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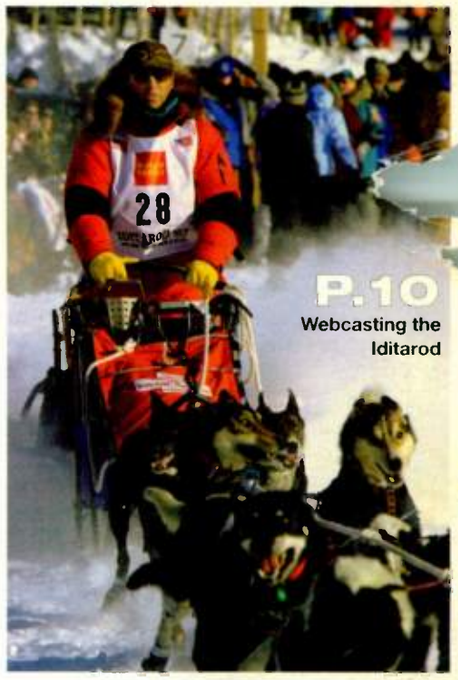

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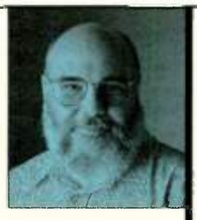
Andy Ciddor

Let There Be Lighting



If there's one thing that's more frustrating in a lighting director's life than a vision controller who pushes the auto-iris button then opens Sports Illustrated, an indecisive and parsimonious producer, a director full of great ideas but insufficient skills to realize them... p. 28

Wes Simpson

Video Networking

Error detection and correction technologies are crucial. They are present on every CD, DVD and hard drive sold today. They are used for satellite links, WiFi links, and many of the networks routinely used for video transmission. Adding some extra... p. 31

Dave Moulton

Inside Audio

Last month, I reviewed the Modulation Sciences SpiderVision Surround Sound signal level meter. As the lead-in to that review, I noted Lord Kelvin's dictum that to measure is to know.
Well, I spent a couple of days this past month using the... p. 32

FROM THE EDITOR

An Important 'First'

As one of the premiere American network broadcast companies, NBC can claim a number of "firsts" when it comes to HDTV: They brought late night audiences to hi-def with the launch of "The Tonight Show with Jay Leno," in HD eight years ago; they pioneered HD coverage of the Olympics and were among the first networks to produce a weekly variety show in HD with "Saturday Night Live."

Now they can claim what could be the most important firsts: the first regular daily network newscast in HDTV with the late March launch of "NBC Nightly News with Brian Williams."

Granted, early on, the only HD images viewers are seeing are in the studio; field reports will remain in SD for the time being. Nevertheless it's a significant step for the future of HD news.

NBC producers were decidedly humble about the move to HD, which involved building a new control room a block and a half away from the NBC Nightly News studio. Director Brett Holey described the move as an "evolution," rather than a "revolution."

Perhaps he appreciates the amount of work local broadcasters are doing to adopt their news programs to HD. Not a week goes by without a local station announcing its move to hi-def news. Some broadcasters shout it from the top of their broadcast tower, displaying graphics alerting viewers of the new higher-resolution format and posting educational materials on their Web sites. Others take a low-key approach.

Some broadcasters are understandably concerned about confusing or alienating those viewers who think the picture should be significantly clearer, regardless of what type of TV set they're watching. In addition, many viewers of widescreen sets are not particularly fond of the sidebars that pop up whenever programming is shown in 4:3.

But with millions of HDTV sets now taking up space in America's living rooms, those issues are becoming less and less of a concern. Broadcasters from small markets to major urban areas are making the move to HD news. In the coming months, they will be joined by their cable brethren, CNN and The Weather Channel, among others.

The ubiquity and importance that televised news plays in local broadcasting, as well as on the national stage, cannot be understated. The move to HD, while difficult and expensive, is inevitable. And apart from the initial move to digital transmission, it's one of the most important steps we can take to enhance the viewing experience.

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

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

The Young Ones

Dear Walter Schoenknecht:

You make excellent points in your column on teaching television production to kids, ("A Note to the Teacher," Inside Production, Feb. 7).

I'd like to add one additional piece: A teacher might point out that all this cool equipment doesn't design, connect or repair itself—there is a whole part of the business called "engineering" that makes it all possible!

From what I've seen, even at the college level there is very little mention of engineering as a necessary part of television production—both in terms of broad activities like setting standards and in day-to-day practice. In fact, I've been told that in some cases, professors of Mass Communications have scoffed at putting a waveform monitor into a control room because it's "too complicated."

Not only do kids need to know that they'd have nothing to produce without engineers, but perhaps some might be inspired to join our seemingly shrinking ranks!

Eric Wenocur
Silver Spring, Md.

Dear Walter Schoenknecht:

Boy, oh boy, your recent article brought back memories, ("A Note to the Teacher"). I began teaching video production in the 1970s and our cameras were Diamond STV-1s with, I believe, turret lenses and one was even adapted with a jury-rigged zoom. We thought we were doing great when we got that Sony color camera with a joystick zoom in the middle.

Now I occasionally volunteer for a local station and find that as you say, the production people never take a mic mixer on location, always zoom and don't even record split channel sound. All they want to do is zoom and pan instead of letting the action occur in the frame. I recently asked for a jib and felt that they only shot on sticks and by hand holding the camera.

During the days when I taught TV production; zooms were outlawed; scripts were required and mics on the camera were disabled!

Thanks for the walk down memory lane and here's hoping that today's teachers do not forget that not too long ago everyone believed in the three Ps of video: Preproduction, Production and Post Production and commands like: "quiet on the set," "roll tape," response 'tape rolling' and that now outdated "Take 2."

Seems everything today can be done in one take and without pre and post roll, I guess it's a miracle due to NLE!

The article was wonderful. Thanks again.

Tony Brazeau
Harrisonburg, Va.

Media Literacy

Dear Frank Beacham:

Once again you are right on! More than ever now we need a strong dose of media literacy, ("In YouTube Era, Watch For 'Macaca Moments,'" Net Soup, March 7). It needs to be taught in our schools right alongside English and Math, etc.

I certainly enjoy your articles; keep up the good work. Who knows maybe someday people will figure out that a lot of TV is about FTF (fooling the folks).

Grayson Mattingly
Irvington, Va.

TV TECHNOLOGY

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Fran
Ohio, k
Just as the
launching its 5 p.m
major story broke, forc

"We still needed to m hanges," Willson said. "As our anchor was on the air, we were off to the side deciding whether we should just go ahead and work underneath the set while he was broadcasting." Instead, they switched to a live field shot and moved the anchor into the newsroom while they finished the last technical details.

NEWS, PAGE 16

SPECIAL REPORT: HD NEWS

'NBC Nightly News' Goes HD

'The evolution will be televised,' director says

by John Merli

NEW YORK

When NBC News debuted the "NBC Nightly News with Brian Williams" in high definition March 26, it marked a milestone in the evolution of high-definition news.

"We are in the detail business, after all, and now you can see every last detail," anchorman Brian Williams said, alerting viewers that "NBC Nightly News" had become available in 1080i and 5.1 surround sound.

The transition of HD to the evening news staple extends the reach of daily national news in HD, following in the digital footprint of nearly a dozen local NBC affiliates whose HD news in each of its respective markets runs adjacent to the Williams newscast. (NBC affiliates represent about one-third of all local U.S. broadcasters currently airing local news in HD.)

NBC Nightly News Anchor Brian Williams

NBC News took a decidedly low-key approach during the HD premiere, flashing a brief "in High Definition" graphic at the beginning of the newscast. Williams didn't mention the fact until the last segment of the show.

'JUST ANOTHER STEP'

The subtle approach was very much intentional, according to the program's director, Brett Holey.

"I had written a blog entry on our Web site with a headline stating that 'the evolution will be televised.' It's a big step for us, but it's not a revolution. It's just another step along the way. The core business remains journalism and we think this is an impressive thing to be first, but it's not what we're all about."

Holey pushed for the conversion to 1080i

NBC, PAGE 14

Broadcasters Rely on Dolby® E for Backhaul

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2 GHz Relocation Hits Snags

Sprint Nextel expects to request more time for the project

by Deborah D. McAdams

RESTON, VA.

Replacing equipment for nearly 1,000 newsgathering operations has turned out to be a bit more daunting than Sprint Nextel originally anticipated. In its annual status report on the project, the telecom company said it needed more time to get the job done. "Sprint Nextel anticipates requiring an additional 12 to 24 months to complete the BAS transition," said the report, filed with the FCC in March. The project deadline is currently Sept. 7, 2007.

The undertaking is a result of Sprint Nextel's agreement with the FCC to move out of the public safety spectrum and squeeze into the 2 GHz broadcast auxiliary service band. Part of the deal, reached in late 2004, called for Sprint Nextel to pay for BAS gear made obsolete by the move.

Sprint Nextel spokesman Travis Sowders said the statement about needing more time did not represent a formal request for an extension of the deadline. However, he said, it was "pretty clear" from the status report that "we are going to have to be filling a formal request."

Just when that request will be made, and for what length of time, had not yet been determined, he said.

Sowders was not aware of any specific ramifications for missing the Sept. 7 deadline. Multiple queries to FCC personnel about potential ramifications received no response.

The status report, filed with the FCC March 7, detailed some of the unforeseen complications that slowed the process.

Early on, a dispute emerged over whether Sprint Nextel or broadcasters would have to pay the property taxes on replacement equipment. The IRS eventually ruled that because the relocation was involuntary, new equipment would not incur additional taxes.

Then there's the way that some BAS operations have been cobbled together over time.

"Some of this equipment is 30 years old or older, and can prove difficult to locate because it is used only occasionally or kept as a backup in a remote location," the report said. "Often, BAS equipment is located in difficult-to-reach places—on towers, on rooftops, in vans, in helicopters and even on devices mounted in blimps. To inventory this equipment, Sprint Nextel and the licensee must use specially trained vendors who are in short supply and may also require local governmental approval prior to accessing."

Sources familiar with the project said that equipment has even been lying out in a field, but regardless of the location or state of decay, gear must be produced to be replaced. Since the relocation expenditures count against the $3.2 billion Sprint Nextel will owe for the spectrum it's moving into, a complicated paperwork process was established for every phase of the project. Everything down to tie-wraps has to be documented, verified, reverified and priced out within a standard range. Sprint Nextel said the resultant pile of paper would stand two stories high.

> "Sprint Nextel anticipates requiring an additional 12 to 24 months to complete the BAS transition."
>
> —Sprint Nextel

The company reported that it already laid out $186 million for 12,000 pieces of new BAS gear. The equipment came from a select group of specialized manufacturers who ramped up production to meet the anticipated need. Nucomm, in a separate statement to the FCC, said it nearly doubled its workforce and went from producing five or so systems a week to 30 or 40. MRC said it went from 60 to 120 employees and also expanded its production area.

Additional complications also are coming from across the border and from BAS operators who don't hold spectrum licenses. Canada is saying the relocation constitutes a new use of frequency and therefore requires Canadian approval. Fox and Entravision are arguing that unlicensed BAS operators will also have to replace gear, and that Sprint Nextel should pay for it. (Broadcasters are allowed to use the BAS spectrum for up to 720 hours a year without a license.) Sprint Nextel disagrees.

Yet another complication in the mix is the anticipated entry of mobile satellite service (MSS) providers into the 2 GHz BAS band being vacated by broadcasters. MSS operators don't have to replace BAS gear for broadcasters in markets 31-210, so if Sprint Nextel doesn't get there first, small market broadcasters may get stuck paying for their own relocation.

And finally, there is the matter of the BAS operations themselves. BAS comprises electronic newsgathering, which in turn, goes on 24/7. The timeframes in which Sprint Nextel transition teams can actually replace and return BAS gear are very limited, as the report indicated.

"Installations must occur late at night and cannot take place during weekdays, sweeps periods, holidays, elections or during major news and national and local sporting events," it said. That leaves less than 30 weekends to transition 198 markets. ■

ATSC Mobilizes

WASHINGTON

The Advanced Television Systems Committee intends to develop a mobile DTV transmission standard. ATSC-M for "mobile," and ATSC-H for "handheld" will be targeted at the distribution of free and subscription TV, interactive services and "nonreal-time" downloads within the 19.39 Mbps terrestrial broadcast payload.

"The ATSC-M/H standard will facilitate broadcasters' use of their DTV broadcast channels to provide new services directly to small handheld receivers, laptop computers and vehicles moving at a high rate of speed," said ATSC President Mark Richer. "ATSC-M/H will be backward compatible, allowing operation of existing ATSC services in the same RF channel without an adverse impact on existing receiving equipment."

(See "Strategic Plan to Guide Future Work on DTV," p. 30)

The announcement came just a week or so after Harris and LG Electronics unveiled a joint effort to develop a mobile DTV standard. LG subsidiary Zenith is the primary patent holder on 8-VSB, the terrestrial DTV transmission standard in the United States. The Harris/LG technology is going by the acronym, "MPH," for "mobile, portable, handheld." MPH is also said to be backward compatible with 8-VSB, and was demo-ed at the ATSC Hot Spot NAB2007 last month.

Both standards will compete in the mobile arena with A-VSB, developed by Samsung and Rohde & Schwarz, and demonstrated at last year's NAB convention. A-VSB is currently in the standards pipeline at the ATSC.

Standards Standards **Standards**

Zenith Files 8-VSB Lawsuit

TEXARKANA, TEXAS

Zenith is going after several TV makers that it claims are infringing on its 8-VSB patents. The company, a subsidiary of Korea's LG Electronics, developed the eight-level, trellis-coded, vestigial side band technology that became the terrestrial DTV transmission standard in the United States.

In a suit filed April 4 in U.S. District Court in Texarkana, Texas, Zenith claims that a dozen of its patents were infringed upon by Funai, Westinghouse Digital, Polaroid and parent company, Petters Group, Vizio, Akai, APH USA and Syntax-Brillian.

According to the suit, Zenith wants the court to make the infringement stop, and award it three times the amount that the skirted license fees would have represented. It's also asking to be awarded attorney fees and other costs associated with the lawsuit.

A Zenith spokesman declined to comment on pending litigation as a matter of company policy.

Since the suit was filed, Syntax-Brillian, headquartered in Tempe, Ariz., has settled with Zenith, according to a report in TWICE.com. The same publication reported that Funai last month filed suit against some of the same defendants, also for patent infringement. In that case, Funai claimed Vizio, Petters and Syntax-Brillian were using a technology for which Funai held an exclusive license.

Funai, based Osaka, Japan, makes TVs under its own name, as well as Symphonic, Emerson and Sylvania

Lawsuit Lawsuit **Lawsuit**

THE GREEKS ADDED ALL THOSE COLUMNS TO THE PARTHENON BECAUSE THE ARCHITECTURE DEMANDED IT.

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Technicolor Advances Digital Cinema

Company anticipates beta test to be completed by year's end

by Jay Ankeney

LOS ANGELES

In what may become the largest installation of digital cinema screens ever, Technicolor Digital Cinema is in the midst of a beta rollout program intended to test technologies that could bring digital theatrical entertainment to 5,000 screens within the next four years, and up to 15,000 screens throughout North America and Europe over the next decade.

Since 1999, as part of the services division of Thomson, Technicolor Digital Cinema has managed and distributed more than 130 titles for eight studios representing more than 400,000 digital presentations worldwide.

The rollout—which is expected to be completed toward the end of this year—will involve the distribution of DCI-compliant media files, JPEG2000 digital cinema servers, 2K or 4K projectors capable of both 2D and 3D presentation along with all the related workflow management and infrastructure monitoring systems. The systems comply with the Digital Cinema Initiative, a specification approved by Hollywood in 2005 to standardize the distribution of digital cinema material.

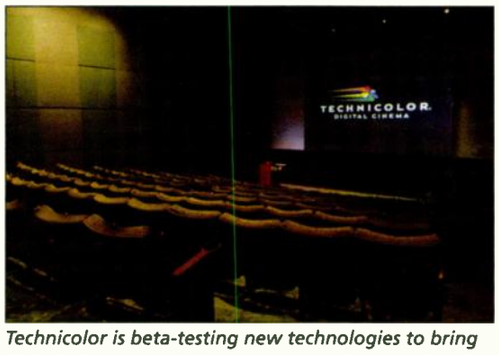
END TO END

Technicolor is calling this initiative a "beta rollout" with the intent of remaining technology-agnostic during the extensive testing process. In addition to providing digital mastering services, Technicolor will be the only systems integrator deploying projectors from all the leading digital cinema equipment manufacturers such as NEC, Barco, Christie and Sony in prominent exhibition chains including ArcLight Cinema Company, Mann Theatres, National Amusements, Wehrenberg Theatres, Zyacorp's Cinemagic Stadium Theatres, and Kinepolis Group in Belgium.

"There are still many things to be worked through involving DCI compliance, data management, adherence to FIPS [Federal Information Processing Standards] security and general workflow issues." said Curt Behlmer, chief operating officer of Technicolor Digital Cinema, "So we set out in the middle of last year to deploy multiple configurations of equipment to see how well they function together. We'll be installing a maximum of 250 systems over a period of 12 to 24 months to work through these issues before launching a full deployment to let the technology catch up with the users' requirements."

With approximately 35,000 theater screens across the United States. Behlmer said their ultimate goal is to get Technicolor Digital Cinema presentation systems in close to a third of the existing feature film venues.

This will involve four main lines of business from Technicolor: digital content mastering/encoding at their Burbank, Calif., and London facilities; distribution on hard drives or via satellite to Technicolor Digital Cinema and other theaters, including key management to unlock the content; system installation, integration and pro-active monitoring services; and SkyArc mastering and distribution supporting pre-show advertising for Screenvision, a Technicolor movie theater advertising company.



Technicolor is beta-testing new technologies to bring digital cinema to 15,000 screens over the next decade.

Initially, most of the in-theater playback servers involved will be DCP-2000 models from Doremi Cinema since it was the first server system capable of playing JPEG2000 digital movies to hit the market. Doremi Cinema was able to deliver 250 JPEG2000 servers for the March 30 release of Disney's "Meet the Robinsons" in Disney Digital 3D.

"Many of the other server manufacturers had gambled on using MPEG-2 technology," said Michael Archer, vice president of sales at Doremi Cinema LLC, a division of Doremi Labs Inc. in Burbank, Calif. "But when the DCI specified JPEG2000, Doremi already had existing storage systems using that file format that we could quickly implement into digital cinema servers. The DCP-2000 can also handle other compression formats that may be used for preshow presentations, but feature film playback will have to be JPEG2000. JPEG2000 also lets you play out the 2K resolution layer from a 4K package which many exhibitors see as a future necessity, and we have a 4K server scheduled for release in Q2."

PIRACY FEARS

But one concern that has made some studios hesitant to climb aboard the digital cinema bandwagon has been the fear of rampant piracy cutting significantly into profits. Technicolor Digital Cinema's installations will benefit from CineLink II encryption which is a form of strong link encryption required by the DCI specifications that was invented by Texas Instruments' DLP Cinema division. With CineLink II, the image data is encrypted using an AES (Advanced Encryption Standard) algorithm that the National Institute of Standards and Technology developed to replace the previous Triple DES, also known as "Triple Data Encryption Algorithm."

"AES is used to encrypt a JPEG2000 movie delivered to a server, and the server gets a key to decrypt it on the fly," said Reiner Doetzkies, director of technology for DLP Cinema at Texas Instruments. "Then the expanded file is re-encrypted with CineLink II when it is sent to the projector over dual coax cables running at 1.5 Gbps each. The studios recognize that this is considered the highest level of strong encryption to protect their intellectual property."

This algorithm has been under review by the top experts in the crypto community but as with earlier encryption processes it could still eventually become vulnerable.

"If that happens there is a mechanism to refresh CineLink II in firmware at the chip level by upgrading to a different algorithm," Doetzkies said. "That should help keep us ahead of pirates working from within a theater's server/projection system."

But once a digital cinema presentation hits the big screen, pirates often sequester themselves in the audience with a camcorder to video their illegal copies.

The bulwark against this kind of thievery is digital watermarking for which Technicolor Digital Cinema will be implementing NexGuard invisible watermarking developed by the Thomson Content Security team. Thomson's watermarking technology embeds an invisible forensic mark in both the audio and video of a digital cinema movie through a data replacement process. This hidden information includes the date and time of playback along with a unique location ID of the screen.

"We add these two pieces of information into the content for real-time playback after decoding by the server," said Jian Zhao, chief technical officer at Thomson Content Security. "Pirates using a camcorder could not even detect that the watermark is there since the encryption involves modulated signals. After all, the camera can receive more information than humans can hear or see which means they won't know if they are going to be caught."

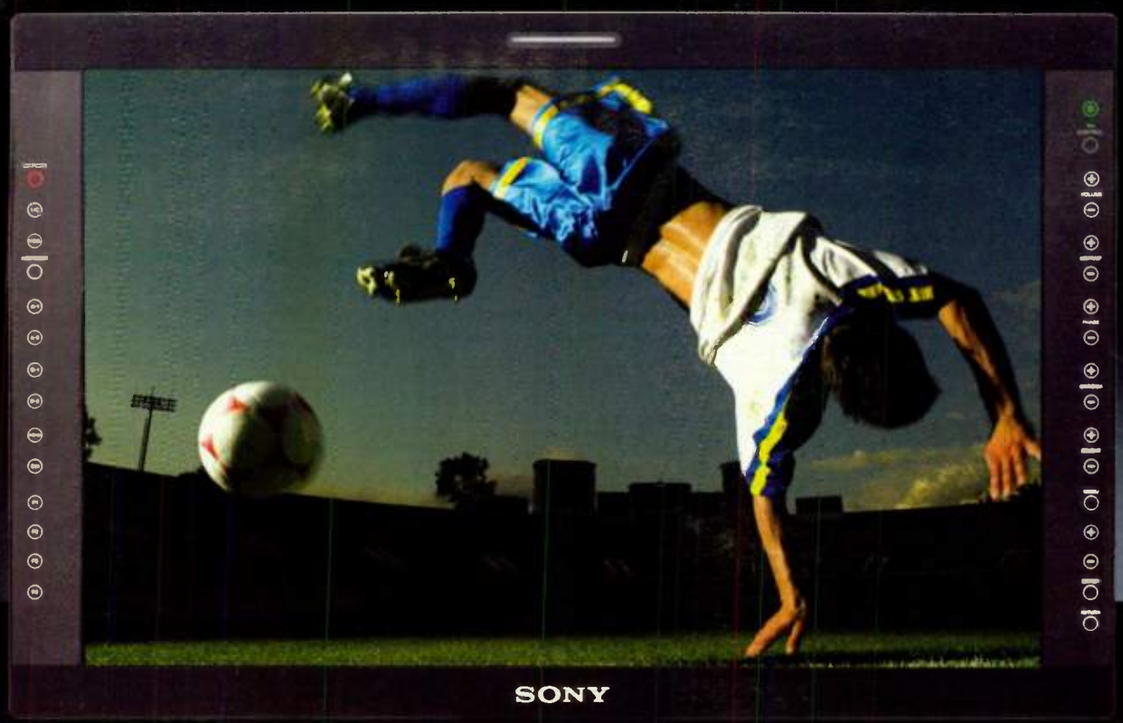
So with secure encoding, encrypted delivery, server-level decoding and watermarked play-out backed by aggressive anti-piracy offensives from all the studios, this new technology infrastructure should provide the intellectual property protection Hollywood has been demanding before adopting digital cinema exhibition.

"We have been serving the studios and exhibitors for over 90 years and have mastered more digital titles than anyone else," Technicolor's Behlmer said. "So we feel that if this beta rollout results in a single point of contact to manage future forms of theatrical distribution, it is really just an extension of our core business." ■

"We'll be installing a maximum of 250 systems over a period of 12 to 24 months to work through these issues before launching a full deployment to let the technology catch up with the users' requirements."

—Curt Behlmer, Technicolor Digital Cinema

SONY



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Mush! Panasonic Streams Iditarod in HD

Producers in the field use P2 to post daily HD updates on the Web

by Mark R. Smith

ANCHORAGE, ALASKA

Between the starting line in Anchorage and the finish line in Nome, it's a 1,122 mile endurance test that includes hubs in such tiny dots on the map as McGrath and Unalakleet. It's run up one side of the Alaska Range and down the other, through the bitter cold of the Interior and the whipping winds off the Bering Sea coast.

It's the Iditarod Dog Race. And if you think it's tough on the participants, just imagine how the crew felt.

In a word, "c-c-cold."

"We slept out in the Alaska wilderness in tents," said Greg Heister, producer of an HD Webcast of the event. "We roughed it."

And rough it they did, but still accomplished their mission—to successfully Webcast the famed event (www.iditarod.com) in HD using Panasonic's P2 technology after a tough learning experience in 2006.

IF AT FIRST...

An attempt to broadcast the race in a timely manner on the Web site failed last year, and that had everything to do with the choice of equipment, Heister said.

"We shot with Beta SP cameras, used a big deck and tower CPUs, in addition to lugging around a C-band transmitter" that weighed upwards of 400 pounds, he said.

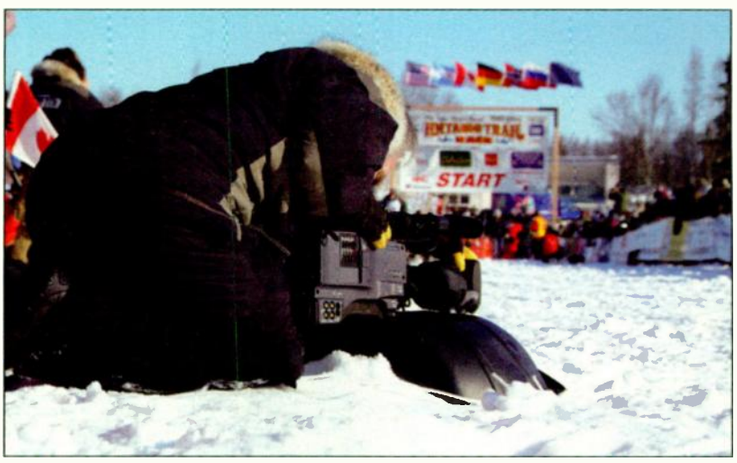
All of that equipment had to be transported up and down the trail before the crew could transmit any content.

"In the end, it was a waste of time getting the video on the Web site 10 hours after the fact, since viewers come to the Web for the immediacy," he said.

This year, it was the Internet, combined with Panasonic's P2 HPX 2000 and HVX 200 cameras, a hard drive, a P2 player that weighs about a pound and can be inserted into a laptop, and an Ethernet line that made the difference.

"Minus the cameras, the equipment weighs less than 12 pounds," Heister said, "and it all fit in a backpack. That's a huge deal in the Iditarod, because we're flying down the course in two-seat Cessnas with wheel skis."

A gyroscopic Wescam mounted in a helicopter to accentuate the coverage was also used to acquired content in P2. It was part of an equipment list that included products from Canon (lenses), Anton/Bauer (batteries and lights), Apple (computers), Imagine Products (logging software), Porta-Brace (insulated camera cases), Sachtler (tripods) and Schneider Optics (filtration).



Barry Green gets the shot at the Iditarod re-start with the new AG-HPX500 P2 HD camcorder.

> **"In 10 days, we posted 300 clips of video and interviews, from one to three minutes long each, within minutes of the action."**
>
> **—Greg Heister, producer**

The project included two crews who produced the race on snowmobiles between checkpoints; plus three more that would leapfrog each other between the various stops. The result was a huge increase in the amount of content that was produced.

"In 10 days, we posted 300 clips of video and interviews, from one to three minutes long each, within minutes of the action," Heister said. "This year it was about 25 a day. Last year with the C-band, the best we could do was about five or six clips a day."

In fact, he said results were so instantaneous that the clips were posted on the Web site "long before any other media covering the race."

TO THE RESCUE

Jan Crittenden Livingston, product line business manager for Panasonic Broadcast in Secaucus, N.J., said that the plan to cover the race originated with a local district manager who introduced her to Chas St. George, who handled public relations for the Iditarod Trail Committee.

"It made sense that they decided to use P2 HD," Crittenden Livingston said, adding that the crew had been planning to shoot in SD with DVCPRO 50 before concerns about the storage capacity for the HD broadcast turned out to be for naught.

Indeed, the P2 technology was ready for primetime, so to speak. And she liked the challenge of shooting the race in the extreme weather.

"There are a number of stories on our Web site about cold weather shooting, but nothing quite like this as I recall," Crittenden Livingston said. "But I liked this concept due to the documentary nature of the shoot."

The experience of the crew was another plus. "The crew Panasonic sent [consisted of] seasoned P2 shooters," she said. "The only thing we had to do was to pay for warm clothing and a couple of sleeping bags."

Each member of the team came to the shoot with his own expertise; like Art Aldrich, who designs Mac systems and teaches Final Cut Pro courses. He was "extremely useful in helping to configure a workflow," Crittenden Livingston said. "C.R. Caillouet made sure the shooters knew how to run the big cameras and Barry Green, the smaller cameras. Overall, the [images] had a nice look."

Aldrich, a partner with Odyssey Tek N.J. and one of five consultants that trained the staff, said, "We trained the Iditarod production team on the P2 equipment for a week before the race." (In addition, the consultants trained one Varicam shooter and a few more crew on using a P2 mobile editor for Versus, the Comcast-owned cable sports channel, which broadcast parts of the race in highlight shows. "Nightline" also broadcast a segment about the race).

When the race started, the training crew left and the Panasonic tech crew took off with the racers. "Last year, the C-band transmitter and the editing system were airlifted to every point where the producers wanted to upload footage," Aldrich said. "The weather made that a disaster from a daily update standpoint. This year, the portability of the P2 system was the key," he said.

But Heister was skeptical of the new plan working before the race. "I didn't know this Panasonic technology well and the trail is the worst place to test gear," he said.

"I've seen every tape format fail, back to 3/4-inch, Beta, etc. in the 45-degree-below cold of a ground blizzard," he said. "But aside from dropping it in a lake, this technology went through every hardship that you can dream of and held up extremely well. It didn't freeze up."

Panasonic video consultant Michael Caporale shoots musher Paul Gerbhardt with a P2 camera on the Iditarod trail.

In the end, using P2 technology to produce the race made all of the difference. "We were able to offer viewers something that was never done before," he said, "and now, we have a solid foundation and can probably find a way go live from each [of the 20-plus] locations at some point."

The news element made the approach even more justifiable. "When people wanted news, they were coming to us before The Associated Press and any local TV station or newspaper in Alaska. We're all real proud of our team and we really made progress," Heister said.

It sounds like being part of what is known as "The Last Great Race on Earth" is easily worth the hardships. "This is the greatest story to tell in sports and, if you're a storyteller," he said, "you should want to die to tell this story." ■

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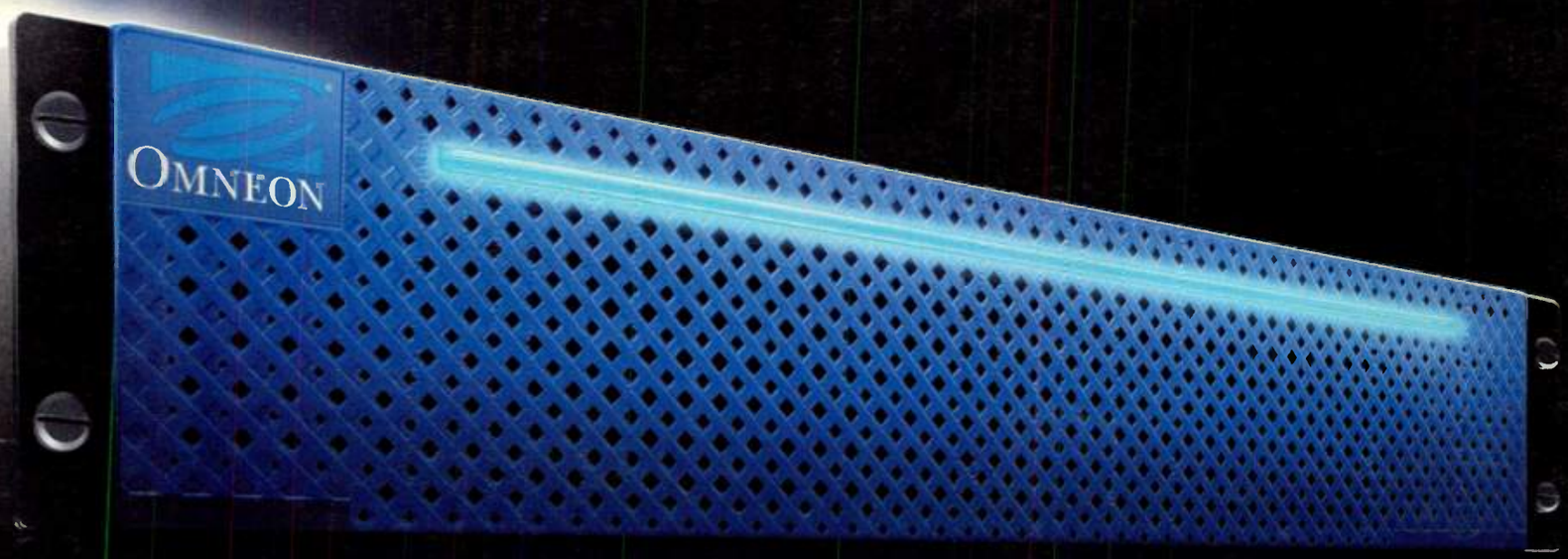

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...how '07: Convergence & Creativity

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By Gary Arlen

LAS VEGAS

When the National Cable and Telecommunications Association unveiled its agenda for Cable Show '07, May 7-9 in Las Vegas, the most obvious missing ingredient was public policy—more specifically, the traditional corps of Capitol Hill and FCC delegates did not appear on any sessions.

NCTA executives said they expect a contingent of FCC, Commerce Department and Congressional policymakers (among others) to accept invitations, albeit possibly at the last moment. Given the recent contentious comments about cable TV from the FCC and Congress, the policy-makers' presence—and their possible remarks—could become a "fireworks index" for the industry.

Whether or not federal officials bring their insights to the 56th annual NCTA convention, the three-day agenda includes a more-expansive-than-ever range of business and technology—reflecting the cable industry's moves towards Internet Protocol (including IPTV), wireless and commercial services. NCTA has also extended its alliances with other cable associations to present technical, business and operations ideas and products in the conference and exhibit halls at the Mandalay Bay Convention Center.

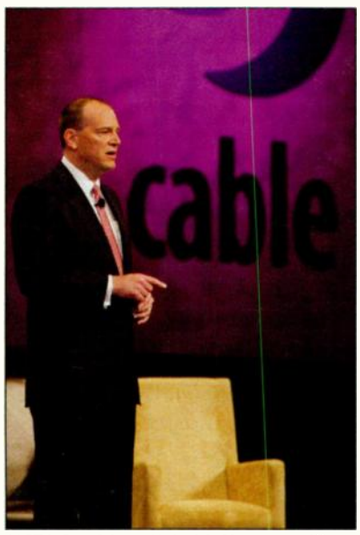
Industry topliners, appearing on the "State of the Industry" and other keynote sessions, include Comcast Corp. CEO/Chairman Brian Roberts, Time Warner Inc. CEO/Chairman Richard Parsons, Walt Disney Company CEO/President Robert Iger and News Corp. COO/President Peter Chernin.

August Busch IV, president and CEO of Anheuser-Busch, will keynote a "Sponsoring the Future" session, focusing on advertising, run with the Cabletelevision Advertising Bureau.

CAB has moved its annual spring conference under the NCTA convention umbrella. More than three dozen program network companies (many of them offering multiple channels) flesh out the video content sector of the exhibit halls, including many services focused on broadband, streaming and on-demand distribution.

In collaboration with CableLabs, the industry's research consortium, Cable Show '07 will start with a two-day OCAP Developers Forum, "OCAP—Interactive and More." The program will provide an in-depth look at CableLabs' OpenCable Applications Platform, which is designed to foster unified, open standards to speed the development of interactive applications.

NCTA and CableLabs expect that program network creators, along with broadband designers, will attend the 11-sesssion forum, May 6-7, just before the main convention program begins. In addition to specialized technology descriptions, the forum will include an OCAP "roadmap" from the top technology executives of the largest cable multiple system operators: Mark Hess from Comcast Corp., Mike Hayashi from Time Warner Cable, Chris Bowick from Cox Communications and Arthur Orduna from Advance/Newhouse Communications.



NCTA President Kyle McSlarrow will give the state of the industry address on Tuesday, May 8, 9:30 a.m. in the Mandalay Bay Ballroom J.

For the third year in a row, the OCAP training tracks will be run by Vidiom Systems Inc., a Broomfield, Colo.-based developer of interactive television technology. Now, with the looming deployment of OCAP devices, NCTA wants to "build awareness among third-party developers about the platform, toolkit and roadmap," said Mark Bell, NCTA vice president of industry affairs.

Among the more than 40 business and technical sessions, Cable Show '07 features five management sessions dealing with new technology and three more about information technology. A separate track of "cable gaming" sessions is returning to this year's show, with presentations about distribution, publishing and leveraging IP networks for videogaming.

Although HDTV is high on NCTA's political agenda, the topic has become mainstreamed into the convention program. Sessions focus more specifically on emerging technology issues, such as "Asset Management in a Multiplatform World," "Transport and Networking in the Optical Age" and "The Next Leaps in Digital Rights and Conditional Access."

NEW TECHNOLOGIES

CableLabs is also coordinating its annual CableNet pavilion, an integrated technology exhibition area that showcases cutting-edge technology. About 40 displays—roughly the same number as last year—will demonstrate not only new transport and display systems, but the ability to inter-network with various cable devices. Several new exhibitors are introducing customer-generated video production tools, and there are "more home alarm and security demonstrations than I can recall from prior years," said CableLabs senior vice president Mike Schwartz.

"Our goal with CableNet is to continue to have a technology showcase where attendees [can] catch a glimpse of... future opportunities," Schwartz said.

Several OCAP-compliant devices and the first OpenCable high-definition set-top box will debut at CableNet. Many CableNet participants are focusing on IPTV and Web-based components.

Samsung Electronics claims that its SMT-H3050 OCAP hi-def set-top box enables HD viewing while running bound and unbound applications. Samsung will also display a dual-tuner OpenCable HD DVR that uses a multistream CableCARD to simultaneously decrypt and record two streams of digital cable to a 160-GB hard disc drive.

Representing the computer industry's growing participation in the cable industry, Advanced Micro Devices Inc. will show an OpenCable 2.0 hardware platform for development of integrated bidirectional digital cable ready TV.

Sofia Digital will demonstrate its Backstage Browser Platform for OCAP, a comprehensive XHTML microbrowser solution running on top of OCAP for deploying interactive services. NDS will show its latest interactive applications and production tools for existing cable and new OCAP set-top boxes. NDS will also unveil its next-generation user interface, geared to advanced, high-definition set-top boxes.

Among CableNet's wireless displays is Aurora Networks' LcWDM, a newly developed technology that maximizes the installed fiber infrastructure through single-fiber utilization.

Many exhibitors at CableNet will focus on the growing interconnection of the Web and voice services. For example, Clique Communications will demonstrate its SIP-compliant Clique Video Phone, which offers real-time video messaging and videophony through a DOCSIS connection over the Internet. Comverse will exhibit Personal TV BlogCast that enables users to broadcast live video content to any device over IPTV and IMS. Front Porch will show a direct-to-the-browser communication solution that lets cable companies target and send to any high-speed Internet subscribers any message or content without client-side software.

At its CableNet exhibit—separate from its parent company's sprawling main booth—Motorola's Connected Home Solutions group will focus on DOCSIS 3.0 channel bonding for IPTV, showing how the technology can be used to deliver multicast, high-definition IP video streams to an IP set-top box.

BEYOND CABLE

"Technology changes, the fundamentals don't. That's what makes it interesting," said Dan Pike, who chaired the NCTA committee that selected the 40 technical papers that will be delivered during the show. About "150 qualified abstracts" were submitted, and Pike said it was challenging to winnow the roster down.

"The papers look a little ways ahead," while on the show floor, there are things "that are a little more immediate," he said.

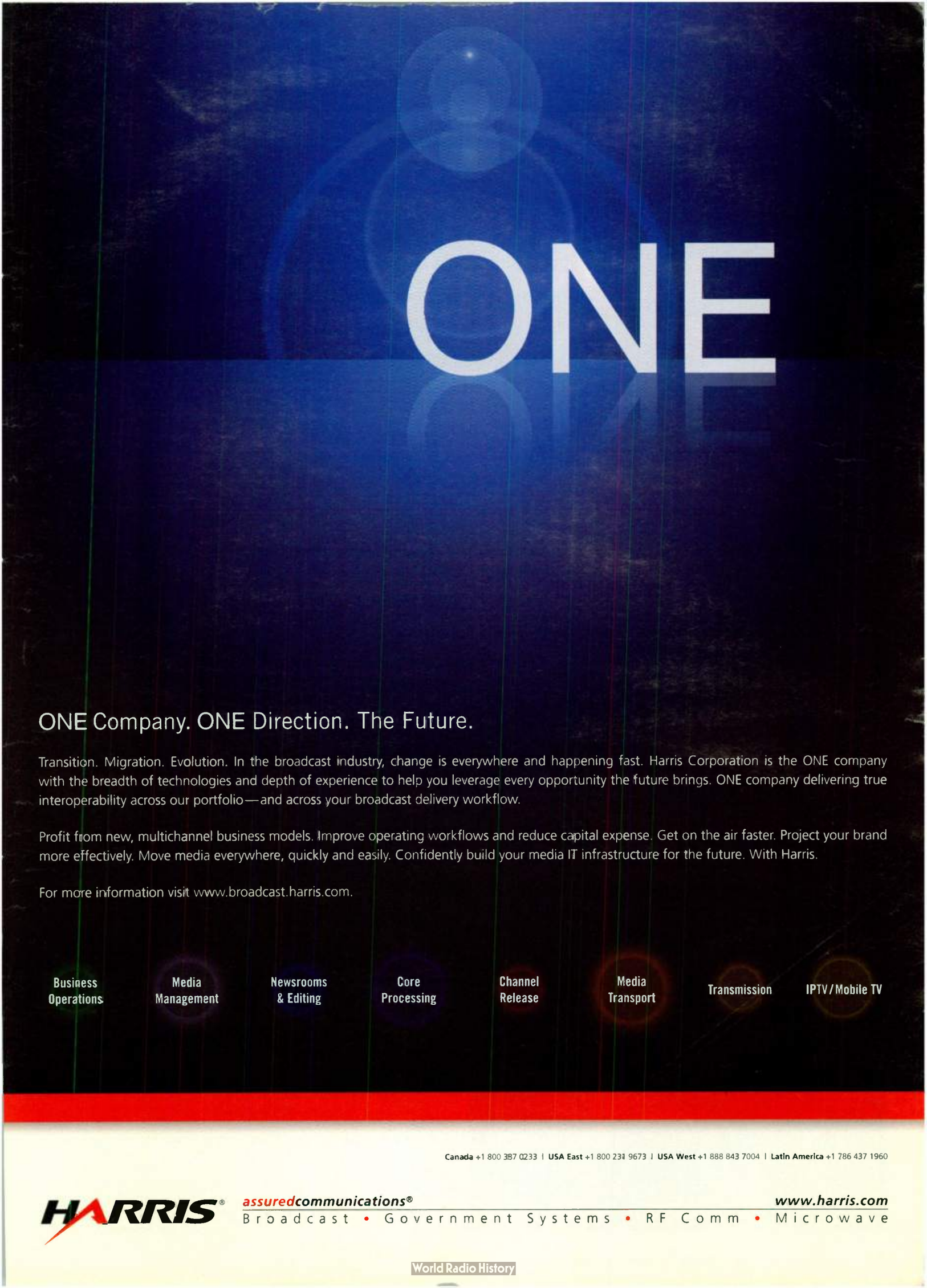
Pike, the chief technology officer of GCI Cable in Austin, Texas, said that "convergent technologies and new technology for transport" are the focus of several presentations. More papers deal with Internet Protocol infrastructure and improved optical transmission.

His committee found that this year the topics "didn't coalesce in the usual bins" of video-related topics. New offerings include papers about thin client services, which Pike characterized as "computer science that is now showing up in the cable industry."

All the presentations have been compiled into "The 2007 NCTA Technical Papers" documents, which are available for $50 (book or CD-ROM format) at the show or $75 afterwards.

The Society of Cable and Telecommunications Engineers (SCTE) will also be in Las Vegas, coor-

SHOW, PAGE 20



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NBC

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because he sees the format as a tool for telling news stories in a better way.

"If you see New Orleans and [Katrina] or a tsunami in Indonesia in HD, you just see a lot more of what it is, its impact, and it helps viewers understand it better," he said. "Yes, it's a visual medium and we certainly want to look better than anyone else, but HD is also a tool."

Holey believes HD is also an inevitable part of the future of electronic journalism.

"HD is not an obvious choice for a breaking-news broadcast like ours because so much of what we do is on the fly from many places around the world. But we decided it was at a point where it was time to do it."

Most of Holey's field reports will continue to be shot in SD. The HD segments will include all New York studio shots at 30 Rockefeller Plaza, as well as most Washington coverage—including stand-ups at the White House, State Department, Pentagon and Capitol Hill. NBC's Los Angeles bureau also has been HD-equipped.

The Nightly News primary workhorse cameras—both in the studio and in Washington—are Sony HDC-1500s, which can both be handheld or secured to sled mounts (which NBC is doing for its fixed studio camera work). According to David Migdal, vice president for corporate communications at Sony, the "migration of HD to network news is important on several levels [and] it certainly further validates the technology. The networks wouldn't be transitioning to HD unless they felt there was an adequate audience."

NBC News also is employing Sony's MVS-8000 HD multiformat switcher, Calrec Alpha 100 digital console, and Evertz Maestro imaging software for a virtual monitor wall built from several Barco projector cubes. But NBC News has decided to continue using the 4:3 aspect ratio for its SD feeds, even though several popular NBC Universal primetime series switched their SD configurations to 16:9 a few years ago.

"HD is not an obvious choice for a breaking-news broadcast like ours because so much of what we do is on the fly from many places around the world. But we decided it was at a point where it was time to do it."

—Brett Holey, "NBC Nightly News"

The new control room for the "NBC Nightly News" in HD is situated underneath the "Today Show" studio, a block and a half from the Nightly News studio.

"We had a long discussion about that," Holey said. "We decided to stick with 4:3 because we know most viewers are still watching on [analog] screens. We'll watch the numbers closely to see how the market changes."

LOSS OF CONTROL

While no changes to the studio news set were necessary, director Holey said a big logistical change was the loss of a control room near the Nightly News studio. The network's new digital control center (CR 1A) is now adjacent to the "Today" studios in another building to accommodate the top-rated morning program's jump to 1080i last fall.

"The control room is nearly a block-and-a-half away from Brian's studio now. Before that, I was 30 seconds from getting to it, if I needed to," Holey said.

But there are benefits, too, he added.

"If 'Today' has access to a resource, we have it now, too. There are certain synergistic things about the setup. It's all one nerve center now." The new CR is being used for all of NBC News' HD feeds from 30 Rock, including what will be a heavy slate of election-year coverage for 2008.

Holey is approaching audio in an evolutionary way, too.

"The first thing we did is ask John Williams to rerecord our theme music, which is titled 'The Mission,' for 5.1 surround sound. That was a no-brainer, hearing the piccolo behind your head now in surround sound."

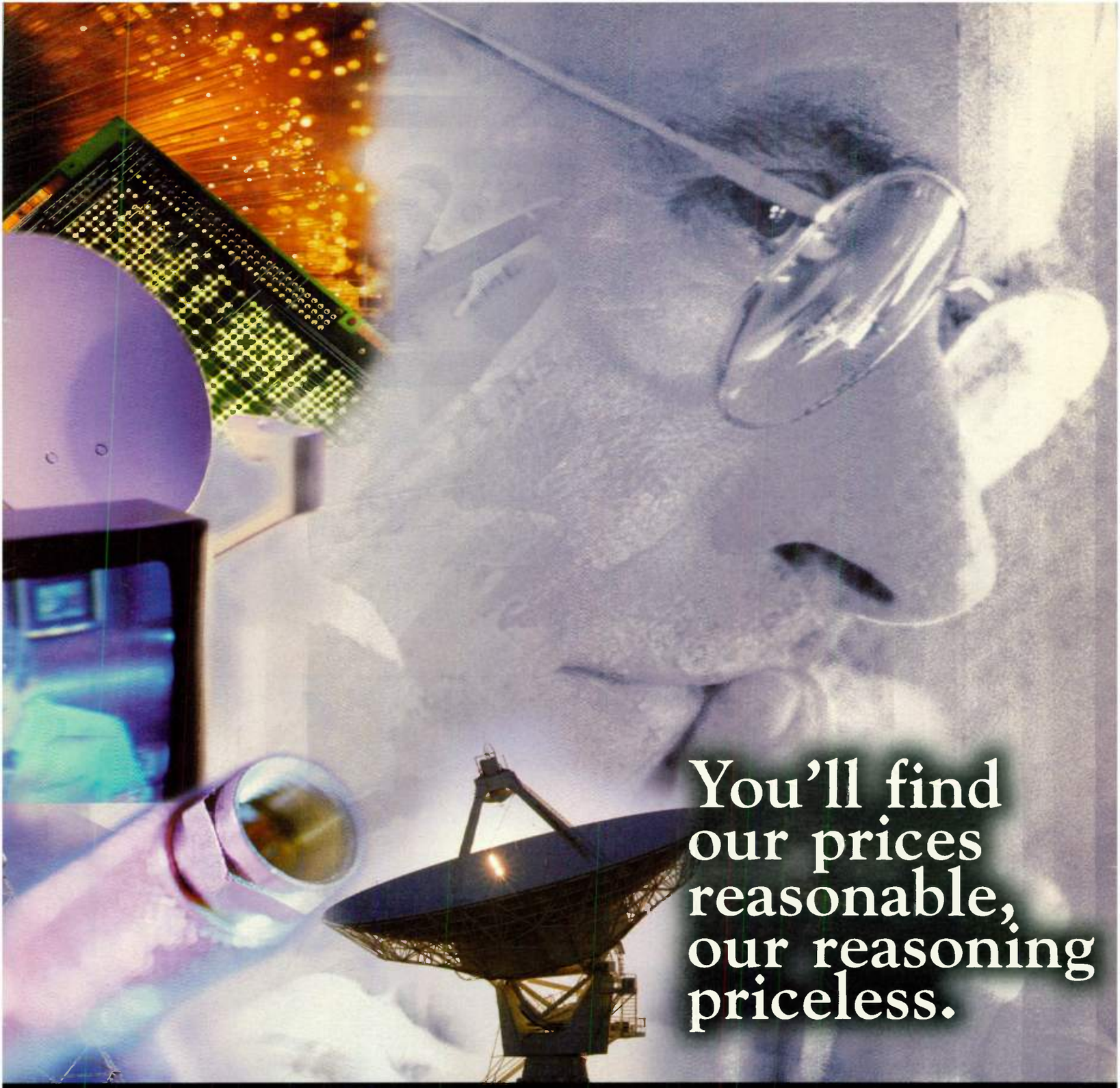
Gerry Kaufhold, principal analyst with In-Stat in Scottsdale, Ariz., said latest move by NBC News is part of the "natural migration" towards HD by all broadcasters whose markets are large enough to justify the investment.

"This is a long-term opportunity that will take another several years to really develop, but HD programming will eventually become the norm for broadcast television."

Although large flat-screen HD sets in the home are getting most of the attention these days, Kaufhold forecasts a growing array of wireless and online devices soon will be able to display HD content, as well.

"Hockey's Wayne Gretsky calls this 'passing the puck to where the player is going to be,'" Kaufhold said.

NBC News had already been repurposing much of its content as podcasts and other next-gen media. Director Holey was part of the team that also initiated the network's NBC Mobile and NBC ToGo venues. And, he said, it helps to have a media-savvy anchorperson: Williams has been writing his own online daily blogs (the "Daily Nightly") for nearly two years, and on most weekdays records informal video previews in his 30 Rock office (the "Early Nightly") that are posted on MSNBC.com a few hours before each evening's newscast. Those online previews, as another sign of the times, are now being streamed in 16:9. ■



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News

CONTINUED FROM PAGE 1

"Everything worked," he said. "There were some small glitches behind the scenes, but none that made it to air."

WBNS reworked its entire plant with new sets, lighting and production gear, including Ikegami HDK-790 cameras, Avid Deko 3000 HD and Weather Central 3D-Live-HD CGs, a Snell & Wilcox Kahuna switcher and terminal gear. Willson's team visited stations in Orlando, Fla., Cleveland, Raleigh, N.C. and Atlanta that had already made the switch. WBNS even timed its launch date to optimize CBS's NCAA Final Four coverage.

Some stations have moved to HD news with little fanfare. WBNS, on the other hand, aggressively promoted its HD leadership with on-air promos and a six-page, full-color insert in the company-owned Columbus Dispatch newspaper. Engineers pitched HD at consumer electronics outlets and an entire section devoted to HDTV was posted on the WBNS Web site. WBNS benefited from some viral marketing from members of the Columbus HD online forum who attended an HD rehearsal with anchors and staff.

Willson said the staff matched the Dispatch Co.'s investment with "emotional capital," even making punch lists to avoid miscues. "It's the little things," he said. "Like you can't fire off graphics really fast—click, click—the HD graphics just take longer to load."

In Washington, D.C., Allan Horlick, president and general manager of WUSA says parent company Gannett also assumed the leadership role in May 2005 when it became the first station in a top 10 market to offer HD newscasts. The CBS affiliate still heralds its position as "the only local news in HD" in every newscast open along with its bold, animated 9 News Now HD logo.

Horlick says while there are still no quantitative measures or ratings of HD viewership, there is considerable *qualitative* feedback.

"We have a nice, robust file... lots of people thanking us for taking this step and making the expenditure," he said. "They love seeing their news in HD. It really pops."

WLS-TV in Chicago is one of four ABC O&Os that recently moved to HD newscasts. President and General Manager Emily Barr says the move was a logical extension for them, since the station already had an HD helicopter and an all-digital facility.

"We are number one in all our newscasts and viewers really expect us to play a leading role whether in news coverage or in technology," Barr said. "You can't say that it gives you an extra quarter point in ratings, but you can say the viewers expect the best."

Like most stations doing HD news, WLS is still shooting most of its news footage in 16:9 SD. Kal Hassan, vice president and director of technology, credits the station's digital infrastructure for good picture quality, noting that "our HD conversion path is so pristine, the results look very good."

MAKING THE LEAP IN RENO

At KRNV-TV in Reno, Nev., Chief Engineer John Finkbohner opted for an end-to-end HD solution.

"We do everything we can for news in HD," he said. "Our field cameras are HD; we edit in HD. We playback in HD everything we shoot locally. When HD microwave is available, we'll do our remotes in HD, too." General Manager Mary Beth Farrell said the change for the NBC affiliate was more about service to the community than ratings., adding that the staff stepped up to the challenge.

"The change required training for everyone in news, production and engineering," she said.

Talent concerns that HD would magnify imperfections were easily calmed when she brought in an HD makeup artist.

"Everyone learned how to airbrush their makeup and it made a big difference," she said. "They need a lot less makeup and look great."

The Sunbelt-owned station uses Leitch 6800+series converters, a Utah Scientific MC switcher, Canon HL X1 A cameras in field and studio, Canopus Edius Pro 3.0 for HD editing, Avid Deko 3000HD, Avid Thunder HD and BitCentral Precis HD news play-out server.

Finkbohner stressed the importance of vendor relationships.

"We're all learning how to do HD and you need a good partner to iron out any rough spots," he said.

WFAA, which has been broadcasting in HD since 1998, faced a different challenge when it launched its HD newscasts in February from its new, showcase studio in Victory Park, the thriving entertainment and sports complex anchored by American Airlines Center.

The station's morning show, noon and 5 p.m. newscasts originate from the 4,000 square-foot, glass-enclosed, fishbowl studio that opens onto the plaza. The Belo-owned ABC affiliate's new studio is about a mile from WFAA and does not have a production control room.

Dave Muscari, WFAA vice president for product development combined fiber transport and the latest from Grass Valley to marry the facilities. Four Grass Valley LDK 4000 HD cameras operate in the new studio and the outputs are fed via fiber optics back to the station for insertion into a Kayak HD video production switcher before going to air.

There's an added HD dimension: Passersby at the new studio also see the hi-def output from the remote switcher on a super-sized screen located on the south wall of the news studio.

"It's really fabulous. It's a great branding opportunity for us," Muscari said about location. ■

HD News From the Ground Up

PHILADELPHIA

On April 2, KYW-TV Channel 3, the ABC affiliate here, marked another historic first for the station and for the CBS Television Stations Group. As the first official broadcast from the station's new, all-HD, state-of-the-art plant, it was also the first HD newscast for the station and for the entire group.

Jeff Birch, vice president of engineering for the CBS Television Stations Group, says Channel 3 is one of the first stations in the country built from the ground up as an HD plant. It's also unique because the entire news-gathering and production chain is built to handle HD.

The CBS 3 Anchor Team, from left: Beasley Reece, Larry Mendte, Alycia Lane and Kathy Orr

Birch expects the bulk of news field work will be in HD, but for fast-breaking news, crews may still shoot in 16:9 SD and microwave to the studio for quicker editing. He anticipates full HD field work as technology progresses and HD microwave is available. CW Philly 57 also operates from the 120,000 square-foot broadcast center, which has a skyline view of Philadelphia.

It's been a busy time for the engineers at the CBS Television Stations Group. Last month, WCBS-TV, New York also began HD newscasts and KCBS-TV, Los Angeles switched to full-time HD. WBBM-TV, Chicago will be HD when its new plant opens in Spring 2008. Birch expects two more CBS stations will add HD newscasts in the coming year.

Over at ABC, Dave Converse, vice president and director of engineering for the ABC Stations Group, said the network is balancing the individual market's need for HD news along with competitive and economic factors. ABC currently has five stations doing their newscasts in HD: KABC-TV, Los Angeles; WPVI-TV, Philadelphia; WABC-TV, New York, WLS-TV, Chicago, and KGO-TV, San Francisco.

Converse anticipates three additional markets will join the HD news roster in the next several months. None of the ABC stations are doing HD newsgathering although several use HD choppers and fixed HD cameras in metro areas.

To date, the only NBC O&O with HD Newscasts is WNBC, New York, although managers say plans for other stations are under consideration. Fox-owned stations currently provide HD newscasts in Philadelphia and Cleveland.

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SPECIAL REPORT

WETA Preps for 'NewsHour' in HD

Public broadcaster inks deal with CEI for HD transition

by Ian MacSpadden

ARLINGTON, VA.

WETA the nation's third largest public broadcaster, has long been an innovator and leader in the transition to digital television. In 1999, the station completed its early transition to HD broadcasting and three years later, in 2002, the station became one of the first to utilize a four-channel multicast digital broadcast. More recently, WETA became the first to broadcast in both HD and three SD digital channels 24/7.

Later this year WETA will begin broadcasting live its flagship evening newscast, "The NewsHour with Jim Lehrer," in high definition. With a plan that includes HD field acquisition, editing, and a complete control room upgrade, the broadcast will be completely produced in 1080i.

DETAILS, DETAILS

Transitioning from analog to digital and then to HD has been a long-term endeavor for WETA staff. In 1998, during the early stages of facility planning, the technical staff decided to involve a systems integrator in a decade-long project that started with rebuilding WETA's master control and core infrastructure, and eventually led to completing the station's conversion to an all-HD production facility.

The decision to use the services of an SI is "a dilemma that most stations have on a varying scale," said Ed Kennedy, senior director of engineering and technology at WETA. "Even at a large station like WETA, staff can't always handle the planning and devote the time to the detail work necessary for the successful execution of a project this large and long-term."

Kennedy points out that his staff does participate however, in the projects.

"We made our systems integrator, CEI, the lead in design and execution and my staff took on a consultancy role to make sure that nothing was missed."

"The NewsHour with Jim Lehrer" is hosted by Jim Lehrer (seated) with correspondents (L to R), Margaret Warner, Ray Suarez and Gwen Ifill.

CEI, a full service systems integrator based in Virginia, just outside of Washington D.C., became involved at the very beginning of WETA's conversion to HD. Kennedy feels that it was important to include a systems integrator early on in the development of the station's major projects.

Joe Strobel, senior project manager and engineering process analyst at CEI, recommends bringing in a systems integrator as soon as possible.

"Come up with a plan, goals, and a budget," he said. "Then the SI can provide a phase 1 study that looks at the plan's feasibility within the budget, and whether it can be completed in the allotted time."

The partnership between WETA and CEI has been many years in the making. Like any good relationship, it's "built on mutual trust and respect for each other, developed through the years," said Tom Hackett, project manager at CEI.

Strobel says CEI's goal is to prevent miscommunication with the customer. "During the discovery phase of the project we try to figure out exactly what the client is truly asking for and what they really need. We then verify that we have properly interpreted what they are asking for."

Kennedy added that both sides have grown through this process and are therefore able to improve on each successive project. "Looking back at this re-modernization project, it has altered noticeably from our original plans, due in part to lessons learned by both CEI and WETA," he said.

MULTIFORMAT SCENARIO

The duo leveraged skills and experiences in selecting the equipment for the project. CEI had a deep understanding of WETA's existing facility infrastructure and worked with station staff on choosing the best path for digital migration in what had previously been an analog-only control room. CEI and WETA previously had upgraded the router core, intercom, and central nervous system of the broadcasting plant. This enabled a multiformat scenario, where legacy SD equipment could be used until modules of the HD upgrade could be completed. When finished, one of WETA's two studio/control rooms will have undergone a complete HD renovation; the next project will involve upgrading the second studio.

Existing infrastructure, including the Grass Valley router and Avid Unity systems were both upgraded to handle the new HD signals.

"The choice for remaining with Avid was obvious since we already have a pretty good scale of their system running," Kennedy said. "The Omneon servers were added as a supplement to the news process and as a replacement for legacy tape machines."

For field and studio acquisition, WETA chose Sony HDC1000LW HD studio cameras, which will be processed through a new Sony MVS8000A switcher.

"This camera and switcher combination offers a high level of performance, combined with high reliability," said Rob Willox, director of Sony's Content Creation Group. "These combined systems allow connectivity to a wide array of formats and platforms. For a station that does a broad range of programming, this type of production flexibility is essential."

Kennedy says the Barco display wall was chosen "specifically for its physical configuration for our space limitations, as well as the feature set, resolution, and perceived reliability." Although the station will be broadcasting in 1080i, all of the new equipment is capable of 720p as well as upgradeable to 1080p.

WETA coordinated purchases of the equipment through CEI, a practice preferred by most systems integrators. In a big project, such as a complete studio and control room conversion, the sheer number of pieces of equipment would take up more space than most stations have available. CEI's Newington, Va. facility has an 18,000 square-foot production floor that allows for the delivery, testing, and assembly of all the equipment prior to installation in the facility.

When asked about their next HD project, WETA staff says they plan to partner once again with CEI when upgrading their second studio and control room. CEI's Tom Hackett says that many of the stations that were once holding out for digital upgrades are now finding themselves making the full migration to HD. ■

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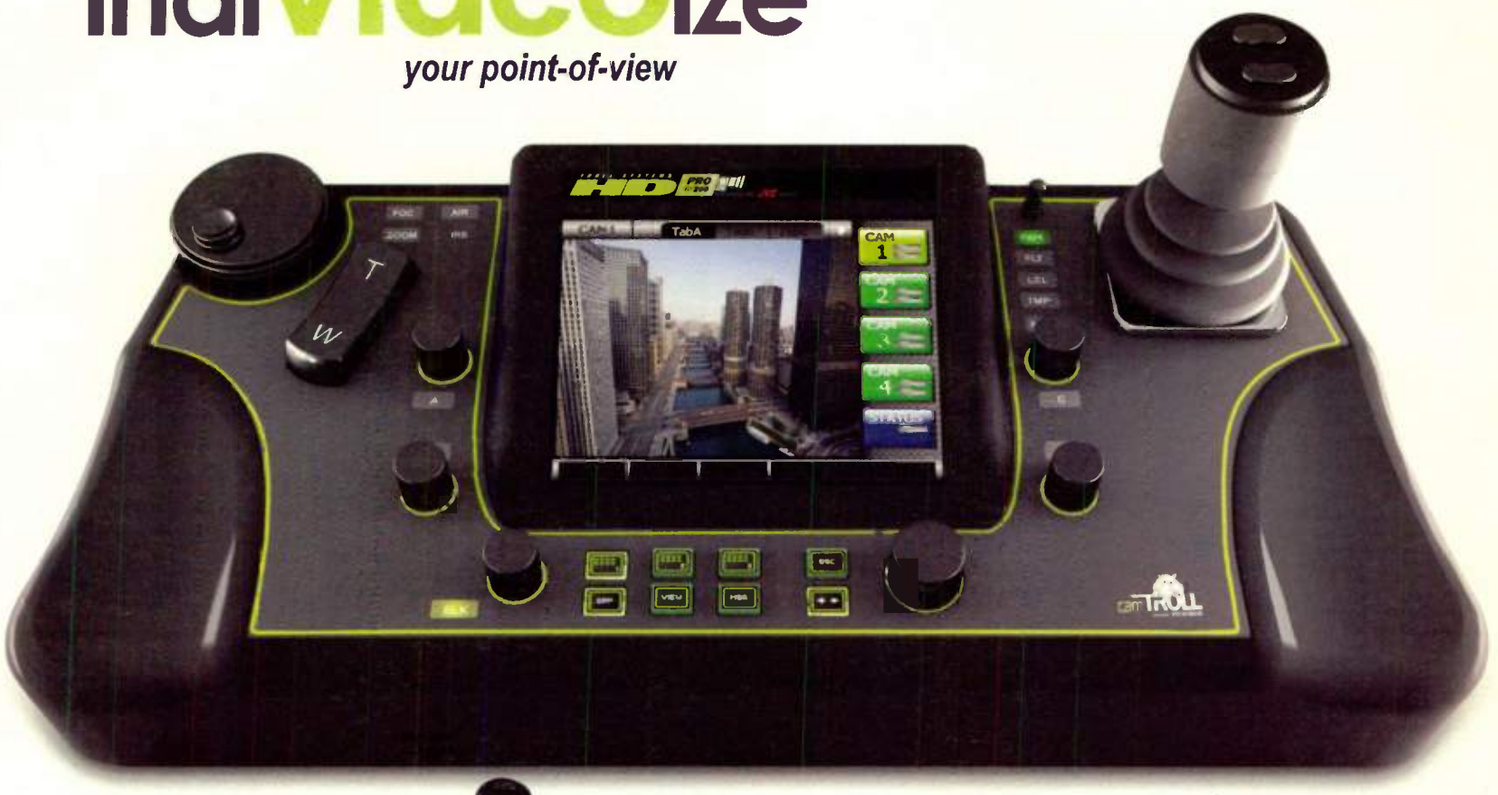

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Cable: Slow Traction for HD-VOD

Technology hampered by capacity, compatibility issues

by Ken Freed

DENVER

North American cable operators value the prospects for high revenues from HDTV delivered as a video-on-demand service. But while the technology for HD-VOD is already in place at major cable headends, the service is still years away from full market penetration.

"It's tricky to be exact on how many of our subscribers get HD-VOD," said Page Thompson, senior vice president and general manager of Comcast Video Services.

Out of 12.7 million digital cable customers at the end of January 2007, "we have 4.5 million households with advanced digital set-top boxes that support HD alone or HD with a dual-tuner DVR," Thompson said. "If I had to guess, I'd say about 25 percent of these households have HDTV screens, which means 25 percent of them [about 1.8 million] are capable of enjoying HD-VOD, if they choose."

Thompson said Comcast prices both HD-only boxes and HD-DVR boxes at $9.95 a month, and the company does not differentiate between them in their tracking.

Over at Time Warner Cable, the ntation's second largest cable operator, spokesperson Alex Dudley said that among TWC's 7.3 million digital subscribers, only 1.9 million of these have HD boxes, yet all of them can receive HD-VOD (which also equals about 25 percent of TWC's digital base).

Rogers Cable in Toronto has 2.7 million total subscribers in Ontario, Newfoundland and New Brunswick. According to David Purdy, vice president and general manager of television services, 90 percent of their set-top boxes are digital and 20 percent of these support HD.

"We're adding about 250,000 digital subscribers a year," Purdy said, "and we expect that by the holiday season this year, about 40 to 50 percent of the boxes going out will be HD."

The VOD control room at the Comcast Media Center in Littleton, Colo.

WORKING THROUGH THE FORMULA

The overall uptake for VOD at the end of 2006 was 50-70 percent of the 39 million digital cable households in the U.S., said Ian Olgeirson, senior analyst for Kagan Research, a media analysis firm in Monterey, Calif. About 23 percent of these households have DVR set-tops, he said, "but it's hard to pin down how many of them deliver network-based HD-VOD services."

All of the new advanced digital boxes from Motorola and Scientific-Atlanta are HD-compatible, Olgeirson said, and so are the digital boxes from Pace, a West Yorkshire, U.K.-based set-top provider with a small install base in America. So the potential for HD-VOD, theoretically, is enormous.

"The delivery of HD-VOD really is a capacity issue," Olgeirson said. "HD-VOD basically requires four times the network capacity as SD-VOD. A related issue is the value proposition; that is, figuring out the economics on equation of signal capacity versus the value of the service. I think cable is still working through the formula."

The challenge for cable operators is not just building an HD-VOD infrastructure of encoders and servers, he said, and it's not just building a library of HD content.

"Cable still needs to map out where to set VOD usage maximums and minimums to accommodate HD traffic," Olgeirson said.

The promise of HD-VOD still comes down to the capabilities of the technology at hand, and each cable operator makes different choices.

Purdy said that Rogers is using the VOD encoding and distribution platform from SeaChange International to offer about 3,000 hours of VOD content over its 860 MHz plant. The VOD system can handle up to 7,000 hours.

"We do our own encoding in house," he said, "because we want to guarantee compatibility with our network."

TWC, on the other hand, relies on each movie studio supplying HD-VOD movies to deliver the content already encoded, according to Dudley. HD-VOD content is encoded into MPEG-2 at a rate of 15 Mbps at resolution of 1920x1080.

TWC relies on InDemand, a New York City-based provider of VOD technology, as a content aggregator "pitch" or distributes the content to all divisions through the Tandberg Television MediaPath secure on-

TECHNOLOGY, PAGE 27

Show

CONTINUED FROM PAGE 12

dinating and participating in many of the technical sessions, providing a preview of the detailed engineering agenda coming up at its annual Cable-Tech Expo next month in Orlando.

BACK TO VEGAS

NCTA expects just over 14,000 people to attend this year's convention, about the same number as last year and also comparable to the last time the NCTA convention was held in Las Vegas in 1987, according to Barbara York, senior vice president of industry affairs for the association.

NCTA lists nearly 1,200 categories of products on display in its exhibit halls even though fewer than 350 exhibitors, including 77 first-time participants), will be on hand. Many of the vendors offer multiproduct line-ups, ranging (on the technical side) from amplifiers and ATM switching equipment to WiFi products and wireless telephony devices.

York pointed out that many of the new exhibitors are overseas suppliers seeking a role in the U.S. telecommunications sector. ■

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Bay Area Pubcaster Goes Green

KQED explores new eco options

by Robin Berger

SAN FRANCISCO

Britain's Queen Elizabeth II and San Francisco public TV station KQED have something in common: They both hired consultants to audit carbon dioxide emissions from their respective domains.

One of six greenhouse gases linked to global warming, carbon dioxide is being perceived by more and more people as an environmental threat. Speculation on the queen's CO2 reduction options includes turbines in the River Thames, more fuel-efficient limos, and boreholes in the royal wine cellars.

But KQED is well ahead of the queen in its initiative.

By the time experts were contracted to take stock of Buckingham Palace, Windsor Castle and the Palace of Holyroodhouse (the queen's Scotland residence), KQED had already bought its first carbon credits contract from the Chicago Climate Futures Exchange. And it was working out the details of an energy pact with BP Solar.

TRADING CARBON CREDITS

KQED has been environmentally sensitive for a long time, said Don Derheim, executive vice president of Northern California Public Broadcasting, which oversees its functions.

He noted that the "Green Team" makes sure the station recycles and uses recycled paper for its direct mail requests. Green consciousness is featured in its coverage, as well. So, last November the station was ripe to hear a pitch on becoming "carbon free."

That pitch came from Jason Smith, founder of DriveNeutral, a grassroots, nonprofit organization. It was founded in 2005 as a community enterprise of the San Francisco Presidio School of Management, which offers an MBA program in Sustainable Management. The Presidio School is also a KQED underwriter, Derheim said.

DriveNeutral collaborates with corporations, educational institutions, and municipalities to stop global warming by offsetting their own carbon emissions and by encouraging other entities to reduce theirs. The group had 20 partners, Smith said at presstime.

Don Derheim, executive vice president, Northern California Public Broadcasters

To accomplish the first goal, DriveNeutral's Carbon Calculator assesses an entity's carbon emission footprint using an energy audit of the past year's kilowatt consumption from fleets, flights and facilities. For example, in 2006, KQED burned 1,292 metric tons of greenhouse emissions from its plant and business travel. Next, DriveNeutral helps brainstorm a plan to reduce these emissions.

To encourage other entities to go green, they also buy futures contracts from CCX (Chicago Climate Exchange), the world's first greenhouse gas emissions registry, reduction and trading system for the six generally recognized greenhouse gases. CCX operates North American and European exchanges based in Chicago and Amsterdam, respectively. Members include Ford, IBM, Motorola, Intel and Sony Electronics.

"We're an associate member on the exchange," said Smith of DriveNeutral's association. "We work with brokers—we can't trade directly."

Eligibility to transact on the Internet-based, electronic trading platform and clearing system is limited to CCX members who qualify as eligible commercial entities.

Smith said members are legally bound to do two things: They establish their annual greenhouse gas footprint under a business-as-usual scenario. They also have to commit to reducing that footprint by 6 percent. Members generate credits only after they have exceeded that commitment. If they are unable to meet their goal, they must purchase credits from an entity that has done so.

Each CFI (carbon financial instrument) contract represents credits for 100 metric tons of emissions. KQED's $10,000 fee to DriveNeutral includes contracts from DriveNeutral's portfolio to cover its 1,292 metric tons of emissions.

Like any other exchange, the price of a CFI contract is determined by the market, and traders can incur gains and losses. But Smith said DriveNeutral opted out of trading; its contracts are simply retired—permanently taken out of the system. Reducing the number of contracts in the system theoretically puts pressure on non-compliers, said one exchange source, though, admittedly, the influence of offset companies like DriveNeutral is, indeed, very small.

Financial payback for DriveNeutral's clients is limited. "We are 100 percent tax deductible because we are a [nonprofit] organization—it looks good on the books for an entity that wants a nice tax break at the end of the year," Smith said. "But I think primarily people work with us because it's a good thing to do. It helps their brands, it helps them attract and retain talented employees, and it creates a culture that's concerned about environmental issues."

SWAPS AND HEMP

KQED was also "at Step 1 of a five-step process" in a deal with BP Solar for solar panels, said Derheim at press time. California announced it would provide $3.2 billion in solar energy rebates through 2017.

During its pledge drive, KQED provided this hemp bag as a green alternative to shoppers after San Francisco banned plastic bags from supermarkets.

Derheim outlined KQED's plan as follows:

1) roof survey (engineering drawing)
2) permits from San Francisco
3) final site survey
4) two weeks building it
5) flip the switch and get final city approval

The entire undertaking would be cashless. "We're going to do this in a barter exchange," Derheim said. "BP Solar will get on-air underwriting credits in exchange for their goods and services."

Derheim said he sought out the company's Bay Area headquarters for the project.

The station also plans to offer its audience a green alternative for shopping. On March 27, San Francisco's board of supervisors voted to ban plastic grocery bags from supermarkets. In various reports, Ross Mirkarimi, the city legislator who championed the new law, said the ban would remove the need to send 1,400 tons of debris to landfills each year. ■

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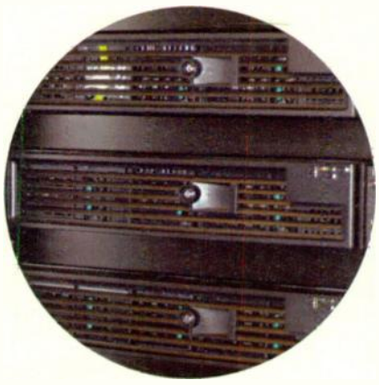

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Building an Audio Infrastructure for HD

Going 'format-agnostic' can effectively future-proof your new facility

by Michael Nunan

TORONTO

I have often heard it jokingly remarked that "HD" must stand for "Hard-to-Do." Inevitably this comes from people who have just been bitten by one of the numerous challenges or problems posed by migrating to the HD world.

While it's certainly true that HD is theoretically complicated, my experience is that these newly frustrated professionals have likely been thwarted by the practical difficulties involved in doing seemingly "easy" things. Invariably, these practical difficulties have a lot to do with trying to make television with a given set of equipment in a technical environment.

My starting point for this article is then the suggestion that facilities design is more crucial to the successful creation of television than it was in the old NTSC world. Given the fact that most of us on this continent have spent our careers working within the narrow and comfortable limits of the NTSC format (and its digital cousin, SMPTE 259M-C) with stereo audio, the almost overwhelming flexibility and complexity of the ATSC specification inescapably leads to frustration. This frustration isn't specific to either audio or video. It can involve either discipline, but for my money—it's usually the notion of multichannel audio that causes everything to grind to a halt.

I don't mean to suggest that video is easy. There is a lot of choice when it comes to planning the video side of the equation:i.e., video formats, frame rates, and codecs. All of these things influence how pictures get made and delivered in HD, but the difference between any one choice and another is quite slender for the folks down in the trenches. The process by which they execute the picture-portion of a TV show remains virtually the same, regardless of technical choices.

THE THIRD VARIABLE

Production/operations personnel and engineering staff can be equally affected by these frustrations, but the issue can rapidly become a crisis when these two groups are learning and growing independently.

New technology and a deluge of new buzzwords aside, the day-to-day struggle between what is possible and what is practical is still the cornerstone of most television production. The difference in the HD world is that we are frequently confronted by a third variable that can be described by the question "What is allowable"?

This question has practical ramifications in both the strategic and the tactical sense. The strategic question concerns the expectations for HD in terms of production quality and whether a given broadcaster is going to make demands, like requiring that all HD programming be delivered in 5.1 Surround. The tactical question concerns the engineering response to a broadcasters' strategic vision (i.e. the demands of production). This is one of the key questions that need to be answered when beginning to design an HD broadcast infrastructure.

There are countless ways to build an audio infrastructure for HD. Embedded HD-SDI, discreet AES3, Dolby E, VANC-embedding, metadata, loudness management, Dolby AC-3... the minefield of issues that engineering staff need to navigate is challenging to say the least.

No solution or approach is necessarily better than the next, save for the crucial fact that long lead-times needed to design and build HD plants mean that engineering decisions are generally taken prior to production decisions. This simple fact creates a situation where engineering staff often needs to guess what the production people are ultimately going to want, or need.

Production and engineering must be on the same page when designing an audio facility for 5.1.

Think of it this way—the engineering folks often can't imagine why a certain thing might be desirable, and the production folks probably don't have a clear enough grasp of what should be possible and therefore have no means to ask for what they want in advance.

The result is that production and operations often have to make do with what they're given. In a sense, the scope and capabilities of an HDTV facility tend to represent handcuffs on production and operations. This is because the outer limits of what is possible have been predetermined by engineering designs.

Let me explain.

WAITING IN THE WINGS

Imagine a typical news control room that is being rebuilt for HD. Let's also imagine that this control room has six VTRs (or server channels), four channels of CG (Deko, Chyron, etc.) and a fairly common complement of three music playbacks (Digicarts, etc.), in addition to the usual fare of studio microphones and receive lines. Confronted by the task of rebuilding the audio infrastructure for this room—the engineering team is immediately faced with a dramatic increase in the possible number of inputs needed by the audio console.

In the old SD control room, each of these devices (VTRs, CGs, Digicarts) would typically only be wired for two channels. If the engineering team is looking at a 40-input console that needs to be replaced, and if each of those two-channel sources could conceivably by replaced by 6-, or 8-, or even 12-channel HD equivalents, that simple little 40-input desk needs to be replaced by a 200+ input monster!

Do you want to guess how the average engineer deals with this conundrum? He decides that not all of the inputs are needed!

In the realm of seemingly innocuous engineering decisions, something as simple as deciding that only two of the six VTRs need to be able to play out multichannel audio is a major problem waiting to happen. In the old control room, production could structure their shows such that all VTRs were identical in their performance. Tape traffic in the old days was an issue of personal preference, and the needs of a given show.

But, in this new environment, if engineering has predetermined that only two of the machines can play back surround material, production has a significant limitation on how they can structure and execute their show.

FORMAT-LIMITING DECISIONS

The list of potential problems in this area precisely matches the number of times engineering makes a format-limiting decision. Deciding that multichannel capable music playback devices aren't necessary because "all of their music is in stereo anyways" starts to be a real difficulty when production decides to have fancy new 5.1 theme music commissioned.

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Marathon Coverage In the Digital Age

From helicopter to motorcycle, broadcasters adapt to changing needs

by Craig Johnston

SEATTLE

Think of a marathon as a sporting event with a 26.2 mile 50-yard line. The action takes place sequentially along the entire race route, and the "game camera" is mounted on a constantly moving motorcycle, just yards in front of the leaders.

Live coverage of a marathon is not the easiest remote to do.

Marathons have two different types of routes: one has a circular course where the start and finish line are in the same place; a second has different start and finish lines that are often a dozen or more miles apart.

"When we park mobile units to do a marathon, we're not running miles and miles of cables to cameras," said Glen Levine, vice president of operations for Pittsburgh-based mobile truck company NEP Supershooters, which covers several marathons annually.

"From the mobile unit perspective we're covering strategically where the highlights are going to happen, such as the start and finish line," he said.

The rest is left to RF cameras from microwave specialists Total RF of Bensalem, Pa., which supplies specially designed motorbikes with an aft-facing rear seat for the camera operator as well as trucks with gyrostablized mounts for the camera operators.

Photo credit: Monika Graff/UPI/Landov

Total RF used this converted motorcycle to cover the 2006 New York City Marathon.

BOUNCE IN THE BIG CITY

Digital microwave has made a huge difference in getting the signal back from those moving camera platforms. For the New York City Marathon in November, Total RF has replaced the helicopter relays with microwave relays on top of three of the city's buildings.

"If you go back to the days of analog, you had no choice, you had to use a helicopter," said Steve Gansky, president of Total RF. "Reflections with NTSC meant phase change, which meant multipath, and the color [was] all over the place.

"Digital microwave loves the bounce in the big city, because it doesn't matter how you get the ones and the zeros to the antenna, as long as you get them to the antenna, you build them back and you have perfect video."

Getting rid of helicopter relays reduced weather worries, Gansky said. Fog or other no-fly weather can still keep helicopters from supplying aerial views of the race, but they don't take down the whole race coverage as they could in the past.

Once the RF sites are in place on the rooftops, it's time for a rehearsal, sans runners. "Put the guys on the motorcycles and start at the start line and wind up at the finish line just check your coverage, Gansky said. "You rehearse and make sure everything's working."

Total RF receives the output of each camera vehicle from of all three rooftops in their own production truck. "We can get reception off of those motorcycles no matter where they are on the course, and we sub-switch which rooftop is receiving that particular motorcycle at that particular time, and we cut that," Gansky said.

While the viewer only appreciates the video and audio signals coming from the camera vehicles to the receive site, it's in fact a two-way microwave path.

"You have to get communications to the bike, because the director wants to direct," said Gansky. "And additionally we send data to the bike to control the cameras, camera control, camera gain, so that the guy in video can sit there and adjust the ped, the gain, just like the camera was in the studio."

LEARNING FROM GOLF

While HD coverage has come to arena sports and even to golf, marathon coverage in the U.S. has yet to be done totally in HD. One reason has to do with all that RF and the long cable runs for fixed cameras.

"What we're learning about golf with the world of HD is that there's multiple ways to handle HD signals," said NEP's Levine. Where with triax they had to put in repeaters for long cable runs, "you can run a piece of SMPTE fiber 10,000 feet, and you may have to power the camera locally, but essentially because it's fiber optics, you can send signals over great distances."

Levine said another trick they're adapting from golf coverage is running 12 strands of fiber optics in "tactical" cable to the truck. This allows them to daisy-chain from one camera location to the next camera location, and power the cameras locally. "It alleviates running 12 individual pieces of cable from the mobile truck to 12 cameras," he said.

From an RF standpoint, Gansky said Total RF could do an HD marathon today. "We are ready to provide HD in marathon coverage. However, our customers are not."

The reason? Cost.

"HD transmission is at a much higher bit rate; you must use modulations that are less robust," Gansky said. "Less robust equals more receive sites and more antennas, or better receive systems. That equals more cost. I do not think that our clients are currently willing to make the leap to native HD from the race course."

In fact, with previously available spectrum disappearing to FCC auctions, just doing an SD marathon is getting harder.

"It's almost where what's available spectrum-wise dictates what spectrum you might do a production on," he said. Not necessarily what's best but what's available." ■

Audio

CONTINUED FROM PAGE 24

Not planning for, and wiring for, the audio I/O on the groovy new HD character generator because "the font never made noise before" becomes a problem when the sound designer builds 5.1 sound effects to accompany the animated fonts, and there's suddenly no way to accommodate them. As you might imagine, this list of "oh, by the ways" is quite lengthy and accounts for most of the "Hard-to-Do" sentiment.

The solution? It's easy and hard all at the same time. The simplest way to build an HD infrastructure which is truly future-proof (to say nothing of production-proof) is to imagine that everything and anything that was two-channels is going to be replaced by a multichannel equivalent.

In other words, make no assumptions about how your new facility will ultimately be used. A VTR that can handle 12 channels of audio is perfectly happy to deal with just stereo, and these days, an audio console that has 200 inputs is no more unwieldy than one that only has 80 inputs.

It's undoubtedly a hard thing to sell at budget time, but, doing the minimum now almost certainly means you'll be doing it again soon, and usually at a higher total cost. Building an infrastructure which is audio-format agnostic is simply the best decision you can take. It will seem a little absurd at times, but I guarantee it will pay dividends when producers and directors start prowling around asking for the world.

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

Technology

CONTINUED FROM PAGE 20

demand content delivery system, a satellite pitch and catch infrastructure that automates receiving, prioritizing and propagating of VOD content.

Time Warner offers a handful of current feature films on HD-VOD but does not offer any broadcast network HD content on demand.

Comcast's HD-VOD offers more content from the major broadcast networks than any other cable system, said Thompson. Within the footprints of the NBC O&Os, Comcast offers five series on a 99 cents pay-per-view (PPV) basis for HD-VOD. These NBC shows include "Law & Order Criminal Intent," "Law & Order SVU," "Las Vegas," "The Office," and "Saturday Night Live."

Within the footprint of ABC O&Os, all HD content from ABC will be offered as a free VOD service, Thompson said.

Seven CBS shows in HD, which had been sold for 99 cents PPV, are now offered as free VOD, including "CSI," "CSI Miami," "CSI New York," "NCIS," "Jericho, Survivor," and "Numb3rs." "Jericho" and the original "CSI" are offered in both SD and HD VOD.

ADVANCED CODECS

Network compatibility is a chief concern for Comcast, which handles all SD-VOD and HD-VOD operations from Comcast Media Center (CMC) south of Denver. Not only does the CMC encode, store and distribute VOD streams for all of the Comcast plants, the facility performs these functions for other cable system operators nationwide.

Within the overall CMC chain, said Gary Traver, COO of the Comcast Media Center, "We're mindful of the need to make sure that the HD content will work on every set-top box in the field. So, we optimize every HD film and television series program to display properly on any HD-enabled box. We've pretty much normalized at 1080i."

Practically all of the commercial HD-VOD content today is being encoded into MPEG-2, according to Phil Simpson, director of product marketing for VOD solutions at Seachange International in Maynard, Mass. "But we're seeing a move toward MPEG-4 with the more advanced codecs."

Since MPEG-4 can compress more content into fewer bits per second, such as 6 Mbps, "the reduced bandwidth requirement is very attractive to the telephone companies offering IP video services," Simpson said. "I think cable may eventually adopt MPEG-4, too."

Traver said the CMC is constantly evaluating new encoding equipment from the major vendors, yet the CMC created its own HD encoders to ensure that all content meets the CableLabs standards for encoding video and metadata for VOD.

"We had to play with the aggregate bit-rate and the kind of filtering for each video source, such as film grain noise, to smooth out the video for optimal compression," Traver said. Similar attention goes into audio encoding.

Many of the studios supplying content to Comcast and the other cable operators using the CMC have not invested in HD encoding equipment yet, he added, "so we do it for them. We have a bank of HD encoders that validates the source content and then makes the appropriate encoding choices for that content."

If the encoded content will be offered as VOD more than once, such as a TV series, Comcast will store it long-term, so it does need to be re-encoded the next time that it's made available. "It's just cheaper to store content we know is encoded right than to trust this to a third party," he said. We'd rather do it ourselves."

The CMC now is experimenting with dual-pass MPEG-2 encoding, Traver said.

"The first pass encodes the content at a higher bit-rate for better quality and the second pass at a lower bit-rate looks at the initial encoding [and] drops it down while maintaining the quality. Our results are not yet definite, but so far it looks very promising."

Part of the challenge is encoding the metadata into every program and movie. Each content provider and each cable system using the CMC has different business rules that govern the VOD offerings, such as how many times a given program can be viewed on free VOD or subscription VOD services. "These business rules are encoded into the metadata here at the CMC," Traver said.

For storage of the encoded VOD content, Traver said the CMC uses servers from StorageTek (now part of Sun Microsystems), Network Appliance, EMC, and SeaChange International. "Our goal is to make all these pieces of equipment in the VOD system work together in a totally seamless way."

An outgrowth of this integration allows Comcast to offer ancillary on-demand services, Traver noted, such as the Comcast Gallery Player, which can deliver high-resolution digital images on-demand to an HDTV screen. Among the most popular images are the hi-def shots from the Hubble space telescope.

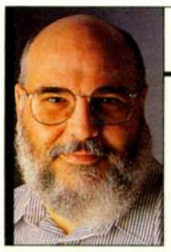
Olgeirson from Kagan Research concluded HD-VOD is part of a major evolutionary trend for cable.

"We're going to increasingly see more and more HD content on cable, and as cable's library of HD content grows, we're going to see more and more of the HD content offered on-demand," he said.

He predicted that at first we're not going to see a lot of the HD content offered as free VOD, as with the archival family TV shows like "The Jetsons," "but as the advertising models begin to adopte VOD better, we'll see a migration toward free HD-VOD, especially with the network shows. The smart cable networks are open to a broad mix of VOD traffic." ■

"Cable still needs to map out where to set VOD usage maximums and minimums to accommodate HD traffic."

—Ian Olgeirson, Kagan Research



LET THERE BE LIGHTING

Andy Ciddor

Lighting Another LD's Show

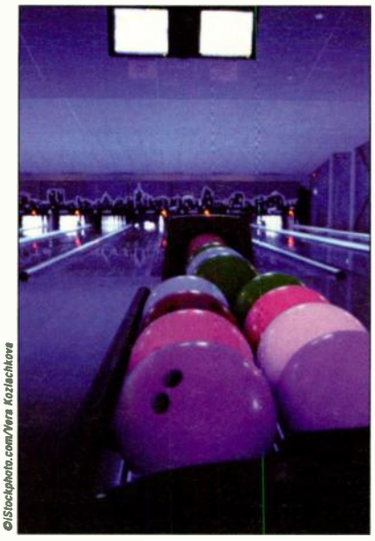
If there's one thing that's more frustrating in a lighting director's life than a vision controller who pushes the auto-iris button then opens Sports Illustrated, an indecisive and parsimonious producer, a director full of great ideas but insufficient skills to realize them, or a boom operator that doesn't believe that mics cause shadows—it's being the TV LD on an event that's already been lit by someone else.

Despite the widely accepted view that an event didn't happen if we didn't watch it on TV, (or at the very least see the episode of "The Simpsons" that retells the story), many events are not actually staged for television.

Even some "photo opportunities" that are staged for television (such as the toppling of Saddam's statue in Baghdad in 2003) may not be fully produced with adequate lighting and proper pool audio and video splits.

However, for many news events, our audiences are still prepared to accept lower production standards because they can accept it as actuality. In the long term, we may find that reality television, with its high production values, results in serious viewer dissatisfaction with how tacky the un-produced world looks on our news and current affairs screens.

Not long ago, I was contracted by a government protocol office to provide the broadcast lighting for a media conference given in a 19th century grand ballroom by visiting European royalty. Everything was going beautifully, the networks all had their audio splits from a couple of discretely placed table mics and all of the camera crews had lined up good shots of the stand-ins, complete with subtle highlights on the some of the more interesting architectural features of the room.



©iStockphoto.com/Vera Kazlachkova

I was reasonably pleased with what I could see in the viewfinders. Then, less than two minutes before the prince and princess were to appear, the royal media minder marched into the room, looked around, then demanded that all front lighting should be switched off so as not to annoy their highnesses.

I protested to the protocol people on behalf of the assembled camera crews, but was told that despite my contract, the palace had the final word in these matters. However, instead of switching off the front lighting, I tilted it up to bounce off the distant ballroom ceiling in an attempt to throw at least some light onto their highnesses' faces, then hastily reduced the brightness on the architectural features to allow the camera crews to crank up camera gain to capture the faces without burning out the rest of the noisy shot. We very nearly gave them good pictures.

In that instance, I was only fighting the client (whoever who that was), but coming in to shoot an already lit event is akin to stepping blindfolded into a minefield. Having been both the visiting and the visited LD, and even more interestingly, a freelance writer covering such events from the control room and on the comms loop, I have come up with a checklist of points to ponder.

The very first issue must always be: Whose show is it anyway? This generally boils down to the question of who is the real target audience of this event? Is this staged for a paying audience and are we just along for the ride to televise the event? (Sometimes this question comes down to the nasty issue of whose producer is putting up the most money for the event.) Or, despite having paid to see the event, is the audience there merely to provide the applause track, some foreground and the cutaway reaction shots for the TV coverage? Or, has the event been staged with the sole intention of attracting media coverage to promote a product or idea?

I was once assigned to a zero-budget, one-off broadcast of a bowling tournament. Why this happened at all I can't recall, but possibly one of the teams was sponsored by the television station.

TV SPECTACULAR

An illustration of this problem comes from one of the more interesting weeks of my life, spent watching the production of an Olympic games opening ceremony. For reasons that remain unclear, this event had been produced as a live show for the 80,000-person stadium audience, although it was really a television event for a worldwide audience in excess of 3 billion viewers. An unnamed U.S. network was the largest single purchaser of broadcast rights and was expecting an impressive television spectacular.

The lighting designer and his team had put together a good-looking and exciting production that pushed at the boundaries of what was possible with the technology then available. Surprisingly, during the several years of the production process, no television production advisors had been involved with lighting the ceremony. While minimum light levels had been specified, no specifications of contrast ranges been passed on to the lighting design team. A television LD was involved in the ceremony production, but only to design the audience lighting for the broadcast.

When the director of the television

broadcast finally got to see the dress rehearsals on camera, there was pandemonium when it was discovered that contrast ranges were too wide and that the timing for some lighting cues just didn't work for a television production.

After much contract and check-butt waving and a not inconsiderable amount of yelling and storming about, the live LD and the TV LD sat down with the multitude of console operators and spent several all-night sessions replotting the lighting cues to work for the TV audience too. The result was indeed a spectacular production.

EXTENT OF THE COVERAGE

The extent of our coverage should give us a clue as to how to approach the lighting process. Are we just at the event to pick up a short sequence such as the announcement of a major award or a juicy sound bite? Or are we capturing the entire event for condensation into a highlights package? Or are we covering the entire event either for live broadcast or for transmission after post production?

From this information, we should be able to decide which are the critical positions and sequences that we should treat for television and which we can leave in their original format.

I was once assigned to a zero-budget, one-off broadcast of a bowling tournament. Why this happened at all I can't recall, but possibly one of the teams was sponsored by the television station. Although I had a reasonable amount of lighting equipment available, there was barely enough power available for the OB truck and no budget for a utility tie-in or a generator.

With the prevailing light source being a vast number of overhead fluorescents, this provided the color temperature *du jour*. Unfortunately, when it came to boosting the lighting on the competitors for close-ups and reaction shots, there was not enough power available to throw more than half the light into color temperature correction filters to match the fluorescents.

Instead, I did a deal with the director, and after some coercion, the vision controller as well.

All shots of the bowlers would be lit in straight tungsten light and taken only from the direction of the lanes. All shots of the lanes and pins would be under available fluorescent light and taken only from the direction of the competitors. Each group of cameras was balanced for the light source it was shooting, and no shots would be put to air if they crossed the line between the zones.

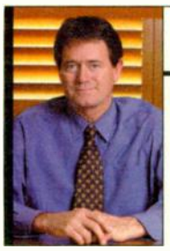
Astoundingly enough, the director and the camera operators stayed within the bounds of the agreement for most of the time and the pictures were acceptable, although the highlights package for this event never did make it to air.

Finally, the technical capabilities of our cameras will have a significant impact on the decisions we can make about the lighting process. On a sports awards presentation that was being covered only for a couple of major awards, I found that the event lighting levels were just within the exposure capability of our cameras on a fully zoomed lens.

This allowed me to simply get the followspot operators to drop CTO and ND filters into their metal halide spots to match the color temperature of the stage lights and to keep all exposures within a stop or so of the stage levels. The pictures were of good quality and rather than beefing up the stage to TV light levels, my lighting for the production involved a couple of sheets of gel. It also entailed no grief for the event producers, the television producers, or either of the LDs involved.

Early in my career, I had my beautiful, subtle, stage lighting "improved" by a swarm of TV lighting gorillas armed with truckloads of 10Ks to feed their thirsty cameras for a broadcast. Since then I have become very sensitive to the possibilities of other paths to enlightenment.

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



ATSC OUTLOOK | Jerry Whitaker

Strategic Plan to Guide Future Work on DTV

The ATSC has developed a comprehensive plan for future work of the organization, reflecting the evolution of technology over the next two to five years. The ATSC board of directors developed this strategic plan, taking into account the likely progression of technology and the importance of backwards compatibility with existing DTV consumer receivers. The new efforts will focus on comprehensive solutions that enable compelling services and products. Major recommendations include the following.

Documentation of service levels that group standards together to form a logical bundling of features and functions, specifically:

ATSC 2.0—new services for conventional fixed DTV receivers;

ATSC-H—delivery of programming to handheld and portable devices;

ATSC-M—delivery of programming to mobile devices.

The strategic plan furthermore calls for development of a standard for nonreal-time delivery of new services that leverage the low cost of storage and provide consumers with content they want, when and where they want it.

Work has already begun on several of these initiatives within the ATSC Planning Committee under the leadership of Graham Jones from NAB. Under the ATSC structure, the committee explores applications of digital broadcast technology. It considers business opportunities, with a focus on new applications that may be enabled by digital television standards.

Based on this analysis, the committee makes recommendations to the ATSC board regarding development of voluntary standards, recommended practices, and/or informational documents relating to DTV.

These recommendations are typically supported by a list of user requirements. Within this realm, it falls to the committee to begin many of the projects envisioned by the strategic plan.

Current projects relating the strategic plan include:

Interactive TV—The committee is working to raise awareness and identify implementation issues through demonstrations and field trials of the ATSC Advanced Common Application Platform standard for interactive television. This work, led by Dan Berkowitz from NBC Universal, has already provided two demonstrations of ACAP operation—one at the NAB2007 Convention in Las Vegas and the other at the 2007 Technology Retreat in Palm Springs.

Nonreal Time—A study group, chaired by Dr. Richard Chernock from Triveni Digital, is developing service scenarios and a list of system requirements for a practical nonreal-time service.

ATSC-M and ATSC-H—A study group chaired by Mark Aitken from Sinclair Broadcast Group has developed a formal New Work Item Proposal to develop standards for mobile and handheld applications. This document, setting out the requirements, has been approved by the full planning committee and the ATSC board. Work on the necessary documents and specifications will begin shortly.

Under the ATSC structure, once the scope of a new project is defined by the planning committee and approved by the board, it is sent to the Technology and Standards Group, which creates the necessary technical documents.

Throughout the standards development process, potential synergies with existing standards—published by the ATSC and other organizations—are considered. Every effort is made to avoid reinventing the wheel. The technologies considered by TSG, led by William Miller from ABC, may be improvements to current systems or entirely new systems. Compatibility with existing systems and protecting legacy receivers is always a primary consideration.

Estimating when an ATSC H/M standard will be final is difficult at the present time, but it's recognized that broadcasters should have the opportunity to announce and launch new mobile and handheld services before the end of analog TV in February 2009.

NONREAL TIME

Although not directly related to new technologies, the current state of DTV audio implementation is identified by the strategic plan as an important issue needing further study in coordination with other industry organizations. While the AC-3 digital audio standard has been on the books for many years, implementations in the field have varied, in particular with regard to lip-sync and sound levels.

TSG has directed the ATSC Specialist Group on Video and Audio Coding (TSG/S6) to look into these issues. TSG/S6 has established two working groups to gather implementa-

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VIDEO NETWORKING **Wes Simpson**

Correcting IP Network Errors With FEC

Error detection and correction technologies are crucial. They are present on every CD, DVD and hard drive sold today. They are used for satellite links, WiFi links, and many of the networks routinely used for video transmission. Adding some extra data to a signal can make it possible to detect all errors, to correct most bit errors and to replace missing packets.

One example of checking errors in data transmission code involves the parity bit used on many serial data interfaces. This works by designating one bit in each eight-bit byte as the parity bit, with the remaining seven bits used to carry data, such as an ASCII character. In the case of even parity (commonly used in serial data interfaces) the eighth bit is set to a value of one if there are an odd number of ones in the other seven bits of data, and to zero if there are an even number. With this added information, the receiver can determine if there has been a single bit error in any received byte.

P_1	P_2	P_3	P_4	P_5	F_{R1}
P_6	P_7	P_8	P_9	P_{10}	F_{R2}
P_{11}	P_{12}	P_{13}	P_{14}	P_{15}	F_{R3}
P_{16}	P_{17}	P_{18}	P_{19}	P_{20}	F_{R4}
P_{21}	P_{22}	P_{23}	P_{24}	P_{25}	F_{R5}
P_{26}	P_{27}	P_{28}	P_{29}	P_{30}	F_{R6}
P_{31}	P_{32}	P_{33}	P_{34}	P_{35}	F_{R7}
P_{36}	P_{37}	P_{38}	P_{39}	P_{40}	F_{R8}
P_{41}	P_{42}	P_{43}	P_{44}	P_{45}	F_{R9}
P_{46}	P_{47}	P_{48}	P_{49}	P_{50}	F_{R10}
F_{C1}	F_{C2}	F_{C3}	F_{C4}	F_{C5}	

Fig. 1: Red characters represent corrupted packets.

Unfortunately, a single parity bit can't detect a byte with two errors, and can't be used to correct errors.

More sophisticated error detection schemes address multiple bit errors. One example is a checksum, which performs binary addition of a series of bytes and sends the resulting sum along with the data. At the receiver, the same addition is done on all the message bytes, and if the sum calculated at the receiver does not match the sum sent by the transmitter, then one or more errors has occurred in that group.

This is the method used in every standard IP packet to detect any errors that may have corrupted the packet header data.

More sophisticated techniques, such as cyclical redundancy check, avoid some of the problems of a simple checksum, which include the inability to detect an all-zero byte that was mistakenly added or removed. An example of a CRC code in a video application is the error detection and handling information that can be added to standard SDI video signals.

ERROR CORRECTION

FEC covers a range of technologies that implement a single, powerful idea—adding extra information to a data stream to allow transmission errors to be detected and corrected. This extra data is specifically designed to allow the receiver to determine if errors have occurred and to correct them. At the output of the receiver, the extra data is removed, so that the stream returns to its original form.

For true error detection and correction, more sophisticated techniques involving fairly intense mathematics are required. One of the most popular techniques is called Reed-Solomon, after the two gentlemen who invented it in 1960. This techniques works on groups of data bytes, and can be tuned for a variety of network error types and intensities.

A familiar example of Reed-Solomon coding is the FEC often used with MPEG-2 transport streams. Standard transport stream packets are 188 bytes long, and can be optionally augmented with 16 or 20 bytes of Reed-Solomon code. When 16 bytes are used (as per the DVB standard), up to eight byte errors in the packet can be corrected; when 20 bytes are used (as per the ATSC standard), up to 10 byte errors can be corrected.

Reed-Solomon codes are very effective as long as the duration of burst errors is relatively short (less than eight or 10 bytes long in the case of MPEG). If, however, longer burst errors must be handled, such as those lasting for hundreds of bytes, row/column FEC is typically used. Row/column FEC is frequently used on networks when entire IP packets (often containing seven MPEG transport stream packets) are liable to become lost.

Row/column FEC works by arranging groups of packets into rows and columns, and then adding an FEC packet to each row and each column. For example, a 10-row, five-column FEC scheme would add 10-row FEC packets and five-column FEC packets to every 50 data packets. With this extra data, it becomes possible to correct burst errors of up to five packets in length and even replace missing packets. However, there are limits to what can be corrected. Fig. 1 shows two examples of different error patterns that can be corrected. Packet P9 has been corrupted by a short bit error. Since none of the other packets in row two have been affected, the error can be corrected with FEC. Packets P37, P38 and P39 have also been corrupted. These errors can't be corrected with the FEC because there are too many, so instead, the correction must be based on the FEC data for columns two, three and four.

Columns two and three can easily be corrected since there is only a single packet error in each column. For column four, packet P9 must be corrected first using the row two FEC, and then packet P39 can be corrected using the FEC for column four.

Of course, the added row/column FEC data is fairly costly in terms of bandwidth, adding 15 extra packets for every 50 transmitted, for 30 percent overhead. End-to-end delay of the system is also increased, because the receiver needs to buffer the block of 50 incoming packets in order to check the FECs and correct any errors in the data block.

Like any technology, FEC has advantages and drawbacks. There is a tradeoff between the error rate and the amount of extra bandwidth needed for correction, as well as the consequences of uncorrected data errors..

One surprising place where FECs are sometimes not used is on DSL lines used to deliver IPTV services. In this case, the extra bandwidth needed to deliver FEC data for every stream is too wasteful. Instead, some operators have systems that automatically recover from packet errors by sending a signal from the receiver back to the transmitter requesting that the missing packets be retransmitted.

Wes Simpson, who hopes this column is error free without the use of FEC, is the proud author of he newly released book "IPTV and Internet Video" from Focal Press. He can be reached at wes.simpson@gmail.com.

INSIDE AUDIO | Dave Moulton

Where Are We? This is Where!

Last month, I reviewed the Modulation Sciences SpiderVision Surround Sound signal level meter. As the lead-in to that review, I noted Lord Kelvin's dictum that to measure is to know.

Well, I spent a couple of days this past month using the SpiderVision meter to measure in considerable detail the various channels emerging from my set-top box. The results are quite interesting and, as Kelvin noted, I now know a good bit more than I did.

At the same time, Randy Hoffner, another columnist for our magnificent magazine, wrote to suggest that I was being a little unfair in my March column in suggesting that HD might not be viable yet. In a subsequent exchange of letters, we sort of identified the problem as existing in the difference between what content producers generate and what end users actually get to perceive in their living rooms.

So, it is timely and relevant to share with you something about the reality of the couch potato experience, as measured by your somewhat trepid reporter.

I am a subscriber to DirecTV, a satellite service. I have an expanded service with lots o'channels. These are advertised and described as having "crisp digital picture and sound." For the purpose of this study, I auditioned 184 of these channels, making notes about the measured nature of the audio signals of all of them.

I did not audition the XM music bundle, and I skipped some of the instructional channels supplied by DirecTV. I did include various shopping channels, the NASA channel, the RFD channel and the C-Spans, as well as the major networks, news, sports and movie channels.

Note also that I reside in a somewhat narcissistic and well-to-do cultural ghetto (Boston metro). I'm assuming that the technical quality of our offerings in such a media hot bed is approximately as good as it gets.

Before we actually start picking into the details, note that this is not intended as a rant about DirecTV. It is not possible for me to determine what, if any, of the problems I found are the fault of DirecTV, and I make no case that any of them are. I have quibbles about DirecTV's service, but it is a considerable improvement over its cable predecessor, Charter Communications.

Approximately half the TV audio being broadcast is mono, slightly more than a quarter is stereo and slightly less than a quarter is surround sound.

Let's consider what I found: There were 184 channels that I observed and documented. Of those, only nine (5 percent) were HD channels. One-hundred-seventy-one (93 percent) had analog audio that triggered the Dolby Pro Logic upmix on my TV, while 18 (10 percent) had Dolby Digital audio, (some channels did both).

Eighty-two channels (45 percent) had mono signals, 59 (32 percent) were in stereo and 43 (23 percent) had a significant enough surround component to be regarded as surround sound. Keep in mind that this distribution is program-dependent and will vary over time. Also, what I observed does not necessarily reflect the intent of the source producer—only what was coming out of the set-top box *while* I was observing it.

I typically auditioned each channel for several minutes and tried to get at least some program content (as opposed to commercials). Some stereo signals appeared to be simulated, and on numerous channels, there was a significant amount of HF phase shift

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Photo: Steve Jordan

NET SOUP | Frank Beacham

As News Shifts, Training Declines

Only those with heads implanted deeply into the sand are missing the swift transition of multimedia news reporting to the Internet.

Following in a less timely way, however, is much-needed training for those charged with carrying out this transition.

Until recent years, the staffs of television news organizations were made up of people with clearly defined skill sets. The key jobs were reporters, camera operators, sound recordists and editors. Most had learned their craft in order to get the job.

Now, of course, one person may be all of these things combined. Often, the staffer was mandated his or her new multifunction role through economic dictate from management. Training for the new job was incidental.

But those who still care about the *quality* of news production know that skills can't simply be mandated. A good reporter has to learn the craft of visual storytelling. A camera operator must have photographic skills and understand how to use light to create compelling images. A sound operator needs to know more—far more—than that the VU meter bars need to stay in green.

Whether you're from television, newspapers, wire services—whatever, the migration of information reporting to the Web is creating a new kind of multimedia news presentation. And, as if we didn't already know it, few news veterans from traditional outlets have mastered the creative possibilities of the new medium.

Of course, it will take a few years for a new generation of talent to truly exploit the new technology. Having been immersed in multimedia from birth, younger people will rise through the ranks perceiving the Internet differently from those of us who had to learn news skills.

OLD CODGERDOM

But we old codgers (aka "midcareer journalists"), if we are to continue our chosen work, must learn the ways of new media. Unfortunately, most news organizations are providing little help.

The issue of change, and the training for skills to address it, is the subject of new book, "News, Improved: How America's Newsrooms Are Learning to Change," by Michele McLellan and Tim Porter. Citing opinions from more than 2,000 journalists, the book is based on a new survey conducted for the John S. and James L. Knight Foundation.

The book finds that good training helps newsroom personnel adapt more quickly to the changing news distribution landscape. Most news workers, however, are not getting such training.

I was surprised to learn that six in 10 news organizations have actually cut or are barely maintaining the status quo with training budgets in this era of accelerated change. This, the authors say, is significantly lower than with other industries dealing with training of workers for the digital age.

According to the findings, overall training in the news industry hasn't changed much in the past five years, making the training issue the No. 1 source of dissatisfaction among today's working journalists.

Nine in 10 journalists feel the need for more training than they are getting now. Their bosses agree, with nine in 10 news executives saying their staffs would benefit from additional training.

One in 10 news organizations provides no training at all, and three in 10 journalists were not provided with any training by their news organizations.

"Virtually everyone agrees training for journalists must increase," said Eric Newton, vice president of the journalism program for Knight Foundation. "What is puzzling and distressing is that only one in three news organizations are actually doing that. It's as if only one-third of the news industry wants to have a future."

Can it be that many news organizations... simply don't care about the quality of their reporting or about their reputation in the future.

How can this be? You guessed: M-O-N-E-Y. Only three in 10 news organizations have increased their training budgets in the past five years, the authors found. Those increasing training tended to be national media organizations, the top 100 newspapers in circulation, and smaller-market television outlets.

What training there is usually focuses on new media. Four in 10 journalists who feel they need additional training said they would benefit most from more training in new media, followed by craft skills, at 22 percent; beat areas, at 13 percent; and ethics, at 8 percent.

If you think it's the new (lower paid) blood coming into the news business that's providing multimedia skills, think again. Only 3 percent of news executives who had recently hired new journalists said the new hires had the training they needed. More than half said new hires need some additional training and four in 10 said new hires need a lot more training.

I wish I could make sense of the data in this new book. Can it be that many news organizations—broadcast and otherwise—simply don't care about the quality of their reporting or about their reputation in the future? If that's the case, they seem to be on the right path to extinction.

Fortunately, the Web has lowered the cost of entry for a new generation of journalists who can choose to work independently and outside these stifling, unresponsive organizations. Hopefully, Internet technology will enable this talent to challenge the status quo, and ignite a new quest for excellence back into a once great profession.

For more information on the book and survey, go to *www.newsimproved.org/*.

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

MEDIA SERVER TECHNOLOGY **Karl Paulsen**

The Essence of Wrappers And Components

The material interchange of moving media can be accomplished by different means. A tape or disc may be used as a physical transport, with its content comprised of essence in the form of a compressed file, a contiguous interleaved video sequence (i.e., a videotape), or a string of individual files (i.e., JPEG images) that when ordered properly for reproduction, make up a video clip.

Just as common in today's networking environment are file and stream transfers. In terms of workflow, incoming streams are often captured by a recording medium and turned into a set of files, which are then converted back into a stream for transmission or distribution. It is the structure of the files and the streams themselves that lead to the interoperability issues that have instigated, in part, the development of the Material eXchange Format, or MXF.

Understanding why MXF is what it is requires knowing the concepts of wrappers and content packages, items and elements. In the simplest of terms, a wrapper is like an envelope—somewhat closely aligned to a packet in the IT-sense, but that's where the similarity ends. A wrapper must have organization characteristics. It needs to convey, and link essence and its associated metadata.

KLV is that methodology by which the data strings in MXF are parsed into their proper buckets.

Before climbing under the hood of MXF, first recall that essence components may be video, audio or other data. The organization of all these essence components is supported at its highest level by the wrapper. In the content model, content is comprised of content packages, which are a collection of content items.

Content items are made up of content elements, each of which contains a grouping of similar element types of essence. Note that each set of essence components needs some vital metadata—the bits that describe the essence type, as a recordkeeper of what the structure is inside the content element.

ESSENCE, PAGE 35

Where

CONTINUED FROM PAGE 32

between L and R on several mono signals, resulting in a fake, fairly spitty-sounding narrow stereo image.

So, the basics are this—approximately half the TV audio being broadcast is mono, slightly more than a quarter is stereo and slightly less than a quarter is surround sound. Only 5 percent of the content is received as HD, although perhaps 10 percent may be generating HD.

The good news is that 138 of the channels (75 percent) appeared to have no problems with their audio signals.

The bad news is that *only* 138 (75 percent) had no problems, which means, of course, that 46 channels (25 percent) did have observable errors and/or problems. Uh-oh!

Note also that I did not measure level variance nor did I measure dialnorm error. I suspect that had I done so and specified that anything greater than 3 dB variance was an error, the number of problem-free channels would have been much smaller.

Many of the problems had to do with imbalances between left and right channels, often as much as 6 dB. One channel had significant and pervasive clipping, while another had pronounced overshoots, but without the clipping artifacts.

INTERPRETING THE DATA

Much of the stereo was quite narrow, and some of the surround consisted of mono voice and surround audience noises. One old mono movie suffered from embarrassing synthesized surround. At least three other channels were transmitting legacy mono movies in mono (which is fine with me). A few channels (nine, or 5 percent) had sound that inspired me to write "good" or "really good."

Finally, I made an arbitrary and somewhat subjective distinction between "major" and "minor" errors. The major errors were, in my opinion, embarrassingly audible and representative of very poor engineering craft. Seventeen channels (9 percent) had such errors. Minor errors are probably audible, but more representative of sloppiness than incompetence. Twenty-nine channels (16 percent) exhibited such errors.

This was an informal, nonscientific study. We have only one sample point, for instance. It is reasonable to assume that what I found will not reproduce very precisely at other sites, with other service providers, etc.

On the other hand, this particular couch potato has some professional expertise and, further, sought professional installation. Also, the service provider under test broadcasts in parallel to (I am guessing conservatively) more than 1 million subscribers, so a certain amount of consistency across set-top boxes can be expected.

I suggest then that the errors in my findings will probably not be much greater than plus or minus 10 percent vis-a-vis the average condition for all viewers. That in turn suggests that the number of channels with errors will constitute between 22 and 28 percent of the total. The amount of mono being broadcast ranges more widely (it being program-dependent, remember), probably between 35 and 55 percent.

Mono is still with us, in spades. This is true even though we broadcast using stereo or multichannel. Given that voice tracks are predominant and mono by nature, that isn't surprising. I was, however, a little surprised by the number of mono music beds under mono voiceovers. And, sadly, at this point in time, HD and surround sound (synthesized and real) remain very much in the minority.

This reality is a little sobering. We really truly aren't there yet.

And thanks for listening.

Dave Moulton has the blue state blues. He thanks Modulation Sciences for enabling him to do these measurements. You can complain to him about anything at his Web site, www.moultonlabs.com.

Essence

CONTINUED FROM PAGE 34

MXF employs a generic container, a slightly different twist on the content model that defines frame-interleaved content comprised of system items, picture items, sound items, data items and compound items.

The twist allowed the inclusion of multimedia-related items, mitigating the need to differentiate between moving elements (video), audible sound elements (synthesized audio or MIDI), and generally static elements (still graphics or text) as well as data items (teletext or closed-caption files). So the MXF concept broadened the coverage immensely, taking a step well outside the confines of other content package specifications, most notably, SDTI-CP (SMPTE 326M).

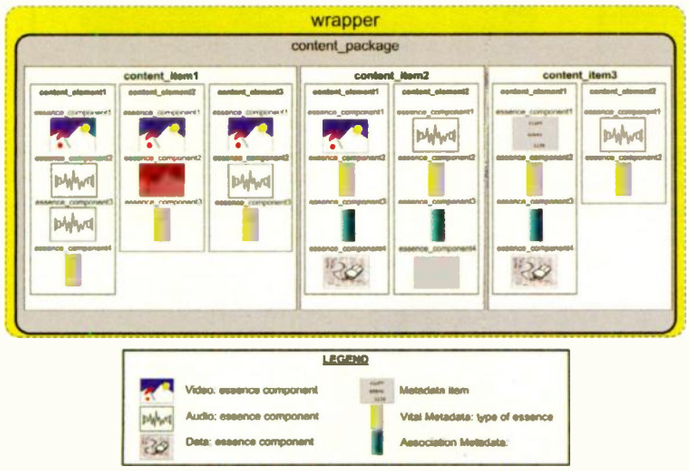


Fig.1: The content model composed of content packages is made up of content items, which contain content elements made up of essence components.

SDTI-CP is the format for the transport of content packages (CP) on the serial digital transport interface (SDTI). It consists of a group of timing and control elements, plus any metadata associated with the picture, audio, and auxiliary data items.

It includes a picture item, assembled as a group of up to 255 picture stream elements; an audio item, assembled as a group of up to 255 audio stream elements; and an auxiliary item assembled as a group of up to 255 auxiliary data elements such as ancillary data lines, teletext, and other data.

The MXF Generic Container is a native essence container capable of being continuously decoded through mechanisms such as interleaving essence components with stream-based metadata. The container allows essence to be wrapped in key-length-value encoding and to optionally associate an index table that permits multiplexing with other essence containers. In turn, this allows the setting of decoder requirements for listening, playout, display or execution of a command for that content.

Key-length-value, described in SMPTE 336M as "KLV encoding," is a triplet employed as a data interchange protocol for data items whereby the key field identifies the data, the length field specifies the length of that data, and the value field is the data itself (sometimes called the payload).

KLV provides a common interchange for all compliant applications irrespective of the implementation or transport method. The key in this protocol is a 16-byte SMPTE universal label per SMPTE 298M that identifies the data in the value field.

The length field uses basic encoding rules/length encoding, from a type of ASN.1 coding, but with a variable length. Basic encoding rules comprises a standard language used to code protocols, which furthermore is the transfer syntax for simple network management protocol, and lightweight directory access protocol, an application protocol for querying and modifying directory services running over TCP/IP.

KLV is that methodology by which the data strings in MXF are parsed into their proper buckets. All system elements, essence elements, and the like, are KLV-coded.

While the topic of KLV is well under the hood of MXF, and there are hundreds of additional structures of data inside MXF; it is with these principles that the elements associated with MXF are based.

The point to realize is that MXF uses many established principles and protocols of networking, encoding and the like. It grew as a means to satisfy media exchanges and interoperability at an equalized level—not unlike how nearly everyone can surf the Web without worrying about myriad protocols, interconnections, routing, etc.

We started this column establishing that file transfers and streaming delivery are fundamentally different—yet collecting, storing and retrieval for distribution must move seamlessly between transfer and streaming. It is precisely here that we must recognize the necessity of a common architecture for interchange.

After about 10 years of work on interchange/interoperability, we still find substantial differences in how systems (and products) interpret MXF. While they all may understandably and correctly state "MXF-compliant"—the industry which seems to gain the most from a proper exchange is still trying to use this boat with a very short rudder.

Most recently, a collection of industry giants (and real users, too) have set out to establish a model for baseline utilization, and in turn, conformance in MXF. This is not, by any means, a new standard or a new version of MXF, it is an implementation, dubbed the "MXF Mastering Format Project."

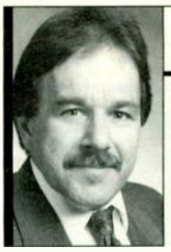
For the past several months, this group, in alliance with members of the Advanced Media Workflow Association, has been putting AAF and MXF to work.

At NAB2007, the AMWA is sponsoring the first public demonstration of this long-term initiative, which is being led by Turner Broadcasting System. The mission of this project is to bring a fresh approach to MXF and to provide proposed, real-world solutions for key workflows, focusing on creating a single MXF master file from which multiple versions of a program may be created.

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

PRODUCTS & SERVICES SHOWCASE

PRODUCTS & SERVICES SHOWCASE



TECHNOLOGY CORNER | Randy Hoffner

Video Delivery Technology Marches On

Is it just me, or is the television industry changing by the day? I recall one day oh-so-long-ago when I was being shown the headend of a cable TV system. At the time, this system was doing what all cable TV systems did—retransmitting local terrestrial television signals.

Recall that the industry's acronym was CATV, which stood for "community antenna television." My host told me that they were gearing up to be able to transmit 36 channels to their subscribers, and I couldn't figure out how they were going to do that, or what they were planning to transmit on all those channels.

There were three commercial broadcast networks at the time, and it required a sizable city to have independent television broadcasters beyond the network and public TV affiliates. The VHF television dial was full in only the largest cities, where there may have been a couple of UHF stations as well.

FROM THREE TO 104.2

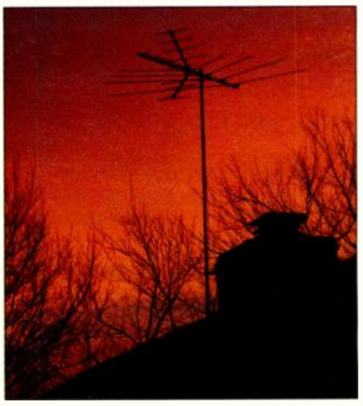
Things have changed. There are now four-plus commercial networks, a practically uncountable number of cable networks, and two direct satellite broadcasters, not to mention VCRs, DVDs and hard disk video recorders.

A recently released report by Nielsen Media Research tells us, among other things, that in 2006, the average American household received 104.2 television channels! The available-channels trend is, unsurprisingly, up. According to Nielsen Media Research, in 1985, 18.8 channels were available to the average U.S. home. By 1990, this number had increased to 33.2; by 2000, the number was 61.4; and in 2005, it was 96.4.

Lest we think that terrestrial broadcast is waning, the average U.S. household now receives more than 17 broadcast TV channels.

And lest we think that terrestrial broadcast is waning, the average U.S. household now receives more than 17 broadcast TV channels. Fifty-eight percent of TV households receive 15 or more broadcast channels, and 36 percent have 20 or more.

The number of channels actually viewed by the average household has increased as well, although the percentage of the total of available channels actually viewed in a home has dropped. In 2000, the average household viewed 13.6 channels, 22.1 percent of the 61.4 available. By 2006, the average household viewed 15.7 channels, 15.1 percent of the 104.2 available.



This data also revealed that more Americans are viewing television programming delivered by alternate delivery systems, and that cable penetration has concurrently hit a 17-year low. According to the data, the penetration of alternate delivery systems was 25.8 percent in February 2007, an increase of about 4 percent from the previous February. During that time, the penetration of wired cable fell from 64.1 percent to 61.3 percent, its lowest point since 1990. It was reported elsewhere that in a number of markets, alternate delivery system penetration has exceeded 40 percent. One example cited in *tvnewsday.com* is Springfield, Mo., where a reported 57.7 percent of subscription television households are receiving programming via an alternate delivery system. The largest alternate delivery system is direct broadcast satellite, the overall penetration of which is reported at 25.8 percent, up from 21 percent the previous year.

The Nielsen study reports that for the 2006-07 television season, there are an average of 111.4 million television households, 82 percent of which have more than one TV set. Twenty-eight percent of U.S. TV homes subscribe to digital cable, while 84 percent have a DVD player.

The television industry has been in a significant state of flux since the early 1980s, if not the late 1970s. The combination of satellite video delivery (now to automobiles as well as homes), digital television, digital video recording, computers and the Internet, has given us a television landscape that seems to be changing daily.

The ascendancy of DTV and HDTV broadcasting has given rise to one ironic apparent trendlet: The return of the rooftop antenna. Recent statistics indicate that about 20 percent of the TV households in the U.S. still receive their TV signals off-air, and recent anecdotal evidence seems to indicate that this number might be increasing slightly.

If you take a look around your neighborhood, you might notice some relatively new, frequently UHF-only, rooftop antennas up there among the satellite dishes. Off-air DTV reception with the latest generation of DTV receivers is quite reliable in many areas, and the quality of HDTV signals so received is high. The viewer with an HDTV receiver discovers that off-air DTV has some desirable qualities: It's free, it's wireless, and it looks great. This could foretell another emerging alternate delivery system—off-air reception.

The impending cessation of analog television broadcasting, and future technological advancements, will give rise to more changes in the television industry, to be sure. As someone once said, prediction is difficult, particularly prediction of the future, so we will not attempt to predict what those changes might be. It is safe to say, however, that there will be many of them, and that some of them will surprise us.

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

DTV

CONTINUED FROM PAGE 30

tion data and report back with recommendations.

A number of possible service scenarios are being considered for an ATSC nonreal-time service by a study group. This group is documenting uses and business applications to aid in understanding the requirements for practical nonreal-time applications. While not an all-inclusive list, these scenarios provide insight into potential applications for nonreal-time standards; for example:

News, weather, traffic and sports clip service provides for the delivery of national and local content. Clips are downloaded to storage within receiving devices for playback at a later time. .

Telescoping ads is a service that focuses on ads with additional content pushed to the receiver to allow the viewer to drill down into more detail. Additional Web pages and video segments are pre-downloaded as files—possibly based on user-defined profiles. Additional content may be pulled, if the application and a return channel allow.

Long-form entertainment programming provides the capability to download entertainment content to receivers. Possible business models include advertising-supported, subscription-based and pay-per-view material. Free local DTV broadcast channels could be blended together with private long-form entertainment to provide more value.

As currently envisioned, inbound transmission will be broadcast to the fixed, handheld, or mobile nonreal-time device and the outbound transmission—when necessary—will be through a broadband Internet connection. Not all scenarios will require an Internet return channel.

ABOUT ATSC-M/H

While still in the early stage of the development process, the planned ATSC-M/H services would be carried in the DTV broadcast channels along with regular programming and services. The presence of the new services will not preclude or prevent operation of current ATSC services in the same RF channel, or have any adverse impact on legacy receiving equipment.

It is expected that ATSC mobile and handheld technology would be utilized for a variety of services to mobile and handheld devices, which may include but are not limited to:

Free (advertiser-supported) television content and other services delivered in real time;

Mobile and handheld subscription-based TV, video-on-demand, pay-per-view and electronic sell-through services;

- Nonreal-time content download, to playback later;
- Datacasting;
- Interactive television;
- Real-time navigation data for in-vehicle use.

These new services may transmit various types and quantities of content that may be versions of regular TV programming optimized for handheld and/or mobile reception or specific audio-visual content and/or data produced for mobile reception.

Estimating when an ATSC-M/H standard will be final is difficult at the present time, but it's recognized that broadcasters should have the opportunity to announce and launch new mobile and handheld services before the end of analog TV in February 2009. To meet this date, of course, the standardization work needs to move forward quickly.

Work within ATSC is open to all organizations with a direct and material interest. If you are interested in contributing to ongoing efforts reported in this column, please contact the author. Additional information on the ATSC can be found at *www.atsc.org*.

Jerry Whitaker is vice president of standards development for the ATSC. You can reach him via ***TV Technology****.*

USER REPORT

For-A Converters Valuable Tools for Sports

by Lawrence Partington
TV2GO Partner

TORONTO

TV2GO, an international satellite transmission and video production company converted coverage of Super Bowl XLI to European HD standards using For-A's FRC-7000 frame rate converter. We're following this success by transmitting additional major sportscasts to Europe, including the 2007 Masters Tournament from Augusta, Ga. and the International Ice Hockey Federation 2007 World Championship from various cities in Russia.

SERVES AS GATEWAY

TV2GO has served increasingly as a gateway between Europe and North America, providing European-generated sports programs to North America and vice versa. The FRC-7000 converter allowed us to meet growing demands for HD sports programming.

Last summer's World Cup marked a turning point for Europe. Since then, European sports broadcasters have begun looking to North America to satisfy their subscribers' appetites for HD sports broadcasts. In my opinion, images from high-speed sports such as ice hockey and football actually look better going from North American HD to European HD. In standard definition, European PAL has always been vastly superior to our NTSC.

Our transmission of Super Bowl XLI was converted from North American HD (1080i 60), to European HD (1080i 50), for rebroadcast in Russia, Italy and Germany. TV2Go was contracted to send three simultaneous signals to Europe: one was a re-transmission of the CBS Sports HD feed; the second was a clean feed version, so that European broadcasters could add their own narration, titles and graphics; and the third was a direct downconversion from 1080i to widescreen PAL.

The FOR-A FRC-7000 converter

'FAKE' HD

This winter we conducted experiments with ski racing from Europe for Canadian TV viewers, using a sort of "fake" HD. The signal started out in widescreen standard definition PAL. Using a For-A FS-9000 converter, we upconverted the PAL to 1080i/50 and then with the FRC-7000, converted it to North American 1080i/60 for delivery to our Canadian customer. This workflow allowed us to skip the NTSC stage altogether, achieving an upconversion that was visibly superior. Although it never went to air, the results were very well received. We used this same technique while transmitting the IIHF World Championship in April.

The FRC-7000 device uses motion compensation processing to convert field frequencies, and enables conversion between different HD frame rates. The FRC-7000 can convert between 1080/59.94i and 50i, and between 720/59.94p and 50p.

The FRC-7000's motion compensation processing technology uses motion vectors to reduce judder and video resolution deterioration during field frequency conversion. Competitors may have similar technology, but For-A delivers a superior product that's less expensive. We've done side-by-side comparisons and prefer the functionality and picture quality of the For-A FRC-7000.

Every successful event that we do with the For-A FRC-7000 adds credibility to the technology and the service. This technology sets us apart from other providers, because we know how to use it and make it work. So far the service has been faultless. More and more prestigious clients are looking for ways to capitalize on the HD market and they're calling TV2GO.

Lawrence Partington is a partner of TV2GO Inc., an international satellite transmission and video production company based in Toronto. He may be reached at Lawrence@tv2go.com.

For additional information contact For-A at 714-894-3311 or visit www.for-a.com.

BUYERS BRIEF

The MX5600 series of multiplexers from **Tandberg Television** are designed for MPEG-based broadcasting.

Transport stream outputs of up to 100 Mbps are available and the units can multiplex up to 8191 streams with full PID remapping.

The MX5600 units accept external 10 MHz and 1 Hz GPS references and have a highly accurate internal 27 MHz clock. They provide remote monitoring via SNMP and offer user-friendly configuration via the Tandberg nCompass control system, and also offer basic setup and monitoring from a front panel interface.

Many options are available, including a SMPTE 310 interface, DVB ASI and video bit-rate changing.

For additional information, contact Tandberg Television at 678-812-6300 or visit www.tandbergtv.com.

USER REPORT

NEP Counts on Cobalt Conversion

by Don Phillips
Director of Systems Integration
NEP Supershooters

PITTSBURGH

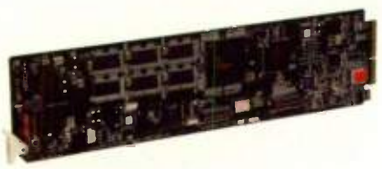
We've been using Cobalt Digital 9821 HD/SD downconverters since they first came on the market in 2006. We use them to downconvert HD serial digital video to either standard definition SDI or to analog composite. The reclocked outputs feed our truck's router and production switcher, and the 9821 also provides downconverted signals to the control room monitor wall, repeat monitors and any other piece of equipment that needs to see standard-definition video.

USES THEM EVERYWHERE

We essentially use the 9821 everywhere in the input chain of our high-definition production trucks.

The 9821 offers high-quality 10-bit downconversion that allows us to use it for standard-definition program distribution. Whenever we are doing an HD production and have users needing SD feeds, it's the Cobalt 9821 that we use.

The 9821 has four outputs that can be independently configured as either SDI or analog. These four outputs allow us to use the 9821 as a downconverting distribution amplifier, simplifying our system design.



The Cobalt Digital 9821 conversion module

In addition to its four SD outputs, the card offers four others that are reclocked copies of the input to the card and we've used the 9821 as a simple SDI distribution amplifier.

Aspect ratio conversion is another valuable feature of the 9821. We use it to create standard-definition letterbox or sidecropped video feeds. Aspect ratio conversion can also be applied to standard-definition inputs. The 9821 has the versatility to function as an SDI aspect ratio converter, and we use it whenever we have such a requirement.

The ability to perform field alignment upon downconversion of a 720p input is extremely useful. We use this feature when feeding signals to stadium screens. With the 9821 providing proper field alignment, we don't need to feed the signal to a frame sync before it hits the screen switcher.

A ROUGH RIDE

NEP has found the 9821 to be extremely reliable. A TV truck by its nature is a very rough ride. We use only air-ride trailers but it's still a rough ride with significant bouncing going down the road. However, the 9821 has proven itself up to this challenge.

The unit provides excellent signal quality and seems to have the ability to recover signals that are near the edge of the digital cliff.

The fact that the 9821 is designed to work with the openGear frame is another plus for us, providing a lot of flexibility. With openGear, cards from different manufacturers and with different functions (video or audio, for example) can be used in any slot in the frame. We don't need multiple types of frames for different cards.

As for service, NEP has a long history with Cobalt Digital and we've always been pleased with their response. They've bailed us out more than once when we've had problems with other manufacturer's equipment. We've found Cobalt's service and support to be exceptional.

For NEP, the 9821 is an integral part of the video systems architecture that we use on all of our HD trucks.

Don Phillips is director of systems integration at NEP Supershooters, a Pittsburgh-based mobile production company. He may be contacted at don.phillips@NEPinc.com.

For additional information contact Cobalt Digital at 800-669-1691 or visit www.cobaltdigital.com.

USER REPORT

Nvision Takes VTN From Analog to Digital

by Ron Brown
Director of Engineering
Victory Television Network

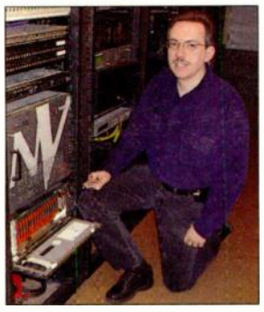
LITTLE ROCK, ARK.

Victory Television Network was faced with a common situation. Our three-station network—consisting of Arkansas stations KVTN-TV in Little Rock, KVTH-TV in Hot Springs and KVTJ-TV in Jonesboro—was all analog gear, with much of it no longer supported. Working with consultants during the past three years, we developed a design to migrate our ingest, router core and master control operations to an embedded SDI infrastructure. We now have one main master control center that sends out the programming to all three stations.

HIGH PERFORMANCE

Being a nonprofit mid-market operation, we required a high-value, high-performance design, while staying within a strict budget. Our strategic goal was to ensure quality programming with superior systems giving the best total cost of ownership. A key element of the project was the integration of several legacy analog sources, such as VTRs and satellite receivers, into the embedded SDI core using conversion equipment.

After evaluating multiple vendors, Nvision's Synapse product line was selected for A/D and D/A conversion. Synapse offers several A/D conversion modules with different feature sets. We narrowed it down to the ASM10, as it provides a large amount of functionality in a single module.



Ron Brown with Nvision equipment installed at VTN

The ASM10 handles composite and YUV inputs, which are converted to SDI with 12-bit accuracy. The SDI output is then fed to a frame synchronizer, followed by an audio de-embedder when processing embedded audio. The signal is then passed on to embedders for adding a second audio group if necessary. Finally the embedded SDI is fed to a processing amplifier with SDI outputs.

The ASM10 was the key element in our final choice of equipment. Not only do the cards provide an elegant solution to convert analog sources to digital, but we can repurpose them as SDI frame syncs and proc amps as our sources migrate from analog to digital. In fact, we are now using them as frame sync/proc amps with our digital IRDs.

We still have one more system upgrade ahead as NTSC prepares to fade to black in 2009—that's conversion of our STL from analog to digital. Several of the Synapse modules can mate with fiber I/O modules in the same Synapse tray, so we'll be looking at this approach. We will be receiving a significant amount of HD syndicated programming in the near future, and are looking into adding an HD channel to our Nvision master control switcher. There's a very affordable upconverter in the Synapse line and this will be the key to feeding our SD programs to the HD channel.

Nvision's Synapse technology made this all possible and has made our analog to digital conversion a lot easier in the process.

Ron Brown is director of engineering for the Victory Television Network, which is based in Little Rock Ark. He may be contacted at ron.brown@vtntv.com.

For additional information, contact Nvision at 530-265-1000 or visit www.nvision.com.

USER REPORT

Ross Adds Flexibility at WDIV

by Don Adzigian
Systems Designer
WDIV-TV

DETROIT

WDIV made the decision to go digital many years ago and needed equipment for distribution, component monitoring and conversion of digital back to analog. We were one of the early adopters of terminal equipment to manage our signal processing needs as we began the transition to digital. We analyzed equipment from a number of different manufacturers and determined that Ross Video RossGear equipment was more flexible and offered an array of products at an effective price point.

MORE THAN 190 MODULES

Today the plant has transitioned to digital and we've installed more than 190 RossGear terminal equipment modules. These are used primarily for distribution and monitoring purposes. We're performing A-to-D conversions to feed our SDI production switcher, D-to-A conversions to feed our NTSC master control, distribution of SDI and SMPTE 310 signals, reclocking and distribution and frame-synchronizing applications.

There's also analog audio, timecode and video distribution going on, as well as analog audio level control and equalization. We use Ross technology for RGB-to-SDI encoding with analog studio cameras, for embedding audio in various program feeds and for numerous applications around the plant.

With all of this equipment, we've experienced only a few small problems, and Ross' responses and fixes were most impressive.

One factor in choosing Ross was that the variety of equipment really provided the flexibility needed in a large network affiliate facility such as ours. Another

ROSS, PAGE 43

Ross

CONTINUED FROM PAGE 42

factor was that all RossGear has redundant power supplies. Whenever possible, it's our policy to purchase equipment with redundant power—this is really an important factor for us. Ross equipment is extremely reliable and the company offers great support for their products.

Ross OpenGear equipment

The design concept of RossGear terminal equipment is solid and provides good value for all the features. The equipment was simple to install, and everything worked without issue. To date we've never had a single power supply failure. Even though we use a very large number of modules, we've had very few returns to the factory for repair, which speaks volumes about the company.

RAPID UPGRADES

As most of our digital terminal gear came from Ross, upgrades are performed rapidly. For example, we recently upgraded some of our studio cameras from analog to HD/SD-SDI. For SD-SDI distribution, we were able to remove the Ross ADC-8033, YUV to 4:2:2 converters and replace them with DSA-8004s—dual serial distribution amps—with only a few simple wiring changes to the input side of things and none to the distribution side. Also, since most of our monitoring is analog, no changes were needed in that respect, as the replacements for the ADC-8033 converters provided proper signals for these, too.

We saw a dramatic improvement in our on-air signal when we converted our plant from analog to digital, with a lot of the credit going to RossGear. Now those same SD-SDI signals are fed through our upconverters and are producing stunning HD signals. We're very pleased with RossGear terminal equipment and will consult with Ross Video for any future signal processing needs.

Don Adzigian is systems designer for WDIV-TV. He's been in broadcasting for the past 29, and with WDIV-TV for most of that time. He may be contacted at zig@wdiv.com.

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

BUYERS BRIEF

The BP 5100 Broadcast Platform from **Terayon** provides stream switching and splicing, channel branding, SD and HD multicasting, and well as automation and control functionalities.

The BP 5100 enables broadcasters to combine up to 32 standard definition, or up to eight high-definition content streams for multicasting. It supports real-time extraction and processing of PSI and PSIP tables and can merge those from multiple sources.

The unit provides seamless insertion of both moving and static graphic images into compressed video streams for channel branding and other purposes. It allows these graphics to be positioned anywhere within a display's safe area and features fade-in/fade-out and opacity control.

For more information, contact Terayon at 408-235-5500 or visit www.terayon.com.

USER REPORT

Teranex Processing Assures Best Quality

by David Webster
CEO
VSI-HD/VSI Media

SOUTHINGTON, CONN.

As a full service duplication and conversion house, I have had much experience with the evolution of standards conversion technologies. Modern vector-based converters have served us very well until HD came along.

What was "Olympic Games quality" one day, was below standard the next. Now, in addition to international conversions, we needed to transfer between resolutions, frame rates, and yes, once again between different international HD standards.

Our clients include some of the most demanding broadcasters, syndicators and distributors in the business, and when the world's largest sports broadcaster came knocking for high-definition conversion, the very best capability was required.

ULTIMATE BOX

We analyzed the various competitors' offerings, often finding that some could do part of the job, but not all that we desired. We needed the ultimate box, a unit that could satisfy us in quality, capability and features, yet be easy to use by technicians. We found our ultimate box with the Teranex VC300 and imageConvert. When we saw how it handled HD conversion our jaws dropped—the quality was that fantastic and our clients were indeed impressed.

Since so much material was being repurposed for HD we also needed the best possible upconversion. The unit excelled again and also provided a great feature we routinely offer to clients called Flexview. It has the ability to convert 4:3 to 16:9 without the stretched look and has been a project saver. In fact, we have acquired several projects due to Flexview alone.

Operationally, the unit features a bright LCD touchscreen, making interfacing as easy as pointing. The user interface is well laid out and easy to follow, giving good status feedback to the operator without hiding feature access.

Operators were up to speed quickly, thanks to Teranex's intuitive and logical layout. Also, the ability to save routinely used setups into user memory frees up a lot of programming time.

Due to the very intensive image processing being performed by the equipment, there is an inherent video latency. The unit internally performs audio delay compensation, resulting in perfect lip-sync, and eliminating the requirement for outboard processing gear and its associated set-up. This additional "no-brainer" feature also saves us time.

David Webster

BUILT-IN TRANSLATION

Another great feature is built-in timecode translation. It may sound mundane, but has been a necessity for us.

Support, while rarely needed, has been excellent and the Teranex philosophy of allowing users to buy and activate pre-installed upgrades has made upgrades, as well as test driving new features, a snap.

In fact, we recently purchased a restoration module to remove scratches and other optical grunge from some old archival films, allowing us to help a client use materials that would have been marginal at best and useless at worst. In our business, solving client's problems is how we've grown and Teranex has been a great partner in helping us to do just that.

David Webster is CEO of VSI-HD/VSI Media, a full-service, high-definition production, post duplication, conversion and distribution facility serving international networks, studios and others. He may be contacted at DWebster@vsimedia.com.

For additional information contact Teranex at 407-858-6000 or visit www.teranex.com.

BUYERS BRIEFS

The XDT820 from **Analog Way** is a very high-resolution scan converter with genlock and multiple format output features.

The converter can provide NTSC, PAL, RGB/S, S-Video, or component formats directly, and an SDI option is also available.

The XDT820 provides eight levels of anti-flicker algorithms, and features an LCD display for control of parameters and unit status. It provides pan and zoom control to provide the best sizing and positioning of images.

The unit has underscan and overscan modes and also does freezeframes. It provides 16 user presets to store format adjustments for later recall.

For more information, contact Analog Way at 212-269-1902 or visit www.analogway.com.

The SC-2055 from **Astro Systems Inc.** is a new multirate frame rate converter that can upconvert and downconvert SD, HD, DVI and analog video formats. The unit is modular in design and the SC-2055 card frame accepts a number of different modules, depending upon user requirements.

The unit uses 10-bit processing and has an RS-232 control port. It features Astro SnaP (Super Natural Motion Picture) technology to reduce jaggy diagonal lines resulting from interlaced video.

The SC-2055 functions as a line doubler to convert interlaced signals into progressive and has 3:2 and 2:2 pulldown functions for use with film and CG images.

The unit also performs noise reduction and edge enhancement. It accepts external synchronization throughout all output modules.

For additional information, contact Astro Systems Inc. at 877-882-7876 or visit www.astro-systems.com.

The DCB-21 from **Broadcast Video Systems Corp.** is a closed captioning positioner/bridge for SDI signals. It is designed to position captions from blocking any emergency messages transmitted per FCC ruling 47CFR79.2.

Repositioning and bridge functions are initiated by latching GPIs and the unit includes a power failure bypass relay to provide failsafe operation. The DCB-21 is supplied in a 1 RU frame and is available with an optional backup power supply. The unit has the ability to bridge closed captioning data from one video source to the other even if they are not timed to one another or are asynchronous.

For more information, contact Broadcast Video Systems at 905-305-0565 or visit www.bvs.com.

The ImagePRO-HD from **Barco** (formerly Folsom) is an all-in-one signal processor that accepts a wide range of video signals and converts them into a number of different formats.

The unit features three universal inputs, plus an additional dedicated SDI/HD-SDI input and provides six outputs, including two for RGB or component video, DVI, composite, S-Video and SDI/HD-SDI.

The ImagePRO-HD features 64 memory presets and allows users to control aspect ratios.

The processor converts analog signals to digital and digital signals to analog. It is also available in a standard-definition version.

For more information, contact Barco at 888-4147226 or visit www.folsom.com.

The VP3000 from **Xintekvideo Inc.** is a video pre-compression processor designed to remove impulse and dropouts, and to reduce random noise and other interference by up to 9 dB.

The unit can compensate for luminance high frequency losses and permits adjustment of color phase and chrominance levels.

The VP3000 can be equipped for analog or digital video inputs and occupies a 1 RU space.

The noise reducer is effective in removing noise content that can affect compression efficiencies, and it also serves as a tool for post-production work including restoration of faded films and old videotapes. The unit can also serve as a high-quality NTSC encoder.

For additional information, contact Xintekvideo Inc. at 203-348-9229 or visit www.xintekvideo.com.

USER REPORT

Streambox Delivers Live Webcasting

by Jeff Hill
Vice President of Webcasting
Onstream Media

POMPANO BEACH, FLA.

Onstream Media provides encoding, live Webcasting, and on-demand video streaming for more than 75 percent of the Fortune 1000 companies, as well as many federal and state government agencies.

A wide variety of clients use Onstream to provide a high-quality pathway from remote meeting venues back to our encoding centers, where the content is then streamed to the Web.

FORMERLY RELIED ON ISDN

In the past, we relied on video conferencing units connected to ISDN lines to provide these services. However, with the evolution of broadband, we've found that this type of access is increasingly less available.

We're also faced with situations where clients want to transmit live video and audio via videoconferencing units over IP. The downside to this is that packet loss can be substantial—as much as 40 percent in some cases—making real-time transmission extremely difficult.

Alternatives include installing ISDN lines into a venue prior to the event or using satellite trucks. However, these options sometimes aren't feasible.

Our solution is the Streambox SBT3-2100 transport system. We are continually impressed by its performance and reliability. Hands down, it's the only system that we've found capable of supplying the high-quality video and audio we need over bandwidth-limited IP connections.


Jeff Hill

Streambox's technology has solved our connection problems beautifully by allowing us to use 1.5 to 2.0 Mbps of connectivity to transmit broadcast video signals without incurring time-based connectivity costs.

The SBT3-2100 video transport system is part of Streambox's ACT-L3 family of real-time video transport solutions optimized for interlaced and progressive display systems.

GOOD FEC CAPABILITY

One of the features we've found absolutely key in the SBT3-2100 is its robust FEC (forward error correction) capabilities, which means quality streaming even when there are irregularities in our IP connection.

There are always issues such as latency, packet loss and bandwidth inconsistencies, so the ability for us to tweak settings has been enormously beneficial. Our technicians are able to quickly and easily adjust target bit rate, frame size, frame rate, buffering size, FEC and keyframe interval to match the characteristics and requirements of each venue. This flexibility and ease-of-use have been paramount to our success.

I recently tested the Streambox system using an iffy hotel Internet connection. After 90 minutes of live streaming, I checked the system's FEC readings—two packets lost and recovery of more than 35,000. We are particularly impressed with its performance in this respect.

Without a question, Streambox has increased our ability to deliver high-quality video Webcasts in settings where this would not otherwise be possible. Clients cannot always control where their events will be held. In the past, difficult venues may have required taping the event for non-live streaming or relying only on audio. The Streambox system enables us to deliver the kind of video events that our clients truly want, with very little concern about the type of IP connection available.

The bottom line is that with the SBT3-2100 integrated into our live Internet video streaming, we're able to bring on a variety of new customers that we would not otherwise have been able to acquire. And at the end of the day, I really couldn't ask for more.

Jeff Hill is the vice president of Webcasting for Onstream Media Corp. in Pompano Beach, Fla. Jeff has been with Onstream for 10 years and has helped to develop the company's Webcasting division. He may be reached at jhill@onstreammedia.com.

For additional information contact Streambox at 206-956-05444 or visit www.Streambox.com.

BUYERS BRIEF

Multibridge Extreme from **Blackmagic Design** is an all-in-one bi-directional converter featuring a new high-speed 10 Gbps PCI-Express connection. It allows capture and playback of uncompressed video in up to 2K feature film resolutions when used with a computer. It switches instantly between standard- and high-definition SDI video, with 4:2:2 and Dual Link 4:4:4 video quality.

Multibridge Extreme accommodates both SDI and analog component video signals and features eight channels of AES/EBU audio, two channels of balanced audio with XLR connectors and two unbalanced outputs for low-cost audio monitoring.

For additional information, contact Blackmagic Design at 408-954-0500 or visit www.blackmagic-design.com.

USER REPORT

Network Ups Digital Signage Ante

by Michael Cusick
President
Specialized Audio-Visual, Inc.

CLIFTON PARK, N.Y.

Our company grew out of a division of Specialized Audio, Inc., established in 1966. In 1985 Specialized Audio-Visual, Inc. became a separate corporation and in 1989 we moved to our present facility here in Clifton Park.

One of our first clients was the Saratoga Performing Arts Center, and over the years, we have worked with the New York City Ballet, New York City Opera, Philadelphia Orchestra and other performance groups.

Today we offer a complete range of services covering all aspects of audio and video, especially consulting, design, and engineering for large-scale installations.

DIGITAL SIGNAGE

I believe the system we just finished beta testing for MotorCity Casino using Network Electronics VikinX routing and their Flashlink transport, processsing and distribution gear points digital signage in a new direction.

MotorCity Casino is one of three 75,000-square-foot casinos located in downtown Detroit. The four-story casino incorporates the landmark Wonder Bread Building, and is currently undergoing a major expansion.

The client wanted to install more than 200 flat-panel displays throughout the campus, with a majority of them being 42-inch plasmas for display of signage, as well as full-motion video.

What made this project different is the client not only wanted typical computer-generated graphics for digital signage, but also the ability to deliver video clips from a server, broadcast live feeds from four entertainment venue locations equipped with camera packages and also from multiple satellite broadcast channels. The client also wanted on-demand control of individual displays for switching between multiple source channels.

We designed a central control room equipped with three 360 Systems video servers. Eight channels of full-motion digital signage are stored on the servers as video clips and played out in sequences. Playlists are programed with the server software. In addition, we have eight DirecTV satelite tuners, as about half the content distributed is preselected satellite channels.

Part of the Network Electronics equipment installation at Detroit's MotorCity Casino

TAKES SIGNALS OPTICAL

Using two Network Electronics VikinX 128x128 SD SDI router frames and Flashlink products, we take those 16 channels of video content and convert them to optical, and then multiplex them using Network's course wave division multiplexer, which takes the 16 video channnels and puts them onto one single mode fiber. The fiber signal is sent to a Network wideband optical splitter/coupler and split 12 ways, with identical groups of 16 channels sent out over 12 fibers to 12 remote AV-IT closets around the facility. At each closet, we reconvert the 16 programs to SDI signals. These 16 sources go into Network VikinX switchers, with outputs feeding each of the associated displays with an independent SDI signal via digital coax.

A great feature of Network products is that they can control remote routers via Ethernet from the control room. We can also set up property-wide salvos.

After building the racks in our shop, and setting up the proper router configuration, the system performed exactly as planned. I had used Network routing on a previous job, a huge installation at the Mandalay Bay Convention Center in Las Vegas, and liked their networking concept and the elegance of the design simplicity. The help and consulting by Chuck Zarriello at Com-Tech, the Network distributor, was invaluable. It paid off for me on this challenging project.

Michael Cusick is president and owner of Specialized Audio-Visual Inc. He has design credits ranging from major Las Vegas entertainment venues to Broadway shows. He may be contacted at mcusick@saviusa.com.

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

BUYERS BRIEFS

The **Evertz** 7714HDC is a new high-quality downconverter that provides image enhancement, low latency and provision for external AES audio.

The 7714HDC has a reference input to allow phasing of converted video and a line buffer on the input to allow clean switching between genlocked video sources.

The unit supports aspect ratio conversions and provides an on-screen display for configuration purposes.

The downconverter transfers closed captioning and timecode information from input to output, performing all high-definition to standard-definition translations and timecode recalculations.

The 7714HDC accepts all popular international SMPTE 292M video formats and can provide up to four standard definition SDI ouputs. Two of the outputs can be configured for analog.

For additional information, contact Evertz at 905-335-3700 or visit www.evertz.com.

The Kameleon Media Processing System from **Grass Valley** provides complete audio and video signal processing in a single module set. It can accommodate up to four program streams in a 1 RU package, and up to 12 streams in a 3 RU frame.

The Kameleon includes audio and video delay, synchronization and proc amps, as well as audio and video test signal generators.

It has five user-programmable E-MEM registers and allows configuration files to be saved to an external PC.

The system can process up to eight channels of audio and perform both A-to-D and D-to-A conversions.

It features integrated audio and video multiplexing and demultiplexing, and has a built-in 8x8 audio routing system.

For additional information, contact Grass Valley at 503-526-8150 or visit www.thomsongrassvalley.com.

The AY 86-A/V-D from **Hotronic Inc.** is a frame synchronizer designed for SDI video signals. The unit is genlockable and features full digital proc amp and signal legalizer functionalities.

It provides audio/video offsetting to eliminate lip flap and accepts and outputs both analog and digital signals. It accepts both 8- and 10-bit video inputs. All ancillary data residing in the video signal is passed by the AY 86-A/V-D.

The frame sync provides up to 20 seconds of delay offset and can be referenced to either NTSC or PAL standard video signals. It has a genlock range of ±5 microseconds.

The AY 86-A/V-D is rackmountable and occupies 1 RU of space.

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

Pipeline from **Telestream** is a network-accessible SDI video encoding and play-out device.

The unit features real-time encoding from SDI to MPEG-2 I-frame, IMX 30/40/50 and DV25/50. It extends the utility of Telestream's FlipFactory to include workflows that incorporate live sources or are tape-based.

Two Pipeline models are available—a single channel unit and a four channel model. Both encoders accommodate up to 16 channels of embedded AES audio, automatically detect 525 or 625 line video signals and mount in 1 RU of rack space.

The single channel unit has a 10/100 Mbps Ethernet port and the four-channel encoder has a 10/100/1000 Mbps port. They both are equipped with an RS-422 9-pin connector for VTRs using Sony protocol.

For additional information, contact Telestream Inc. at 877-257-6245 or visit www.telestream.net.

USER REPORT

Ensemble Makes Airborne ENG Easy

by Steve Cudnofskey
Systems Designer/Quality Control Manager and FAA Representative
Geneva Aviation Inc.

SEATTLE

About three years ago, Glenn Andrews, a systems software engineer/system designer for Geneva Aviation Inc., and I were asked to design and deploy a hybrid video system for electronic news-gathering aircraft that included all the bells and whistles of our standard analog platform.

The requirement was to be able to send HD, SDI (4:3 or 16:9 aspect ratios) and/or analog video to the television station, as well as providing perfect video and audio sync in the process. The system also needed to work with every type of camera, tape deck, file server, moving map, and of course, the optional kitchen sync.

FINE ON GROUND

Equipment for this is easily available in 19-inch rackmounted designs, but space is something we just don't have in the back of a helicopter. None of the small and light 16x16 HD routers available had built-in synchronization, and at HD data rates, a few feet difference in signal path length could cause unacceptable glitches on switching. Many of those must-have devices didn't even have genlock inputs, so we were looking at two full racks of equipment to be squeezed into six cubic feet of space.

As we started the project, a survey of available video format converters indicated that most of what was out there couldn't meet our specifications, which included 12-bit accuracy, operational between minus 20 and plus 50 degrees Celsius, a small profile, mountable and able to withstand severe and constant vibration.

Most of our phone calls of inquiry were met with silence on the other end. Finally, we made a call to Ensemble Designs. From that moment on, our lives became much easier, due to the agile architecture within their product line. They had devices for almost all our applications: analog-to-SDI conversion with synchronization; SDI-to-SDI reclocking; a multiple format signal generator, along with colorbars and title, for synching those decoders.

With the gear's single-axis connector arrangement and an easily mountable footprint, we were able to

Steve Cudnofskey

install them in our existing FAA-approved modular equipment rack.

FAST AUDIO CHANGES

The last hurdle to completing our design was an audio delay for matching the HD-converted talent camera. Ensemble's BE-30 analog-to-AES converter worked great, but there was a slight problem. We needed to delay the audio to match latency through the HD conversion process.

We contacted Ensemble, and within two weeks we received a BE-30D, the first to be constructed with built-in audio delay. This was a level of service and support we've never seen anywhere else! Ensemble's BrightEye PC software made synchronizing audio and video child's play, and their hardware has been running trouble-free for thousands of flight hours in Los Angeles and New York.

Glitch-free switching in multiple formats from an airborne platform is now made easy with Ensemble Designs' BrightEye series of products. Geneva Aviation Inc. has a 20-year reputation for designing cutting edge serial-controlled audio and video systems for news, law enforcement and homeland defense aircraft and we can accept no less than 100 percent from the products we work with. Ensemble Designs products can be trusted for any critical application 100 percent.

Steve Cudnofskey is a systems designer/quality control manager and FAA representative for Geneva Aviation Inc., and has designed more than 10 major platform variants during the past decade. The opinions expressed are those of the author alone. He may be contacted at steve@genevaaviation.com.

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

BUYERS BRIEF

The LTM-HG16 from **Laird Telemedia** is a 16-channel video and audio hum eliminator that provides more than 65 dB of hum reduction in both audio and video signals and has a video bandwidth from DC to 70 MHz.

The unit features eight video inputs and eight balanced audio inputs. It provides a video return loss below 18 dB and a signal-to-noise ratio of 65 dB. Opto-coupled differential amplifier technology is used in the LTM-HG16 to provide isolation and hum elimination.

The LTM-HG16 is designed for use in situations and environments where ground loop noise would cause signal path problems. It works with either NTSC or PAL video.

The LTM-HG16 operates from either 110 or 220 VAC power (selected via an internal jumper) and consumes 30 watts.

For more information contact Laird Telemedia at 800-898-0795 or visit www.lairdtelemedia .com.

USER REPORT

WUSA Puts HD on Web With Digital Rapids

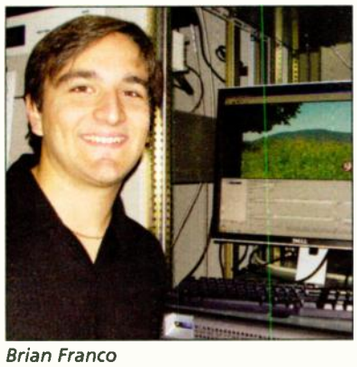
By Brian Franco
Computer Systems Analyst
WUSA Television

WASHINGTON

WUSA, a Gannett Co. Inc. station and a CBS affiliate has a rich history of pioneering achievements, including being the first station in Washington and the sixth U.S. station to present its local live newscasts in HD. Our Web site, *WUSA9.com*, was also the first station Web site to offer local news on streaming video.

GOING HD ON THE WEB

Having proven ourselves as a leader in both HD and leveraging streaming video for local news on the Web, our next objective was to bring the two technologies together—delivering Web streams in high definition, not only on demand, but also live. Finding the right encoding and streaming system was critical to the success of this project. After considerable research, we decided that the Digital Rapids StreamZHD was the only solution that met our requirements for real-time, high-quality live streaming at HD resolutions.



Brian Franco

Extensive testing was done to find the right combination of codecs, resolutions, frame rates and bit rates to deliver the best quality, while remaining accessible to the broadest possible audience. The public launch of our new high-definition Web streaming capabilities took place on Jan. 23, when we streamed the pool feed of the president's State of the Union Address live on the Web in HD.

The high-definition pool feed of the event was sent over to StreamZHD, which encoded and streamed it in SMPTE VC-1-compliant Windows Media Video format (Microsoft's implementation of VC-1) in real time at 1280x720 frame size. We had also successfully tested at higher frame sizes, but chose to be conservative with our initial deployment.

Two DRC-Stream standard-definition encoding boards with Digital Rapids Stream software were also used to provide SD and smaller streams for users with lower-bandwidth connections. The encoders all worked flawlessly.

A total of four streams were provided at 3.2 and 1 Mbps, and 500 and 56 Kbps data rates. These were delivered via a 10 Mbps line to Akamai, which we use as our content delivery network for both on-demand and live streams.

HARDWARE/SOFTWARE

StreamZHD is a combination of hardware and software. In addition to ingest capabilities, the hardware provides pre-processing of the input signal, including motion adaptive de-interlacing and noise reduction. By performing the pre-processing in the hardware, StreamZHD keeps this workload off the CPUs and provides outstanding visual quality in the encoded result.

The system's software interface makes configuration and operation of StreamZHD easy and efficient. Unlike single-function systems or those that require the use of multiple standalone utilities for different tasks, the Digital Rapids Stream software lets us do live streaming, file-based transcoding and encoding of files for on-demand viewing from one streamlined user interface. The Stream software even lets us encode to multiple compression formats, frame sizes and bit rates simultaneously.

The ever-increasing bandwidth available to content consumers enables higher-quality viewing experiences for our audience, and enables us to differentiate our Web offerings. We intend to make as much HD content as possible available through the WUSA Web site—both live events and on-demand streaming of archived clips and programs. Digital Rapids StreamZHD has given us the technical capabilities to efficiently achieve this goal.

Brian Franco has been a Computer Systems Analyst at WUSA television since 2003, specializing in broadcast IT. The opinions expressed are those of the author alone. He may be contacted at Bfranco@wusa9.com.

For additional information contact Digital Rapids at 905-946-9666 or visit www.digital-rapids.com.

BUYERS BRIEFS

The DigiFlex 1190 from **Link Electronics** is a frame synchronizer for SDI signals. It features 10-bit processing and infinite window horizontal and vertical phasing and automatically detects 525 or 625 input signals.

The unit accepts both NTSC and PAL color black reference signals and operates in any Link 1000 series card tray.

The synchronizer allows user selection of either blank screen or last video freeze frame, should the input signal be lost.

The DigiFlex 1190 has card edge LED indicators to monitor power, video presence, NTSC/PAL and H lock. It has four video outputs and a looping reference input.

Return loss is specified at greater than 18 dB.

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

The WJ-NT304 from **Panasonic** is an MPEG-4/JPEG encoder designed to provide high-quality images from remote camera locations.

The unit is designed for monitoring and security applications and is suitable for installation at transmitter and other locations remote to main facility operations.

The WJ-NT304 provides for transmission of 640x480 images at 30 fps. The encoder also includes an SD memory card slot for backup and features built-in two-way audio capability.

The encoder has internal multi-screen display capability and uses Windows-based software for configuration.

For more information, contact Panasonic at 866-726-2288 or visit www.panasonic.com/security.

The V6153 from **Pro-Bel** is a video distribution amplifier designed for use with standard- and high-definition digital signals and is fully compatible with Pro-Bel V1600 series card frames.

The DA can be operated in either reclocking or nonreclocking modes and provides eight outputs. The unit is equalized for use with up to 100 meters of Belden 1649A cable (1.485 Gbps operation).

Return loss is specified at greater than 15 dB from 5 MHz to 1.5 GHz.

The V6153 is hot-swappable and provides front panel status monitoring. It also reports operational parameters via Vistek's Dart control and monitoring system.

For additional information, contact Pro-Bel at 631-549-5159 or visit www.pro-bel.com.

The UDC-550 from the **QuStream Group** is a up/down/cross converter unit with built-in legalizer.

The unit can accommodate a range of input signals, including most popular 480, 720 and 1080 line video at a number of field rates.

It automatically detects film mode and uses 3:2 pulldown when converting between 59.94 and 23.98. All processing on progressive scan video is performed at full bandwidth 4:4:4 sampling.

The UDC-550 has two HD inputs, two HD outputs, two downconverted SDI outputs and two user-selectable SDI/NTSC/PAL outputs.

An optional color-correction feature with eight memory settings is available with the UDC-550.

The unit supports all standard aspect-ratio conversion and autodetects input video format.

For additional information, contact the QuStream Group of Companies at 631-912-1301 or visit www.pesa.com.

The Codico E-1000 from **Scopus Video Networks** is an MPEG-2 broadcast encoder that can be used in both fixed and mobile environments.

It offers 4:2:2 and 4:2:0 encoding profiles and can carry up to four audio channels. The device accepts NTSC, PAL and SDI signals, as well as S-Video. The encoder accommodates closed captioning, Teletext and other ancillary signals,

The E-1000 can output at data rates of up to 48 Mbps and features low delay modes of operation. It has a built-in multplexer for cascading of encoders and can be controlled either remotely or locally.

Scopus offers a variety of options for the E-1000, including optical output, DVB scrambling, Dolby Digital 2.0 encoding and more.

For additional information, contact Scopus Video Networks at 609-987-8090 or visit www.scopus.net.

USER REPORT

Presteigne Races With Harris

by Mark Tomlin
Head of Engineering
Presteigne Broadcast Hire

LONDON

As one of the world's leading providers of broadcast television equipment and systems, Presteigne Broadcast Hire provides custom-built and complete HD and SD flyaway systems for sports productions and other television and entertainment events around the world. Our company has provided systems for some of the world's biggest broadcasters at some of the most prestigious events, including last year's Torino Winter Olympics and Asian Games.

AIR RACE COVERAGE

For the second year running, Presteigne has been asked to provide the technical facilities to Germany's SIVision TV Production GmbH for the Red Bull Air Race Series 2007. This contest starts in April and doesn't wrap up until early November. It pits the world's most talented pilots against each other in a race based on speed, precision and skill in navigating a challenging racecourse in the sky.

A Presteigne crew member readies for coverage of the Red Bull Air Race Series 2007.

This global event, which originates in Abu Dhabi in the United Arab Emirates, make its way from location to location around the world, with stops in the United States, Brazil, Spain, Turkey, Portugal, the United Kingdom and Hungary, to name a few. Setting up the technical facilities for this event is a significant challenge. Essentially, we're building a complete TV facility at each location in quick succession.

As this is an HD production, we provide one of our largest HD systems to the broadcast centers in each of these locations, allowing us to quickly set up transmission facilities for feeding worldwide broadcasters, and also for large screen displays at each location.

During production, the native HD signal has to be downconverted before distribution or for playout on the display screens. It must also be downconverted for monitoring purposes, as not all the broadcasters take the live feeds in HD.

To meet our processing requirements, we chose Harris. We fitted flight cases with an array of Harris products, including the NEO XHD modular up/down/crossconverters, their 6800+ modular core processing products and also X75 HD standalone multipath converter/synchronizers.

We have more than 30 units of the 6800+ modular products with PAL options at this event and 36 NEO XHD series modules. We also have a number of X75HD units that give our operators significant versatility—allowing one HD, two SD and a PAL path to be processed in the same box.

USING PLATINUM ROUTING

We also recently purchased a Harris Platinum router to provide the central routing functionality for this event. The Platinum packs a lot of functionality and power into a manageable space. Our unit provides 256x256 routing capability and supports a mix of SD and HD signals.

Harris' service and support has been excellent throughout our preparations for this project. The company has always listened to what we wanted, rather than offering a one-size-fits-all solution. We were also amazed to receive the Platinum router within 10 days of order, and the remainder of the gear within three weeks.

However, as with most manufacturers, it isn't all perfect. We did have an incident with equipment accidentally being shipped with one key software option missing. But the Harris service engineer based in the Harris Dubai Media City offices raced across to Abu Dhabi to load the software. Often we see manufacturers getting it wrong—but Harris really did pull out all the stops to help us make this event a flying success.

Mark Tomlin is head of engineering at Presteigne Broadcast Hire in the United Kingdom. He joined Presteigne three years ago, and has worked in broadcast engineering in the U.K. for almost 25 years. He may be contacted at markt@presteigne.co.uk.

For additional information contact Harris Corp. at 800-387-0233 or visit www.broadcast.harris.com.

BUYERS BRIEF

The BKPFL608C from **Sony Electronics** is a 4:2:2 frame synchronizer card, designed to sync component serial digital video to an external reference source.

The synchronizer uses 10-bit processing and provides a freeze control that has field/frame and auto/manual operating modes. The unit will automatically provide freeze framing when an error in the incoming video is detected. The card has four fields of storage.

The unit passes up to eight embedded audio channels and provides four SDI video outputs. It also passes any other ancillary data encountered in VBI EDH monitoring and insertion.

Return loss is specified at greater than 15 dB between 5 MHz and 270 MHz.

The unit has a GPI input and allows H and V phase adjustments in the frame synchronization mode.

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

USER REPORT

AJA Converters Best for Acme Professional

by Pete Cosmos
Partner
Acme Professional Inc.

NEW MARKET, MD.

Acme Professional provides complete design, engineering and integration of audio and video systems for performing arts centers, house-of-worship facilities and corporate clients.

A recent project involved the design and integration of an HD graphics and video distribution system for Jazz at Lincoln Center, a multivenue performing arts facility located in the Time Warner Center in New York City.

Dedicated to the advancement of jazz and American music, Jazz at Lincoln Center's facilities at Frederick P. Rose Hall are comprised of five separate venues—Rose Theater, the Allen Room, Dizzy's Club Coca-Cola, the Nesuhi Ertegun Jazz Hall of Fame and the Irene Diamond Education Center, as well as XM Satellite Radio production and recording facilities and various public spaces. The venues have been the scene of many significant events by legendary world class musicians and arts organizations, and the facility is also utilized for corporate events, new product introductions and press events.

DIGITAL SIGNAGE

We relied on the newly released AJA Hi5 HD-SDI-to-HDMI converter to provide Jazz at Lincoln Center with an all-digital HD system headend for high-resolution digital signage and video distribution throughout the public areas.

The setup features 40-inch LCD Samsung displays with HDMI inputs in all of the public areas, and 24-inch Samsung PC monitors at the side concert hall entrances. This provided a challenge in determining converter requirements at each display location. We used the AJA Hi5 converter at all 40-inch LCD locations to convert the distributed HD-SDI to HDMI and provide audio de-embedding and analog audio outputs. For the 24-inch widescreen displays, which have DVI inputs, we used the AJA HDP, a compact HD-SDI to DVI converter that includes an internal scaler to eliminate any issues when outputting to the 1920x1200 displays.

Courtesy of Acme Professional

Pete Cosmos

The "all HD-SDI" routing and delivery provides great flexibility within the facility's infrastructure while significantly reducing installation costs. Since off-the-shelf routers can be implemented, sources and displays can be changed out as desired. Conduit requirements are simplified, and cabling and termination times are greatly reduced. Moreover, format issues are minimized, or even eliminated.

PLENTY OF VERSATILITY

Available outputs on lobby panels allow portable LCD displays and projectors to be set up for event-specific requirements, while portable AJA HDPs and Hi5 HD-SDI converters let personnel drop HD feeds anywhere in the lobby without fear of the degradation noise and ground-loops that plague analog systems. Similarly, a portable live HD camera feed can be input to the system using a single coax.

An HDV deck is available for play-out and recording from the router, and a Blu-ray disc system will be implemented in the future. There's also a Canon XL H1 camcorder for in-house content creation, and a live 1080i video ingest port for lobby events.

The response to the project has been extremely positive, especially so concerning image quality. By relying on AJA conversion products, the HD distribution system opens up new possibilities for the facility, and will help promote the mission of Jazz at Lincoln Center.

Pete Cosmos is a 17-year veteran of the audio/video industry and is one of the founding partners of Acme Professional Inc., an A/V design and integration company serving New York, Baltimore, Washington and beyond. He may be contacted at pete.cosmos@acmeprofessional.com.

For additional information contact AJA at 530-274-2048 or visit www.aja.com.

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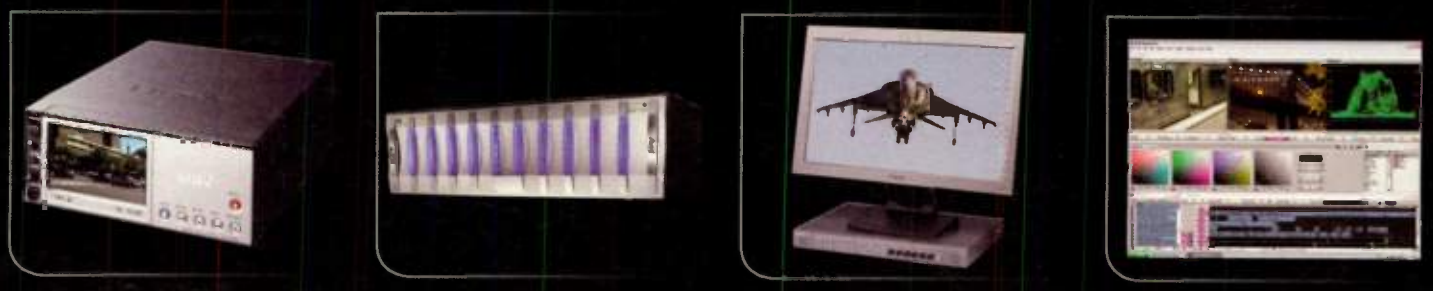

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USER REPORT

DVEO Encoder Is Favorite at AT&T Center

by Clinton Rathmell
Director of A/V Engineering Systems
Spurs Sports & Entertainment

SAN ANTONIO, TEXAS

The AT&T Center here is a state-of-the-art sports and entertainment facility with 18,500 seats. We host more than 200 events every year, including the San Antonio Spurs, the San Antonio Livestock Show & Rodeo, the San Antonio Silver Stars women's basketball team, the San Antonio Rampage hockey games and numerous concerts.

As director of audiovisual engineering for Spurs Sports and Entertainment, the parent company of AT&T Center, I'm responsible for every aspect of the center's cutting-edge A/V system, including production, television broadcast support and a total of 498 video monitors.

GOING HIGH DEFINITION

Last July, I contacted DVEO, the broadcast division of Computer Modules, Inc., to ask about equipment for putting live high-definition content into a channel on our house RF system.

DVEO recommended their NCoder HD, a high-definition MPEG-2 4:2:2 transport stream encoder. It compresses video from HD cameras in near real time, and encodes it to DVB-ASI. The product encodes HD in 1080i, 1080p or 720p.

Since we show fast-paced sports action, it's important that our video displays don't lag behind what's happening in the game. The NCoder HD meets this goal with very low latency—in the normal mode it's 120 ms, and there's a low-delay mode of 60 ms. Typically, encoder latencies can run 800 ms. The NCoder HD also offers IP output or even simultaneous DVB-ASI and IP output, but we use it here just for DVB-ASI.

The DVEO NCoder HD and other products

USES 8-VSB BLASTER

We've had the Ncoder HD in use here since August 2006, and have used it to encode live HD video for our in-house sports events. We use it with DVEO's 8-VSB Blaster, which allows me to modulate the MPEG stream onto the HDTV sets located in our skyboxes, concourse monitors, and other monitors at other locations within the venue.

I'm very happy with the performance and reliability of the NCoder HD. And I'm also impressed with the quality of our HD channel. What's more important is that I believe that the AT&T Center fans are, too.

Clinton Rathmell has been with Spurs Sports & Entertainment since 1991. He has more than 30 years of experience in broadcast engineering. He may be contacted at crathmell@attcenter.com.

For additional information contact Computer Modules at 858-613-1818 or visit www.dveo.com.

COMPANY PROFILE

Miranda Known for Innovation and Service

by James E. O'Neal

MONTREAL

Miranda Technologies is a Canadian company known worldwide for its product innovation and service excellence.

The company owes its start to a downturn elsewhere in the electronics business—another chapter in the "lemons into lemonade" book.

Back in the 1980s, CDL (Central Dynamic Laboratories), another Canadian broadcast electronics firm was experiencing a downturn in business and began a series of layoffs. One of those pink-slipped was the late Christian Tremblay, who had been in charge of R&D. At the time of the layoffs in 1989, Tremblay had developed quite a few new product ideas that were "nipped in the bud." However, he was never one to bow to adversity and partnered with four others let go in CDL's downturn.

These five engineers became the nucleus of Miranda, a company that has grown to more than 400 employees and last year counted $107 million in sales.

CDL has been history for a long time; Miranda continues to grow and now has a global presence.

Tremblay and his associates did government contract work and outsourcing tasks for other electronics firms before the mid-1990s industry-wide upsurge in business caused them to concentrate on developing their own products for broadcasters. The bulk of the product line was based upon signal conversion requirements necessitated by the shift to digital television in North America and elsewhere. The company opened a European branch in 1998, and followed with an Asian branch the next year.

Near the end of 2000, and after more than a decade of building Miranda, Tremblay decided to relinquish the reins to Strath Goodship, the company's current CEO. Goodship has continued to expand Miranda, taking it far beyond conversion equipment. New entries to the product catalog included control and monitoring lines, as well as equipment for switching, content branding and play-out.

"We wanted our focus to be on the growing needs of the broadcast industry," Goodship said. "Our real strength is in innovation; we pride ourselves on a number of industry firsts."

Those firsts include the combining of branding with master control switching, the first large screen multiviewers and the world's smallest interface devices (the company's picoLink series).

In addition to building the company's product lines, Goodship has also been busy building the company itself.

"We were private until December of 2005," said Goodship. "We looked at our track record, and how well we were doing in the areas where we were excelling in, and decided to grow the company. We went public, raised capital, and are using it to add to our R&D efforts, expand our distribution network and to acquire other businesses that will strengthen our position."

"We acquired VertigoXmedia last year to strengthen our graphics range, and we're continuing with our acquisition program."

Asked about the company's name and its affinity for purple-colored products, Goodship explained that the name Miranda had been selected by Tremblay due to his interest in astronomy, and also a name that would work in many languages. Miranda is one of the moons of Uranus and is a word that is easy to pronounce in most of the world's tongues.

"Christian didn't want to name the business after himself and really didn't like acronyms," said Goodship. "He selected Miranda. We are truly an international company and the name is very multilingual."

As for the color purple, it was just a marketing decision reached when the company decided to abandon the orange tint that it had adopted earlier in its existence. However, purple is working well for Miranda and there are no plans to move elsewhere within the artist's palette.

When asked about the pattern for Miranda's continuing success, Goodship said that the company has always been very responsive to recognizing and meeting the changing needs of its customers.

"Michel Proulx, our chief technology officer, is very astute in recognizing industry changes and determining and implementing technology that the market needs," said Goodship. "The big driver for us right now is HD. We're already in the fourth generation of some products. Also, we manufacture our own products—all assembly is done in-house. This gives us an edge on managing quality and controlling availability of our products."

Customer service is also part of the equation.

"We're concentrating on developing an enhanced service organization," Goodship said. "Products are much more complex and there are an increasing number of interoperability issues as the number of venders grow. Our customers need a much higher level of support than ever before." ■

MIRANDA TECHNOLOGIES INC.

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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; ADC DAL3-14MKIINS digital audio patchbay, $350; GVG 8550 tray w/8-8551 audio DAs, $800; Sony MXP-744, 36-input, 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.

CAMERAS

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(3) Hitachi Z One C studio config cameras, $15000; 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. 908-879-9590 or www.mccominc.com.

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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

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Canon J20x7.5B studio lens, $12800; (2) Sony DVF-77 7" studio VF, $4000; Sony MSU-700, BO; Fuji A18x8.5FEVM B3 VGrip, 2X, $850; Sony CA-905K studio build up kit/sled, $1200/ea. 908-879-9590 or www.mccominc.com.

Miller 30 tripod II legs only, 2 stage legs only, floor spreader, black, arm, gd cond, $650; Miller 30 tripod II, 30 lbs head capacity, 2 stage legs, floor spreader, black, arm, gd cond, $1800. 808-955-3399.

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

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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.

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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; Sony Sony PVM-15L5 w/BKM-120D, $2300; Ikegami TM20-20R w/SDI option, BO; (4) Sony PVM-14M4U, $975/ea; 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.

RENTALS

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(6) For-A CCS-4360 color correctors, $1000/ea; 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; Abekas DVEous, call for price; Sony DME-7000 dual chnl, $7500; GVG-8500 w/8-8501 video DAs, BO; GVG 9520A sync gen w/TSG, BO; Sony PFV-L10 tray w/10-BKPF-L603 SDI DA 1x8, BO. 908-879-9590 or www.mccominc.com.

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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-TenOSA 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.

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Want to Sell

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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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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.

VIDEO PROJECTORS

Want to Sell

Sony VPL-900 resolution SXGA1280 x 1024, very good picture, compatible NTSC, PAL, SECAM, NTSC 4.43, PAL-M system, wireless remote control, manual, mint cond, $1600. 808-955-3399.

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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

PROFESSIONAL SERVICES

Panasonic AJ-HD3700B, new, call for price; Sony UVW-1800, $3500; Sony BVW-70, $4500; Sony DVW-A500, call; Sony PVW-2800, $4500; Sony UVW-1400A PAL, BO; Panasonic AJ-D580, BO; Panasonic AJ-D351, BO; Sony BKDW-515, $2000. 908-879-9590 or www.mccominc.com.

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Broadcast Engineer WUSF Public Broadcasting , Tampa, Fl. seeks dynamic individual to operate studio and engineering plant equipment and systems, operate CADD drawing and station design, diagnose failures and malfunctions and repair of equipment and systems, adjust systems, and other routine maintenance procedures. Must have thorough understanding of electronic circuit theory and be able to troubleshoot, diagnose and handle the tools necessary to repair studio/transmitter equipment. Scheduled work shifts with logs and the daily maintenance of systems and equipment data bases and documentation is also required. ACAD experience is a plus. For more details, visit website at www.wusf.org **To Apply: Email** cover letter and resume, with application to HR@wusf.org Download application off the USF website at www.usf.edu.

Maintenance Technician (Group III) WETA, Arlington, VA: WETA seeks Maintenance Technician. Performs daily and routine, and preventive and corrective technical maintenance of all broadcast equipment associated with television operations. Position covered by IBEW union contract. Five years experience in television engineering systems. Associates Degree in electronics or equivalent. SBE Certification (television)a plus. Send resume to hr@weta.com or visit www.weta.org. WETA is EOE.

NBC UNIVERSAL/RF ENGINEER-FIELD OPERATIONS (NABET)/Long Island City, NY; Responsibilities: Provide technical, logistical, and maintenance support for the NBC News Gathering operation worldwide as well as remote broadcasts for the entire organization. Qualifications: 5 years RF experience in RF network design or RF performance engineering; BSEE. Apply: www.nbcunicareers.com, #582089.

NBC UNIVERSAL/SYSTEMS ENGINEER (NABET)/Burbank, CA; Responsibilities: Diagnose and repair audio/video systems and equipment. Qualifications: Applicants must be familiar with all popular component/composite analog/digital video, videotape, and audio standards; Must have experience with non-linear editing systems. Apply: www.nbcunicareers.com, #455837.

Wanted!! Very Much Alive! Business is booming and we need help! Professional Products is looking for creative and dynamic engineering talent. We need Assistant Engineers/Drafts People, Design Engineers - EE's preferred All disciplines: Production, Broadcast and AV. Please send resume and salary requirements to HR@ppionline or visit us at www.professionalproducts.com.

Broadcast Systems Engineer: ABC is seeking a Broadcast Engineer for our Broadcast Operations and Engineering department. BO & E provides trained personnel and technical facilities to support the production and distribution of ABC Television Network programming. The Engineering Department in BO&E is responsible for planning, designing, installing, and testing professional broadcast systems (audio/video/control/IT/etc) used by ABC Television Network. We seek a Broadcast Engineer who is capable of designing and implementing professional broadcast systems for a wide range of projects and facilities at ABC. Responsibilities include (but not limited to): Technical Design of audio/video/control/communications/IT for professional broadcast systems; Interaction with Operations, Maintenance, Engineering Management, etc to provide appropriate technical solutions to their requests; Creation of technical AutoCAD drawings for crews to build the designed systems; Interaction with vendors as appropriate; Working with personnel to purchase equipment/Cables/Connectors/Hardware as appropriate; Working with/Supervising crews (internal or external) who install the designed systems; Working with Maintenance and Operations to checkout the systems (with cutovers as appropriate); Provide as-built documentation for the official files and all appropriate manuals to Maintenance and Operations; The Broadcast Engineer should have knowledge on how to implement and test audio/video systems, be it analog, digital, or High Definition. The candidate should be familiar with SMPTE standards for audio, video and control systems. The Engineer must be able to work with a team and handle multiple projects. Experience with supervising installation crews (both union and non-union crews) is a plus. Required Qualifications: Work Experience: Minimum of three to five years experience in the television broadcast industry (in an engineering role.); Technical Skills include: A/V System Design and troubleshooting skills, experience with SMPTE standards for audio, video and control systems, proficient in AutoCAD, familiarity with computer and networking technologies; Non-Technical Skills include: strong verbal and written communication skills, ability to work under deadlines, ability to complete projects in a multi-tasking environment. Desired Qualifications: Education: Bachelor of Science in Engineering or Telecommunications. How To Apply: please visit our website, www.disneycareers.com and apply to this position, code 74382.

Broadcast Engineer/ Operation Manager: KSMQ, located in Austin, Minnesota, has a full-time opening for a Broadcast Engineer/ Operators Manager. Qualifications for this position are experience in master control operations and maintenance, radio and UHF transmitter operation and maintenance, strong electronics/ troubleshooting skills and computer/ networking skills. The ideal candidate would also have 2 or more years electronics/ broadcast education and 2+ years broadcast experience. Applications and a more detailed job description are available at: www.ksmq.org/jobs Send application materials to: KSMQ Public Television, 2000 8th Ave NW, Austin, MN 55912.

KTVU-TV/KICU-TV, the Cox-owned FOX affiliate in San Francisco, is looking for an experienced Director of Engineering. We're looking for someone who can demonstrate success in future planning, managing capital and operating budgets, along with a through understanding of transmission and RF systems. Excellent digital, IT and networking skills are a must, with a solid grasp of broadcast technical operations. Candidate must have proven outstanding management skills to direct and manage people in a complex multi-station broadcast environment. Since we're first in HD local news, programming and production, working with high expectations is required. You must have a minimum 5-years experience in television engineering management. A BSEE, and SBE certification is desired. If you're up to the challenge of working at the #1 station in San Francisco contact: Jim Haman, KTVU, Director of Broadcast Operations, jim.haman@ktvu.com 510-874-0454, 2 Jack London Square, Oakland, CA 94607.

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.

SYNC GENERATORS

MANUFACTURER	MODEL/SIZE	CONFIGURATIONS	AUTOMATIC CHANGOVER	REFERENCE OUTPUTS	EXTERNAL REFERENCE	STANDARDS	SPECIAL FEATURES	PRICE
Echolab 978-715-1020 *www.echolab.com*	Analog/Digital Video Sync Generator; 1 RU	Standalone	N/A	4 SDI, 4 composite	Yes	Supports multistandard operation	Adjustable timing, certified for Echolab switchers, expandable option supports additional processing modules	$3,000
Ensemble Designs 530-478-1830 *www.ensembledesigns.com*	Avenue 7400; 3 RU	Modular	Available	Two color black or tri-level sync	Composite, tri-level sync, 10 MHz	525/625, 14 HD standards	Simultaneous multistandard SD, HD composite; flash memory for custom HD/SD test signals	$4,500
Evertz 905-335-3700 *www.evertz.com*	5600MSC; 1 RU	Standalone	5600ACO or 5600AC02	Six	Color black, tri-level, 10 MHz, GPS	SD and HD	Available with SD and HD test outputs, 2x LTC outs, DARS	$8, 000-$15,000
Grass Valley 607-775-2165 *www.thomsongrassvalley.com*	8980TLS; 2 RU	Modular	N/A	Four	NTSC color black	NTSC	Front panel setup switches; tri-level sync	Call for pricing
Harris Corp. 800-231-9673 *www.broadcast.harris.com*	MTG-3901; 1 RU	Modular	ACO-3901	Four	10 MHz, color black phone line, Ethernet	All HDTV formats	Timecode; DARS	$3,695-$13,070
Link Electronics 573-334-4433 *www.linkelectronics.com*	IEC-833; 1 RU	Standalone	N/A	One	NTSC video	NTSC	Provides HD, VD, BL, and burst flag.	Call for pricing
Nvision Inc. 530-265-1000 *www.nvision.tv*	NV5500; 1 RU	Standalone	N/A	4 NTSC, 4 PAL, switchable between color black and bars	Video or 5 MHz precision reference	NTSC/PAL	AES silence or tone and word clock, at 48 kHz or 44.1 kHz	$4,980
Tektronix Inc. 503-627-7999 *www.tektronix.com/video*	TG700; 1 RU	Modular	ECO422D	Up to 16 outputs	NTSC/PAL; HD tri-level, ext CW	525/625, SDI support	Stay GenLock, analog, SD/HD/ dual-link SDI, AES/EBU audio	Starting at $4,560
Trilogy 800-372-3198 *www.trilogycomms.com*	Mentor XL; 1 RU	Standalone	Available	Five	Blackburst, 5/10 MHz	525/625, analog/ digital	Word clock output, AES and analog tones, 13 character ID	Call for pricing

ADVERTISERS INDEX

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

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51	B&H Pro Audio	www.bhproaudio.com	16	Network Electronics ASA	www.network-electronics.com
18	Bittree, Inc.	www.bittree.com	26	NTT Electronics Corporation	www.nel-america.com
42	Boland Communications	www.bolandcom.com	11	Omneon Video Networks	www.omneon.com
41	Broadcast Store	www.broadcaststore.com	59	RF Central LLC	www.rfcentral.com
14	Burk Technology	www.burk.com	37	RF Central LLC	www.rfcentral.com
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BMS Acquires Tandberg Television AVS

POWAY, CALIF.

Broadcast Microwave Services Inc., a subsidiary of Cohu Inc., has purchased Tandberg Television AVS GmbH for $8.3 million in cash.

Tandberg Television AVS, located near Frankfurt, Germany, has been renamed BMS-Europe. The company specializes in the manufacture of COFDM transmitters and receivers, and its high-definition COFDM transmission products will complement the BMS product portfolio of digital and analog microwave communication systems. The combined product line of both companies is now available.

"With this purchase, we have expanded our digital microwave communications solutions; especially for high-definition broadcast television and public safety/law enforcement applications," said Graham Bunney, president of BMS. "The acquisition also enables us to quickly respond to changing market requirements, grow into new geographical territories and offer the customer service and support necessary to sustain our global expansion plans."

Tandberg Television CEO Eric Cooney said "We look forward to continuing to serve our exising and future microwave customers through our new commercial partnership with BMS and are very confident in teh future outlook fore the business."

Tandberg Television AVS has 25 employees in Germany. The previous management team of Reinhard Kuehn, managing director and Rainer Horn, director of operations will continue in their roles.

Ikegami, Toshiba to Develop Tapeless Gear

MAYWOOD, N.J.

Ikegami Tsushinki and Toshiba Corp. recently announced a global collaboration to produce a next-generation system of editing and production products.

Specifically, the two companies will develop components for a tapeless video production and editing system that will include a professional quality camera and video recorder. The target date for the new product is April 2008.

Ikegami said the partnership was reached as a result of Ikegami's strength in camera technology and Toshiba's expertise in the field of Flash memory, citing Ikegami's EditcamHD that premiered in 2006 and Toshiba's shipping of the first Flash memory broadcast video server 11 years ago. At NAB2006, Toshiba debuted its On Air Max flash memory storage system, the company's first such product for the U.S. broadcast industry.

The collaboration is expected to blend each company's expertise in seamlessly connecting all parts of the video production workflow.

Telecorps, Wexler Partner to Ease Transition to HD

BURBANK, CALIF.

Telecorps Communications and Wexler Video are launching a new division to help U.S. broadcasters making the transition to HD television.

The new service, "Telecorps Leasing powered by Wexler Video," allows station groups and affiliated stations to obtain the equipment needed while minimizing capital expenditures, technology risk, and maintenance staff. It leverages Wexler's equipment rental and consultative services with the experience of the Telecorps Communications executive team, which includes seasoned television executives with backgrounds in station management. In addition to equipment leasing and consultative services, Telecorps Leasing will also offer repair services on leased equipment.

Indianapolis-based Telecorps Communications, an acquisition company that focuses on media enterprises, bought Wexler Video last month. Wexler has been a leading provider of equipment rentals and workflow expertise to top television productions for more than 25 years and is known for designing solutions for video villages, hidden cameras and multipath wireless sound gathering.

"Our intent is to help stations preserve and extend local market brands in the digital era with a plan that moderates expense and risk to prudent levels," said Rob McConnell, CEO of Telecorps Communications. "We understand from our own experience that maintaining a competitive edge in respective markets is always of utmost importance. This service offers stations an alternative financial agreement to buying equipment outright and does not oblige the broadcaster to a lease-to-buy scenario."

DirecTV Places $6.7M Orders With Radyne

PHOENIX

Radyne Corp. has received repeat orders for more than $6.7 million in Ka-band power amplifiers and DM-240 satellite modulators from DirecTV. The products will be installed at new facilities supporting the satcaster's expansion of its high-definition TV service to customers.

The company, which makes satellite and microwave communications equipment, said the orders are shipping during the first three quarters of 2007.

Radyne's DM-240 satellite modulator was one of the first to market featuring DVB-S2 technology. This standard saves up to 30 percent of transponder bandwidth as compared to the standard it replaces. Ka-band amplifiers represent an emerging market providing customers with greater bandwidth than is available with competing technologies.

CBS Acquires High School Sports Net

NEW YORK

CBS has acquired MaxPreps, an online high school sports network. The network will become a unit of CBS-owned CSTV (College Sports Television). Brian Bedol, president and CEO of CSTV, announced the deal.

"From the professional sports covered by CBS Sports and CBS Sportsline to the collegiate athletics covered by CSTV," Bedol said, "this acquisition expands CBS's portfolio of sports programming and brings a spirited community of athletes and a highly desirable demographic into our reach."

MaxPreps provides information on nearly 80,000 high school football games and more than 500,000 high school basketball games played annually. It has more than 1 million high school athletes registered in its database.

"Sports fans and participants are among the greatest beneficiaries of the advancements in video delivery technology," Bedol said. "Athletes, their families and members of their communities can now experience personalized sports programming, following the teams and games they care most about. What's more, our affiliate partners will benefit from the availability of this great content to feed their broadband and VOD channels."

Mark Gray Appointed President of SAMMA Systems

NEW YORK

SAMMA Systems, a division of Media Matters LLC, has appointed Mark Gray as its president. The company, which manufactures products for automated migration of videotapes into a digital server environment, has offices in New York, Rome and Beijing.

Gray has more than 35 years experience managing public and private companies in video software and hardware manufacturing. His previous experience includes serving as chairman, president and CEO of several companies, including Kasenna, Pluto Technologies and Chyron. He also held senior executive level positions at Sony Corp. of America, Pinnacle Systems and Ampex, as well as executive positions with Harris and Tektronix.

"Mark's history speaks for itself," Jim Lindner, founder and chairman of SAMMA Systems said. "His vision and pioneering spirit have changed the landscape of the industry and driven many companies to great success. His leadership and experience will be a great asset to SAMMA Systems."

Gray also serves on the board of directors at several companies including EGT, Telco Television Corp. and two Silicon Valley startups.

Clear-Com Relocates U.S. Headquarters

ALAMEDA, CALIF.

Communications systems provider Clear-Com, a Vitec Group brand, has relocated its U.S. office to Alameda, Calif., near San Francisco.

Dan Wall, vice president of operations, said "The streamlined facility best enables Clear-Com to deliver practical innovations and services to improve product performance for our clients."

Clear-Com has recently introduced several new-to-market solutions and market-driven product enhancements to its existing portfolio of party-line, digital matrix, wireless intercom and IP-based communication systems. These new products will be produced, distributed and marketed at the Alameda location.

The new Clear-Com address is 850 Marina Village Parkway, Alameda, Calif., 94501.

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- 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)
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- 12 user-programmable switches (comm, salvos, triggers, etc.)
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- multiple surfaces can share I/O

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