's mobile TV programming originates from SES Americom's IP-Prime IPTV broadcast center in Vernon Valley, N.J.

Once the signals have been packaged and prepared, they are uplinked via SES Americom's satellite-based distribution network and transmitted directly to DTV broadcast towers which broadcast them to handheld devices throughout Las Vegas.

Two transmitter sites were established in Las Vegas, just to facilitate this market trial. Each transmitter site houses two UHF DTV transmitters. These four DTV transmitters are synchronized on a single frequency network to ensure market coverage. The transmitters broadcast DVB-H, the mobile version of the DVB terrestrial broadcast standard. The DTV transmission equipment was provided by German transmitter manufacturer Rhode & Swartz in Germany, and DMT, an Italian transmitter provider with extensive experience in DVB and DVB-H transmission.

> **"It is the first extensive testing of DVB-H in the United States."**
>
> **—Bill Squadron, SES Americom**

Two of the transmitters operate on channel 54 and two on channel 59—two channels that Aloha Partners has free and clear in the Las Vegas market. Between the two frequencies, the SES Americom/Hiwire test service is broadcasting 24 channels in 12 MHz of channel capacity. Each transmitter's 6 MHz channel must be synchronized into a SFN to have sufficient capacity to broadcast a total of 24 channels of HD/SD programming.

MARKET RECEPTION

SES Americom and Hiwire cooperated in choosing all the vendors and equipment for the trial, including T-Mobile as wireless service provider. Another key vendor to the DVB-H trial is LG Electronics, which provides the LG-U900 DVB-H compliant cell phones. These cell phones were modified by LG to send programming simultaneously across two UHF channels, a technique which enabled the channel capacity.

RRD, an Italian-based DVB-H integrator, assumed responsibility for the middleware platform, a key aspect enabling the DVB-H mobile technology. RRD developed both the hardware and software layer, and handled all the necessary conversion of the programming to DVB-H. "We chose RRD because they have experience with mobile television on the DVB-H platform in Europe," said Bill Squadron, president of IP-Prime for SES Americom. "This is the first time that SES Americom's IP-Prime service is being distributed via DVB-H. It is the first extensive testing of DVB-H in the United States."

According to Scott Wills, president and chief operating officer for Hiwire LLC in Mountain View, Calif., the Hiwire trial offers "the largest channel lineup, at the highest quality, ever provided in a market test.

"The results of the technical testing exceeded our expectations," Wills said. "In terms of the signal propagation, we're getting great coverage and great in-building reception, as well as great reception in vehicles that are traveling at speeds exceeding 75 miles per hour. The technical testing is finished, and we're right now in the process of tweaking the final 'rev' [software version] on the handset.

"During our technical testing, which began in February 2007, if you were to [compare reception on] a MediaFlo phone and a Hiwire phone, you'd find many locations, like convention centers and airports, where we were getting coverage and they were not," Wills said. Wills declined to give details as to how they managed to achieve the impressive coverage/reception results.

GAMBLING ON LAS VEGAS

Channels 54 and 59 were selected for testing because Aloha Partners owns those two channels free and clear across the U.S. Aloha Partners and Hiwire cannot use the entire 700 MHz spectrum they currently own in all markets because analog and DTV

MOBILE, PAGE 26

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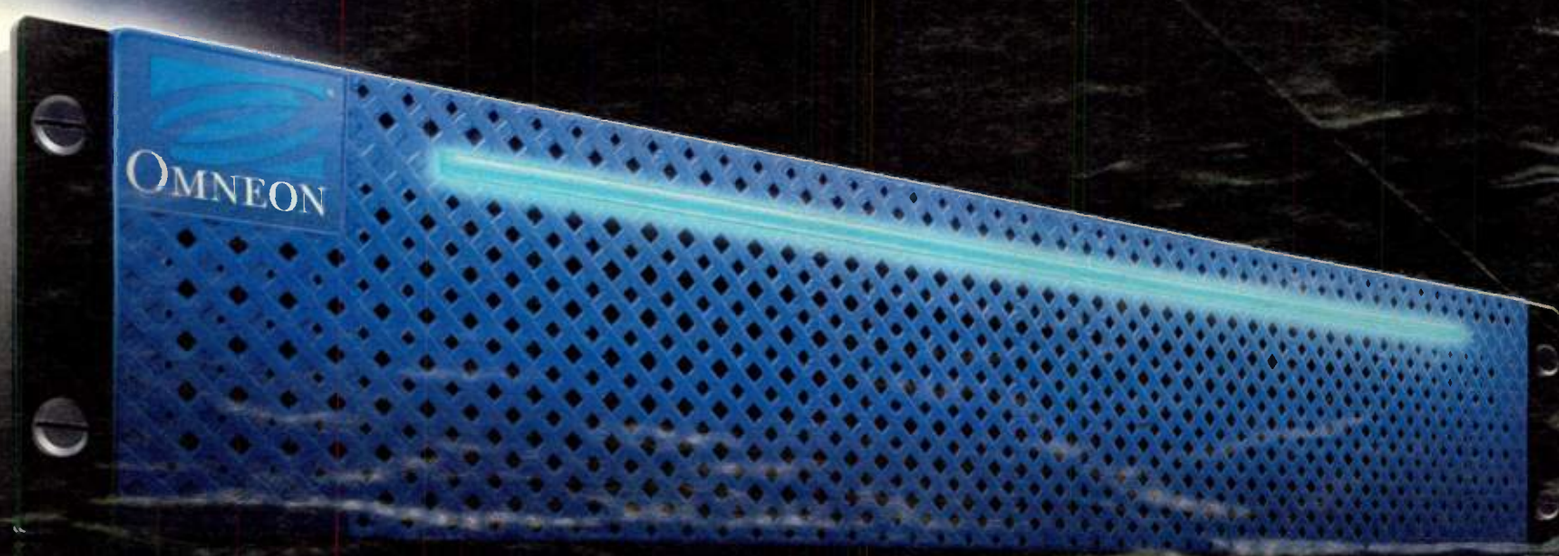

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The Sound of Sports

5.1 and HD present new demands, new opportunities

by Michael Nunan

TORONTO

Most people will likely agree that the appearance of 5.1 surround has, on the whole, been a good thing. Sure, there are good and bad examples of the form, but in general, the arrival of HD, in concert with 5.1, has provided for a renaissance of sorts in the audio community. But what does the current state-of-the-art say about the future of sports audio?

Photo: Joe Giza/Reuters/Landov

Philadelphia Phillies batter Jimmy Rollins sports a microphone on his jersey during a 2005 game against the Washington Nationals.

Televised sports audio has evolved to the point where the industry is finally running headlong into the practical limitations presented by the way televised sports is produced. In other words, we're finally hearing just how bad things have always been.

Were it not for the technical capabilities now taken for granted, we might never have readily imagined that the essential makeup of TV sports represented a fundamental limitation on how good the sound *could* be.

Think back just a few years, and it's not hard to remember a time when the soundtrack to a televised sporting event was largely commentary with a few smatterings of effects. While there is certainly a stark contrast between the sound of a football game from 20 years ago and one from last week, the essential difference speaks more to the arrival of fidelity, and less to a sudden and miraculous change in our fundamental approach to the craft.

It's hard to remember a time when the soundtrack to a televised sports event was largely commentary with a few smatterings of effects.

There are many examples of truly great programming out there, just as there is a lot of excellence in the field of sports audio; with many professionals committed to improving the craft. We just may not be setting our sights high enough.

SPORTS, PAGE 20

SIGGRAPH

CONTINUED FROM PAGE 6

posed of three members will "forge" ahead to create a character-driven short animation based on a specific theme. The teams will test their animation skills, as well as withstand staged distractions in a test of skill, talent, creativity and physical endurance.

"It will be a unique opportunity to watch talented people do incredible work in a limited timeframe under significant pressure," said Patricia Beckmann-Wells, chair of the event.

The convention will again showcase its annual Computer Animation Festival, whose members often go on to win the "Best Animated Short Film" award at the Oscars. This year marks the first time that filmmakers were able to submit high-definition video to the selection jury, which greatly increased the jury's ability to appreciate the intricacy of each film, said Paul Debevec, the Computer Animation Festival chair.

"This year's winners are perfect examples of how computer graphics is enabling small, independent groups to create films with vast landscapes, complex characters and amazing visuals," he said, alluding to the winning selections, which include animations about a deadly virus, a 1920s tango dancer and a dreammaker.

"Just as computer graphics blurs the line between real and virtual, each of these films in its unique way explores what is tangible and what is imaginary and whether that difference is important," he said.

TECHNO NEAT

Some new technologies on the show floor are bound to garner attention, too. Part of the company's new lineup of surface computing products, the Microsoft Surface turns an ordinary tabletop into an interactive digital surface—allowing users to fingerpaint, play virtual games and manipulate digital photographs. With certain digital phones, data such as traffic information or maps can also be transmitted to and then manipulated by Microsoft Surface.

SIGGRAPH is also pooling together additional resources this year by co-locating with five technology events before and during the conference, including the Graphics Hardware Workshop, the Emerging Display Technologies Workshop and Sandbox: A Videogame Symposium.

"This will give attendees a chance to delve deeper on select topics through co-located events, while also getting broad exposure to the latest developments in computer graphics and interactive techniques at the main conference," Marks said.

For more information on the conference, visit *www.siggraph.org/s2007*. ■

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Sports

CONTINUED FROM PAGE 18

The best traditions of televised audio demand that broadcasters create sound which is motivated by, and in service of, the pictures given by our video counterparts. With that said, the arrival of 5.1 represents an enormous leap in the total available capacity of television sound. Broadcasters now have three times the number of audio channels to the home (5.1) and the ideas of "depth" and "envelopment" have become part of our vocabulary.

However, the accompanying arrival of HD pictures was arguably less remarkable in the way it changed the lives of our video colleagues. To be sure, HD brought incredible improvements in picture quality, with the complimentary addition of new technology and equipment, but the processes and creative approaches to making TV with these new tools has remained virtually unchanged.

HD brought us the possibility for widespread adoption of 5.1, but the pictures we're obliged to respond to haven't changed as radically as our sound *might* have, given its potential.

The TV sports audio community needs several things. To start with, we can always use better technology. Every working audio person has a laundry list of things they wish they had.

Here are two items from my wish list: first, a shotgun microphone that could compete with the ridiculously long lenses that my camera friends have. It's pretty hard to deliver audio that matches the pictures when you have a cameraman who can fill his frame with a skater who is 400 feet away, and we're hampered by microphones that not only have vastly shorter "reach," but that also need to be unobtrusive.

Next, I'd like for someone to design a DSP algorithm that could remove human speech from an audio signal in real-time. We could provide some exceptionally vivid audio from the field-of-play if only we didn't have to worry about the exceptionally vivid language that often comes out of players' mouths!

NEW PERSPECTIVES

That's enough about gear. Suffice it to say that the "higher, faster, stronger" ideal as it applies to audio technology makes this a great time to be engaged in the craft of sound, but in many ways, we already have more toys than we can effectively use.

For my money, the tools we currently have at our disposal are already outpacing most of the requirements placed on them by the pictures we're given.

To truly take our game to the next level,we really need to be given new pictures to respond to. If we truly want to work in service of the pictures, and if those pictures leave us wanting, then it's clear that new angles, new places, new spaces, and new cutting styles that could support the progressive use of "sound perspectives" would let broadcasters really unleash our creativity, and re-think the experience of sports audio.

To truly take our game to the next level, we really need to be given new pictures to respond to.

©NFL Films

For example, in the world of 5.1 music, it's a fairly common mixing approach to place the listener "inside" the band; that is, create a sonic perspective where the listeners feel as though they are surrounded by the band.

Contrast this with way most concert DVDs (or HD shows) are produced. In these cases, the band usually occupies the front of the soundstage, with the crowd or room ambience behind the listener. It's hard to imagine an HD concert show where the band was arranged around the viewer; since this would more or less dictate that the visual perspective was from a camera onstage.

This example is a little nonsensical, but it raises some interesting questions about the concept of aural perspectives that go beyond the typical approaches. In most sports and variety applications, we present the audience with a static image that is a curious amalgam of the "best-seat-in-the-house" and the "up close and personal."

My argument isn't with the fact that this is an unnatural perspective, but rather with the static nature of that perspective. Only occasionally do we bother to generate sonic viewpoints that match the visual point-of-view. Why? I think that the conventional wisdom is that the result would be too confusing for the audience. Having done this exact thing for documentary programming, I can say that the result is often startling, and sometimes unnerving, but never confusing... provided that you let the audience know what's coming.

Left to our own devices, the audio team could easily create some truly unique and engaging aural pictures. These soundscapes could be an interesting starting point for providing the audience with a novel way to experience live sporting events. It's a pity that no one has invented "video-follows-audio" technology.

The networks, clients, producers, and directors we work for may ultimately decide that they like things the way they are. Furthermore, it may not be possible or practical to reinvent the TV sports experience, at least to the point where the audio community could truly exploit the power of sound.

Unfortunately, we don't get to choose the pictures we get. Those decisions properly come from production. A TV sports producer who doesn't know what is possible, has never heard it done, and isn't worried about mimicking what the competition has already done, can be forgiven if he or she lacks the sonic imagination to go to the audio team and either ask for something really extraordinary, or give them permission to start thinking *outside the box*.

In the end, viewer expectations could force the issue. Hollywood blockbusters with their hyper reality soundtracks, and the videogame culture, with its highly immersive point-of-view environments, play an increasingly large role in informing viewers' exceptions when they turn on their entertainment systems. This could compel some broadcasters to re-examine their craft and imagine new and exciting ways to let sound be a creative and visceral force in the next wave of the TV sports experience. ■

Michael Nunan is the Post Sound Supervisor for CTV Television, based in Toronto, Ontario. He can be reached at mnunan@ctv.ca

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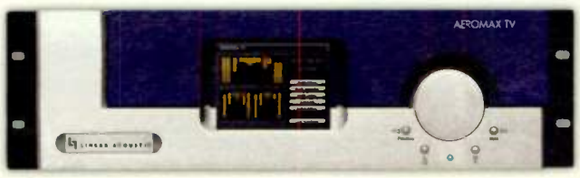

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3 Gig: The Pipeline to 1080p

Forward-looking companies anticipate demand

by Jay Ankeney

LOS ANGELES

1080p is all the rage in home theater displays, and the new Blu-Ray and HD DVD disks as well as the latest gaming systems are all based on the 1080p format. The European Union is also actively considering adopting 1080p/50 as its standard production format.

With the acknowledgement that mastering in 1080p provides an efficient medium for conversion to other forms of HD delivery, the need to handle 1080p's 3 Gbps data requirements is starting to influence the design of acquisition, post-production and distribution systems and their infrastructure.

The Gennum HD-LINX III chipset targets 3 Gig.

Until recently, cumbersome dual link HD-SDI connections were required to transport 1080p and higher data rates. But at NAB2007 the industry started to see equipment based on a new serial digital interface called 3 Gbps (actually, 2.97 Gbps), or more commonly, "3 Gig" appear that could transport twice the data rate of the 1.5 Gbps (1.485 Gbps) 1080i/60 or 720p/60 signals over a single 75 ø coaxial cable with simple BNC connectors on either end. As its adoption becomes increasingly widespread, 3 Gig technology may change the way the industry thinks about transporting 1080p and higher signals throughout the entire digital production chain.

SMPTE 424M

The strongest proponent of 3 Gig technology and the first to bring 3 Gig chips onto the market is Gennum Corp., a Burlington, Ontario-based chip developer.

"HDTV standards have been around since the 1990s," said Alan Ferguson, director of marketing for video transport at Gennum, "but the standards for 3 Gbps just came into being last year as SMPTE 424M for the physical interface of the connections and 425M for the mapping documents which handle the different video formats."

3 Gig eliminates the duplicate cabling required for dual link HD-SDI, cuts the number of distribution amplifiers in half, and removes the complications of resynchronizing the signal if one dual link cable were of a slightly different length than the other.

"That's why Gennum's manager of video product definition, John Hudson, took the initiative to work with other leading equipment manufacturers to standardize 3 Gig technology," Ferguson said. "Today, Gennum is already providing a fully compliant 3 Gbps SDI chipset called HD-LINX III that includes our GS2974A equalizer, GS2975A reclocker, and GS2978 cable driver."

One of the great advantages of 3 Gig technology from Gennum and other manufacturers is that 3 Gig's coaxial cables can be used in the same patch panel layouts designed for standard definition connectivity with only modest modifications.

"With this high bandwidth, the BNC connectors and associated jacks need to be fine tuned to as close to 75 ø as possible with a minimum of return loss," said Anis Khemakhem, product manager for broadcast and cable connectivity at ADC in Eden Prairie, Minn. and one of the industry's largest suppliers of network equipment and broadband integration services. "Once a facility has tested their coaxial wiring for compliance, our MVJ-3T dual, self-normalling, 75 ø-terminated midsize super video jack can enable any existing plant to pass 3 Gig signals within the patch panels they already have."

Empowered by cost-effective interconnectivity, several manufacturers are already providing the kind of support technology needed for successful 3 Gig implementation. Norway's Network Electronics, for one, introduced the Flashlink 3GHD-EO-2 3 Gbps optical converter and router system at NAB2007.

"Our main business is signal transport and 3 Gig technology is vastly increasing our throughput potential by letting us multiplex two 1.5 Gbps signals into a single channel," said Lars Erik, chief technology officer for Network Electronics. "No conversion is necessary because it is just a question of combining the transport streams. It is something the market needs if it is going to begin widespread implementation of 3 Gig technology."

Pro-Bel has already released Cygnus, a 1080p 3 Gbps native router that offers up to 576x576 crosspoints in a single 26 RU housing in order to future-proof its customers' investments.

Pro-Bel Cygnus Router

"It's a core infrastructure product," said Neil Maycock, president of Pro-Bel in the U.S. "The life of a routing switcher can stretch over many years so even people not stepping up to 3 Gig right now will want to be able to handle its data throughput within the life of this product. We do a

lot of work with ESPN who is already using 720p for its improved depiction of motion over 1080i and they are looking forward to moving into 1080p for what is called 'True HD' production."

Evertz has incoporated 3 Gig in their flagship EQX router and considers 3 Gbps technology a fundamental building block that has to be included within the overall structure.

"We are trying to introduce a whole complement of systems that will let people realize the potential of 3 Gig throughput as they move toward the goal of realistic 1080p production," said Rakesh Patel, vice president of engineering for Evertz in Burlington, Ontario. "Every link within our EQX router had to be designed to run 3 Gig right from the start rather than being retrofitted for it. This will let us handle 1080p as well as digitized computer video over a single cable to a designated crosspoint in the same router as interlaced HD or SD."

EURO INTEREST

Over at Miranda Technologies Ltd., Michel Proulx, chief technology officer for the Montreal-based provider of broadcast equipment, was recently at a European users group meeting that included representatives of the BBC and Sky among many others, and found to his surprise that the level of interest in 3 Gig was even greater than it is stateside.

"One of the topics I discussed is that the biggest hole in the chain is the limited bandwidth allocated to terrestrial transmission," Proulx said. "But we are also going to be dealing with cable, satellite and IPTV and they are all bandwidth challenged. The truth is there is no set-top box already deployed that can handle 1080p and reasonable compression algorithms have not been developed yet. But when that happens, single wire technology like 3 Gig is going to be key. We have 1080p cameras and 1080p displays. Now we need to connect the two ends."

On the production side, Miranda offers the HDA-1911/1931, a 3 Gbps HD-SDI video DA supporting a variety of compressed and uncompressed serial digital video signals. The HDA-1911/1931 can provide up to 9 reclocked outputs with automatic equalization for up to 120 meters of cable (Belden 1694A) at 1.485 Gbps and up to 60 meters at 2.97 Gbps.

Chuck Meyer, CEO of Nvision in Grass Valley, Calif., believes one of the earliest implementations of 3 Gig will be in production trucks.

"Now that we have a SMPTE standardization of 3 Gig transport, we are seeing that the road map to the future may start with remote production," Meyer said. "Every one of our compact routers, such as the NV6128, the NV82856 Plus, the NV8288, the NV7256 and the NV3128, are already 3 Gig-capable, letting us make great headway into the OB marketplace. After all, since especially sports producers are on the cusp of getting their 1080p cameras, the trucks they use have to have a signal integrity lifespan over at least the next three to five years. This gives them a migration path to 1080p that is affordable."

Harris Corp. is providing 3 Gig capabilities across its complete portfolio from ingest to transmission.

"We need to be 3 Gig ready," said Paul Eisner, vice president of product marketing for video processing and distribution at Harris, "so all of Harris's systems are already shipping with 3 Gig capabilities."

This includes the Harris Platinum and Panacea routing platforms and their NEO and 6800+ distribution amplifiers. The new X75 multiple path converter/synchronizer, launching at IBC in September, will be able to convert signals both ways from 1.5 Gbps to 3 Gig.

"3 Gig is incredibly significant," Eisner said. "Consumer expectations of picture quality up to 1080p is driving its adoption by broadcasters and content producers. We feel that it will help make 'True HD' viable sooner than most people expect because that is what the public is going to demand." ■

Newseum

CONTINUED FROM PAGE 1

replacement for the former Newseum facility that was located across the Potomac in Arlington, Va. and which closed its doors to the public five years ago.

Even though it's officially a "museum," the Newseum is definitely not going to be a collection of dimly lighted static exhibits.

TRULY UNIQUE

"The Newseum is truly a new unique museum—it's the most interactive in the known world and also the most changeable," said Joe Urschel, executive director and senior vice president of the Newseum. "We are really the only museum that studies this subject—the news and its flow in a democratic society. Because the news changes every second our museum has to be equally changeable."

Urschel cited the events of Sept. 11, 2001 as an example.

"We want to be able to react instantly to whatever the big story is. Before [in the previous Newseum] we had the beginnings of such an exhibit of 9/11," Urschel said. "We will be able to do things like that to a greater degree and much faster in the new museum."

The new facility is designed not only to provide news-related artifacts and information about them, but also to allow visitors to participate interactively in many of its exhibits. Opportunities will be available to test an individual's ethical judgment in reporting an event. It will also allow visitors to get a ringside seat in connection with current events.

"We will have daily programs with newsmen and newswomen and involving newsmakers, that visitors can watch and interact with," said Urschel. "We are really a unique presentation."

While still a work in progress at this point, there is enough of the technical infrastructure in place to provide a good idea of how the facility will look at its formal ribbon-cutting ceremony.

Even as workers from many trades scurry about—accompanied by the smells of fresh concrete, wet paint and hot metal—it's difficult not to be impressed with what's taking shape just steps away from the National Mall. The larger of the two television studios is being built out to 3,000 square feet and will have seating capacity for a live audience of 135 people, making it one of the largest in the region. Enormity even trickles down to the passenger elevators being installed. These three hydraulically driven lifts are the largest in the world according to Bud O'Connnor, the Newseum's director of engineering. Each will accommodate between 70 and 100 people.

Framed around a Grass Valley Kalypso switcher, Barco video wall and Chyron graphics, the Newseum video control room "A" takes shape.

A STUDIO MADE OF GLASS

A second TV studio is located at the very front of the building and is glass-walled. It was designed to give the impression of overhanging Washington's main thoroughfare and offers an unimpeded view of the nation's Capitol through its east wall.

Perhaps the most visible aspect of the Newseum is its special "Media Wall." This is located in the atrium lobby of the building and measures 40-feet by 22-feet. Barco 6 mm LED technology is used, and there are enough LED clusters to provide full 1920x1080 video resolution. Even though the display will weigh in at 30,000 pounds, it is moveable. A special cable suspension arrangement will allow it to travel between the main lobby floor and the Newseum ceiling, a span of 50 feet. Passersby on Pennsylvania Avenue will be able to glimpse the high-definition images through the glass front of the building.

WTC REMEMBERED

Plans call for a newsgathering helicopter to be suspended above the heads of visitors entering the Newseum, but the real focal point is at the lobby's eastern end. Workmen are readying to install the remaining upper portion of the 350-foot television antenna mast rescued from the rubble of the World Trade Center.

Along with the television studios and large artifacts, there's a full-time radio control room, five video editing suites and 15 theatres—one equipped for 3D and another with a 90-foot long video display.

Interactive video will be a big part of the Newseum, and the 125 kiosks being installed will allow visitors to pull audio, video and data from Newseum archives, or to view current happenings.

The master control facility for the Newseum is sized at 1,225 square feet and is designed to accommodate up to 12 operations people. A semi-circle of GKM custom-sized racks is already positioned to accommodate the bulk of MC equipment. As soon as these are populated and wired, they will be crowned with a 30-foot long video wall to provide the majority of the room's video monitoring.

"SNMP will rule the day here," said O'Connor. "We expect it to be a big help in troubleshooting when something does break. It will be a big part of the master control and overall operation."

The amount of electronics equipment needed to drive all of this is massive and is spread over much of the Newseum space. Communication Engineering Inc. (CEI) of Newington, Va., was selected as the designer/integrator for the technical side of things.

"It is really a huge project," said Greg Echols, CEI's marketing director. "It's a high profile location and a pretty important job for us and everyone involved. It ranks up there as one of CEI's largest projects."

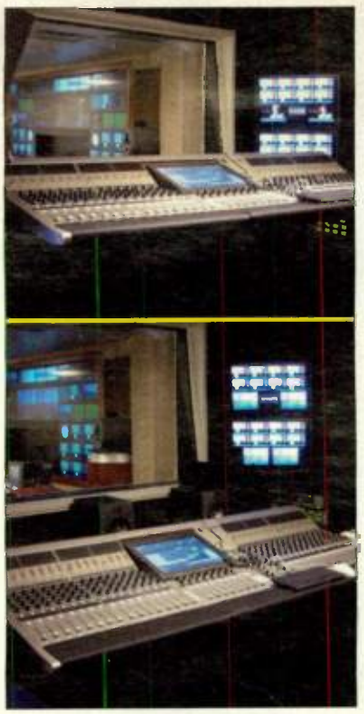
Raef Alkhayat, director of engineering at CEI, reports that the company has a total of 18 people working on-site full-time.

A sea of scaffolding creates a backdrop for the shaft where one of the three world's largest passenger elevators will be installed in the Newseum building.

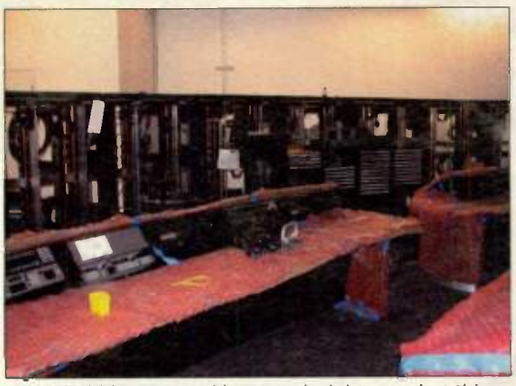
"And that doesn't take into account the large amount of pre-wiring that was done before the equipment left our shops," said Alkhayat. "This is our single biggest project right now."

CONSOLES THAT GO UP AND DOWN

CEI has woven several one-of-a-kind features into the new Newseum. One of these is an elevator mechanism



Now it's up, now it's down—the Newseum's Euphonix audio consoles ride on an elevator to adapt to operator requirements.



It's all bubble wrap and loose ends right now, but this space is quickly being transformed into the Newseum's master control room.

into the bases built for the Euphonix Max Air digital audio consoles. This feature is designed to ease ADA compliance and provides an up or down adjustment of the control surfaces within a two-foot range,

The latest in high-definition video gear will be used in the Newseum, including eight Grass Valley LDK-6000 MKII HD cameras fitted with Canon optics. The cameras can be shared in any combination between the two television studios. Three Kalypso high-definition switchers are also part of the configuration, with two 3-M/E units in the studio control rooms and a single M/E Kalypso installed in the Newseum's master control area.

Barco display units are being used for the project, with Evertz providing the necessary image video multiplexing. Sony direct-view monitors will be used in other locations as appropriate.

The walls, floor, ceiling and HVAC system for the facility's central equipment room has been completed, and gear installation and wiring is underway. The Emcor racks placed there are beginning to fill up with equipment, including Grass Valley K2 video servers and Apex digital audio routing system. Doremi Nugget HD playout servers were selected for theatre use. In another section of the room racks are already loaded with the shelves to accommodate the scores of PCs that will also be tied to kiosks. There's a full complement of MediaMatrix Nion6 digital signal processors through which all of the Newseum's audio will pass. Transport for a planned 1080p kiosk video is being accommodated with 3 Gbps fiber optic gear. The quantity of support equipment contained within the central equipment room can be reckoned by the capacity of the UPS installed—450 KVA.

3D THEATRE

As large and spacious as everything else is, the Newseum's Walter and Lenore Annenberg Theater is by far the largest single entity. The theatre was designed to seat more than 500 and is equipped for 3D presentations with two Christie CP2000X DLP projectors. Audio will be full 5.1, and a total of 196 of the theatre's seats are special "motion" types which can move with on-screen action to provide an enhanced viewer experience.

October 15 had been planned as the opening date for the Newseum, but this has slipped. O'Connor says that he's ready to complete the technical build-out, but, of course, the bricks and mortar side of things must come first.

"We're dependent upon the builder," said O'Connor. "They're trying hard, but there's a lot to do. It's a complicated building and the tech people can't come in until the structure is built out. A lot of the building is still in the construction mode. The construction people are still working on the façade's glass curtain wall and this is tricky. They're having trouble with some of the details."

Newseum officials at this point are still hoping for a formal dedication this year, or at the latest, in early 2008. ■

Mobile

CONTINUED FROM PAGE 16

broadcasters have the right to use it during the DTV transition. However, after the DTV transition is completed on Feb. 17, 2009, analog stations will shut down and DTV stations will vacate that temporary spectrum, and Aloha/Hiwire will have full use of their spectrum in all markets.

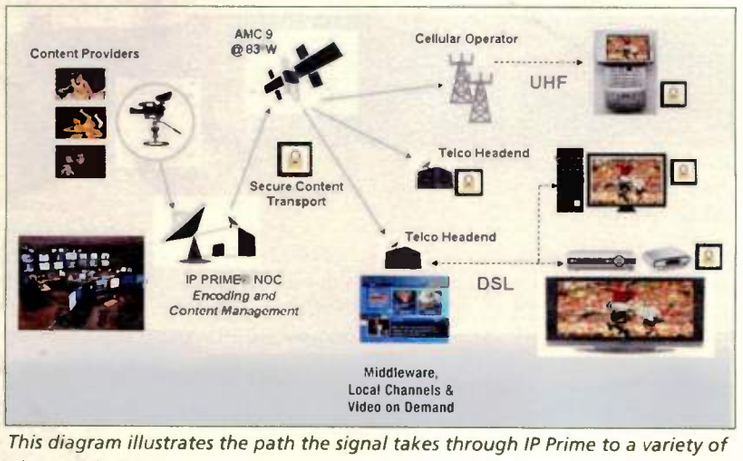
MARKET ATTRACTIONS

The fact that both channel 54 and channel 59 in the Las Vegas market were available was the primary reason that this market was chosen for technical testing of the trial service. Another key factor was that the Las Vegas market is representative of the demographic profile of audiences across America.

"Las Vegas is also home to the two biggest electronics shows on the planet, NAB and CES," said Alan Young, SES Americom's chief technology officer. "It offers a talented computer programming community, and nice RF propagation characteristics."

Since the target demographic is Adults 18-40, preliminary research was conducted to find the top national cable networks and other programming channels of interest to this market. But, Squadron said, "The programming mix was also intended to have a diverse menu of news, entertainment, weather, and educational choices, appealing to all age groups and demographics. In that way, we can get the most valuable market research about consumer interests and usage."

MediaFlo from Qualcomm, a competing technology that Verizon Wireless is using to offer a multicast video service in the Las Vegas market, only offers eight channel choices. Hiwire is testing two to three times more channels than any other mobile TV test in the world largely owing to its ample spectrum bandwidth. Wills declined to comment as to whether the Las Vegas trial consumers would be asked to compare the Hiwire to MediaFlo services in any regard.



This diagram illustrates the path the signal takes through IP Prime to a variety of play-out devices.

SES Americom and Hiwire hired leading market research companies, including Horowitz Associates, which will sign up trial participants, distribute cell phones, and track their experience with the service. Also hired was Rentrak, of Portland, Ore., which will collect viewership data and report their actual usage.

"We need to see what programs they watch, where they watch them, how they interact with the guide on the cell phone, and how the video service impacts the cellular phone usage if at all," said Young.

Hiwire's package of 24 channels will include two DTV stations—a first for a U.S. mobile TV service. The two Las Vegas stations—KVMY (Fox) and KVCW (CW)—are part of the Sinclair Broadcast Group. Sinclair, a leading advocate for mobile DTV, was working out the final details at presstime, according to a company spokesman.

Wills says Hiwire is currently talking with many local broadcasters in the Las Vegas market. "This arrangement will definitely produce a new revenue stream for the broadcaster involved," he said. "We believe that local channels will add a compelling value."

If local broadcasters contribute one or more of their DTV signals to the Hiwire trial service, it would be a good way to expand their audience and revenues, according to Colin Dixon, practice manager, IP Media for The Diffusion Group, a Plano, Texas-based market analyst firm..

"A broadcaster could decide to create a channel just for the mobile market featuring local news, weather, and sports," Dixon said. "That same channel could be run or repurposed as a DTV subchannel, and the two channels could dovetail nicely. Now both the mobile and static audiences would be able to receive it. And with the mobile audience, broadcasters may particularly love the fact that viewers can't skip over the commercials because that [PVR] technology is not yet in the mobile handsets."

Currently, the Hiwire trial service just carries ad-supported networks without inserting new commercials into the streams, but Wills said that local ad insertion is planned for a future implementation. Also, next-generation handsets may implement PVR technology that enables users to record shows, or have live shows record while they are answering cell phone calls.

Lingering over the trials is the question of marketability.

"We don't yet know how the American consumer is going to take to watching broadcast television on a handset," Dixon said. "But, once the spectrum and towers are in place, which they are, the DVB-H platform becomes an incredibly efficient way of delivering the content."

With respect to the technical testing of Hiwire, SES Americom's Young said, "We're satisfied with the technical capabilities and quality of the video and audio. So now we have to determine how the trial participants like the cell phone-based television service. The point of the technical and market testing is to determine if it's worthwhile investing any more money into it, and whether to go ahead and launch a commercial service." ■

DIGITAL JOURNAL

Bill Hayes

Evaluating Next-Gen Camcorders

IPTV compares XDCAM HD to HDCAM

JOHNSTON, IOWA

PBS has contracted IPTV to produce a documentary on the historic pubs of Dublin, Ireland and the trip has given us an opportunity to evaluate the Sony XDCAM.

I have been watching the rollout of XDCAM with great interest for the last few years as a logical next step for our move into non-tape based production. Ideally, evaluation of the technology and its applications at IPTV would have been targeted to begin in earnest next year, after we completed the construction of all nine of our digital transmitter facilities and the completion or our HD production studio rebuild, scheduled for completion in December. But people who have worked with me know that I am always willing to look at opportunities when they present themselves and adjust the plan to take advantage of the circumstances.

HDCAM VERSUS HDV

Since the crew are still in Ireland at the time I'm writing this, I can't give the depth of coverage to how things went as I would like. There will be a presentation on the project at the Iowa DTV Symposium, Oct. 1-3 that will highlight how the production went and how we dealt with the differences between producing HD on XDCAM rather than HDCAM. I can give some of my initial reactions and a little bit of feedback from the field regarding the project and the equipment. But first, I have to thank Fred Wood, Peter Dilorio, Bill Fleming and the rest of the folks at Sony who not only agreed to lend us the gear but embraced the project as partners to ensure that the final production will be impeccable.

The camera supplied is a PDW-F350, which is the latest addition to Sony's Cine Alta line. IPTV's initial experience has been primarily with the standard HDCAM hardware producing 1080i content at 29.97 fps and we have been extremely happy with the quality of the content that we are producing. Quite frankly, our focus most recently has been on what place if any, the HDV format will have in our operation. There is a considerable price difference between XDCAM/HDCAM hardware and HDV hardware and we wonder if the performance justifies the price difference. Based on my initial comparisons on the type of content that we produce and environments that we work in, I say yes. I based this on comparing the technical performance of the XDCAM and feedback from the operators with whom I have spoken.

A lot of the technological benefit is much more clearly identifiable in comparing the XDCAM with HDV than was apparent in our first generation HDCAM systems when compared to HDV. Improvements in the imager made between the HDW-700 and HDW-700A in the first year were fairly significant and the F350 is using three of the latest generation of HyperHAD 1/2-inch CCDs. The fact that the imagers are 1/2-inch as opposed the 1/3 inch (HDV) should not be overlooked; this is one area where size does seem to matter.

While working for KHON TV in Honolulu, I was responsible for the migration of the news and production field cameras from 2/3-inch tubes to 2/3-inch CCDs. During the transition, I pulled the existing lenses off the tube cameras and placed them on the new CCD cameras. No one was able to spot any of the performance issues that were presented because even though the tube camera lenses had performance issues at the edges that the tubes masked and the CCDs didn't, the display devices masked them as well.

The reason I make this point is that we will soon reach a point where the average home display will be as sharp and accurate as any professional display and will be of a size that even the average viewer will start to see some of the aberrations caused by limitations of physics. In my mind the 1/2-inch imager and the associated lens offer the best price/performance combination. That's not to say that a 1/3-inch system cannot approach the performance of the 1/2-inch but who is going to hang a $2,000 camera on the back of a $50,000 lens?

COMMON TOOL

Another area where the XDCAM demonstrates an advantage over HDV is in compression. Recently, there has been an ongoing debate on the PBS Connect messaging system about the evils of compression. I tend to be much more philosophical about it and look at compression as a common tool. One of my hobbies used to be working on my MGs or Triumph sports cars. Any number of manufacturers made tools to repair the cars; some were cheaply made and didn't work very well. They either broke or didn't fit the fastener correctly and often resulted in skinned knuckles and colorful phrases being shouted from under the hood. So the first lesson is to make sure that the tools you are using are of good quality.

Occasionally I would find myself under the hood holding a socket wrench when I suddenly needed a hammer and I would then find myself using the socket hammer which frequently resulted in more skinned knuckles and colorful phrases. Lesson two, therefore is to use the appropriate tool for the job.

Compression is just a tool; make sure you use a good quality tool that is appropriate for the task at hand. The F350 offers one hour of record time on a single disk at 35 Mbps which even in first generation looked better to me than the 25 Mbps HDV. In our environment, starting out at the highest performance level possible ensures that as the content is manipulated, the finished product will maintain the highest level of quality possible. I do have to admit that even though I don't view compression as evil, I like the fact that the XDCAM audio isn't compressed at all since I tend to notice audio compression artifacts long before I see video compression artifacts.

Photo: Bill Young/KERA

Cameraman Alan Barrett uses a Sony XDCAM HD camcorder inside an Irish pub for an upcoming PBS special.

In our environment, starting out at the highest performance level possible ensures that as the content is manipulated, the finished product will maintain the highest level of quality possible.

One of the potentially cool features that I didn't get a chance to play with before the camera left for Ireland is the FireWire interface. By using the FireWire connection and the appropriate driver, the camera can be plugged into a Windows based laptop and appear as another disk drive. I would think this would provide access to the MPEG-4 based proxy files and allow for logging and viewing content using any MPEG-4 compatible player or the Sony supplied proxy browsing software.

When the crew returns, the second part of the process will begin which is ingesting the material into our Avid Adrenaline editing system. Unfortunately, I cannot comment on the process and how it works until the crew returns. If the end users' experience for editing the project is similar to the acquisition phase, I am confident that XDCAM will become an integral part of the IPTV production process.

Bill Hayes is the director of engineering for IPTV.

COUNT ON IT | Mark Turner

Testing, Testing... Is This Thing On?

"Check, check, can you hear me?" If you've ever been to a meeting where a PA system was being used, chances are it started with those words. Once everyone assures the person speaking that the technology is doing its job, the meeting begins and nobody gives it a second thought. That is, unless something goes wrong later.

That approach to testing a system is good enough when the system is relatively simple and the consequences of failure are minor. Unfortunately, the approach we often take in testing more complex systems isn't much better.

Traditionally, testing was an important part of installing broadcast systems. Analog video and audio systems required signal levels to be precisely set in order to ensure proper operation and preserve quality. As a result, engineers learned to test and measure signals along the signal path to make sure everything ran smoothly before, during and after system installations.

INITIAL TESTING

IT-based systems have made us lazy with regard to testing. As with many digital systems, a fair amount of configuration during the installation phase is often required. However, if a device gets connected and appears to be working, it generally isn't given a second thought. As with the microphone example, we tend to only get concerned if something goes wrong later.

For example, while troubleshooting a particularly stubborn problem recently, our technical team thought to start checking the SID of some Windows-based broadcast systems.

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First, a little background; a computer SID is a security identifier, basically a number that is assigned to a particular workstation or server when the operating system is installed. The SID is intended to be unique to each physical server or workstation.

OK, back to the troubleshooting. In the process of checking SIDs on broadcast systems, we discovered several systems had been installed with duplicate SIDs. After taking a closer look, we realized that systems from vendor X shared an identical SID and systems from vendor Y shared another common SID. Yikes!

We were able to determine that the vendors in question used a technique called "imaging" to create a master copy of the software needed for their systems. These images were then used to clone systems for installations in the field. This is a pretty smart approach because it minimizes the likelihood of introducing changes to a configuration that's known to work. This technique of imaging also duplicates some supposedly unique tidbits, like SIDs, so the imaging tools generally provide a function to recreate the SID when the imaging is performed. For whatever reason, that process didn't work with these systems.

Ultimately, we were able to identify and correct the duplicated SIDs using some readily available tools (search the Internet for "getsid" and "newsid" if you are interested). And, while this turned out to not be the cause of the problem being researched, we did determine that it was creating some confusion with other key systems on our network domain. Just as important, this issue diverted us from the real cause of the problem and wasted valuable time. Had we tested the SIDs on these systems when they were installed, we would have saved ourselves a lot of time. But when those systems were installed, they worked and nobody gave them a second thought. We test SIDs now.

If a device gets connected and appears to be working, it generally isn't given a second thought.

CHECK EVERYTHING

There are other examples. We've found issues where the speed or duplex of a network connection had been incorrectly set for years, creating bottlenecks that were just lived with. Similarly, we've found issues where computers with multiple network cards had been installed with the incorrect binding order, causing seemingly random problems.

Some of these issues may only create nuisances in the form of unexplained events showing up in system error logs. Others may bring critical systems to their knees with no warning. That's the wonderful thing about digital systems, they often work great—right up until the point they fail completely.

Broadcast engineers figured out years ago that this issue could occur with digital television. If an engineer just plugged things in, they often were rewarded with pristine video that no analog system could be tweaked to reproduce. But under the hood, the system could be on the edge of complete failure. Their response was to simply continue the same basic testing principles that worked in the analog world. Namely, check everything.

The tried and true approach of testing systems during installation should be a part of any IT checklist. Granted, there are a lot of things that could be checked and there probably won't be time to check them all. However, one can create a checklist that covers some of the more common issues and develop build procedures for systems that use tested images as a starting point (just check those SIDs). Whatever you do, don't wait until systems fail before you start testing them. You'll be glad you did. Count on IT.

Mark Turner is IT director for Media General Broadcast Group in Richmond, Va. He can be reached via ***TV Technology.***

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TUNING IN | Gary Arlen

'Anyware' Needed for Everywhere Video Hopes

Video delivery was the talk of the NXTcomm telco convention in Chicago last month, with the keynoting CEOs of Verizon and AT&T describing their visions of television service via their expanding wired and wireless networks. Since dozens of vendors in the nearby exhibit halls were showing off IPTV hardware and software, the long-enunciated promise of widespread telco TV seemed imminent.

Even more effusive were those well-known digital arms merchants, the CEOs of Cisco and Motorola, who gladly sell their video—as well as data and voice—technologies to telco, cable, wireless and any other carriers who can afford them. As they have done at other events—but rarely in such close tandem—both Cisco's CEO John Chambers and Motorola's CEO Ed Zander described nearly identical visions for the "connected home" and "follow-me" operations. However, each has slightly different trademarked terminology for the same concept.

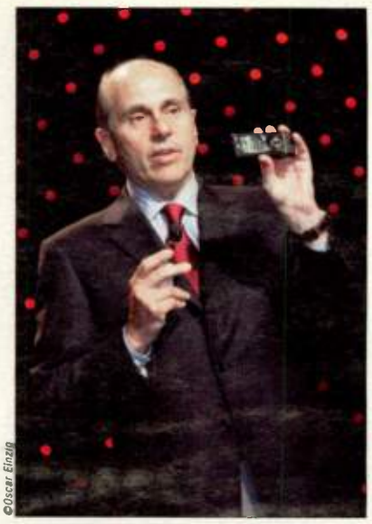
ANYTIME, ANYWHERE

Fundamentally, the idea is that a viewer or listener will be able to tune into any service via every platform as he or she moves from house to car to office to just walking in the park. Fixed, mobile and portable devices will sense the customer's presence and accessibility, then seamlessly migrate the content and the signal carrying it to the appropriate gizmo.

Using the manta "Anywhere, Anytime" (or some variation thereof), the executive visionaries presented dramatic scenarios of digital handoffs. Of course, the carriers—whether Verizon, AT&T, Comcast, Time Warner or others—glorify the script that keeps the customer somewhere on their own networks across all the platforms. And everyone agrees that Internet Protocol is the foundation that assures content will be managed and delivered efficiently across the various platforms.

While universal accessibility appeals to infrastructure operators and suppliers, it doesn't seem to have widespread attraction to either content producers or end users right now. Inevitably, the vendors trot out convergence market research to show that consumers have a terrific appetite for these integrated services.

But content suppliers face the challenge of middleware—the software to assure that programs can be delivered to all those platforms. True, dozens of IPTV middleware packages are on the market, from suppliers ranging from Microsoft, SeaChange International and Minerva Networks to Kasenna and Myrio Corp. (now part of Siemens).



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Ed Zander, CEO of Motorola, delivered one of the keynotes at NXTcomm2007 last month.

I've begun using the term "anyware" to characterize the capability for universal accessibility. The terminology of anyware encompasses both the technologies to deliver digital content to multiple platforms—preferably without reformatting—and also the kinds of material suitable for multiplatform availability.

TUNED IN EVERYWHERE

In demonstrations such as the ones that Chambers and Zander showed in Chicago, the "everywhere" flow usually went from the car towards set-top box. For example, you're tuned to a program while driving then want to continue watching or listening to it when you arrive at home. A more likely scenario is that you'll tune into morning traffic reports (on TV or PC) as you leave the house, and then want an update via mobile delivery en route as you proceed through traffic.

These pedantic examples underscore another hurdle for anyware during these formative days of convergent technology. Services are premised on existing consumer behavior. Specifically, programming is being packed based on expectations of what viewers want to watch.

Invariably topping the list are sports, news, business reports and other short-form content—ideally material that is easily packaged for on-demand retrieval. At the Chicago convention—and more specifically at the Digital Hollywood conference adjunct to the trade show—considerable focus went to consumer-generated media (channels such as YouTube and MySpace) and emerging Web video services, such as Joost.

POTENTIAL ROADBLOCKS

That's where the real technology fun begins. Thanks to new convergent products, notably the iPhone and Apple TV, both of which have YouTube delivery relationships, viewers will have the opportunity to tune into very short form clips. There are plenty of business scenarios in which a viewer may find a YouTube video online or via the Apple TV set-top box, then suggest a friend look it up via his Web-enabled handheld device when they are out and about later that night.

If—as in this example—the content is IP-based, there should be no problem in seeing it. But some mobile and broadband services are using proprietary technologies, thus requiring middleware solutions to assure access. Further complicating the situation are digital rights management barriers, aimed to limit access via multiple devices.

As a result, this potential for everywhere video is shaping up as a formula for frustration—especially if consumers embrace the "Anywhere, Anytime" promises and expect that they'll be able to see whatever they want wherever they are.

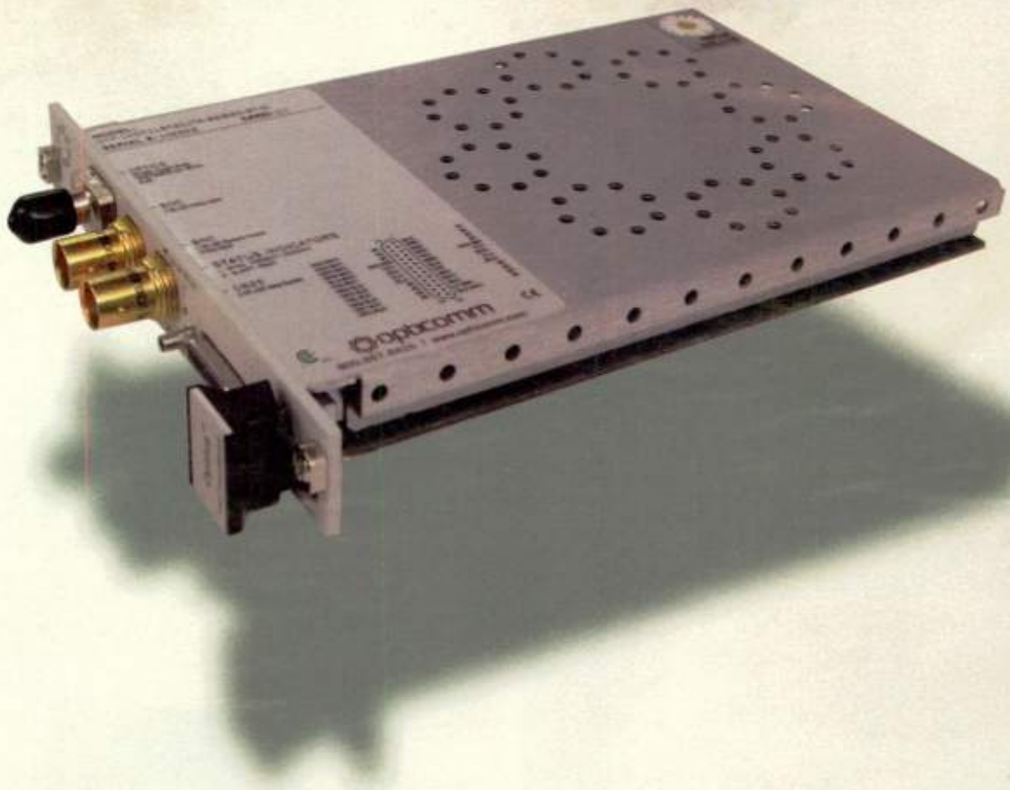
Another problem may evolve if consumers have chosen or have been locked into services from different telecom suppliers. For example, they may have chosen an iPhone, available only from AT&T's wireless system for now, but have home Internet and video service from Comcast or Verizon FiOS (a factor largely based on geography and wireline territoriality).

While all of the carriers would like to lock such customers into delivery across all platforms, the reality is that in some cases customers will not be able to or want to rely on one carrier for all service.

Several of the Digital Hollywood panelists agreed that Apple TV could lead the way into a "heterogeneous world of future content." The blending of TV and IP may be one way that viewers will be able to embrace the on-demand options—but only if it is relatively easy to adopt. And existing carrier relationships may be a severe barrier to many potential customers.

Hence the challenge of anyware becomes even more critical. As with so many other digital decisions, the process pits the market clout and determination of powerful providers against the technology options and preferences of empowered viewers.

Gary Arlen, president of Arlen Communications Inc., can be reached at GArlen@columnist.com.



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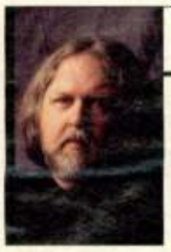

Photo: Steve Jordan

THE BIG PICTURE

Frank Beacham

The Dark Side Of Apple's iPhone

If you're like me, you're probably sick of hearing about Apple's iPhone. Yet, what's missing from all the celebratory news coverage is the dark controversy brewing under the hood of the nation's latest glamour phone.

The controversy involves a very real threat to "net neutrality." It was spawned from a remarkable statement made by a top executive at AT&T, the telco that has exclusive network rights to the iPhone.

The executive, James W. Cicconi, revealed that AT&T would become the first Internet provider to monitor its networks for perceived misuse of copyright-protected films, television, music and other media.

This is a major policy shift, especially coming from the largest provider of both local and long distance services, wireless service, and DSL Internet access in the United States. Previously, network operators have remained neutral to the nature of the content delivered over their networks.

Apple's iPhone

This scenario is a bit like Ma Bell listening in and shutting down a phone call if one of the parties uses an obscenity, or God forbid, plays part of a commercial recording to a friend over the line. Make no mistake about it; this is brave new territory for a telco.

Cicconi, a senior vice president at AT&T, told the Los Angeles Times that since his company is now moving into the pay-television business, its interests are now more closely aligned with those of Hollywood's studios.

What was left unsaid was any concern that Cicconi might have for the privacy of AT&T's customers.

To fully comprehend the implications of this development, a little history lesson is in order.

FLASHBACK

Remember late last year when AT&T, as a condition of allowing its $86 billion merger with BellSouth, promised the FCC that it would abide by "net neutrality" principles for a period of two years?

Network neutrality is the principle that all Internet users should be able to access any Web content they choose and use any applications they choose, without restrictions or limitations imposed by their network service provider. That means the operator of the network should have no preferred business relationships that favors certain Web sites.

My, oh my, how time flies—and along with it good intentions. AT&T's move, under the guise of copyright protection, could serve to bypass net neutrality altogether. How? By blocking assess through filters to Internet destinations throughout the world where AT&T and its partners deem the content to be illegal.

Harold Feld, senior vice president of the Media Access Project told tJosh Silver, a writer for the Huffington Post and executive director of Free Press, a national, nonpartisan organization, that AT&T is creating a charade to mask its real intentions.

"This has no more to do with 'stopping piracy' than the NSA surveillance program under which AT&T spied on Americans was about 'national security,'" Feld said. "This is about entrenched interests using the rhetoric of law enforcement to erode essential freedoms."

Using filtering to block specific Web sites has a history of harming innocent victims. In 2003, the Center for Democracy and Technology successfully overturned a Pennsylvania law that required ISPs to block overseas child pornography sites, partly on the grounds that the filtering included many third-party Web sites as collateral damage.

Feld noted that copyright holders already have numerous mechanisms available to them under the Digital Millennium Copyright Act. "If they feel their rights are infringed by carriers, they can sue—as Viacom has sued YouTube," he said.

However, as Silver also pointed out, AT&T's plan to monitor its networks is not about piracy, but about controlling video programming and discriminating against content on the Web. "Remember how the big phone companies tried to dismiss net neutrality as a 'solution in search of a problem?' Well, here's the problem," he wrote.

So, exactly what does AT&T propose to do? That's another part of the mystery since they are not saying. Cicconi said only that the telco had started working with studios and record companies to develop anti-piracy technology that would target the most frequent offenders.

The Electronic Frontier Foundation, a digital media rights group, called AT&T's technology "pure vaporware,"

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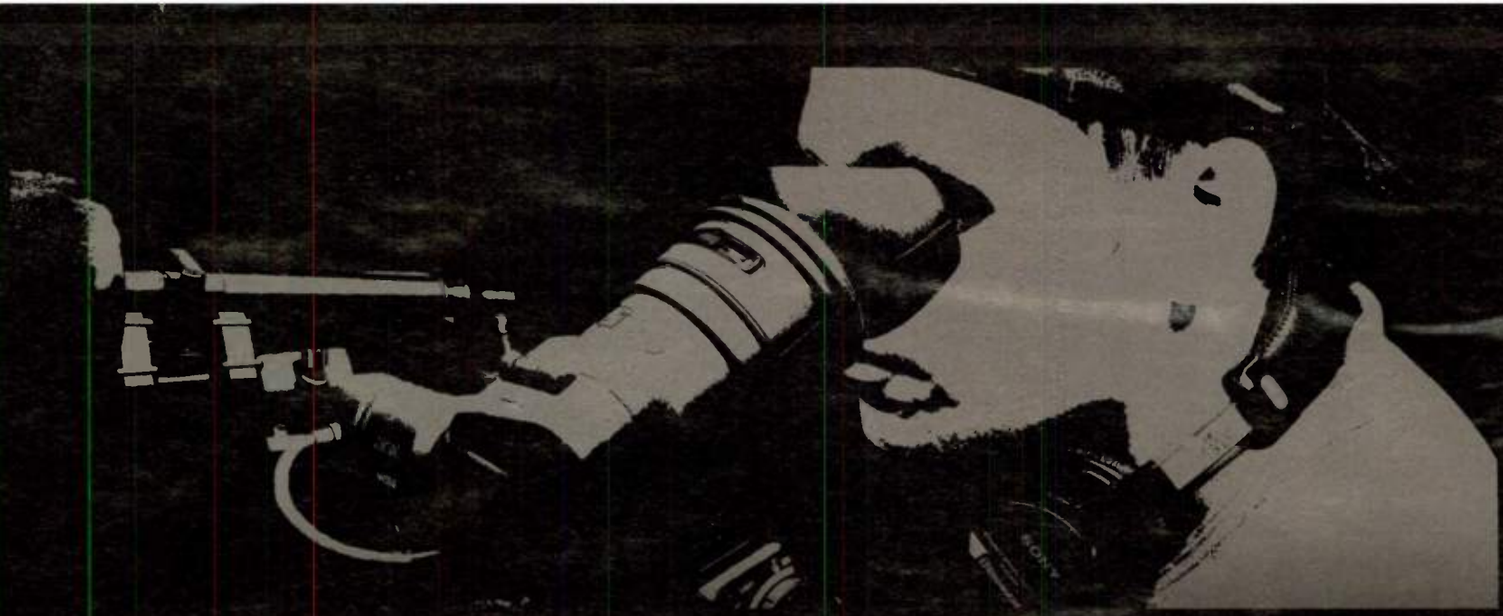

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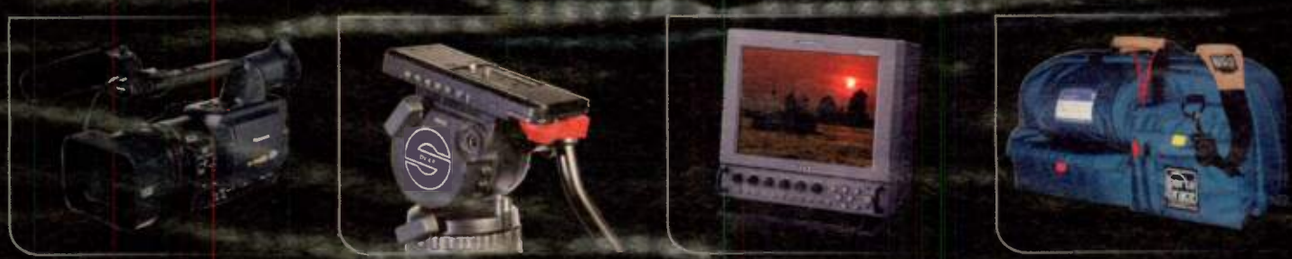

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PRODUCTION MANAGER Craig Johnston

The News Director's Office of Tomorrow

This may sound suicidal for a production manager, but I used to like sitting in the news director's office with the man himself, watching the evening's newscast. I didn't do it five, six or seven nights a week, but I was usually glad when I did it.

For one thing, if there was a technical problem—and wasn't there always—I didn't hear about it until the next morning from the general manager, who'd gotten a blistering note or had a hot conversation with the news director. I was there when it happened, and we talked about it then. That was good, because as George Orwell once pointed out, there are some equals that are more equal than others. That would be the news director he was talking about.

But this column isn't just about trashing news directors. This is about the audio/visual setup of the news director's office itself.

WAY BACK WHEN

Before there were consumer versions of television remote controls, there were one-off, built-in-the-maintenance shop remote controls that were custom built for news directors' offices. The news director would have enough video monitors so they could watch all the competition newscasts at the same time, but he could switch the audio to the competition when he wanted to hear what they were covering.

Things haven't changed much. While we can all look at several video sources at the same time, even news directors can only listen to one thing at a time.

I can remember complaining to the chief engineer once about the TV in the news director's office. The chief told me to put a sock in it. If the news director had a state-of-the-art television in there, he would be:

- Complaining about the lighting on his anchors;
- Unhappy about the quality of his ENG camcorders;
- Irritated about the video quality of his liveshots;
- Etc.

Gee, it seemed like he was complaining about those things anyway. But I digress.

There's a problem in the offing with a news director's antiquated viewing environment. Gradually, more and more viewers in your newscast's audience are going to have a home theater setup in their homes. Today, that might not be all that many viewers. Soon, it'll be more.

Whether or not my chief engineer colleague had the right strategy way back when, it seems to me it's the wrong strategy now. To win in the news-rating race during this evolution to HD, the news director is going to have to see—and hear—his news product the same way his audience does.

And this is the really tough part: He needs to see and hear his competition's news product the same way his audience does, too.

Whew. So the news director's office now has to be large enough to accommodate three, or four, or five 50-inch LCD or plasma screens? And does it have to be speaker-rigged for Dolby 5.1 (7.1?) surround sound?

Well, maybe not today—but maybe tomorrow.

Somehow, there needs to be some way of evaluating, technically, the HD quality of your newscast with that of your competition. But in my mind, that's not in the news director's office.

Somehow, there needs to be some way of evaluating, technically, the HD quality of your newscast with that of your competition. But in my mind, that's not in the news director's office.

The news director, day in and day out, has to determine two things about his newscasts:

- Is his news coverage beating the daylights out of the competition?
- Is the technical quality, audio and video of his newscast, first class?

In other words, when he's not beating you or the chief engineer up, he wants to know how he's journalistically beating the competition up.

So, my sense of how a news director's office of the near future should be set up is that there's the 50-inch LCD/plasma monitor for your own station's signal, complete with Dolby 5.1 (and then 7.1) surround sound, along with smaller 16:9 HD monitors to watch the competition on.

Oh yeah, and when he jumps from one audio source to another, the audio always comes in at top quality. That's because a difference in audio quality between your station and the competition will be starkly noticeable when such a switch is made.

And somewhere, on a once a week, once a month or whatever-basis, a station does need to evaluate itself, in high-end audio and video quality, against all the competition. That's not going to change one day to the next, so pick a Wednesday or Thursday set of the market's early evening newscasts, record them all, then watch and listen to them for comparison.

But I'd like to close with a warning about audio and video.

I opened this column by alluding that many people may be watching and listening to newscasts in a home theater environment, with HD video and end-all sound. But it will be a long time, if not forever, before all of your news audience is viewing your signal in HD video and listening to it in any more than simple stereo or monaural audio.

It would be good for the news director's office to have a 20-inch standard-definition color set that's got a digital conversion box feeding the downconverted hi-def signal into it. That way he can glance at it every once in a while and make sure the graphics, which look like a million dollars on the 50-inch flatscreen, aren't so fine that they're indecipherable on the set that half of the audience is likely watching the program on.

The same goes for audio. For the foreseeable future, it not only has to sound terrific in a home theater environment, but be clear to those with lesser audio systems as well.

Craig Johnston is a Seattle-based Internet and multimedia producer with an extensive background in broadcast. He can be reached at craig@craigjohnston.com.

iPhone

CONTINUED FROM PAGE 32

noting that on the surface that the telco's action might look reasonable "but problems arise once you start to ask hard questions about exactly what AT&T is up to."

Whatever technology AT&T deploys, said the EFF, it is bound to be some type of filtering that haphazardly restricts legitimate, lawful traffic. "The AT&T Internet traffic cop appears poised to shoot first, and ask questions about the impact on your civil liberties and ability to access lawful content and applications later," the EFF said in a statement.

A SECRET ROOM

As to Feld's comment about the NSA, here's a bit more history. Last year, the EFF filed a class-action suit against AT&T accusing the telecom giant of illegally helping the National Security Agency spy on millions of Americans. The government has argued the case could expose state secrets.

However, as the case progresses, documents have been released describing a secret, secure room in AT&T's facilities that gave the NSA direct access to customers' e-mails and other Internet communications.

"This is critical evidence supporting our claim that AT&T is cooperating with the NSA in the illegal dragnet surveillance of millions of ordinary Americans," said Cindy Cohn, the EFF's legal director. "This surveillance is under debate in Congress and across the nation, as well as in the courts."

If all this sounds a bit like a spy thriller, add one more ingredient to the mix. James W. Cicconi, the AT&T executive who told the LA Times of AT&T's plans, has a most interesting background. Again, we'll quote directly from the Huffington Post:

"...consider that Cicconi is the same guy who was the assistant to James Baker in the Reagan Administration and staff secretary for Bush Sr. (and he sits on the board of his presidential library). While at SBC (former name of AT&T), he served on Dubya's White House transition team—before handing thousands of Americans' private phone records over to the Pentagon. And under his leadership, SBC/AT&T broke more communications laws and rules—and paid more FCC fines—than just about anybody."

OK, what do we know and not know? That's the problem with this picture—a big lack of information and clarity. Unfortunately, the situation is much too important to ignore when one takes into account the future of media.

All electronic media is migrating to the Internet. As these broadband networks expand capacity to embrace video delivery, it is a huge issue as to whether or not their owners are allowed to interfere with a subscriber's use of or access to content on the network.

PANDORA'S BOX

In my opinion, network owner/operators should not be allowed to control or limit content access in any way. If a company owns or controls a network, that company should have no financial interest whatsoever in the content delivered on that network. Period.

Allowing corporations to own or sell content on their own network opens a Pandora's box of public policy issues. Unfortunately, the cat is already out of the bag. Where are the unbiased, unbought government regulators to set the rules?

Mr. Cicconi's old boss, Ronald Reagan, used to say of the Soviets: "Trust, but verify." Unfortunately, in today's corporate war to control new media, trust is long ago out the window.

We'll be extremely lucky if we can get objective oversight to "verify" that the media conglomerates are playing by the rules.

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

THE MASKED ENGINEER | Mario Orazio

New Cameras & Post: The Fix Is In, or Is It?

You might not have noticed that things are rarely black and white. I ain't talking about TV shows; I'm talking about "fixing it in post."

Someone once told me the first edit was in an Edison short about a beheading. "How do we make it look like we chop off the head?" "Don't worry; we'll fix it in post."

Methinks that particular fix probably worked rather well, and the actor got to live another day. But there's a good reason why "Fix it in post" has the ring of "The check is in the mail."

Back in analog, composite, mono, tape days, there was a limit to what you could do in post. My hat's off to folks who could mechanically edit quad tape, and it stays off in honor of folks who could do electronic match edits without H or V shifts and cut into a continuous tone without a pop.

In the days of nonlinear digital, naturally, when you can edit on a per-sample basis, anything goes. So, the simple answer to the question "Can I fix it in post?" is "Yes." The slightly longer answer is "Yes. How much money have you got, and how long can you wait?"

THAT'S VIDEO

A 1080-line HD frame has 2,073,600 pixels, and in this neck of the woods there are 29.97 of those per second, so that'd be less than 224 billion pixels to recalculate, if you needed to recalculate them all in an hour-long show. That's video. With surround sound, it'd be a mere 864 million samples to recalculate in that same show.

"But, Mario, why would you have to recalculate all of them?"

Oh, I can think of a few reasons. How about ground loops? I seem to recall a show for which the producer rented a supercomputer and programmers to try to eliminate hum bars in post. I seem to recall it wasn't 100 percent successful, either.

There have been some pretty terrific adaptive processors for audio that can pull buzz out of sound with a noise-to-signal ratio of 60 dB or so, but I ain't found one yet that can make the sound picked up in a tiled bathroom seem like it was recorded in an anechoic chamber. So, those are two examples.

I'd like to take this opportunity to point out that, in both cases, there are some pretty simple things that might have been done during production (or in pre-production) to fix the problem before it became someone's doctoral project. For the video hum bars, there are hum-buck coils. For the tile walls, there are sound blankets (or better).

I'm bringing this all up on account of Sony's F23 camera. Some folks have been calling it Sony's Viper, an allusion (as they say) to Grass Valley's digital-cinematography camera.

There ain't anything wrong with either of those cameras. But maybe Grass Valley pushed the idea that the Viper was an analog of a film camera a little too hard in regard to fixing everything in post.

Folks who shoot film don't fix everything in post. Heck, they try not to have to fix anything in post. That's why they undergo training and apprenticeship and experiment up the wazoo.

Tiffen showed a product at NAB called Dfx, software with versions of its filters. They said it could be used two ways. You could use it in post to simulate what might have happened had you used the filters in production, or you could use it in pre-production to figure out which filter to stick on your lens or camera.

If you have any doubts about the way to go, I suggest you click on the product literature for their UltraPol filter (*www.tiffen.com/userimages/UltraPol_Lo.pdf*). Near the bottom, you'll see a picture of a woman framed by a window. Above it is a similar picture, except there are some reflections in the window glass from a Brand-X polarizing filter. But above that is a picture of a window that has so many reflections that you sort of have to convince yourself that there's a woman at all. That's the result of shooting that scene with no polarizing filter. It's time to recalculate those 224 billion pixels.

MORE SITES

I ain't done yet with my tour of good Web sites. Go over to the Lowel lighting site (*www.lowel.com*), and click on "Lowel EDU" for some basic education on lighting. One part lets you see what it looks like as you move the key light around in a circle, add fill light in different positions, or even just move the light up and down on a stand. Try doing any of that in post. And I ain't done yet.

Go to the Goodman's Guides site (*www.goodmansguide.com/index.html*), and click on "What We Do." Unless they've recently changed it, you'll see three pictures that look pretty different. They've got the same content, the same lighting, and the same optical filtering (or lack thereof). This time, what's different is the camera settings. By the way, there are more pictures, and they're easier to see, in the book. Buy one, look one up in the library, or try to finagle Panasonic's Varicam Training DVD instead of straining your eyes on the Web page.

Anyhow, it's pretty true, on cameras like the F23 or the Viper or any of the digital-cinematography jobbies that have raw outputs, that you can duplicate any of the camera digital processing in post. Digital manipulation is digital manipulation, whether it happens in the camera or in an edit suite, and I ain't going to quibble about signal-to-noise ratio.

No, this time just look at those three pictures and decide if you wouldn't have changed the lighting or lens filtering if you went for those extremes of processing. So, yes, setting everything to 12 o'clock and leaving it to post is one way to go; seeing what you're doing while you're shooting so you can adjust lighting, filtering, and aperture is another.

It ain't black and white.

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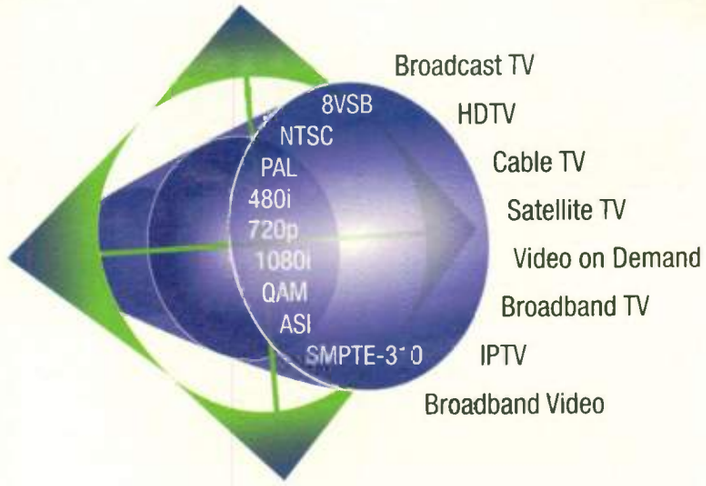

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AUDIO BY DESIGN | Mary C. Gruszka

5.1 Audio for HD: YES Case Study, Part 2

Last month we took a look at the signal path for the main 5.1 channel of YES Network's new HD master control. Let's continue with the secondary audio program channel and Dolby metadata.

SAP CHANNEL

For the Yankees baseball games, YES provides Spanish-language play-by-play on the SAP channel. For other programming, the SAP channel is the main Lt/Rt signal de-embedded from master control.

YES HD control room

The Spanish-language feed originates from radio station WQBU 92.7 FM and is sent to the YES Broadcast Center via phone lines, where it is then converted to digital audio, embedded in the HD video for master control switching, and ultimately ends up as the AES-3 pair of the post-master control audio de-embedder.

From there, the SAP channel, like the main audio channel, passes through the Norpak NAVEII (Nielsen) encoder and from there to the AES-3/4 input of a second Dolby DP 569 AC-3 encoder (the first DP 569 is used for the main channel). The AES-1/2 input to this second AC-3 encoder is the main Lt/Rt feed that comes from the post-master control Dolby E decoder.

The SAP AC-3 encoder switches between the Spanish game call or the main Lt/Rt depending on whether Dolby E is present in the post-master control Dolby E decoder just upstream.

When master control switches to a source with Dolby E, the post-master control Dolby E decoder detects the presence of the "E" stream, and produces a closure called Status. This Status output from the Dolby E decoder is connected to the general-purpose input of the SAP AC-3 encoder.

The logic pattern is: Status closure on the Dolby E decoder closed—Dolby E present—AC-3 encoder switched to WQBU 92.7 FM for Spanish SAP; Status closure open—Dolby E not present—AC-3 encoder switched to main Lt/Rt feed, as switched by master control, for the SAP channel.

For redundancy, there are two complete parallel and identical systems from the intake Harris DS-3/ASI decoders to the Motorola DigiCipher II transmission encoders, with one pathway for program and its twin for protection. As Chief Engineer John McKenna said, "even the Opus-HD master control switcher is protected by a Leitch (Harris) Panacea 16x1 channel switch."

DOLBY METADATA

YES Network brought in Kenneth Hunold, broadcast applications engineer at Dolby Laboratories in New York to help set up all the various Dolby encoders and decoders, including audio metadata.

Ideally metadata should be generated when the audio material is being created, and then passed along with the audio program through all of its pathways, from the production truck, editing, master control, and finally the transmission MPEG encoder.

And that is what YES Network is doing.

McKenna said the best way to set the dialnorm is for the audio operator to mix the show to ear and then, using a Dolby LM100 Broadcast Loudness Meter, determine what the dialnorm number is and then set the Dolby encoder to place that dialnorm into the metadata.

According to Hunold, the dialog loudness from the game audio was measured at around –27 dB below full-scale digital, as indicated on an Leq(A) meter, in this case the Dolby LM100. This is the value that's inserted as the dialnorm parameter into the Dolby E metadata stream sent from the truck to the YES Broadcast Center.

At the Broadcast Center, the dialog loudness from the pre- and post-game programs from the HD studio measures consistently around –21 dB below full-scale digital, according to Hunold, and this becomes the dialnorm number for the Dolby E stream created in the HD studio control room.

For the commercials and other upconverted programs on YES Network the loudness reading is –23 dB below full-scale digital, so that dialnorm number is inserted by the Dolby E decoder in master control when it switches to the stereo (PCM) program.

"The fact that these dialog loudness values are different for each source is not a problem," Hunold said. "More important, it is that these loudness differences are correctly indicated by the dialnorm parameter included with each source that makes it possible to present a program to viewers that does not vary in loudness from source to source."

Hunold said the master control operator routes these signals, along with the included audio metadata, to the Dolby Digital encoder, and ultimately to the Dolby Digital decoder in the viewer's set-top box or home theatre. There, the decoder uses the dialnorm parameter to scale the audio before it reaches the viewer's volume control, presetting (or normalizing) the loudness of dialog for each source. The end result is that the viewer hears speech at a consistent loudness level from each source, even though those sources didn't necessarily agree with each other, he said.

Does this work in practice? McKenna thinks so.

"If this is done properly the commercials, interstitials and program material will all come out of the viewers' speakers at a consistent level and require no adjustment of the receiver's volume control," he said. "Remember, the dialnorm measurements are only taken during dialog portions of the program. Crowd noise, audio effects, music, etc. are not included in dialog measurements."

Mary C. Gruszka is a systems design engineer, project manager, consultant and writer based in the New York metro area. She can be reached via ***TV Technology****.*

FOCUS ON EDITING

Jay Ankeney

Checking in on This Year's Editing Products

Our editing cup runneth over with vigorous competition between NLE system manufacturers providing ever-increasing capabilities to a widening community of editors. Now that some post pros have had a chance to get their hands on new editing products announced at NAB2007, it's time to see how they are faring in the field.

Avid released Version 2.7 software for its Media Composer line of systems and Editor Robert Bramwell has been testing it while cutting the next season of the sitcom "It's Always Sunny in Philadelphia" starring Danny DiVito that airs on the FX network.

"New version 2.7 is one of the most rock-solid releases Avid has ever put out," Bramwell said. "I've been mirroring our editing procedures using a version 2.7 Intel-based Media Composer software with a FireWire drive against an older Meridian-based hardware multicam Media Composer system, version 12.1.2, that my assistant uses and it is considerably faster. Frankly, it's great software."

Bramwell has been editing since 1979 when he worked on the TV show, "Different Strokes," and he won an Emmy Award for his work on "Cheers" in 1992. Starting on linear, timecode editing systems like the CMX and Grass Valley controllers, his career has carried him through all the stages of nonlinear editing development including the venerable Ediflex that introduced ScriptMimic, the first implementation of script-based editing. Upon the demise of Ediflex in the early 1990s the concept was sold to Avid, and in version 2.7 it has burst forth as the feature Bramwell finds the most noteworthy, ScriptSync.

Robert Bramwell, editor of "It's Always Sunny in Philadelphia"

Phil Beckner, supervisor and online editor at Plaster City

AVID'S SCRIPTSYNC

ScriptSync is voice recognition software that can phonetically identify spoken words on a production track and correspond them with the related lines of dialog in a script. Although Avid systems have long included script-based editing, ScriptSync automates the task of dialog recognition, cutting the time involved from hours to seconds. Most Hollywood writers use Final Draft scriptwriting software to write their scripts, and Final Draft has an Avid script-based editing ASCII format export feature whose .txt files can be loaded directly into a Media Composer.

Of course, you have to tell the system what is a master shot and what is coverage, but once all the shots are aligned Bramwell says being able to edit to the script is far more efficient than dragging clips out of a bin.

"I just drag the takes to the highlighted area on the script, go to the script pull-down menu, select ScriptSync, and seconds later I have location markers on every line of dialog," he said. "Not only does this speed up creating the editor's cut, but when the director and producers come in later to review it and add their input, I can easily show them all the alternative color-coded takes for any given scene."

This is especially useful on comedy shows where finding the funniest line of dialog is so crucial. Bramwell calls ScriptSync, "A brand new revolution in editing. It is far superior to any form of bin-style editing I have ever come across in my life."

FINAL CUT STUDIO 2

Apple's big announcement at the annual Vegas gala was its new Final Cut Studio 2 suite of software that includes the Final Cut Pro Version 6 editing software. The folks at Plaster City, a full featured post-production house in the midst of Hollywood that services most

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INSIDE BROADBAND **Will Workman**

Cable Operators Finally Face FCC Mandate

The Telecommunications Act of 1996 may now seem like ancient history, but its reverberations are still being felt. The law's framers, for all their flaws as politicians, did realize the lightning pace of telco developments meant there needed to be some flexibility to the regulatory framework.

What they should have been more worried about was how industry lobbying would take advantage of that flexibility, particularly in one area that's been a bee in my bonnet for the last decade—the digital set-top box.

Now the FCC is finally cracking down. As of July 1, after two full years of granting the cable industry further deadline extensions, the agency is requiring operators to separate two functions that have long been integrated into their proprietary set-top boxes; security, or the process by which a user is authenticated and granted access to services, and navigation.

Though some operators at the deadline were awarded FCC waivers, many of the biggest players, most notably Comcast, must comply.

The shift carries enormous implications for broadband technology development.

WHAT'S ON TAP

FCC Chairman Kevin Martin invokes memories of the rotary phone, saying that government intervention into Ma Bell's business (which had its own monopoly on the phone) led to "more innovation and lower prices and better quality phones." The same can be achieved now with cable boxes, he said.

Where was he in 1996? OK, so that's a rhetorical question. But regulators and industry visionaries voiced the same logic back then, when I wrote a feature story for Computer Shopper (remember how thick that magazine was stuffed with ads? Alas, the tech bubble slimmed it down considerably), forecasting a new era in set-top box development.

At CES2007, Scientific Atlanta demonstrated the HDC-8300, a CableCARD-enabled version of its Explorer HD set-top boxes.

Features already on tap at that point included digital video recording, interactive gaming and networked media sharing, all navigated by an intuitive program guide. Even more advanced technologies were on the drawing board, including broadband video sharing.

Along with the act's framers, I envisioned an open, competitive marketplace that would lead to a slew of retail choices, speeding the evolution of what would come to be called a media center, or some such gaudy gadget. My dreamy fantasy: buy one box, get a digital authentication card from your cable or satellite operator, plug the box into your home network, and Presto!

Back then, there were even several candidates for the media center device. Bill Gates of course touted the PC, with Microsoft at its core. Cable and satellite operators spoke dreamily of partnering with consumer electronics manufacturers and software developers on the next generation of set-top boxes. Console gaming was considered the dark horse in the race.

A decade later, we have Wii, the Xbox and PS3 as our dream machines, replete with media sharing and networking (and they even play DVDs!). We can watch endless YouTube clips and BitTorrent downloads on our laptops. But the digital set-top box has hardly evolved.

Oh, the DVR technology's in there, all right, as well as video-on-demand.

But, if I want anything approaching what they promised, oh so long ago, I'm either forced to fork over $800 for a TiVo, plus pay a monthly subscription fee, or buy a high-end desktop and plug in an external digital tuner box that takes the cable feed—hardly a simple set up.

Otherwise, I'm forced to put up with whatever set-top box my particular operator leases to me. Their navigation systems, conceived a decade ago, are clunky affairs, bogged down by all the ads they sell that clutter their primitive program guides. On most there's no way to search for programming. And heaven help me if I want to easily incorporate the box into my home network, play a cool game (or a DVD) or share media.

Instead of an open platform that would have allowed for rapid integration of features and software, and interoperability guaranteeing manufacturer, retail outlet and consumer confidence, cable's proprietary approach has stifled development. And they've gotten away with it through extensive lobbying.

INDUSTRY CLAIMS

The cable industry, of course, has its counterarguments, some valid, some specious.

The most hubristic is the claim some operators have made that consumers don't want to deal with the hassle of shopping or owning a box that may face obsolescence. So instead they charge us $10 a month to lease our device, then warn that this latest FCC meddling will add more to that cost.

Cable executives and their lobbyists (primarily the National Cable & Telecommunications Association) also argue the regulatory nuisance will unduly delay development and roll out of further advanced services.

One credible point they make is in the area of security, which will now be handled by CableCARDs, operator-supplied plastic cards that authenticate subscriber information and have only been marginally deployed to date.

Operators say a new form of "downloadable security" could be available soon that would be superior to CableCARDs—if only they could dedicate the time and effort to deploying the technology, instead of having to comply with the burdensome July 1 regulatory meddling.

I'll be intrigued to see if any of these claims prove to be more than mere bluster, and how many years it'll take before my local Best Buy offers any kind of reasonably priced TiVo alternative.

In the meantime, it would be even more intriguing to see what Steve Jobs would do with this problem, now that the iPhone is old news.

Hey, I can dream, right?

Will Workman is a former editor of telco industry publications Cable World and MediaView. He is now working on his PhD in mass communications. He can be reached care of ***TV Technology****.*

Products

CONTINUED FROM PAGE 39

of the major studios, are an all-Apple plant and Phil Beckner, supervisor and online editor at Plaster City, said they have been making the most out of Final Cut Studio 2's capabilities.

"All of our media lives on a 32 TB SAN storage system which means that all of our 10 Final Cut editing seats can access the same material," Beckner said. "For us, one of the biggest new features of Final Cut Studio 2 is ProRes 422 that produces HD-quality images at almost SD file sizes. Not only does that maximize the use of our storage, but for some clients we can even output our final masters using ProRes 422. The average viewer is not able to tell the difference between uncompressed HD and ProRes 422."

One of the best features of Final Cut Studio 2 is the new color application, which provides eight levels of secondary color correction.

Becker finds the new Final Cut Pro 6 easier to configure than its predecessor thanks to its "easy setup" feature that has pull-down menus to facilitate selecting the desired compression codec for the system's video card.

"Additional pull-down menus make the selection options easier to sort through," Beckner said. "For example, adding a given clip triggers the whole sequence to change to the proper codec. You can also have multiple codecs on the same timeline which, among other advantages, lets you play back a DV-quality reference movie right along side a 10-bit HD sequence without the delays of rendering."

Whenever possible, Plaster City finishes their projects to HDCAM SR for the best 4:4:4 level of HD quality in their nonlinear online process. However, although Final Cut Pro 6 will allow you to mix different formats on the same timeline, Beckner has found it is best not to rely on its ability to combine various frame rates without checking the final result.

"If you are trying to use 29.97 fps material on a 23.98 fps film-style 24P timeline, there is room for error," Beckner said. "You need to understand how codecs make the conversion to produce the best output. But it can work fine if you know what to look for."

Beckner has also found that Final Cut Pro 6 has a tendency to leak RAM, meaning it sometimes gives an "out of memory" message during long renders despite the fact all their editing systems have 4 GB of onboard memory. However, one of the best features of Final Cut Studio 2 is the new color application, which provides eight levels of secondary color correction. Since it originated as Final Touch color-grading software made by Silicon Color, Plaster City's color specialist, Ian Vertovec, was familiar with it even before the release of Final Cut Studio 2.

"Color has been smoothly integrated into Apple's editing software, so now we have those capabilities in all of our Final Cut Pro workstations," Beckner said. "Ian doesn't have to be the only one dealing with color considerations any more. We can access his files from any of our edit bays, and that greatly improves our workflow."

So, the editing wonders introduced at NAB2007 are living up to their promises.

Jay Ankeney is a freelance editor and post-production consultant based in Los Angeles. Write him at 220 39th St. (upper), Manhattan Beach, Calif. 90266 or at JayAnkeney@aol.com.

DIGITAL TV | Charles W. Rhodes

Interference by Tuner Overloading Feared Worse

The FCC Laboratory report on the interference rejection capabilities of modern DTV receivers dated March 31, brought to my attention the fact that many viewers live in relatively weak signal areas.

Eleven percent of the noise-limited coverage area has a 1 dB or less signal level margin. Twenty-nine percent of the coverage area has less than a 3 dB margin and fully 84 percent of the coverage area has a received DTV signal power of less than –68 dBm, which the ATSC calls a "weak DTV" signal.

This is by area, not population, but still, it focuses upon the fact that the FCC Lab found the interference susceptibility of receivers is worse where the desired signal is weak, not strong. This interference is primarily due to tuner overloading by the undesired (U) signal(s).

This column has long been concerned with interference due to tuner overloading, and so I was concerned with the problem of strong signals, which can only exist near the transmitter. I was therefore as surprised as anyone with the finding that tuners were being overloaded by what the ATSC describes as a moderate DTV signal level of –53 dBm, and I am alarmed to learn that the problem only gets worse below D = –53 dBm. This means that such interference will be much more widespread than was previously imagined.

Above about D = –50 dBm, the tuner's RF amplifier gain is reduced by the RF AGC circuit, so at D = –68 dB, any signal two or more channels offset from the desired channel and which is 30 dB stronger is being amplified before the mixer. This is what causes cross-modulation (X-M) in the tuner. X-M looks like noise in the desired channel.

If there is only one such signal present it can generate X-M. It can also generate third order intermodulation products (IM3) between its own sidebands, which is the mechanism by which adjacent channel interference (DTV-DTV) occurs. When there are two or more strong undesired signals, they can generate IM3, which spread out over many channels. Alas, in many communities, there are, or soon will be multiple DTV signals, some of which are on channels of the form n+k and n+2k (k is an integer, either positive or negative).

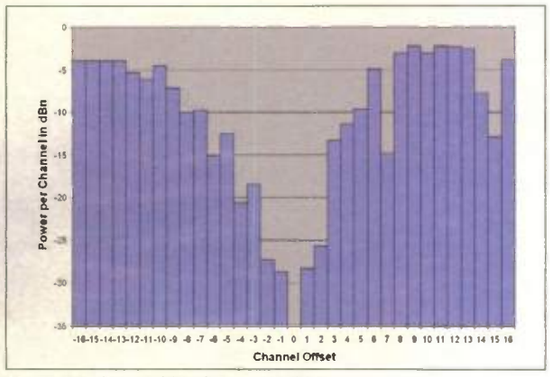

Fig. 1: Median U (dBm) D = –68 dBm

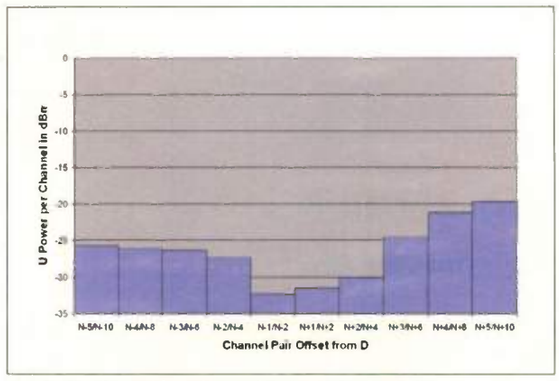

Fig. 2: Median U for Channel Pairs at D = –68 dBm

TABOO CHANNELS

As this column has reported, IM3 products generated by signals on such channel pairs fall in the desired channel (D) where it increases the in-channel noise. As the spectrum of IM3 products generated by one DTV signal is three channels wide, three channels are affected by just one undesired DTV signal. In fact with an undesired signal on say, Channel 34, Channels 33 and 35 will each have equal noise, which is only 6 dB less than in Channel 30.

Another example is in n+3 and n+6, there will be noise in channels between n–3 and n+9, surrounded by noise 6 dB lower on channels n–4, n–2, and n+8 and n+10. Any or all of these channels may be jammed by IM3 generated by the presence of DTV signals on just n+3 and n+6. This column has shown actual spectra of such IM3 products many times so I won't repeat them here. Any of these channel pairs consists of frequencies, which were considered taboo channels for NTSC signals.

Fig. 1 was prepared from the data in the FCC Lab report. The desired signal power is –68 dBm. The plot shows the undesired signal powers at which reception fails as a function of the channel offset between the U and D signals for the median receiver tested.

What this means is that where your DTV signal is received at –68 dBm, 50 percent of the receivers will be unable to receive your signal if there is one undesired signal above the indicated power for any of these channel offsets. The only difference between channel offsets is the RF selectivity of the receiver. In Fig. 1, a signal more than nine channels from the desired signal would have to be extremely strong to cause interference. That is fine for DTV signals, but when the folks in the same apartment building activate their unlicensed device (UD) it may cause interference to many DTV signals in many homes. When anyone in the household uses a UD, TV reception will be jammed in that home. The total noise (X-M and IM3) and tuner noise in your channel will be 15.2 dB below your signal power at threshold of failure—noise is noise.

Fig. 2 shows the FCC measured median U power per U signal for

channel pairs of the form n+k, and n+2k at which DTV reception fails for D = –68 dBm. From Fig. 2, you see the combined effect of X-M and IM3 for channel pairs n+k and n+2k for k values from –5 to +5. Fig. 1 and 2 are to the same scale.

In comparing both figures, you will note that the power per channel of each of these U channel pairs at which reception fails is much less than the U power for either member of the channel pair by itself. Note also that the U channel power at which reception fails is well within the range of received DTV signal power, that is, interference results when the U signal power per signal is –26 dBm to –32 dBm. The channel pairs all involve what were UHF taboo channels in NTSC. These are unregulated regarding power, as the FCC believed, back in 1997, that DTV reception was inherently immune to interference from other DTV signals on taboo channels. That might have been true for the double conversion tuner Zenith provided in 1995 for testing of its 8-VSB modulation signal, but the FCC has recently learned that there are no double conversion tuners in the DTV marketplace today. The RF selectivity of DTV tuners shown in Figs. 1 and 2 is probably much better than what will be provided by a tuner-on-a-chip, which I fear, will be widely used in by 2009.

GOOD NEWS, BAD NEWS

If the FCC were to establish protection ratios for DTV-DTV interference, a good place to start would be Fig. 2. However, this is only half the story. Below D = –68 dBm, in the vast outlying area of your station's noise-limited coverage, different U limits must be established. The FCC found that the threshold U power is even lower below D = –68 dBm. For example, U for n+6 = –4.9 dBm @ D = –68 dBm, while at Dmin + 3 dB, U is limited to –8.9 dBm. The FCC Labs did not report any tests at Dmin + 3 dB with pairs of undesired signals. Meeting these requirements is clearly more restrictive than would be suggested by data in Fig. 2, where D = –68 dBm; but it would extend DTV coverage almost to the noise-limited contour, which would not be the case were new protection ratios based on D = –68 dBm data.

Without knowing the U limits for the channel pairs below D = –68 dB, it would only be guess work. More testing with these same receivers at the FCC Lab would be needed before this matter could be properly resolved.

Somewhere above D = –53 dBm, the RF AGC in receivers starts to reduce the gain of the RF amplifier, which in turn, reduces the U signal power at the mixer. This was observed in all DTV receivers tested by the FCC. At D = –28 dBm, the maximum expected DTV signal power into receivers within a few miles of the transmitter (–8 dBm according to the ATSC), does not cause interference. That is the *good news*. The bad news is that nearby unlicensed transmitters next door, or even on the same block or apartment house may overload nearby DTV receivers anywhere within the station's noise-limited contour.

I believe the interference problems of spectrum sharing between UD and DTV cannot be solved along the lines the FCC has proposed. I also do not believe that signal sensing to determine which channels are vacant is practical. Think of all the IM3 from pairs of DTV signals overloading the frequency agile front-ends (tuners) of these signal-sensing devices. These IM3, as shown in Fig. 2 will be a much bigger problem for signal sensing, than tuner noise around –99 dBm. I hope the FCC Lab will test the prototype signal-sensing hardware with a pair of strong DTV signals on channels of the form n+k, n+2k over a range of k from at least –8 to +8, while n is the channel being examined by the prototype sensing system. Remember that each UD will be required to include such sensing technology. These will be consumer appliances to be mass marketed to the general public at a price point at which consumers in large numbers will buy them. So, I expect to find consumer DTV tuners in these signal sensing devices.

A TECHNICAL SOLUTION?

Rather than sandwich UD and DTV signals into the remaining broadcast spectrum (Channels 2–51 after Feb. 17, 2009) I favor some partitioning of spectrum, and to do that would mean repacking DTV channel allotments. This drastic step may be the only way to save terrestrial broadcasting from hopeless interference from unlicensed devices spread across the broadcast spectrum and across the coverage area of DTV stations. This is not a matter of if, but when repacking must be done, I believe.

Charlie Rhodes is a consultant in the field of television broadcast technologies and planning. He can be reached via e-mail at cwr@bootit.com.

USER REPORT

Utah Scientific Delivers Reliability at ION

by Brian Reitmeyer
Senior Systems Engineer
ION Media Networks

CLEARWATER, FLA.

At age 29, I've been in television more than half my life—since I was 14, in fact. That's when I started volunteering to run a camera during fundraising drives at WCLF here. I was fascinated to learn how a TV station operated and to be part of it at a young age. When I turned 16, I was offered a part-time job in master control and production. Later, while I was a senior in high school, I began work as a master control operator for The Christian Network, Inc. I've worked in that same building ever since.

MANY CHANGES

During the last 12 years here, there have been more than a few changes. I've seen the evolution of our facility from running a single analog satellite channel to becoming the network operations center for ION Media Networks, the nation's largest broadcast TV station group. We offer family-friendly programming, both original and vintage.

About the same time we were transitioning to the ION Media brand, we were implementing our design for a new Network Operations Center (NOC). The facility was constructed to accommodate future growth and expansion, but the biggest goal was to do away with our old analog signal path. The new equipment is all-digital, and the infrastructure is HD-ready.

The new NOC occupies five rooms and supports transmission of 12 digital feeds, (main programming feeds, as well as backhaul channels) which are all delivered by satellite to 60 owned-and-operated stations. We also handle transmission for the local ION station, WXPX.

ROUTER IS CORE ITEM

When you rebuild an operations center, a lot of new systems are introduced, and for a while there's the feeling that anything can go wrong. The router is the core of the system and it was one thing we couldn't afford to lose sleep over. That's the primary reason we selected Utah Scientific's Utah-400 288x288 SDI as our main router. Since day one, everything has gone well.

In selecting a router, price was a consideration, but there was an even more important factor—our previous router was a Utah-300 that we ran 24 hours per day for 10 years, and we'd had no problems. From this long-time association, we knew the Utah people and their level of support, including a 10-year, no-questions-asked warranty. This commitment was reinforced when Tom Harmon, Utah Scientific CEO, came on site and walked through the entire system with us.

For control, we're using Utah's SC-4 system. Making a programming change takes only a few seconds. In fact, any kind of change, even a hardware change, is simple. If we want to add an engineering monitoring station or a source switcher, all we have to do is plug in a panel, make a few clicks and then update the SC-4 and panels with the new information.

We also have a Utah-400/DATA router and a Utah-300 router for timecode. As we use embedded audio, the entire router only takes up one rack.

Our company is growing, and we pride ourselves on being state of the art and aspire to do more in HD. We kept that in mind when building the new NOC. With the Utah router, making the transition from SDI to HD will be simply a matter of a board exchange. I hope all future transitions will be as easy.

Network control operator Ivan Summers performs QC operations within ION Media's new NOC monitoring room.

Brian Reitmeyer is an active SBE member and a Certified Broadcast Television Engineer and a Certified Broadcast Network Technologist. He may be contacted at brianreitmeyer@ion-media.tv.

For additional information contact Utah Scientific at 801-575-8801 or visit www.utahscientific.com.

USER REPORT

WMTJ Builds Future With GV

by Ariel Diaz Osorio
Vice President of Engineering
WMTJ

SAN JUAN, PUERTO RICO

We've been anticipating the move to digital operations for several years, but it all became reality for us this year when we started construction of a new all-digital SDI production facility right next to our existing analog operations. We are being very careful to implement systems and equipment that are flexible enough to support our production and distribution activities, both now and in the future.

PUBLIC SERVICE PROVIDER

As a public station, our mission has always been to educate viewers in a variety of ways. Moving to digital operations will make it easier to provide these important public services. When we're finished installing all of the equipment this fall, our broadcasts will be from new studio and master control facilities. As part of our educational mission, we plan to multicast one HD channel and one SD channel, along with four other SD channels. This programming will be delivered by our two high power DTV transmitters.

In building the new facility, the first step was to install a robust signal infrastructure that could handle both standard- and high-definition signals. We chose two Grass Valley Concerto Series routing switchers—one configured as a 128x128 matrix for the four SD channels and the second one set up for 64x64 operation to handle the HD channel. We also purchased four Grass Valley Maestro master control switchers, which complement each other nicely by giving us the ability to control all of the systems from a central location. In addition to the TV station signal routing, the Concerto will also handle a nationwide EBS network (formerly ITFS).

WMTJ has installed two Grass Valley Concerto routing systems as part of the station's digital transition.

Reliable routing is the heart of any production facility and we've used the same Grass Valley Horizon router for more than 15 years. In fact,

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GV

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when we get the Concerto routers on line later this year, their control system will also extend to the Horizon, which we plan to continue operating for as long as necessary.

The Concerto routers will also be tied to newly built HD production studios, SD/HD control rooms and other technical areas of the facility. The routers will allow us to configure and reconfigure different production and distribution areas within the facility in order to support the various channels we're developing content for and transmitting.

FLEXIBLE & SPACE EFFICIENT

To meet our requirements, the router we selected had to be space efficient and flexible. The Concerto is both. The frame is 7 RU and it can accommodate a huge amount of signals, in different combinations of SD, HD and even digital audio. As we continue to move to other distribution platforms, such as mobile video and Internet broadcasting, the Concerto router will help us there as well.

Each day we have a lot of different formats coming into our station and those will all need to be routed through the Grass Valley system, so we're putting a lot of trust in this router. We tested other routers before deciding on Grass Valley and feel optimistic that it will help us achieve our digital production goals. We're betting our viewers will appreciate the high-quality images we broadcast as well.

Ariel Diaz Osorio been with WMTJ for the past 20 years. He may be contacted at ca_adiaz@suagm.edu.

For additional information contact Grass Valley Inc. at 800-547-4949 or visit www.thomsongrassvalley.com.

BUYERS BRIEFS

The 862-XL818HD/2A is an 8x8 SD/HD SDI router with AES audio-follow-video switching capability from **Link Electronics Inc.** It accommodates data rates of up to 1.4835 Gpbs signals and occupies only 1 RU of rackspace.

The unit has local control, but can operate with up to 256 remote control panels. These remote control panels are connected via standard 10base2 Ethernet single coax cabling. RS-232 control is standard with the router.

Power supplies are accessible from the front of the assembly and are easily removed and installed.

Models can also be supplied for analog video and audio signals.

For additional information, contact Link Electronics Inc. at 573-334-4433 or visit www.linkelectronics.com.

The DVS series of routing switchers from **Multidyne Video and Fiber Optic Systems** are designed for both standard and high-definition SDI and AES/EBU audio purposes and are available in nine basic frames that accept a mix of different modules.

The compact routers are useful for television stations and other facilities making the transition to HD. DVS units can function as the main routing switcher for smaller facilities and also be used for switching within edit suites and other self-contained operations. The units are available in sizes that range from 8x8 to 32x32.

Multidyne offers a variety of programmable router control panels for use with the DVS matrices.

For additional information, contact Multidyne Video and Fiber Optic Systems at 800-488-8378 or visit www.multidyne.com.

USER REPORT

Token Creek Sold on QuStream's Big Cats

by John Salzwedel
President
Token Creek Mobile Television

DEFOREST, WIS.

Token Creek Mobile Television began operations here in 1992 and now serves a client base from the Atlantic coast all the way across to the Pacific. We currently operate a fleet of two high-performance SDI trucks (Millennium and Hiawatha), and have just taken delivery of our first multiformat truck (Varsity). This is a 53-foot expandable, equipped from the axles up for live multicam 1080p, 1080i, 720p and SD. It goes into action in September.

Fifteen years in the broadcast television business has confirmed what we knew at the outset—you are only as good as your most recent project. Each one presents a unique combination of production and logistic challenges to be met and overcome.

STUDIED TECHNOLOGY

Reliable and flexible routing is a crucial requirement for every mobile production truck. When we planned Millennium back in 1999, we made a very careful study of the available technology and opted for QuStream's Cheetah 64XE SDI video router and their Jaguar audio router. Both operate with the 3500PRO system control. QuStream was PESA in those days, but the stripes are the same color.

The choice proved very successful, and once we were up to speed with the 3500PRO software, it made sense to deploy that experience across our second SD vehicle. That way our operational staff could move from one vehicle to another without having to familiarize themselves with a different user interface.

For Hiawatha, which is a larger and more powerful truck, we implemented a Cheetah 256CX HD/SDI video router and Tiger audio router under 3500PRO system control.

Configuring a multiformat truck proved quite a challenge in itself compared with the much easier task of designing an HD-only vehicle.

Varsity's primary role will be to cover regional sporting events for ESPN and we have encouraged cable sports network to work closely with us in specifying the equipment inventory. There will be no backup vehicle for Varsity, so the technical system inside it needs to be ultra-reliable and easy to reconfigure.

The QuStream 3500PRO router control system

TWO MORE CATS

We have again opted for two QuStream big cats: a Cheetah 288XL HD-SDI video router and a Cheetah DRS distributed audio router, both operating under QuStream's new PERC2000 system control. Varsity will be our first truck with embedded AES digital audio. Processing between formats will be handled by the QuStream Integrity Series signal processing gear, including the UDC-550 up/down/cross converter with built-in color correction and sidebar keyers.

We have been very happy with the performance, build-quality and reliability of the PESA/QuStream equipment. The company's pre-sale and post-sale support has also been great. They've taken very good care of us.

The routers are very easy to maintain on a module-swap basis, with each output card secured by a single fast-access lockdown screw.

The combination of high reliability, redundant control, internal redundant power and dual outputs makes the Cheetah a very safe investment. The modules themselves are hot-swappable and can be monitored online using QuStream's ViewPort diagnostic software.

Cheetah also allows close integration with incoming or outgoing fiber optic lines, as both coax and fiber I/O cards can be used in the frame. That adds up to a powerful system that can be reconfigured to accommodate the requirements of the evolving broadcast marketplace.

John Salzwedel is president of Token Creek Mobile Television. He is actively involved in the company's production and engineering operations. He may be contacted at john@tokencreek.com.

For additional information contact QuStream at 800-328-1008 or visit www.qustream.com.

BUYERS BRIEF

The TX 500 series of master control switchers from **Pro-Bel** are based on the company's Master Builder concept, allowing as much or as little functionality as appropriate for the application. The TX 500 series is designed for both SD and HD digital video and features multichannel operation with a single control panel.

The switchers are engineered with an open architecture to assure easy integration with any major automation and are fully controllable via a TCP/IP interface.

The TX 500 series also integrates with Pro-Bel's Sirius line of routing switchers, with the master control switcher controlling the router directly, or via a separate control system.

The largest of the TX 500 series control panel accommodates 20 prime inputs and has integrated machine control functionality.

For additional information, contact Pro-Bel at 631-549-5169 or visit www.pro-bel.com.

USER REPORT

Ensemble Router Is Big Deal at Big Wheel

by Mick Hitz
Owner/Editor
Big Wheel

WINSTON SALEM, N.C.

In the competitive world of corporate and agency work, we need all of our equipment to work flawlessly. Our Ensemble Designs router is the greatest little piece of equipment, because I don't have to think about it, it just works.

About half of our work is agency, and the other half is corporate. We have an Avid DS SD nonlinear editing system and SD and HD Final Cut systems. The machine room contains our Avenue router and video A-to-D converters, our source decks and a new Facilis TerraBlock server.

The Avenue 5440 8x8 router handles all SD feeds to and from the Avid DS and Final Cut editing suites. The Ensemble frame holds the router and several analog-to-digital converters as well. The router itself is a module that lives in an Avenue frame. As the frame holds 10 Avenue modules, we can have our video converters in the same frame as the router. The frame's front door is

Avenue frames and control panels from Ensemble Designs

equipped with a built-in touchscreen for making router crosspoint selections and adjusting levels on the converters. It's really easy to make source and destination selections from this screen.

MANAGES SIGNAL FLOW

Avenue manages my signal flow in and out. All the Beta and DVD feeds go through the Avenue A-to-D converters and then into the 8x8 router. (Believe it or not, we still use an S-VHS deck as a source occasionally and that is fed into the Ensemble conversion and routing chain too.)

Ensemble handles just about any format—it serves as my in and out boxes for the edit suites.

The router has an analog monitor output that is useful in the machine room. We send this feed to a video monitor for convenience when we're bringing up sources. Any of the eight router busses can appear on the monitor output. There's a text overlay that displays the source name too.

COMPLETELY EXPANDABLE

The Avenue system is completely expandable. We are installing three new Final Cut suites to meet our client's HD demands and we'll be adding more HD Avenue modules to our existing system. There's no need to redo the whole thing—we'll be able to upgrade the system we've got by just adding some upconverters and an HD tri-level sync generator. We recently moved into a new building and a situation related to the move made me realize just how much we depended on the Ensemble router. After the move, we didn't have it wired correctly and my workflow just stopped. Things that used to take five minutes were now taking an hour. Converting a source and getting it into the DS took way too long. Rather than continue to struggle, we stopped everything and took the time to rewire the new facility. After that, our workflow returned to normal, as our Ensemble router was working and we were once again productive.

Mick Hitz has been editing for 15 years. He has worked in broadcasting and spent several years freelance editing before buying Big Wheel. He may be contacted at mick@bigwheel.tv.

For additional information contact Ensemble Designs at 530-478-1830 or visit www.ensembledesigns.com.

PRODUCTS & SERVICES SHOWCASE

PRODUCTS & SERVICES SHOWCASE

USER REPORT

Nvision Boosts WCSN-LP's On-Air Quality

by Sean McFarland
Chief Engineer
Church of Jesus Christ of Latter-day Saints

SALT LAKE CITY

When the term "low power" is used, the first thing that you think of isn't a scaleable high-end routing system. When I was asked to engineer the new WCSN-LP sports channel in Columbus, Ohio, early plans were for a very efficient studio with capability for basic editing and switching of live feeds from remotely produced regional sports events. After years of planning, the project grew into a full four-camera studio with five edit suites and master control. Although not typical of a low-power station, an aggressive schedule required master control switching capability to be on the air within 60 days from the official project start. With the deadline looming, a tight budget, and the scope of the project continuing to expand, it was time for an immediate and capable solution.

Compact routing systems controlled by automation are ideal for smaller installations, but for a low power station to really compete, they need an on-air look not achieved with "cuts-only" switching. Although products are available to create transitions and branding, kluging together pieces of the core infrastructure—routing, distribution, and master control switching—presents significantly more complex installation and maintenance issues and is ultimately more costly than a single system.

Sean McFarland and Nvision router and master control products

I've excellent results with Nvision's large-scale routers in far larger installations. Compact routers were originally planned at WCSN. But as more sophisticated on-air requirements were realized, Nvision's NV5128 with integrated MC and routing was identified as the most cost-effective solution. The owners quickly understood the benefit of combining the router and master control in one unit and the savings to be gained by using modern broadcast equipment in the core of the facility. The NV5128 provides redundant power supplies and control cards, signal conversion, and accommodates any signal type. Without consuming more valuable router crosspoints, it provides inputs from the entire router to the integrated master control functionality. The additional cost for all these advantages was determined to be an excellent overall value for WCSN.

SCALEABLE SYSTEM

It was important for me to ensure WCSN's equipment investment. The NV5128 is scaleable and cards are hot-swappable to easily add capacity and update formats. The WCSN studio is digital, with some analog monitors and audio. Adding digital audio or high-definition routing and master control will be as simple as adding cards. This is key for smaller stations like WCSN, which need to stay competitive, but don't have infinite engineering resources.

With WCSN's aggressive schedule, Nvision helped to meet deadlines by supplying loaner gear. The modular architecture allowed a simple card swap to cut over to the permanent system.

WCSN met their on-air requirements and they are now finishing up the studios. My reputation relies on providing cost effective, robust, extensible system design, and long-term customer satisfaction. Nvision and the NV5128 provide the hardware and support to make possible an excellent final product.

Sean McFarland is chief engineer for the Church of Jesus Christ of Latter-day Saints in Salt Lake City. He may be contacted at McFarlandSD@ldschurch.org.

For additional information contact Nvision Inc. at 800-860-4388 or visit www.nvision.tv.

USER REPORT

KOHD Goes HD With Sony

by Dennis Hunt
Corporate Chief Engineer
Chambers Communications Corp.

BEND, ORE.

KOHD may well be the first ground up, all HD station, built with absolutely no legacy SD or analog equipment to contend with. Still, we had legacy issues on our mind when searching for the right HD switcher-processor that could work seamlessly with SD gear at sister stations. These are all linked by fiber and are able to trade files as necessary.

When we started the search for KOHD's new switcher, a major influence was our prior experience at sister station KDRV with a Sony DVS-9000 SD small-frame switcher with 2.5 ME that was purchased two and a half years ago.

In both of these projects, Professional Video & Tape, located in Tigard, Ore., has been a valuable asset, working with us throughout the process from selection to integration. As much as we liked the DVS-9000 itself, we loved the attention that Sony has always given us. On-site training and constant attention were more than we'd hoped for, and far more than we expected. So when we got the license for KOHD, we knew we were going to give Sony's new MVS-8000G switcher a close look.

Due to Sony's efforts to design common operational elements into all its switchers, the MVS-8000G would

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Sony

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be instantly familiar to our DVS-9000 users, greatly reducing the learning curve. We can have everyone on the same page, instead of trying to juggle different skills and capabilities learned on completely different switchers. Besides that, we can also enjoy interoperability between the two stations. We can script shows and build templates in Medford on the DVS-9000 and share it in Bend on the MVS-8000G.

Dennis Hunt

The modular design of the MVS-8000G really stood out. It meant that we could craft the board to fit our needs and not have to shape our work to someone else's notions.

BUILT-IN CONVERSION

A few other features also sold us on Sony. These include the ability to scale up easily. We can build out by going to Sony's large frame. Also, for what legacy gear we do have, the new G series has built-in cross-conversion. It's SD and HD capable, with analog and straight SDI coming in and the MVS-8000G doing up- or down-conversion internally. This design simplifies things, as there is less need for support equipment.

What finalized the decision to go all HD for KOHD was the fact that the technology is now the standard, and the price differential is negligible as compared with SD. In addition, buying SD now is a guarantee of obsolescence in two years, stranding precious capital.

We may well have the honor of being the first ground-up, all HD facility, but being first isn't what really interested us. Doing it right, was. We are confident that our choice of the MVS8000G switcher is a lasting choice.

Dennis Hunt is corporate chief engineer for Chambers Communications Corp., owner of four Oregon television stations. He may be contacted at dhunt@cmc.net.

For additional information contact Sony Electronics Inc. at 800-686-7669 or visit www.sony.com/professional.

BUYERS BRIEF

The Ponderosa family of SDI multiformat routing switchers from **Sierra Video Systems** is available in matrix sizes up to 64x64 in a 4 RU frame.

The Ponderosas feature hot-swappable input and output cards, power supplies and CPU boards. They are modular in design and offer expansion in increments of eight inputs and/or eight outputs. The switchers can handle digital video signals including SMPTE 310M, SMPTE 259M, SMPTE 344M and DAV-ASI, and at data rates of up to 540 Mbps.

The switchers are supported by most major third party control systems and feature GPI/GPO control functionality and alarms.

For additional information, contact Sierra Video Systems at 530-478-1000 or visit www.sierravideo.com.

USER REPORT

Miranda Simplifies RTL Broadcasts

by Gertrud Groterhorst
Engineer Broadcast Projects
RTL Television

COLOGNE, GERMANY

In order to satisfy RTL Television's commercial clients' play-out requirements, we needed a graphics setup that would allow us to make last minute adjustments with all the special effects of a traditionally pre-prepared item and more. We began looking for a solution in 2005 and found it with Miranda's field-accurate master control and channel branding system. We are now able to perform DVE effects for commercial spots and split-screens for sports program insertions just before going to air; extending potential revenue, while saving a lot of time and resources.

AUTOMATES IMAGESTORES

We have three Imagestore master control switchers that are controlled under our Abit Present_it automation system. One is used for preparation and preview of the main RTL channel, and two are running in parallel for playout and backup. This configuration is dynamic and allows us to use one Imagestore as a complete test system for experimenting with ideas and testing field accuracy and software.

The Miranda processors provide all "secondary events" for RTL's main channel—from a simple text insertion to eye-catching DVE effects.

All the graphical insertions for the Imagestore processors (animated logos, countdown clocks and backgrounds) are provided in graphical Tiff sequences on a file server.

We use Miranda's Intuition Builder for graphics template creation, and also Clock Builder, Audio Builder and Animation Builder to create corresponding files on the file server.

The transmission area at RTL

Intuition's advanced template software allows our graphics team full control over the look of the channel. Our automation can handle all 16 keying layers of the Imagestore /Intuition, assigning up to 16 secondary events per main event through dragging and dropping layers. We can also adjust the duration of each secondary event.

And our operators need only to confirm each secondary event on preview before going to air. In the past, our play-out system could only manage channel branding and promotional graphics that were fully prepared in advance.

EASILY INTEGRATES LIVE EVENTS

RTL Television's main channel carries several live news programmes on weekdays and covers live sporting events and live show events on the weekends. With such live programming, the automation system can assign manually controlled secondary events.

Secondary events are identified by

MIRANDA, PAGE 53

USER REPORT

Harris MC/Branding Aids KKTV

by Emily Edwards
Station Manager
KKTV

COLORADO SPRINGS, COLO.

Gray Television-owned KKTV is the number one channel in the Colorado Springs/ Pueblo, Colorado, designated market area (DMA). We're a CBS affiliate and also an affiliate of MyNetworkTV, a News Corporation-owned network. Currently, KKTV is the only station here that's digitally multicasting a uniquely programmed, second digital channel with local news.

I've been with Gray Television for more than nine years, joining KKTV in 2005. In September 2006, we launched the new digital multicast channel and needed a switching system to handle the second channel. We were not prepared to go completely HD then, so our goal was to make the best investment we could, purchasing equipment with the tools needed to achieve our immediate goal, while providing us with a path later to high definition.

After doing our research, we decided to go with a Harris IconMaster master control and branding system. IconMaster is able to operate in SD or HD, and has a small footprint—only taking up two slots in the Harris NEO series modular frame. We've found the IconMaster to be a really powerful and flexible switching solution. And, we haven't even begun to tap into some of its other great features, such as keying capabilities, channel linkage and the branding engine. We do like what we see so far, and are looking forward to really opening it up and seeing what else it will do for us. Harris worked with our master control automation system provider, Crispin, to design a control solution for the IconMaster, and everything is running smoothly.

EXPAND ANALOG OR GO DIGITAL?

The station had also maxed out the source inputs on the old analog router. We looked at the option of building out a supplementary system, but our other new equipment, including a production switcher and weather graphics system, was digi-

HARRIS PAGE 56

Miranda

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Miranda equipment installed at RTL Television

an ID number that is used for planning and display. The Abit automation system checks the different components of the secondary events and distributes copies of all files to the Imagestores and Intuition, which can be dynamically assigned for on-air, backup or preview. This ensures failsafe and accurate on-air processing for RTL's commercial clients.

The automation system can calculate what fits into the commercial time availability and warns operators when it becomes overloaded. (German law limits commercial time to 12 minutes per hour.)

Miranda's solution makes life easier for our operators, as they only have to set up the special logo, animation or commercial with templates and can leave the professional on-air control to the automation.

Gertrud has been with RTL for 11 years, working closely with traditional broadcasters who specialize in video and audio using business logic and workflow systems to improve playout operations. She may be contacted at Gertrud.Groterhorst@rtl.de.

For additional information, contact Miranda Technologies at 514-333-1772 or visit www.miranda.com.

BUYERS BRIEFS

The **Sigma Electronics Inc.** Dagger series of routers are available in 8x8, 16x2, 16x8 and 16x16 configurations. They are available for SDI or analog video and AES or analog audio signals.

The Daggers may be used as a standalone device, or as part of a larger Sigma 2100 signal switching system.

The units provide input equalization and automatic reclocking of digital signals. Sigma offers a variety of control panels for the Dagger line.

The units can be controlled locally or via an RS-232/422 serial communications port. Control data rates of up to 38.4 kb are supported.

For additional information, contact Sigma Electronics Inc. at 866-569-2681 or visit www.sigmaelectronics.com.

The 1T-HDMI-881 digital video router from **TV One** switches up to eight high-definition multimedia interface signals, allowing users to select between program material without unplugging and plugging in cables.

The device may be controlled locally from their front panel or via an included infrared remote control.

The 1T-HDMI-881 operates as a desktop unit, or mounted in a standard 19-inch rack with the included mounting hardware. It supports television resolutions of 480i, 480p, 720p, 1080i and 1080p.

The switcher certified as being both HDMI and RoHS compliant.

For additional information, contact TV One at 800-721-4044 or visit www.tvone.com.

PRODUCTS & SERVICES SHOWCASE

USER REPORT

Network Electronics: A Pleaser at Outpost

by Randy Main
Chief Engineer
Outpost Digital

NEW YORK

Outpost Digital was founded on some basic modern principals. We recognize that ours is a "new media world," and we do our part to participate in the development of emerging platforms, evaluate new technology trends and quickly embrace those that have real impact on the price and performance of our business. We have always done more with less, and have grown our resourcefulness exponentially by providing a balance of exceptional talent and state-of-the-art technology.

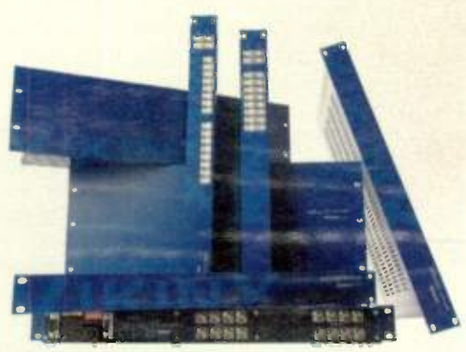
Outpost Digital, now a fully owned subsidiary of @radical media, is a media technology and post-production organization with locations in Santa Monica, Calif. and New York City. Our client base includes major motion picture studios, independent film clients, epidsodic television, advertising agencies, production companies, editorial companies, interactive companies and record labels. We're also developing a post-production pipeline for emerging VOD platforms, streaming content for 3G devices and iTV (interactive television) content.

We have been using Network Electronics VikinX routers since we launched the New York shop in 1998. Network was with us when we expanded to California in 2002, and we integrated a complement of the company's routers into our existing system when we upgraded the entire West Coast operation two years later.

MOVING ALONG WITH HD

As HD gains momentum, we find ourselves moving into new areas along with it. As a subsidiary of @radical media, best known for there ever-expanding creative interaction in media production, we are growing at an incredible pace and need a router configuration that works with us now and will help us reach our potential.

Our Network Electronics VikinX compact router system provides a multifaceted solution. First and foremost, we didn't need the large router that other companies provide now. Our Network Electronics configuration is comprised of 32x32 and 64x64 configurations, which is perfect for us. We saved a significant amount of money because we were able to purchase units that met our needs now and would allow us to expand as needed. With Network Electronics, we didn't have to spend money on systems that, along with limited modular scalability, would take us years, if ever, to grow into.



Network Electronics VikinX compact routing system

EASY TO INCORPORATE

Network Electronics VikinX compact routers were very easy to incorporate into our facility. We were able to install them into our machine room with a straightforward configuration and the knowledge that they would grow with us. The system also streamlined our workflow by allowing us to get away from patchbays—we still keep them as precautionary devices—and in this respect, the routers have increased our productivity immeasurably. At their most basic level, just the ability to route multiple sources to multiple targets has increased our monitor and quality control capabilities tremendously. With that scalabilty, and the support for third-party user interfaces and customizable interface options, we've been incredibly happy with the results of the gear. Network Electronics offers super fast turnaround and the system is extremely reliable. It has presented us with virtually no problems. The people have been so accommodating and are right here when we need them.

Randy Main has served as Chief Engineer at Outpost Digital?s New York facility since 2005. He has previously served in IT and editorial services for multiple post-production facilities in the New York area. He may be contacted at randy@outpostdigital.com.

For additional information, contact Network Electronics US at 800-420-5909 or visit www.network-electronics.com.

BUYERS BRIEF

The QMC-2 from **Evertz** is a new master control switcher that supports both standard- and high-definition operations. The switcher processes a complete preset and program channel at 1.5 Gbps and provides a full "lookahead" operator preview of the next transition.

The QMC-2 supports multiple standards, including 720p and 1080i. It also includes enhanced audio capabilities as a standard feature, handling 16 channels. The switcher also supports Dolby E, when fitted with optional internal decoders.

The QMC-2 is housed in a 3 RU frame with space for an additional channel of SD or HD video.

For additional information, contact Evertz at 877-995-3700 or visit www.evertz.com.

Harris

CONTINUED FROM PAGE 52

tal, so it made a lot more sense to do digital routing. We chose a 128x128 Harris Integrator Gold digital router, along with various Harris conversion equipment and router panels. The Integrator Gold has been very dependable and integrates well with IconMaster. A portion of the router is HD, but the majority of it is SD. We really like the fact that we can expand within the current frame and easily transition to HD when we're ready.

BECOMES A BRAND NEW STATION

Ultimately, KKTV became a brand new station. We hired a systems integrator and literally went source-by-source and rebuilt the entire plant.

The training and support Harris has provided to our engineers has made us experts on the system. We are able to make our own standard changes and upgrades, but when necessary, the Harris support team walks us through the more complicated reconfigurations. Additionally, our systems integrator has a great relationship with Harris, and had previous experience installing Harris hardware. The planning and scheduling of the switchover went really well. Since installation, we've also been very pleased with Harris support in troubleshooting (mostly minor control issues that that have been solved quickly).

The Harris IconMaster master control system installed at KKTV

At KKTV, we were looking for a master control and routing solution that would not only solve our challenges at the time, but that would also prepare us for HD migration. Harris' IconMaster and Integrator Gold have definitely put us on the right course.

Emily Edwards is station manager for KKTV-11. She joined KKTV-11 in 2005 and has been with parent company Gray Television for more than nine years. She may be contacted at eedwards@kktv11news.com.

For additional information contact Harris Corp. at 800-387-7004 or visit www.broadcast.harris.com.

BUYERS BRIEFS

The AMX5030 from **Avocent** is a four user, 16-port matrix switcher designed for IT routing within broadcast and other facilities. It can provide remote access for servers and serial-based devices that are located in machine rooms and allocate these resources as required in day-to-day operations.

The AMX5030 switcher features real-time bandwidth up to 1,000 feet from the server and has an automatic compensation feature to adjust for any video losses caused by cabling.

The AMX uses standard UTP cabling and has "hotkey" switching that allows a user to rapidly switch between a number of servers without having to use an on-screen display. The unit also features plug-and-play operation and auto configuration for ease of installation. It integrates with video wall software and has a user activity and event logging feature.

For additional information, contact Avocent at 866-277-1924 or visit www.avocent.com.

The cDR67-DL from **Barco** is a dual lamp 67-inch DLP technology video wall display unit designed for television control rooms and other applications.

The unit provides a full viewing angle of 180 degrees and features an optical dimmer to allow side by side display units to be matched in brightness and contrast and color depth across the display wall.

The DLP projector unit features a large color gamut that spans the EBU/SMPTE color triangle and has an easily removable color wheel cartridge to facilitate maintenance of the system.

The cDR67-DL illumination unit is modular and removable, and can be replaced without geometrical readjustment.

For additional information, contact Barco at 678-475-8000 or visit www.Barco.com.

The **For-A** UFM-41DRS is a modular digital video routing switcher designed for use in For-A's UFM series of card frames.

The switcher can accommodate serial digital video at rates between 143 Mbps and 270 Mbps and supports DAV-ASI. The unit can provide reclocking of input signals and offers GPI control and tally output. It's also possible to implement an RS-232 communication and control port on the UFM-41DRS.

The small router is designed to switch any of four input signals to a single output port. Compensation is provided for cables extending up to 200 meters in length. A maximum of to 12 UFM switcher modules can be installed in a single For-A rack-frame.

For additional information, contact For-A at 212-861-2758 or visit www.for-a.com.

The SDI8x8 from **Knox Video Technologies** is an 8x8 router for SDI video signals. The unit is designed for broadcast applications and provides reclocking of all inputs. It both accepts 8-bit and 10-bit signals.

The SDI8x8 supports data rates of 143, 177, 270 and 360 Mbps and can provide input cable equalization up to 200 meters.

The router features front panel LED indicators to confirm data lock and stores crosspoint patterns in nonvolatile memory for later call-up.

Push-button front-panel switchers are provided for changing configurations. BNC connectors are used for inputs and outputs, and an RS-232 port is also available.

For more information, contact Knox Video Technologies at 301-840-5805 or visit www.knoxvideo.com.

The AX-81 from **Hotronic Inc.** is an 8x2 video router with optional audio-follow-video switching functionality. It provides glitch-free switching of signals and has genlock capability.

The AX-81 offers cut or dissolve switching of asynchronous signals and maintains constant SC/H phase relationships.

Each of the router channels is equipped with individual proc amp controls and the switcher unit may also function as two independent frame synchronizers. The unit features local front panel control, as well as remote control via an RS-232 external control port.

The AX-81has a full six MHz bandwidth and provides a S/N ratio of better than 70 dB.

The router draws consumes less than 30 watts of power and weights between 12 and 15 pounds, depending upon the configuration ordered.

For additional information, contact Hotronic Inc. at 408-378-3883 or visit www.hotronics.com.

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.

Manufacturer	Product	Capacity in KVA or Watts	Regulation Range	Shutdown Voltage	Harmonic and Noise Filtering	Line Noise Suppression	Number of Power Outlets	Weight	Special Features	Price
Equi=Tech Corp. 877-378-4832 *www.equitech.com*	ET20WQ	20 kVA	+/- 2 percent	350 V TVSS only	Yes	100 dB+	10 circuits	256 lbs. + 216 lbs. (2 cabinets)	Balanced voltage output, very low harmonics, low noise grounding and signal reference	Call for pricing
ETA Systems 330-677-4424 *www.etasys.com*	Conditioned Power Center	10-300 kVA (Three phase)	N/A	Normal mode: less than 10 V; common mode: less than 1/2 V	Yes; harmonic filter optional	-60 dB at 100 kHz; -80 dB at 1 Hz to 5 MHz	Customer specified	520 to 3,350 lbs.	Voltage matching isolation transformer, safety interlocks and lockout/ tagout breaker	Call for pricing
Furman Sound 707-763-1010 *www.furmansound.com*	AC-215	1,800 W	90-140 VAC	188 VAC	Yes	10 dB at 10 kHz; 40 dB at 100 kHz; 100 dB at 10 MHz	2	3 lbs.	The highest level of protection available and in a compact design	$249
Juice Goose 713-772-1404 *www.juicegoose.com*	FE Series	80-75,000 W	+10 percent to -20 percent under full load	Complete isolation	Both	60 dB normal mode; 120 dB common mode	Various	11 to 3,320 lbs.	Plug-in and hard-wired	$250-$42,000
Middle Atlantic Products 973-839-1011 *www.middleatlantic.com*	PD-915RV-RN Rackmount unit	1,800 W	N/A	No shutdown limit	Yes	More than 20 dB	9	9 lbs.	Surge suppression health indicator and notification; 3 USB style gooseneck light ports	$150
Monster Cable Products 415-840-2000 *www.monstercable.com*	HTS 2600 PowerCenter	1,800 W	90-140 VAC	330 V	Yes	-80 dB	10	8 lbs.	Ultra low-loss RF circuitry; component color coding with matching power cord labels	$349.95
Panamax Corp. 800-472-5555 *www.panamax.com*	MAX 5500-EX	1,800 W	90-142 VAC	330 V	Yes	60-120 dB	11	30 lbs.	AVM AC monitoring, AC regeneration transformer and new noise elimination design	$999.95
PS Audio International 866-406-8946 *www.psaudio.com*	PS Audio Power Plant Premier	1,500 W regenerated; 1,800 W peak	90-137 V	Less than 90 V or greater than 137 V	Both regenerated	Greater than 70 dB regenerated	10 regenerated over 5 isolated zones	43 lbs.	Regenerated power, filtered outputs, 5 isolated zones, remote control and waveform options	$2,195
SurgeX 215-766-1240 *www.surgex.com*	SA82 FlatPak	960 W	N/A	145 V	Yes	50 dB at 5 MHz	2	3 lbs.	Designed for flat-panel monitors; over-voltage shutdown with auto reset	$279
Tripp Lite 733-869-1111 *www.tripplite.com*	HT7300PC	1,440 W	N/A	330 V	EMI/RFI filtration-Digital and analog	up to 90 dB	12	19 lbs.	Four ir controllable outlets, two LCD meters for current usage and input amperage, and 12 diagnostic LEDs	$499.95

MARKETPLACE

Highlighting the latest products available to professionals in the video industry

Video Server

The Geevs SDEs are new video server devices from Gee Broadcast Systems Ltd., designed for operations not needing high-definition capability or multiple channels.

The Geevs SDE1 provides two playout channels and a single record channel. The Geevs SDE2 has four playout and two record channels.

Both servers are designed to accommodate up to six internal hard drives to provide storage capacity of 100 or more hours. Transfer rate is 25 Mbps. The system supports avi, quicktime and mxf file formats.

For more information, contact Gee Broadcast Systems Ltd. at 44-1256-810123 or visit *www.geevs.co.uk*.

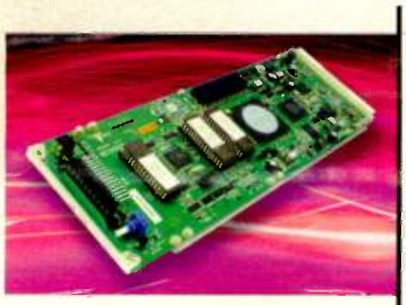
Sound Equipment Carrying Bag

The Sound Knapsack from Petrol, a Vitec Group brand, is a professional carrying bag for sound equipment and accessories. It features three cushioned compartments, with the largest capable of accommodating a laptop computer with a 17-inch screen.

It has three chambers and a total of eight removable pouches for carrying microphones, batteries, headphones, spare connectors and other audio-related items. It also has a "net pocket" for a boom pole, as well as a front "eargonizer" section for keys, wallet, pens and notebooks.

The bag's exterior is constructed of blue and black Cordura and ballistic nylon.

For more information, contact Petrol at 845-268-0100 or visit *www.petrolbags.com*.



Aspect Ratio Converter

The ARC-10MC from Crystal Vision Ltd. is a 10-bit bi-directional aspect ratio converter. It can perform six standard fixed conversions between 4:3 and 16:9 video and provides vertical and horizontal cropping fro cleaning up picture edges and removal of undesired material.

The ARC-10MC will pass closed captioning data on line 21 in 525 television systems. It uses motion-adaptive de-interlacing to maximize the appearance of video content and has adjustable detail enhancement. Simple color correction is also provided by RGB gain adjustments. Picture black level can be changed by a DC-offset adjustment.

For more information, contact Crystal Vision Ltd. at 44-1223-497049 or visit *www.crystalvision.tv*.

Audio Monitoring System

The AMU-8HD from Broadcast Networks Ltd. is an eight-channel bargraph type audio monitoring system.

The unit has two SD/HD SDI inputs, eight AES input pairs and eight analog inputs. It also features multiple outputs, including four AES pairs, four stereo analog outputs with variable levels, four stereo analog outputs with fixed levels and a stereo analog monitoring port.

The AMU-8HD features an LCD menu system that allows internal routing of signals and "save" feature allows users to store signal pathing and other settings. The monitoring system is also available with a Dolby D/E decoder option.

For more information, contact Broadcast Networks Ltd. at 44-1962-733000 or visit *www.bcnet.co.uk*.

Audio Connector

The Crimp-XLR is the latest addition to Neutrik's line of professional audio connectors. The new units are crimp-on versions of Neutrik's XX and DLX cable and chassis XLRs and are available in several configurations for greater versatility.

The Crimp-XLRs are designed to speed up the assembly of large volumes of cable sets, or to ensure compliance with RoHS restrictions on leaded solder. Neutrik is producing models of the new connectors for termination with hand-type crimp tools and also for termination with semi-automated machines.

For more information, contact Neutrik USA Inc. at 732-901-9488 or visit *www.neutrikusa.com*.

P2 Media

Panasonic Broadcast & Television Systems Co. is now delivering a new P2 storage card with 16 GB capacity. The AJ-P2C016RG provides double the recording time of previous P2 cards and puts P2 storage camcorders on equal par with tape or disc based recordings systems, as record/play times equal or exceed those associated with these other media.

With a five-slot camcorder capturing at 720/24pN in DVCPRO HD, up to 200 minutes of storage is possible. The cards weigh less than 0.1 pound and are immune to shock, dust and extreme environmental conditions. In addition to operating with camcorders, the storage cards are compatible with many laptop PCs.

For more information, contact Panasonic Broadcast & Television Systems Co. at 800-528-8601 or visit *www.panasonic.com/business/provideo/home.asp*.

Send new product press releases along with color photographs to:
Marketplace Editor, P.O. Box 1214,
Falls Church, VA 22041, USA

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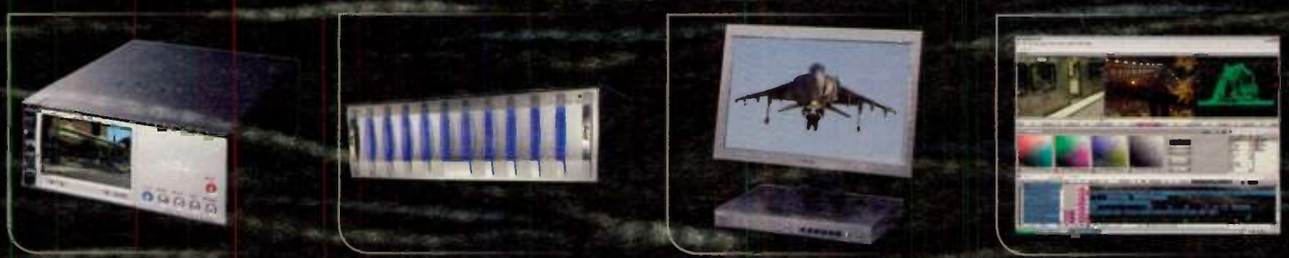

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MARKETPLACE

Highlighting the latest products available to professionals in the video industry

Headend In A Box

Scopus Video Networks' Piccolo, an integrated "headend in a box" system for digital simulcast, integrates all key video processing elements and targets cable operators who want to launch digital simulcasting services.

Piccolo includes real-time MPEG encoding, grooming, rate-shaping, splicing, and edge decoding functions while working with a single network management system. The system employs Scopus' UE-9240, which combines four MPEG-2 encoders in a 1 RU platform; the IVG-7000 digital video processor; and the UID-2912 high-density edge decoder, all of which are integrated with the NMS-4000 network management system

For more information, contact Scopus Video Networks at 609-987-8090 or visit *www.scopusamericas.com*.

ENG Lighting

PAG has introduced a 24 W PowerArc plug-in HMI unit designed for use with its miniaturized 12 V Paglight M.

Paglight M, a more compact version of the ENG Paglight, has a 24 mm reflector and measures approximately 90 mm, front to back, with the standard halogen lampholder. Its reduced proportions target smaller broadcast digital camcorders, as well as DV and high-definition handheld camcorders.

The PowerArc uses a 24 W lamp which has an output equivalent to 100 W of halogen light, but at daylight color temperature. It produced a soft, clean and even spectral distribution, which is fully focusable, from spot to flood.

For more information, contact Ste-Man, PAG's U.S. distributor, at 818-760-8240 or visit *www.ste-man.com*.

Call-in Software

Studer Professional Audio has introduced Version 2.0 software for its Call Management System (CMS) used for telephone call-in shows.

The new release integrates with the screen design of Studer's OnAir 3000 console and operates directly from one of the console's display screens.

The product features a "waiting room" facility for caller holding and allows an operator to pre-select a dedicated console fader. When the call is brought up from the "waiting room," it appears on that fader.

The Version 2.0 feature set also includes waiting area priority and greater flexibility in assigning pre-recorded announcement to different callers or groups of callers.

For more information, contact Studer USA/Harman Pro North America at 866-406-2349 or visit *www.studer.ch*.

Blade Server

The SGI Altix ICE 8200 is the first in a new line of bladed servers from SGI purpose-built to handle true high-performance computing and large-scale workloads.

Its ultra-dense rack architecture delivers up to 40 percent more compute performance per floor tile than competing blades, according to SGI. A single SGI Altix ICE 8200 rack can be powered by as many as 512 Intel Xeon processor cores and deliver 6 TFLOPS of performance.

SGI achieved dramatic density improvements by implementing a new, highly integrated version of the Atoka board, which SGI co-designed with Intel. This next generation board allows a single SGI Altix ICE 8200 blade to be powered by two Dual- or Quad-Core Intel Xeon processors, and up to 32 GB of memory.

The Altix ICE line is managed by the SGI Conductor software solution stack, a comprehensive array of essential components that comes pre-installed in every SGI Altix ICE 8200 system. Configurations range from 8 to 512 processors per rack.

For more information, contact SGI at 650-960-1980, or visit *www.sgi.com*.

Boom Pole

The G5 from Lightwave Audio is a news boom pole designed to be simultaneously robust and lightweight. Instead of metal threads, the G5 News Pole uses a patented triple-cam locking system allowing for a minimal 15 degrees of twist to lock/unlock, facilitating cleaning and reducing the likelihood of jamming.

The pole can be supplied with an internal coiled cable as an option using Neutrik NC3 (XLR style) connectors with gold-finished pins.

For more information, contact Redding Audio, Lightwave Audio's U.S. distributor, at 203-270-1808 or visit *www.reddingaudio.com*.

Fiber Optics

Prisma II from Scientific Atlanta, is a new and compact product designed to enhance the performance of existing fiber-optic distribution systems.

The device is able to extract additional capacity and performance for cable operators by enhancing fiber use in forward path transmissions. The unit is backward-compatible with previous Scientific Atlanta technology and offers a new and smaller form factor. It supports up to two reverse busses and the new Prisma II chassis can accommodate up to 16 optical modules in a 3 RU rack frame.

For more information, contact Scientific Atlanta at 770-236-6609 or visit *www.scientificatlanta.com*.

Send new product press releases along with color photographs to:
Marketplace Editor, P.O. Box 1214,
Falls Church, VA 22041, USA

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ANTENNAS/ TOWERS/CABLES

Want to Sell

Channel 46 antenna, new in box, Andrew ALP16L7-HSOC-46, chnl 46, freq 662-668, beam tilt 1.75 degrees, input power rating 5.6kW average, input connection 1-5/8" EIA, polarization horizontal, pattern OMNIOID, gain 28.20 (14.50-dBs), addl Andrew specs are avail in the Andrew Catalog 38, pages 293-302, $16320. R Streeper, Liberty University, 434-582-7381 or rstreeper@liberty.edu.

AUDIO PRODUCTION

Want to Sell

ART MDC 2001, $99; Clear-Com AP-22, $2000; Sony DTC-75ES DAT audio rcdr/plyr, $399; 360 Systems DIGICART II digital audio rcdr & plyr, $799; Clear-Com ICS-2003 intercom, $1250; Sony WRR810A/WRT822B/ECM77 wireless mic, $1200; Graham-Patten D/ESAM 200 audio mixer, $2600; GV AMX-100S audio mixer, $499; Mackie 328 8-bus Series audio mixer, $1899; Mackie SR408 audio mixer, $2499; Eventide BD600 outboard, $2995; Graham-Patten ADC20 outboard, $299; Alesis Monitor One speakers, $279; Sony tape decks, $2499. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

Wohler AMP 1A, $375; Sony PCM 7040, $3995; Sony PCM 7030, 2995; Sony PCM 7010, $750. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Graham Patten D/ESAM 820 digital audio mixer, BO; SSL 6000E 48 input, call for price; ADC DAL3-14MKIINS digital audio patchbay, $350; GVG 8550 tray w/8-8551 audio DAs, BO; NVision NV1000 tray w/11-NV1035 20-bit AES3 A to D, BO; SSL Aysis Air Digital Mixer w/hub router, 40 faders, call for price. 908-879-9590 or www.mccominc.com.

Telex ENG-4 wireless system w/rec & trans, $300; Mackie 1604 VLZ Pro 16-input mixer, $600; Behringer 1804X 16-input mixer, $400; Crown D-75 amp, $175; Cyberhome CH DVR-1530 DVD rcdr w/progressive scan playback, $200; Realistic Stereo mic mixer, $25; Marantz PMD-321 compact disc plyr, rackable, BO; Various Winsted Type racks, $150; Telex P-500 video projector, BO. TheVideoGroupm 817-891-8080.

CAMERAS

Want to Sell

(3) Hitachi Z One C studio config cameras, call for price; Ikegami HL-57 w/Sony BVV-5, Canon 14x8.5 IF lens, $4500; Sony DSR-300A w/Canon 14X, $3400; Panasonic SDX-900 PAL, BO; Hitachi Z3000 studio camera, call for price. 908-879-9590 or www.mccominc.com.

(3) Sony BVP-70IS studio cameras w/3 Sony CA-50 camera adapters, 3 Sony BVF-55/55CE VFs, 3 Fujinon A15x8BESM-18F 8-120mm, 1:1.5 box lenses, 3 Fujinon ELH mounting plates, 3 Sony CCUs, 3 Fujinon ESM/EMN zoom/focus, 3 camera cables, buyer responsible for shpg, $25000. 804-230-2716.

(4) Panasonic AJD200P DVCPro cameras w/lens 4:3 or 16:9, $2600/ea; (2) Sony DVW-709WS DigiBeta w/A-17x7 Fuji 2X, call for price; Sony DVW-700 DigiBeta camera w/o lens, xlnt cond, $6500; Sony DSR370 DVCam camera w/18x1 lens, xlnt cond, $7500; Sony DSR300 DVCam, deck needs work, has error code, call for price; Sony DSC-D35 studio widescreen head, $6500; Canon T-90 35mm camera w/85mm lens, $125. TheVideoGroup, 817-891-8080.

Sony HDC-F950 CCD digital 3 camera, BO; Sony BVW-300A Betacam camcorders, $5900; Sony BVW-400A w/lens, $4995; Sony DSR-130 DVCAM camcorders, $7995; Sony HDWF900PAC1B HDCAM camcorders, $82900; JVC GY-HD100AU HDV camcorder, $5495. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

CAMERA ACCESSORIES

Want to Sell

Ike HD-340 w/lens, $2550; Sony BVP550 SDI camera studio system, $2550; Sony DXC-D30 w/CA-537 adaptor, etc, $6599; Canon J20AX8B4IRS, $6500; Canon J20AX8BIRS, $8200; Canon J9aX5.2B4KLL-SC T2.0, $6900; Canon YJ 17x9.5B4 KRS SX12, $2375; Daiwa DW-11M1 tripod, $3199. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

Sachtler 30 head & sticks, $4995; Sony Cine Alta XDCAM HD PDW-F330 new demo unit, full warranty, Only $9,900; Sony BVP-50 Camera Head, $2750; BTS LDK93 w/Studio VF, Fujinon BEVM 15X lens, CCU & Paint Panel, (steal this camera), BO; Sony LDK 90 w/Studio VF, Fujinon BEVM 15X lens, CCR & Paint Panel, BO; Hitachi C2 Camera w/Canon J15 lens, BO; Sony AC550 Power Supply, Make an Offer; Sony VA500 Color Playback Adaptor, $1000. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Canon J20x7.5B studio lens, call for price; (2) Sony BVF-77 7" studio VF, $4000; Fuji A18x8.5FEVM B3 VGrip, 2X, $850; Sony CA-905K studio build up kit/sled, call for price; Sachtler Video 25II tripod, call for price. 908-879-9590 or www.mccominc.com.

(3) Vinten camera pedestals, EXY-PED 3430, controls, manuals, recent batts, no tilt-pan heads, vgc, $4500/ea. 360-254-2978 or majorsat@msn.com.

Canon J8x6B4 IRS wide angle lens, $3500; Fujinon A15x8BEVM-28 lens, $3000; Vinten Vision 5 tripod w/spreader, $1800; Sachtler 20 II tripod, $3500; Sony CA-511 camera adapter, $200; Sony BC-1WD batt chrgr, $125; Canon wide angle YJ12x6.5B I/F lens, $4800; Canon BVP 8.6 wide angle w/2X, $4400; Canon J15 x 9.5B4, $899; Fuji A18x8.5 w/2X lens, $1800; Sekonic Studio Deluxe II light meter, $140; Tiffen filters: Ser.9 6pt Star, $15-$25/ea; Ser.9 4pt Star, (3) Ser.9 Clear, Ser.9 Diffrusion, (2) Ser. 9 Haze, Ser.9 Sky, $20/ea; Sony DXF-501 VF, missing lens, BO; (2) EWC – camera hurricane/rain cover w/lens cap, $175/ea.; (2) Samsung 3-CCD camera copy stand w/lights, focus, zoom, input cntrl, etc, $1200/ea; Kata tripod bag, $150. TheVideoGroup, 817-891-8080.

DIGITAL EFFECTS

Want to Sell

Abekas A-57 combiner, $8600; Accom DIS-422, $1750. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

Chyron Duet, $6,000; Chyron Infinite SDI, last used on Regis and Kelly show, BO. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

EDITING EQUIPMENT

Want to Sell

Avid Express Pro Studio complete, Avid Express Pro HD, Avid FX, Avid DVD, Avid 3D, AvidPro Tools LE, Digi 002, Mojo, Roland audio monitoring speakers, HP XW 8000, p4 3, 6 GHz, 2GBs RAM, 80 GB SCSCI systemdrive, 200 GB storage drive, 500 GB firewire, 400 drives, Nividia 256 MB dual head card, Adys firewire card, 1-800 port 2-400 ports, Avid Express Pro keyboard, plus Avid training DVDs for each software title, $7000; Sony PVE-910 editor w/monitor, $900; Sony DNW-A2200 Betacam SX editor, $4000; Sony DSR-70 DVCam editor, $3800; DVCPro AJ-85 laptop editor, $9500; Avid Xpress Mac G3 w/3D-card, $1650; Avid Xpress PC w/8 Fanton drives, 3-D card, lots of software, $2000; Avid 3D Box 0020-00365-01, BO; Scribe CG, $350; Custom non-linear edit console w/side units rackable, $750. TheVideoGroup, 817-891-8080.

Sony DVW-A500 digital Betacam editor, $31995; Thomson TTV-3452N OEM of Sony DVW-A500 digital Betacam editor, $29995; CMX OMNI 1000E edit cntrlr, $3900; Avid 18GM drive, $350; Accom StrataSphere Spherephous, BO; Avid MCXPRESS-NT V 4.1, BO; Avid SYMPHONY V2.1 system, $6995; Discreet Inferno HD, BO;

Discreet Smoke HD, BO; Sony RM-450 cntrlr, $850. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

LENS REPAIRS

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LIGHTING

Want to Sell

(2) Bardwell & McAlester Baby Spotlight 1K, $200/ea. TheVideoGroup, 817-891-8080.

MICROPHONES

Want to Sell

Sony ECM-66B mic, like new, $250. TheVideoGroup, 817-891-8080.

MISCELLANEOUS

Want to Sell

(2) Sony BCT-5CLN Betacam/SO Betacam head cleaner, $20/ea; Panasonic Pulsa DA WJ-1408. TheVideoGroup, 817-891-8080.

MONITORS

Want to Sell

Aspen VS100 color monitor, $290; Marshall V-R151P-4 color monitor, $1500; Marshall V-R44P color monitor, $1231; Sony BKM-101C color monitor, $750; Sony PHM-20M8U color monitor, $1799; Sony PVM14N5U color monitor, $400; Sony PVM8042Q color monitor, $575; Ikan V7000 LCD monitor, $319; Ikan V9000 LCD monitor, $399; Marshall V-R72P-2SD LCD monitor, $2699; Barco 8100-DATA video projector, $3000. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

Sony PVM20M4U 20" Color Monitor, $1750; Sony PVM14M2U 14-inch Color Monitor, $1050; Sony BVM 20 F1U Monitor, BO; Sony BVM14F1U 13" Color Monitor, $1750; Ikegami TM9-1 9" Hi-rez color monitor, BO; Tektronix 1720 Vectorscope w/1730 Waveform monitor & dual case, $900; Tektronix 1725 Vectorscope w/1735 Waveform monitor & dual case (PAL & NTSC), BO; Tektronix WFM 300, $750; Tektronix 601 M Serial component monitor, $5500; Tektronix 601 A monitor, $4500; Tektronix 601 serial component monitor, $3500; Tektronix 1755a Waveform/Vectorscope dual standard (PAL & NTSC) composite & component, $2995; Tektronix VM700a. $9,000. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Panasonic BT-LH2600W 26" multi-format LCD, new, call for price; Ikegami TM20-20R w/SDI option, BO; Sony PVM-14M4U w/SDI, call for price; (10) Sony PVM-14M4U, call for price; Sony BVM-14F1U, BO; Sony BVM-14E5, BO; (2) Sony BVM-20F1U, $2100/ea; (2) Sony BVM-20E1U, $2300/ea; (15) Sony PVM-96 9" BW monitor w/16:9, BO. 908-879-9590 or www.mccominc.com.

Sony 14" HD monitor, $1000; NEC 9" monitor, $150; NEC 19" PM1971A color monitor, $250; (2) Mitsubishi computer monitors, $100/ea. TheVideoGroup, 817-891-8080.

SERVERS

Want to Sell

Tektronix PDR-100 analog server, $3800; Tektronix PRS200A 20x9GIG server, $4800. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

SIGNAL PROCESSING

Want to Sell

Convergence ECH-HD large HD playout turnkey system, $31000; Darim Vision FDSR2000 playout turnkey system, $11995; Convergence ECS-550LT Media Lite D.Co 1 chnl TV automation turnkey system, $7395; Convergence ECS-650P Digitizer Pro Media D. Co TV automation turnkey system, $39885; Chyron INFINIT! CG, $7999; Chyron MAX CG, $3690; D.Co MediaPlay CG, $2395; DaVinci 2K 3 Power tiers color corrector, BO; Blackmagic Multibridge HD-SD encoder/decoder, $1795; Darim Vision MV401exp, $6995; Darim Vision MV410EXP, $6495; Leitch FR-6802 w/10 VSM-6801 serial DA, $3000; Tekniche Genesis 6001, $1600; Tektronix 2715, $8500; Sony HKDV501A, BO; Digital Vision DVNR1000 4x4 NR, BO; GVG M9131 SDI DA, $150; GVG 9560 PAL sync gen, $1150. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

(6) For-A CCS-4360 color correctors, BO; Chyron Maxine w/Xform II, $1500; Pinnacle DVExtreme 3-chnl SDI DVE, call for price; Pinnacle Lightning 2-chnl SDI stillstore, $3500; Axon ARC-2000 aspect ratio converter, $1800; Chyron Infinit 060, SDI, BO; Leitch X75HD, call for price; GVG DPM-700 dual chnl, BO; Sony BVE-2000, $2000; Sony PFV-L10 tray w/10-BKPF-L603 SDI DA 1x8, BO; GVG 8500 w/8-8501 video DAs, BO; GVG 9520A sync gen w/TSG, BO; Chyron MAX, BO. 908-879-9590 or www.mccominc.com.

(2) ADC-24 video patch panel w/10 video patches, $475/ea; Sigma BSG-26N black signal generators, $175; Kramer VM-3V video DA, $75; TC-100E up/down converter; VDA-100A video DA; (2) Prime Image IBC+, $225/ea. TheVideoGroup, 817-891-8080.

SOFTWARE

Want to Sell

Apple G4 933mhz with Kona SDI I/O card, BO; Avid Symphony Nitrus, newest hardware & software, BO; Avid LVD MediaDock, $2295. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

SWITCHERS

Want to Sell

Panasonic WJ-MX50/30 Tally light upgrade, www.knr.net/tally.htm, 248-557-8276, K&R Research & Design.

Thomson 9200 8-input SDI switcher, BO; BTS DD10 16-input SDI switcher, BO; Echolab DV7 Switcher, BO. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Philips DD30 32 SDI switcher, call for price; GVG 200-2 loaded, $5500; Sony DVS-6464M 128x128 SDI router, BO; GVG 1200 w/10 SDI Ins & chroma key, BO; Pesa 24x16 Lynx VAA router, BO; Sony DFS-300, $2000; Leitch VSM-4044MB 4x4 vid router, $200; GVG 200/3000/100CV/110/Master 21 boards & ps, BO; Sony DVS-6464 64x64 SDI router, call for price; Pro-Bel TX320 master cntrl system, call for price. 908-879-9590 or www.mccominc.com.

Videotek Prodigy 8-input SEG, BO; (2) Comprehensive 1x5 audio/video switchers, $20/ea; (2) Panasonic WJ 225R 1x12 switchers, $375/ea; GVG 100 SEG w/serial, border, Chroma Keyer, $1500. TheVideoGroup, 817-891-8080.

Snell & Wilcox Kahuna 4 M/E HD/SD switcher, BO; GVG M-2100 master cntrl switcher, $19600; GVG 100N prod switcher, $2499; GVG IPS-110 prod switcher, $6999; Sony DVS-8000C 2 1/2ME standard def prod switcher, BO; GVG 20-TEN w/20-Ten0SA stereo audio routing switcher, $5500; GVG 7000 very large matrix w/SDI video routing switcher, $85400; GVG Series 6000 32x32 VAA w/5 panels routing switcher, $8600; Leitch 128x64 V6 Integrator w/10 panels, $31500; Leitch 16x1 routing switcher, $1100; Lighthouse K Series 32x32 SDI vdieo, AES audio routing switcher, $11000. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

PROFESSIONAL SERVICES

TELECINE

Want to Sell

Thomson Shadow complete telecine suite, $725000; GVG Spirit, BO. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

TELEPROMPTERS

TEST EQUIPMENT

Want to Sell

Leader 5850c, $750; Leader LV 5100D, $3495; Leader LV-7700 HD/SD rasterizor, (new) $6,500; Tektronix TSG170D Digital Composite Generator, $1500; 171 PAL sync generator, BO; TPG625 PAL pattern generator, BO; SPG 271 PAL sync pulse generator, $2250; TSG 371 PAL test signal generator, $1200; (2) TSG422 w/ECO changeover unit, $2500. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Tektronix 1750 combo wfm/vec, $1000; Tektronix 1740 combo wfm/vec, $900; Tektronix 1735 NTSC/PAL wfm, $950; Tektronix 1730D wfm, $950; Magni MM400, BO; Tektronix 1730/1720 wfm/vec, $850; Tektronix WFM-610M SDI wfm/vec, $4500; Tektronix 1750A combo wfm/vec, $2000; Leader LV-5700A HD/SDI wfm/vec, call for price; Tektronix 1780R, BO; Leader 5870 combo wfm/vec, BO; Tektronix 760A, BO. 908-879-9590 or www.mccominc.com.

Horita BSG-50 blackburst, sync pulse & tone gen, $275. TheVideoGroup, 817-891-8080.

Tektronix 1720 vectorscope, $900; Tektronix 1730 waveform monitor, $900; Tektronix WFM-601E waveform, $5200; Tektronix WFM601i waveform, $3750; Tektronix 1740A waveform/vector, $2950; Tektronix 1750A waveform/vector, $3800; Tektronix VM700A, BO. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

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VIDEO PRODUCTION EQUIPMENT

Want to Sell

Darim Vision VS2010-STD Virtual Studio Video system, $22800; Darim Vision VS2020-STD Virtual Studio Video system, $34995. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

VTRs/VCRs/ RECORDING MEDIA

Want to Sell

Panasonic AJ-HD2700P w/down converter board D5 VCR & EQ, $22900; Sony BKFC-200 Playback systems parts, $4500; Sony BVU-950 3/4 U-Matic VTR/editor, $1799; Sony DNW-A220 Betacam edit system, $10650; Sony BVW-75 Betacam editor, $7250; JVC BR-D750U D9 digital-S editor, $3750; JVC BR-D350U D9 Digital-S plyr, $2250; Sony SRW5500 HDTV rcdr & plyrs, BO; Sony DIR1000H, new, BO. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

Sony UVW1800 Betacam SP Recorder, $3995; Sony BVW 75 Betacam Recorder, $4950; Sony DSR-80 DV Cam VCR, $3500; Sony SVRM-100A remote for UVW series VCRs, $200; Sony VO 9850 ?" U-matic recorder, $1500; Sony SVO5800 S-VHS Editing VCR, $1250; Panasonic 7350 S-VHS Editing VCR, BO. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Sony BVW-D75, call for price; Sony BVW-75 & Sony BVW-70's, call for price; Sony UVW-1800 w/4 chnl audio, call for price; Sony DVW-A500, call for price; Sony DVW-M2000, call for price; Sony PVW-2800, call for price; Sony UVW-1400A PAL, BO; Panasonic AJ-D580, BO; Panasonic AJ-D351, BO; Sony BKDW-515, $2000; Sony DVW-A500 PAL, call for price; PVW-2650 & BVW-65, mint, BO; Sony BVW-60's & Sony BVW-22's, BO. 908-879-9590 or www.mccominc.com.

Sony DSR 11 DVCam VTR xlnt cond, $1450; Sony PVV3 Betacam SP dockable, $1800; Sony BVW300A SP Betacam w/13x1 lens, great picture, $4900; Sony UVW100 SP Betacam w/lens, gd picture, $1800; Sony PVW2650 DT SP Betacam, $2300; Sony DSR-1 DVCam dockable VTR, $5000; Sony UVW1800 Betacam SP rcdr, $2700; Sony BVW-35 portable SP Betacam, $800; Sony VO 98000 w/TC reader, BO; Sony BVW-50 SP Betacam rdcr/plyr, take 90 min tapes, needs work, $1700; Ampex CVR-10, needs work, BO; Ampex CVR-65, needs work, BO. TheVideoGroup, 817-891-8080.

RENTALS

EMPLOYMENT

Broadcast Information Technologist : We are searching for an IT professional to work in a state of the art broadcast facility in Reno Lake Tahoe area. Duties will include maintaining video servers, LAN administration, wireless networks VOIP and video streaming equipment. Good communication skills in corporate environment and professional appearance a must. CBNT or MCSE Certification a plus. Send resume and salary history to jocon@pappastv.com. Pappas Telecasting is an equal opportunity employer and a drug free environment.

KECI Director of Engineering: KECI-TV, the NBC affiliate in Missoula, MT is seeking a Director of Engineering. Previous experience a must. A college degree or equivalent with SBE certification is required along with an FCC First Class or General License. EOE. See www.keci.com for more information. Please send cover letter, resume and references to: Charlie Henrich; KECI-TV; 340 West Main Street; Missoula, MT 59802.

Regional Manager – West Coast: Network Electronics, a world leader in 3Gbps routing and transport electronics for television and pro-video, has an immediate opening in the greater Los Angeles area for a dynamic and accomplished sales professional to take full charge of all field operations in California, Arizona and Nevada. Recent successful solutions-based selling of professional video-related electronics to the Southern California television and post community is essential, ideally both direct to end-users and through sales partners. This full time position reports directly to the CEO of Network Electronics U.S. Exceptional growth opportunity with attractive compensation package. For prompt consideration, please submit your resume in full confidence by email attachment sent to **tore@nordahl.tv** or call Tore Nordahl at 818-366-0448 for additional information. Get company details at **www.network-electronics.com**. An equal opportunity employer. No agencies please.

WLS-TV - Maintenance Engineer: Ideal applicant has a strong technical background in HD and SD digital video and audio systems, with a minimum of 5 years technical maintenance experience. Candidate must be a self starter. He or she must also exhibit an ability to work with Engineering and News personnel in a demanding environment. Applicant must be comfortable working in an IT – intensive environment. Autocad experience a plus. Job hours may involve nights and weekends. Salary per NABET/ABC Agreement. College degree in Electrical Engineering or SBE Certification preferred. Send resume to Kal Hassan, Director of Engineering, WLS-TV, 190 North State Street, Chicago, IL 60601. No phone calls, please. EOE.

STS is currently accepting **resumes for KU satellite truck operators.** C-Band, and ENG, experience a plus. Must have excellent driving record and references. Job requires flexible on-call schedule, which includes nights/weekends, overtime and travel. Please email your letter and resume to sts@mc.net or fax to (815) 728-1208. No phone calls please. Check out our website: stslivetv.com.

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NewBay Media Acquires IMAS Publishing

NEW YORK

NewBay Media LLC has acquired the assets of leading broadcast and professional audio trade publisher IMAS Publishing including the print and electronic properties of **TV Technology,** Radio World, Pro Audio Review and Audio Media among others.

In addition to adding these brands, the acquisition strengthens NewBay's global reach. IMAS publications reach professionals in six languages and over 100 countries worldwide with regional content and news from around the globe.

"IMAS and NewBay fit wonderfully together—we welcome the IMAS team to NewBay," said NewBay CEO Steve Palm. "The combination of NewBay and IMAS creates a clear leader in the audio, video, and broadcast markets and the ability to offer an ever-growing array of media and information solutions to our readers, marketing partners and advertisers—both here in the U.S. and around the world. IMAS's global publishing and distribution capabilities offer us exciting new opportunities to expand NewBay's brands internationally."

Stevan B. Dana, founder and president of IMAS, said that when he decided to sell his business after more than 30 years, he was intent on finding a buyer who could build the brands in the new media age. According to Dana, "NewBay has both the resources and the drive to make IMAS's industry-leading publications even stronger."

IMAS CEO Carmel King adds, "The IMAS team is excited about not only being part of a larger organization, but one with a similar mindset—build great publications, innovate and lead our categories. It's a great fit."

"I personally look forward to working closely with Carmel King and the entire IMAS team to build NewBay's capabilities online, in person, and in print," Palm said. "The combination of these two talented organizations is very exciting."

Under the terms of the transaction, NewBay acquires IMAS's award-winning brands, publications and Web sites, including **TV Technology,** TV Technology Europe, TV Technology Latin America, TV Technology Asia Pacific, Radio World, Radio World Engineering Extra, Radio World International, Radio World Francophone, Radio World Latin America, Pro Audio Review, Audio Media and Broadcast & Production Italy, as well as the contracts for the official show dailies for NAB and NRB. NewBay Media will retain IMAS's headquarters in Falls Church, Va., as well as the company's offices in the U.K. and Italy.

Vitec Group Buys MSC

SURREY, ENGLAND

The Vitec Group has acquired Microwave Service Corp. Vitec, a provider of broadcast, photographic and entertainment-related equipment and services, plans to further strengthen their broadcast technology position by adding MSC to the company's portfolio.

MSC sells, leases, installs and repairs microwave equipment used by the broadcast industry. It was founded by its current president, Warren Parece, who said the company will be a prime addition to Vitec's newly formed RF Systems unit.

"We are very delighted to be part of the Vitec Group family," said Parece. "MSC prides itself on delivering superior quality and service to our customers. Joining the Vitec Group RF Systems unit will enhance our presence, expand our product availability and uphold our level of service excellence."

MSC joins both RF Central and Nucomm as recent acquisitions of the Vitec Group RF Systems division.

Christie Purchases Vista Systems

CYPRESS, CALIF.

Christie, a provider of display technologies has acquired Vista Controls Systems Corp., makers of video processing systems, including the Vista Spyder. Financial terms of the deal were not disclosed.

The companies said the move creates a comprehensive source for image processing and projection solutions for professional display markets—combining the flexibility of Vista's video switchers and real-time windowing and composition products with Christie's projection systems.

According to the terms of the deal, the Christie and Vista transition plan ensures no disruption to employees, customers or business partners, many of which are already shared by both companies.

"The acquisition is an ideal 'marriage' of complementary technologies, whose combined power and performance have no equal in the industry," Clark Williams, president of Vista Controls Systems said.

Williams also said that Christie and Vista have a long history of working together in other installations. Christie and Vista solutions can be found in broadcast environments, including on the multidisplay set of "The CBS Evening News with Katie Couric."

Verizon FiOS Hits 1 Million Customer Mark

NEW YORK

Less than two years after launch, Verizon has reached the 1 million subscriber mark for its FiOS all-digital fiber-optic service.

The installation of service for the Rich and Marjorie Bayer family in Massapequa, N.Y. pushed FiOS to that milestone. In addition to data service, the Bayers are receiving voice service and FiOS TV via the fiber link. Verizon says that nearly half a million customers now are receiving television service via FiOS.

"Superior networks translate into great experiences for customers," said Virginia Ruesterholz, president of Verizon Telecom. "We're delighted to celebrate this day with the Bayers, who truly make the most out of every FiOS service. We appreciate that they, along with more than a million others, are leading the digital lifestyle revolution, and we're thrilled to be building a network that supports all of their needs."

Verizon is the only major U.S. telecommunications company to provide all digital, fiber-optic service on a mass scale to subscriber homes. It's now available in more than 1,700 communities in 16 states and provides downstream speeds between 5 Mbps and 50 Mbps. Upstream speeds range between 2 Mbps and 10 Mbps. FiOS TV is available to 3.1 million households in 11 states.

Tandberg Appoints Nuñez President of The Americas

ATLANTA

Tandberg Television, part of the Ericsson Group, has named industry veteran Al Nuñez to president of the Americas for the company.

Nuñez, who has more than 25 years of experience in the industry, will oversee all operations for the Americas in his new role. Nuñez will report directly to Eric Cooney, president and CEO of Tandberg Television.

"For more than a decade, Al has proven to be an integral part of the executive team," said Eric Cooney, president and CEO of Tandberg Television. "Due to his diverse background, market knowledge and proven success setting the strategic direction for our sales force, I have complete confidence that Al will drive the Americas organization to the next level of success."

Previously, Nuñez was the senior vice president of sales for Tandberg Television. The company said he has consistently reached record revenues each year and broadened its business partner program in the broadcast, cable, satellite and telco markets. Nuñez also serves on the board of directors for Mixed Signals, provider of digital content monitoring solutions, in which Tandberg Television retains part ownership.

Prior to Tandberg Television, Nuñez served as managing director and partner with Definitive Solutions, an IT solutions company.

Pixel Power Names New VP

BURBANK, CALIF.

Pixel Power, a U.K.-based provider of broadcast graphics systems, has appointed Mike O'Connell vice president for business development.

O'Connell will be responsible for increasing Pixel Power's North American market growth and in fostering relationships with customers.

Pete Challinger, Pixel Power's CEO, recognized O'Connell's addition to the company and acknowledged both his engineering and a problem solving skill set, as well as his knowledge of the international broadcast electronics community.

"Mike's long experience on both sides of the relationship—as an engineer and solution provider—will make him an invaluable partner for our customers," said Challinger. "Pixel Power prides itself on maintaining an intimate knowledge of and support for its customers' requirements. As the company expands its presence in North America, one of our top priorities is to bring the same high degree of attention and insight that customers in Europe and other parts of the world expect from Pixel Power."

O'Connell previously served as general manager for the Australian subsidiary of Gencom, and executive vice president of Quartz Electronics. His background also includes studio engineering work at TV3 Network, NZ and Television New Zealand.

O'Connell will be based at Pixel Power's U.S. headquarters in Burbank, Calif.

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D-12: Compact Enough for OB
Powerful Enough for Breaking News

The D-12 Digital Audio Control Surface

- mixing router based topology
- 5.1 surround sound plus 3 stereo masters
- COMPACT – 32 faders – 53" wide / 32" deep / 9" high
- router based source / destination selection
- paging channel strips – 64 channels on 32 faders
- scalable – up to 64 input faders
- routable mixes
- event storage and recall
- eight stereo subgroup mixes
- eight stereo sends
- eight mix-minus outputs (can be expanded)
- four DCM faders (digitally controlled groups)
- Bus-Minus (w/TB & solo) on every input (direct out)
- pan/bal, blend, mode, EQ/dynamics on every input
- delay inputs or outputs (frames or milliseconds)
- fullscale digital peak and VU metering
- two studios, CR and HDPN/Studio 3 monitors
- talkback communication (programmable)
- mix follows talent / logic follows source
- 12 user-programmable switches (comm, salvos, triggers, etc.)
- automatic failsafe DSP card option
- automatic failsafe CPU card option
- redundant power supply option
- switched meters with system wide access (including all console inputs and outputs)
- dedicated master, group and DCM faders (no fader sharing)
- motorized faders
- pageable fader option
- dedicated LCD display per function (EQ, Pan, Dynamics)
- multiple surfaces can share I/O

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THE DIGITAL AUDIO LEADER

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