

# TV TECHNOLOGY

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## Canada Mulls HD Dilemma

Critics cite no business model, threat to culture

OTTAWA

While the steady transition to HD in America continues to accelerate, its northern neighbor is going through some serious soul-searching on its own transition that, in part, may sound familiar to U.S. broadcasters.

For two weeks last month, the Canadian Radio-television and Telecommunications Commission (CRTC) held annual hearings to examine the state of Canadian broadcasting. Unlike America, Canada has not yet set an official analog cutoff date, although some broadcasters are recommending the adoption of one.

The theme of the hearings was set on the first day when the head of the Canadian Broadcasting Corp. told the CRTC he can find no adequate business model for HD services, but stations are being forced to pay for the expensive transition anyway.

CBC President Robert Rabinovich said advertisers in Canada (as in the United States) are not willing to pay higher rates for HD commercials.

"So basically they're saying if you want to shoot in HD, that's your business [but] we're not going to pay you more," he told the review panel.

The CBC, which began 1080i

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## Bill Clears Way for Denver DTV Tower

Tower opponents weigh options for legal challenge

by Ken Freed

DENVER

In a move that raised the hackles of local opponents to the proposed consolidated DTV tower on Lookout Mountain at the western edge of metropolitan Denver, the U.S. Congress last month passed a bill introduced by Sen. Wayne Allard (R-Colo.) to take away from all local government units

in Jefferson County the right to decide if the tower will be built.

"This legislation will ensure more than 600,000 Denver metro area residents who do not have cable TV or satellite TV will be able to receive free over-the-air digital TV," Allard said following House passage of the legislation by unanimous consent after midnight, Dec. 9. President Bush signed the bill, Dec. 22.

"The choice is simple," Allard said. "We go digital or we go

dark. Going dark is not an option for the many Colorado households who rely on free over-the-air broadcasts for news, emergency alerts, and entertainment—particularly those who cannot afford satellite or cable.

"Facing a fast-approaching 2009 federal deadline for switching to digital TV, we needed a solution to provide free broadcast signals to the metro-Denver area. I am pleased to be part of a bipartisan effort

to preserve free television for Coloradoans."

The legislation, S.4092, was introduced in the Senate on Dec. 6, and passed by unanimous consent that same day. Democratic Colorado Sen. Ken Salazar co-sponsored the legislation.

## LINGUA LEGISLATA

Titled as "An Act to clarify certain land use in Jefferson

TOWER, PAGE 24

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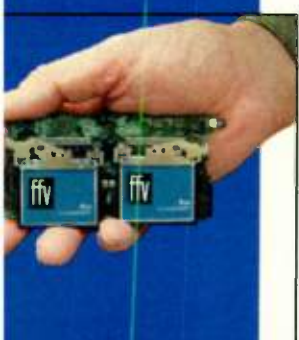
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## CONTRIBUTING WRITERS

Doug Lung  
RF Technology



Last year, I provided a quick overview of ATSC USB tuners. This month, I'll provide a detailed comparison of three—DViCO's FusionHDTV5 USB Gold, the AutumnWave OnAirGT tuner and the Pinnacle HD Stick Pro. All tuners include software that allows scheduling... p. 28

Andy Ciddor  
Let There Be Lighting



Let me begin by stating the blindingly obvious fact that light is our stock-in-trade; something we manipulate every working day as we craft our pictures. Yet despite this, many of us don't know all that much about how to measure, specify and describe it... p. 32

Wes Simpson  
Video Networking



Many people are familiar with digital video recorders in either a set-top box from their cable or satellite TV provider, or as a standalone TiVo-style box. This technology is very popular. In-Stat reported that 19 million PVR units shipped in 2005, a 60 percent increase over 2004... p. 34



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## FROM THE EDITOR

# Dangerous News



The recent death of a news cameraman in the Washington, D.C. area was not only a sobering reminder of how dangerous the broadcast profession is; it also illustrated the dedication of the men and women who put their lives at risk to capture the news.

A week before Christmas, Gordon Davis, a veteran cameraman for ABC affiliate WJLA for the past 10 years, was responding to an early morning fire in Maryland when he was struck and killed by a motorist.

We're familiar with the technical hazards that crews face when they cover news. While many are fewer and far between, stories of journalists getting injured or killed when the mast on a news vehicle hits a power line or overpass still occur.

We're also reminded that, in the

case of Gordon Davis, a seemingly random motor vehicle/pedestrian accident is a common danger. The accident is still under investigation, but it reminds us all of the dangers involved when events are rapidly changing and distractions are ever-present.

"We are out there in situations on a daily basis that have a component of danger," said Bill Lord, vice president of news for WJLA. "We have to be extremely vigilant all the time."

Gordon Davis was very careful and well liked by his colleagues, Lord said.

"Gordon was a legend in the overnight shift," Lord said. "He did his job with unfailing politeness. He was a consummate professional."

Whether it's the journeyman photographer capturing violence on the streets of Baghdad or capturing daily life in your local community, the job

of a cameraman is rarely boring. Ask any cameraman and they'll tell you that there's an attraction to being an eyewitness to history that makes the job such a rewarding experience.

Gordon left behind a spouse and teenage daughter. We extend our sincere condolences to his family and friends as well as to all the others who've lost their lives while reporting the news.

WJLA has set up a scholarship fund for his 15-year-old daughter, Megan. Donations can be made by check to:

Megan Davis Scholarship Fund  
c/o WJLA TV  
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Arlington, VA 22209

Tom Butts  
Editor

[tbutts@imaspub.com](mailto:tbutts@imaspub.com)

## LETTERS

Send to Editor, TV Technology at e-mail [tvtech@imaspub.com](mailto:tvtech@imaspub.com)

### Won't Someone Fix the Audio?

Dear Editor:

First I must tell you that TV Technology's Audio Tips is very informative reading, but I would like to take a moment to tell you about my experiences with HDTV and the audio that follows it.

Here in Chicago, it would be nice if occasional clicks and pops in the audio stream were all that was wrong with the 5.1 audio that is supposed to be transmitted with HD pictures. For all practical purposes, it's safe to say that it's atrocious.

Our PBS station WTTW-DT transmits some of the most amazing pictures seen on TV and at the same time the picture and sound will be between five and 10 frames out of sync. On occasion they will show the same program on the same day and on one occasion the sync is close and the next time it's way out.

Our cable provider is a sponsor of White Sox baseball, and at times the station transmitting the game is WCIU-DT. Some cretin at Comcast decided not to include WCIU-DT on cable, so the only way to get a Comcast-sponsored game is to use an antenna.

In early November, CBS broadcast the Bears football game, (their first loss) and the audio reached a new low. The audio is a reasonable 5.1 and a nice level of SFX with the announcers slightly out of sync but in the center channel only—that's a good experience. Now comes a commercial insert; naturally it's considerably louder, probably between 5 and 10 db hotter. Commercials in the same segment vary wildly in level and everything is mono, coming out of all five speakers at a level that can set your hair on fire.

After the break, it's back to the truck and game. Same as the commercial break, now the announcers are mono in all five channels and at the hot level of the commercials. It can take anywhere from 10 seconds to almost a minute for someone somewhere to say "s--- that's not

right," and lo and behold, the audio is back to a true 5.1, (although the audio would on occasion quit completely, then come back on loud and in mono then quit again and then come back correctly for awhile).

Since we are a post-production studio and have on occasion mixed a spot that's now all of a sudden turned mono, when we finished it and left here it was at least mixed in stereo.

I find it difficult to believe that no one else hears this.

In reality the commercials we mix, we mix hot for the same reasons they make CDs at 0 db digital—so it's louder than anything else. The disparity between commercial audio levels and the program they're in could easily be fixed if the broadcasters cared enough to do it. After all, they have the final gain control.

Mike King  
Chicago

### Hot or Cold?

Dear Mario:

Another good article as usual ("Yes, It's Still Coming," The Two Firms SED Again," Nov. 15, 2006). The one thing that I haven't figured out about SEDs yet is the cathode(s). Are they heated cathodes along the lines of conventional vacuum tubes or are they cold cathodes? If they're heated, the heater assembly has got to be one mind-bending monstrosity.

And if they're heated, will there be a warm-up time involved as well as the possibility of filament burnouts?

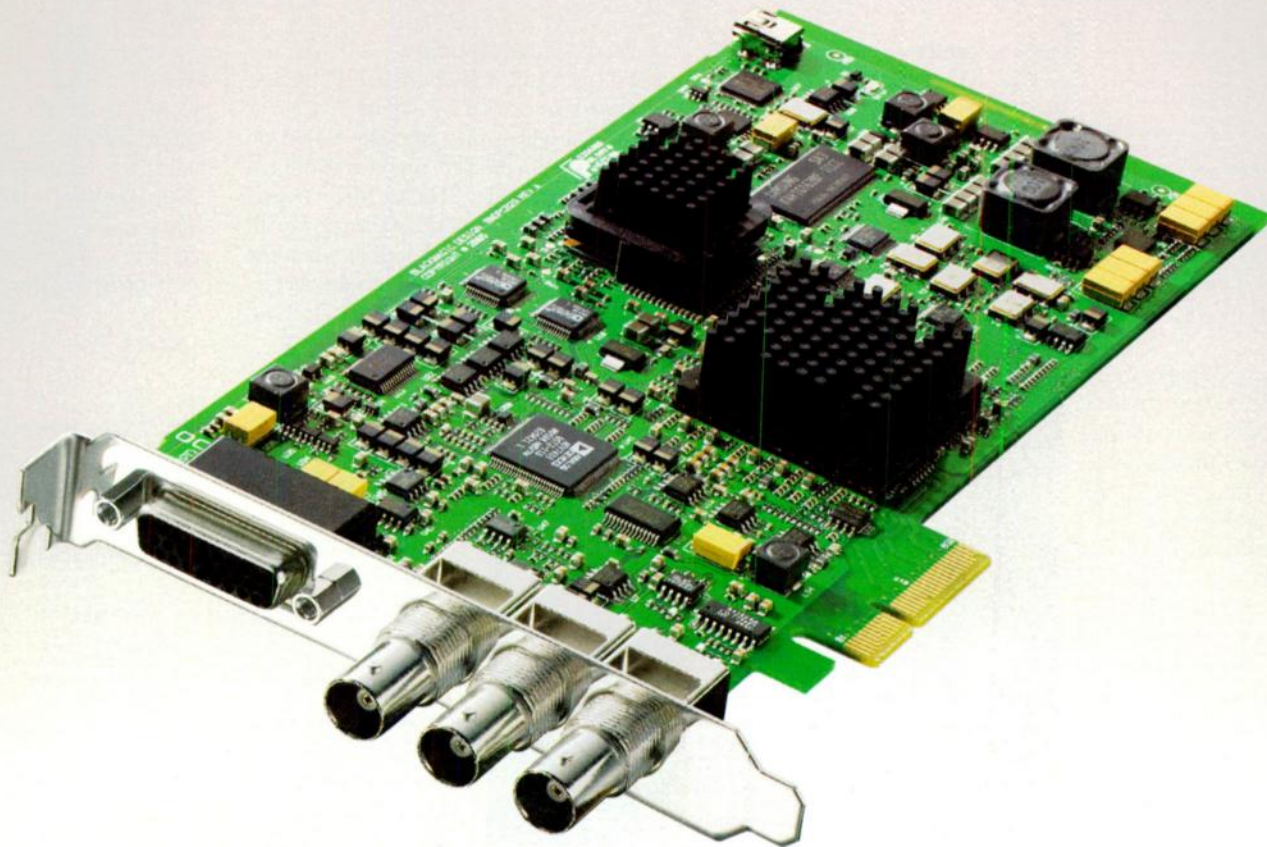
Joanne Bandlow  
Cleveland

Mario responds:

Thanks! They're cold (they don't have to shoot the beam very far).



Blackmagicdesign



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# It's No Snow Job: Winter X Games Is Back

New microwave, camera technologies assure ESPN viewers catch all the action up close

by Claudia Kienzle

ASPEN, COLO.

One of the premiere annual televised winter sports events is the Winter X Games, now in its 11th year. Scheduled to run Jan. 25-28 at Colorado's Buttermilk Mountain, the games can be viewed on ABC, ESPN and ESPN 2.

Last year, the Winter X Games were seen by viewers in 747,130 households, across the three networks, representing a 45 percent increase over the previous year's viewership according to Nielsen Media Research.

"Over the years, the Winter X Games has drawn the public's attention to extreme winter sports, including skiing, snowboarding, and SnoCross snowmobile races," said Paul DiPietro, senior director of remote operations for ESPN in Bristol, Conn. "ESPN contributed to the popularity of these sports, which have since become accepted, mainstream sports."

While the 2007 games will be carried in standard def, DiPietro said ESPN plans to migrate the production of the X Games to HDTV in the near future when sufficient HD trucks, equipment,

and infrastructure become available.

"In the second week of December, we visited the location in Aspen to finalize our production and operation plans," DiPietro said. "We also experimented with a few new technologies that we might use."

A largescale production, the Winter X Games 11 will use all types of inno-

vative equipment, including FollowCam, a U-shaped, RF camera apparatus carried by skiers; FlyCam, a camera which flies over the action on cables; and on-sled cameras mounted on snowmobiles. There's also "weasel cam," a camera buried in the snow with a mirror that's hinged so that when the skier gets close to it they can ski over it.

The lead FollowCam operator, Reid Nelson, an expert double black diamond extreme skier, designed FollowCam's hoop apparatus, which is made of aluminum bicycle tubing.

The U-shaped tube is held by the skiers as they ski, with the rounded part of the "U" in front of them, and the two prongs of the "U" sticking out



Shaun White competes in the Men's Superpipe Finals at Winter X Games 10 in Aspen.

**"The logistics and technical planning involved with the Winter X Games are just incredible."**

**—Pat Hally, designer of FlyCam**

A crew of extreme skiers will operate three FollowCam systems, and many of these skiers have worked on previous Winter X Games.

behind them. The digital RF transmission equipment and batteries are affixed to the back prongs of the apparatus. The camera, which is a Sony DXC-990 three-chip industrial SD camera, with a Fujinon 14x7.3 zoom lens, is mounted at the front of the hoop.

## Panasonic Adds AVC-Intra; Announces New P2 Deployments

NEW YORK

Panasonic last month announced several new additions and capabilities to its P2 HD solid-state format.

At a press gathering in New York, the company said it will begin shipping the AJ-HPX2000 P2 HD camcorder, the first shoulder-mount camera in the P2 HD lineup, this month. Introduced at NAB2006, the camera includes 24p frame-rate capability in addition to optional support of AVC-Intra, a new advanced independent frame compression codec. The codec, based on the H.264 (MPEG-4, Part 10) standard,

will be offered in an optional board that will be available in July 2007.

The HPX2000 can hold up to five P2 cards and features a 14-bit A/D processor to deliver a high sensitivity of F11 at 200 lux and a minimum illumination of 0.007 lux (at +74 dB gain). A new advanced DSP circuit allows users to select gamma curves and make precise color adjustments, while Dynamic Range Stretching automatically adjusts the camera's aperture when shooting scenes with varying degrees of light or when moving from light to dark areas.

Panasonic says AVC-Intra provides highly efficient independent frame 10-bit encoding and will effectively double the

recording capacity of a P2 card. AVC-Intra will be offered in two flavors: 100 Mbps for highest HD quality and 50 Mbps for more bandwidth-efficient operation.

Panasonic is also now shipping the AJ-HPM100, a companion P2 HD recorder player. Dubbed the "P2 Mobile," the 14.4-pound recorder folds like a laptop and features a six-slot P2 card reader, the latest I/Os, an SD memory card slot, broadcast-level editing controls and a 9-inch widescreen HD LCD monitor with stereo speakers, as well as conversion between 1080i and 720p HD formats. An optional AVC-Intra board will be available in July 2007.

Panasonic also announced that Cox Television will transition its news-gathering operations to P2 HD.

Starting this month, WSOC-TV, the ABC affiliate in Charlotte, N.C. and WSB-TV, the Atlanta ABC affiliate will take shipment of the fully equipped AJ-HPX2000 DVCPRO HD P2 cameras to replace their Beta-cam SX gear. WSB has been broadcasting its news in HD since September 2006.

Atlanta-based Cox Television owns 15 TV stations.

Tom Butts



New Panasonic P2 gear, including the AJ-HPX2000 P2 HD camcorder and the AJ-HPM100 "P2 Mobile" recorder, support the new AVC-Intra codec.

## WIRELESS TRANSMISSION

Originally, Nelson designed FollowCam to work with small digital camcorders for nonlive events. But, when the Winter X Games went live a few years ago, BSI worked closely with Nelson to modify the FollowCam so the video could be incorporated into a live show. Besides adding the wireless real-time camera control, another key modification was the addition of a digital RF transmission system, which is currently the Nucomm CamPak.

A rocker switch on the hoop under the skier's thumb lets the operator control the zoom. All other camera functions are controlled wirelessly by UHF telemetry, including the iris exposure, colorimetry and focus. These camera functions are controlled by someone in one of the production trucks in the truck compound, according to Clay Underwood, business development manager for BSI (Broadcast Sports Inc.), in Odenton, Md.

"We pull all the RF signals in from receive sites on the mountain and turn the appropriate slice of spectrum from each receive location into a beam of light that is carried over a piece of fiber-optic cable," Underwood said. "At our production truck in the TV compound, it's turned back into RF, demodulated, and then relayed as video and audio to the production truck that will use it in

X GAMES PAGE 8



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## X Games

CONTINUED FROM PAGE 6

the live show. This technology is similar to what we've been using for NASCAR, Champ Car World Series, Indy Racing League, Busch Grand Nationals, and other racing events where imagery is transmitted from cameras on the cars."

However, unlike these racing events, there won't be any GPS systems in use at the X Games.

### ON-SLED CAMERAS

Besides the FollowCams, BSI technicians will also be on-site to manage 10 wireless camera systems designed for use onboard snowmobiles. The cameras can be mounted in three positions on each sled: Looking back at the driver; looking ahead of the sled; and a view of what's coming along behind the sled. Usually only three or four snowmobiles are outfitted with cameras in any given heat.

Since the snowmobiles have limitations regarding the size and weight of the camera systems they can carry, BSI will use a modified Sony XC-555 single-chip camera, with a fixed 3.5mm lens, housed in a carbon fiber tube, inside of which will be a miniature analog RF transmitter that BSI designed, according to Underwood.

"We have to use analog cameras and wireless transmitters because digital systems are power hungry, and therefore too large and heavy to use on the snowmobiles," he said.

Underwood added that, for the snowmobile onboard camera systems, they also employ a wireless control system incorporating iris control, col-

orimetry, transmission frequency agility and remote activation of a clear plastic spinning disk on the front of the camera to remove snow and other debris from the front of the lens.

BSI will also provide RF transmission capability for two FlyCams. Designed



A snowmobile sports an onboard camera to capture SnoCross action.

and built by Pat Hally, in association with Garrett Brown, the inventor of SteadiCam, FlyCam is a camera system that is unique in its ability to travel along a cable at up to 90 mph to track alongside the athletes as they ski down the mountainside at 60 mph.

Inside the camera housing, which is 24-by-11-by-9 inches, resides a Panasonic 1500 multiformat HD camera with custom-built Fujinon zoom lens. Hally said he designed an innovative solution that spins at 6,000 RPMs

in front of the housing to deflect water, snow, and debris to protect the camera.

The entire run is about 2,000 feet, although fixed cameras cover the action at the top and bottom of the hills. As the cable runs through the hilly terrain, the camera lens can be as little as six to eight feet from the skier, or as much as 40 feet above the ground. FlyCam helps provide perspective of the course, and tracks along for an overview shot as athletes ski alongside, underneath it, away from it, and then back towards it as they ski down the mountain.

"Since the camera can move very fast right near people, my number one priority is safety," said Hally, owner of Philadelphia-based This Side Up, which owns FlyCam USA, FlyCam Europe, and FlyCam Australia.

"I designed the system so that it requires two operators: a pilot who watches where the FlyCam is going; and a cameraman that operates the pan, tilt, zoom, iris, and focus of the camera. The two must operate in unison with good communications to ensure that the camera is tracking at the right speed to capture the shot."

### DEMANDING PRODUCTION

Because the job is so challenging and crucial, Hally is flying his ace cameraman, Mike O'Shea, from the set of "Bourne Identity 3" in India to Aspen just to pilot the FlyCam. FlyCam is in demand by motion pictures, television specials, live sports and commercials.

At Winter X Games 11, there will be two FlyCam systems—one positioned at the Skier X downhill ski course, and one at the SnoCross snowmobiles course. FlyCam has been used by ESPN for the last five Winter X Games, as well as on the last six Summer X Games.

"The logistics and technical planning involved with the Winter X Games are just incredible. There are hundreds of cameras and other broadcast systems all around the mountain and in my experience, it's all plug-and-play because ESPN hand picks the most talented, competent people," Hally said.

"During test runs, if you suggest a creative change, they will immediately call in everyone whose job may be affected by that change to discuss its feasibility and then they'll make a decision right there," Hally said. "With its dynamic, cutting-edge vision, ESPN has set a very high standard for producing extreme sports for live television."

### SURROUND SOUND

ESPN is planning to broadcast the Winter X Games 11 in full Surround Sound, as it has done in the past. According to Ron Scalise, audio project manager for ESPN, there will be approximately 250 microphones in use.

Fifty of these microphones are proprietary 'XDucers,' which are transducers made specifically for the X Games, according to Scalise.

"These are pickup-type devices that work on vibration unlike conventional microphones that pick up sound through air movement," he said. "XDucers are placed right on trick apparatuses around the courses and they are specialized to enhance audio for television."

Scalise added that microphones are placed throughout the venues to pick up audio from snow courses, downhill hard and handheld cameras, and moto sleds. Mics will also be picking up the crowd, friends and family of the athletes, as well as the competitors, announcers, and talent.

"About 10 percent of the 250 mics we plan to use will be wireless. In fact, Winter X Games 11 will be very heavy on wireless communications for all talent and production personnel," Scalise said. "We also plan to use shotgun pattern mics for effects as well as handheld and headset mics for talent, host, and sideline reporters; and these will be transmitted over wireless systems."

### TRUCK COMPOUND

The truck compound will house dozens of mobile units. NEP Broadcasting, LLC, in Pittsburgh will provide several, including SS25, SS12, SS16, and ND 2, according to George Hoover, senior vice president of engineering.

NEP SuperShooters SS25 is actually twin HD mobile units. Truck A houses graphics, editing, and production; and Truck B houses the central equipment room, audio, video, and videotape. SS25 is equipped with Grass Valley KDK 6000 Worldcam cameras; a Grass Valley Kalypso HD switcher with EVS replay capability; and a Calrec Alpha mixing console capable of mixing 5.1 surround sound. ■

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# Video-on-the-Go Gains Momentum

Next-generation content delivery: Slow out of the gate, but still in the race

by James E. O'Neal

FALLS CHURCH, VA

**N**ext-gen TV, the third screen, mobile TV, cell phone TV—there are a lot of names for this next chapter in broadcast television, and quite a list of players too. NAB2006 identified 21 of them and this is just the tip of that proverbial iceberg.

While the service providers haven't exactly had to hire additional help to take subscription orders just yet, there is some interest for the small screen video service among the estimated 180 million cell phone customers in the United States.

With the rollout of third-generation, or "3G" cell phone network technology, telecom service providers are now able to implement video capability, but consumer acceptance and demand are still in their early stages.

## SOUP TO NUTS

Howard Barouxis, Grass Valley senior director of sales for North America, sees a bright future for small screen video.

"I think that the market is great," said Barouxis "We've been involved in a lot of DVB-H trials and we've done a lot of deployments around the world. We're now working with all the major operators in the United States in small city trials."

"We see a huge market and are providing quite a bit of the overall solution—head ends, encoding, IP encapsulation—we're supporting both DVB-H and MediaFLO, and we're offering transmitters and middleware too," Barouxis said. "The only thing we wouldn't offer are handsets."

As for full-scale next-gen service within the United States, Barouxis thinks that it will be here soon.

"What you're seeing in the U.S. this year are small trials," he said. "There will be trials in the larger markets in 2007 and the market will probably open up in 2008."

According to Barouxis, it's a matter of 'build it and they will come,' and says major operators are working on this.

Vizrt, Harris, Snell & Wilcox, Tandberg Television and others have also been producing and marketing items for what may ultimately prove to be a large market.

Halid Hatic, vice president of business development for Vizrt, says that his company has had its ear to the ground when it comes to the small screen.

"What we realized by listening to

our customers, especially in the United States, is that they are looking for ways to monetize their content in new and different ways," Hatic said. "Ipad and cell phone delivery has not gone unnoticed and we've designed a workflow product with which they can repurpose any of their product into a mobile platform."

Hatic sees delivery of video as just part of the equation, with graphics and metadata being value-added items.

"If a person is interested in sports scores, they could have them delivered in the form of a ticker rendered in a local environment with dynamic



*Looking at the beginnings of a new industry—video delivery via cell phone.*

updating. The ability to deliver hyper-local news to a subscriber base is the 'holy grail.' Vizrt can help stations simultaneously produce content for both local news and the handset subscriber."

Hatic views the small screen business as just getting started.

"Our customers [content producers] are already experiencing demands due to shareholder pressure to increase revenue," Hatic said. "On the other hand, stations are waiting for viewers to start asking for mobile delivery. It was a bit of a shock to the industry when ESPN folded up their mobile strategy [earlier this year]. This part of the industry is still in its early stages, but it was great to see Disney take the first steps."

Most proponents of handset video admit that there are some hurdles to overcome before the public completely embraces the technology. Among these are screen size, battery life and subscription costs (estimated to be \$10 to

\$25 per month in addition to the cost of the cell service itself).

At least three major U.S. cell phone service providers are set up for video delivery: Cingular, Sprint and Verizon.

## TOO MANY BITS

Depending on the methodology used for deploying the service, there are other issues too. There is concern that next-gen video delivery could become suicidally successful and drag down traffic throughout a vendor's network. A wideband stream would have to be provided to every customer wanting to view a particular event. Too many viewers could result in system congestion and crashing. The way around this is to provide a more generalized service similar to standard television broadcasting with RF transmission of signals to subscribers.

Jeffrey Nelson, executive director corporate communications at Verizon Wireless, was optimistic that congestion would not really be a problem with Verizon's current VCAST video service.

"When we launched VCAST almost three years ago, we designed the service in such a way as to provide network proper coverage and capacity. This is clearly part of our business model. We're not going to risk our reputation as having the best cellular system by oversubscribing the service."

In breaking away from conventional networked delivery of video, DVB-H and Qualcomm's MediaFLO appear to be the logical choices. MediaFLO supports 320x240 resolution and 30 fps (considerably beyond 3G capabilities) and could offer upwards of 15 live program choices and considerably more when content is limited to short video clips.

## FUTURE FOR VCAST

As Verizon has plans to begin offering MediaFLO service in the first half of 2007, is there a real future for VCAST?

"We really view them as very different services," Nelson said. "On regular TV you can either watch programming where anyone sees the same selection—this is comparable to MediaFLO—or you can opt for on-demand viewing. That's where VCAST is today. It's long form versus short form. We see them as coexisting."

There's also the question of content suitability for the small screen. A wide shot of a football field during a kickoff is not going to play well on a two-inch screen. Content generation for next-gen viewing will have to be carefully considered and cannot be left to simply passing along reformatted video. Editing will no longer amount to deci-

sions as to the best sequence of material and the location of cuts, wipes and dissolves.

It will also have to include "viewability" considerations with regard to wide versus tight shots and the way they are assembled to tell the story. The same goes for graphics. What works nicely on a sports bar 50-inch display may not play at all on a handset screen. Content providers will have to address these issues, just as they have had to do in going from SD to HD and from 4:3 to 16:9 aspect ratios.

## SMALL SCREEN ISSUES

Snell & Wilcox is another player in this nascent industry and the company is marketing their Helios product for easy repurposing of content. It not only handles standard, format and aspect ratio conversions, but also provides deinterlacing and scaling, along with a library of compression selections to ensure operability with various cell phone delivery systems, as well as other next-gen delivery methodologies.

Joe Zaller, vice president of strategic marketing at Snell & Wilcox, described some of the challenges associated with small screen television.

"There's a very big need to make pictures look good in the small space," Zaller said. "There are a lot of issues to deal with. Interlacing is one of those. Most deinterlacers start by throwing away half of the information so the displays are progressive. There are problems too with the different sizes and shapes of screens. With 16:9 coverage of sporting events, the director lets the action move through the frame. When you view this on a small screen you may not be able to find the ball. This is really a big issue for mobile TV."

Zaller described other problems that arise when repurposing content for small screen TV.

One of these is compression efficiency. When the camera sees crowds behind a sports player, the system tends to treat the randomness of that crowd as "noise" and wastes a lot of bits. Helios is designed to recognize such situations and defocus the background crowd images in order to reduce the bit count.

"Some 3G operators are streaming at 6 fps; we want to help them deliver a better picture, so our technology saves a significant amount of bandwidth," Zaller said. "We deliver at 15 fps and the viewer gets a better picture and will come back to watch again. Quality is going to be very important."

"People will initially look at it as a novelty. We don't want to keep it at this level." ■



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# NFL Takes Slo-mo Hi-Def

Broadcasters put Sony HDC3300 to the test during recent football season

by Robin Berger

KANSAS CITY, MO.

Last Thanksgiving's Broncos-Chiefs game at Arrowhead Stadium marked the holiday's first National Football League night game as well as NFL Network's debut telecast.

And the network came out in fine HD form, including Sony's new HDC3300 slo-mo camera in its repertoire.

"What they did—which was very interesting—was to staff two of the slo-mos with NFL Film people," said Pat Sullivan, president of Hudson, N.H.-based Game Creek Video, which supplied the mobile truck. "They had some shots during the game that looked more like an NFL film than a traditional broadcast."

According to NFL Network Director John Gonzalez, Donald Marx operates a handheld HDC3300 diametrically positioned from camera op Hank McElwee, at the near and far sidelines of the end zone. Marx uses a 22:1 lens; McElwee's HDC3300 has a 40x lens, which requires the camera to be mounted on a small high hat with a tripod head, shooting low to the ground. A hard-configuration HDC3300 with an extremely long lens is mounted on a platform at the left low-end zone.

"The camera's a lot faster than film cameras," said McElwee, estimating the

American Standards Association's rating of light sensitivity at close to 1,000, versus a film max ASA of about 400. So far, lighting hasn't been a problem.

"There's plenty depth of field," he said. "We really haven't been in any dimly lit stadiums yet—call us after we go to [the Georgia Dome in]

sion system capable of supporting a bona fide gigabit per second payload—in a lot of ways, we had to start from scratch."

The HDC3300 system transmits 180 frames per second in full high-definition resolution paired with an EVS server, and outputs nor-mal



A CBS camera operator with the Sony HDC3300 at a recent NFL game.

Atlanta." (Editor's note: Not until the 2007-08 season.)

For McElwee, the only drawbacks were cable management and the camera's black and white viewfinder.

"A big part of the SD broadcast was 3x super mo, so we really didn't want to give up that type of capability," said Rob Willox, director of marketing for the Sony Electronics Content Creation Division. "We had to build a transmis-

speed signals simultaneously for live feeds through se-parate digital signal processing. It includes three 2/3-inch high-speed progressive CCDs and enables recording at 1920x1080/180i or 150i, and 1280x720/180p or 150p.

## INDUSTRY ADOPTION

"We had done some season playoffs in Europe with it, so ABC asked for it for the 2006 Super Bowl—we flew in the unit and four engineers," Willox said. "It was the ground-level camera on the goal line that really helped make that decision on whether or not [Steelers quarterback Ben] Roethlisberger had crossed the [goal] line or not."

That third-down play during Super Bowl XL was upheld as a touchdown after official review, one of three controversial plays that put the Steelers ahead of the Seattle Seahawks, 21-10. Broadcasters have clamored for the camera ever since, but Sony was concerned about reliability (overheating issues were reported), and withheld distribution until after the 2006-07 season started.

Game Creek has supplied Fox with four HDC3300s ever since the Oct. 29 Falcons versus Bengals game.

"We use them every single week on our primary NFL game," said Jerry Steinberg, senior vice president, operations for Fox Sports, noting the cameras were specified in the contract for the new Game Creek truck. "It's great—the picture quality and being able to play back at three times speed: there's just more resolution on the replay."

NEP Broadcasting clients, CBS and

NBC, have also contracted HDC3300s. CBS has used them since the Oct. 29 Colts vs. Broncos game; NBC debuted them on its Cowboys-Panthers telecast, also on Oct. 29.

"We can use it as a handheld or a hard camera," said Ken Aagaard, senior vice president, operations and production services, CBS Sports. "A lot of us use it as a low end zone camera—you get the play coming right at you."

CBS is also using HDC3300s to enhance its broadcast of select college football games, and plans to use them for the NCAA basketball playoffs in March. Fox intends to use them to cover NASCAR races, beginning with the Daytona 500 in February. In early December, HBO Sports used the HDC3300 for a live broadcast of two World Championship Boxing matches from the St. Pete Times Forum in Tampa, Fla.

## PROS AND CONS

Praise was unanimous among HDC3300 users regarding the camera's reliability and the quality of its high-speed images, which effectively blend in with the rest of the telecast.

"Unless somebody really points it out to you, you don't really notice the difference—it doesn't jar out at you, it really mixes in," Aagaard said.

But the camera's hefty \$290,000 price tag limits its use.

"It's really purpose-built: there's not a huge market for these things," said Sony's Willox, explaining the \$90,000 premium over its SD slo-mo version.

And, like any new equipment, the HDC3300 had some minor drawbacks. More than one user noted "noise in the blacks," adding that the problem was more noticeable in the slo-mo replays. The HDC-3300 transmits three independent outputs to an EVS server, which stitches them together and can play back at one-third speed or slower.

"This issue has been resolved by adjusting the independent image enhancement controls for the 3x video outputs on the HDC-3300," Willox said, specifically adjustments to the camera's gain and "changing some of the baseline settings from Japan."

In addition, Willox said Sony recommended that users adjust the EVS server data rate for horizontal resolution to 1,280 lines.

"The EVS server has always allowed the user to define resolution and bit-rate settings based on workflow requirements," said EVS Senior Product Manager Michael Shore. "EVS had to make no change to the XT[2] server to accommodate the addition of the HDC3300." ■

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— Jason Taubman and Paul Bonar, Game Creek Video

## HDeManding

Jason Taubman, VP of design for mobile production company Game Creek Video, faced contradictory demands. He tells us, “Some clients required the highest quality in 1080i and others demanded the same in 720p. Some venues only had fiber and some strictly triax. Sony was the only supplier to meet all these requirements in a single camera.”

“We committed to the HDC-1500, Sony’s 1080/60p camera before it was even a model number,” says Paul Bonar, VP of engineering. “And Sony committed to us. Their engineers heard our input on the large lens ‘sled,’ which works like a charm. We gave them distressed cable to help design the triax adaptor, which is brilliant. And in service and support, Sony has risen to every challenge and met every need. We’re now on our fifth consecutive truck with the HDC-1500, the best HD camera we’ve ever seen.”

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# HDV Cameras Bring Accessory Challenges

Manufacturers adapt to the demands of new lightweight low-cost camcorders

by Craig Johnston

SEATTLE

The hottest professional video camera category right now is the smaller HDV camcorder products. And why not? They're low cost, light weight and produce HD images on affordable media.

However, some of the very advantages of this class of camcorders, such as low weight, minimum power draw and small size, have also challenged field production accessory makers to invent and adapt their products to work with the new cameras.

## BATTERIES

HDV camcorders may be able to shoot for hours on end using a small, lightweight lithium ion battery, but such a battery would quickly be drained if it also had to power a light or prompter.

IDX attacked this problem by

Finding a way to mount batteries and accessories on the HDV camcorders is also an issue for Anton Bauer, "so we designed our ElipZ system, an all day battery to power both the camera and



The Frezzi universal mounting system

our lightweight professional 6 volt light, plus an easy to use lightweight grip assist," said Alex DeSorbo, presi-

Electronics. "You slip the battery underneath the camera, where the balance is perfect." Lights and accessories fit above the camera.

## PROMPTERS

Shooting on-camera talent means fitting a teleprompter to the HDV camcorders. While other accessory makers may try to downsize their products to match the HDV camcorder form-factor, that approach doesn't work for prompter makers.

"Just because you have a smaller camera, it doesn't mean your talent has better eyes," said Michael Accardi, president of Autoscript. "So we've actually redesigned our bracketry so that you can put anything from a full-sized BetaCam style camera all the way down to the palm camera on the same prompter."

Andrew Weichmeyer, national sales manager for Telescript, echoed Accardi.

"You're never going to have talent that says 'boy, I wish that prompter was smaller.'"

But most HDV camcorders lack the shoulder mount that places the lens higher over the base of the camera, so Telescript has developed a 2-inch camera riser that lets the HDV cameras align correctly in existing Telescript prompter brackets.

The low weight of HDV camcorders is also a factor in mounting them with teleprompters. Bruce Levine, vice president of QTV, pointed out that with HDV cam-

corders "there's far less weight sitting on the tripod relative to the front end of the prompter.

"What we've done is look at more efficient ways of creating camera balance weights that could be easily adjusted from front to back to compensate" for the lack of weight of the cameras.

## LIGHTING

The affordability of HDV camcorders puts high-definition capability in the hands of shooters that may previously had access to much lower-quality imaging equipment. Light makers are finding new demand for their wares.

"The control of lighting, that maybe some people were considering a lost art form, is likely to make a resurgence in HD," said Duane Sherwood, director of communications at Lowel-Light. He pointed particularly to the fact that boosting gain in low light results in much more distracting noise in an HD image.

"Guys who have been downsizing their light kits and do less lighting, now with HD, even with the small cameras, have to pay more attention to lighting."

He pointed to Lowel Light's ability to use lamps of different wattages as a way to maintain a more versatile light kit.

Gilles Galerne, president of K5600, took issue with some camera makers' claims of the need for less lighting.

"Invariably, a sales person will say

CAMERAS, PAGE 16

**"You're never going to have talent that says**

**'boy, I wish that prompter was smaller.'"**

**—Andrew Weichmeyer, Telescript**

developing adapters for a number of brands of HDV camcorders that allow use of the company's V-mount or NP style batteries. "With these more robust batteries, you can power both the camera and accessories," said Amanda Martin with IDX sales.

dent of Anton Bauer.

Frezzi came up with its own universal mounting system.

"We have all the accessories, all the light fixtures, and these universal mounts that go under the camera," said Jim Crawford, CEO of Frezzolini



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# Cameras

CONTINUED FROM PAGE 14

'these cameras can do fantastic in low-light levels,' but that doesn't help in producing good pictures."

Galerne said such misinformation from camera salespeople can cause new HDV camcorder owners to balk at paying several times their camera's

prices for a lighting kit.

HDV is giving the low budget producers a high-resolution alternative to 16mm film.

"With film, we have Kodak and Fuji, and they have fairly consistent spectral response curves," said Frieder Hochheim, president of Kino-Flo. "With digital cameras... we've got a lot of different ways of processing color information.

"We are constantly evaluating our [lamp source] blends to make sure that as technology progresses, our blends are current with the way things change."

Jaime Emmanuelli, director of sales at LitePanels said the smaller size of the camcorders is influencing the size of some pieces of lighting equipment they

smaller camera, they need a stable platform even more than before," Carr said. "They can't just use their body and get the same stability they were able to with a larger camcorder."

Both Vinten and Sachtler have new products to address the HDV camcorder market. The OConnor division is dedicated to much heavier payloads, and is not pursuing HDV users.

Small HDV camcorder owners expect a reduced size and reduced price of their fluid head/tripod equipment, said Elisabetta Cartoni, president of Cartoni.

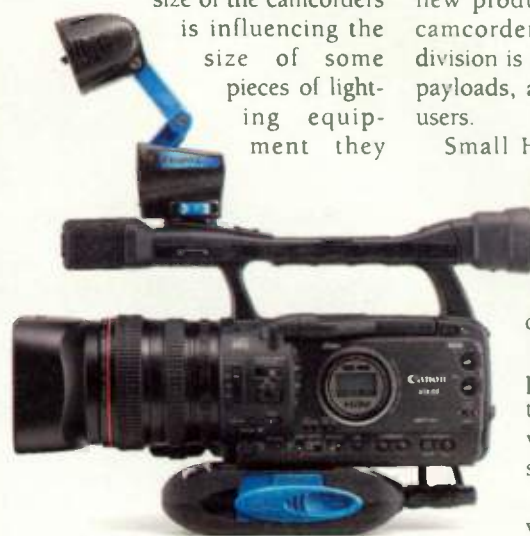
"You don't want to compromise by cutting out true fluid heads, because we believe in true fluids," she said.

But fitting a wide weight-range capable counterbalance into a small head taxes the inventiveness of head makers.

The counterbalance in

Cartoni's new head follows the camera on a tilt from plus 90 degrees to minus 90 degrees, she said.

Gus Harilaou, U.S. sales manager for Miller Camera Support, ditto's Cartoni's concerns about not lowering quality in an HDV fluid head and tripod.



The Anton Bauer ElipZ

make, especially if they're to be mounted on the camera itself.

"We've come out with our RingLite Mini, 10 inches in diameter, to fit any DV, HD camera, full-sized camera as well as Steadicam."

Even accessories like portable hard drive recorders have had to adapt for use with HDV camcorders.

"We've shrunk the size of the DT recorder series to reflect the smaller size of HDV cameras," said Matt McEwen, senior product manager for Focus Enhancements. "We've also integrated our own battery systems."

## TRIPODS

The subject of tripods has been saved for last so that the reader can appreciate the payload range these devices can be asked to accommodate. One moment the HDV camera operator may want to mount only the camera, weighing only a few pounds. The next, he's adding a teleprompter, on-camera light, hard drive and full-sized battery.

"We try to accommodate for these various payloads," said Mark Bender, Bogen rep with Manfrotto. He advised fluid-head and tripod purchasers to think not only about how light the bare-bones camera is, but to add up the possible weight of batteries, prompter, lights and other accessories.

Bob Carr of Vitek, which encompasses Vinten, Sachtler and OConnor camera support equipment, observed that HDV camcorder operators may need tripods more, rather than less than they used to with larger camcorders.

Because greater mass is easier to hold steady, "when people have a



The Miller DS20 Solo System with the Canon XL2

"We try to bring the quality of our precision broadcast products to the HDV market to retain the best image capture available on a true fluid drag system, therefore giving the operator a value investment in a support product to last a lifetime."

The new HDV camcorder product category not only began a revolution in the image acquisition product itself, but has rippled through the accessory gear market as well. ■

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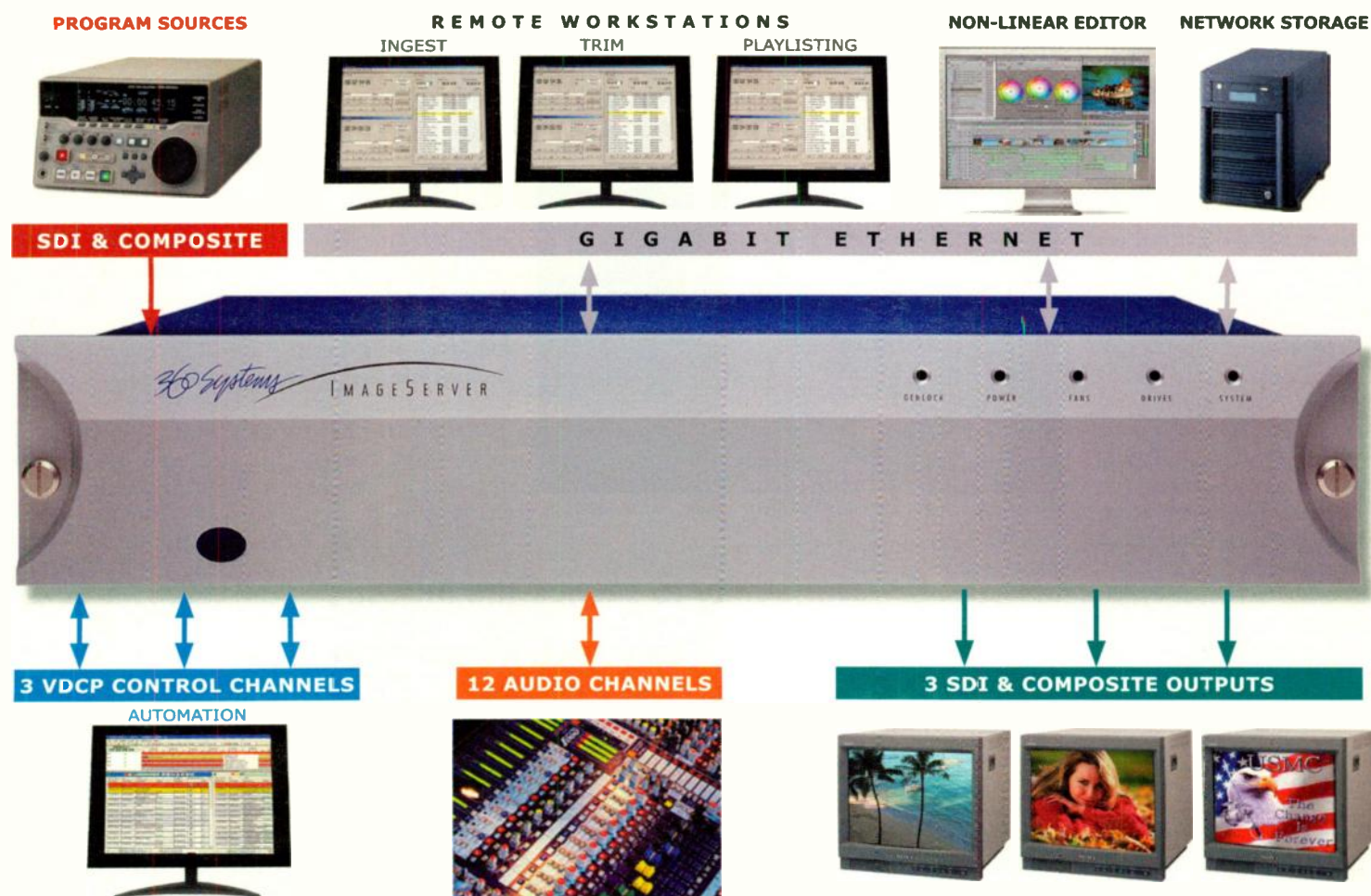
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# Illuminate Opens in Hollywood

## New facility brings four established media companies under one roof

by Jay Ankeney

### HOLLYWOOD

There's a new star in Hollywood, a production/post production facility called Illuminate that comes with a recognized heritage and a brand new attitude.

"We are providing independent producers a one stop venue with the attitude of a boutique but the facilities of a studio," said Jim Hardy, Illuminate CEO. "Our emphasis will be on combining an unprecedented level of personal service with the latest in mainstream and proprietary technologies to make Illuminate a producer's the first call for innovative digital content creation."

Located in a 30,000-square-foot building on Cahuenga Boulevard, right in the middle of the Hollywood/Studio City media district, the Illuminate facility that will open its doors this month is soon to almost double in size to accommodate bringing together four established West Coast media companies under one roof.

### HD AND 2K FINISHING

The core parent company, High Technology Video, has been providing video production services for over 12 years. But to fill out the complement of the new Illuminate entity, over the past two years HTV has also purchased Metropolitan Entertainment for feature film and HD production, HD Vision Studios for stage work and the HD

Vision Broadcast center.

But the sum of Illuminate will be greater than its components, according to Ed Sullivan, chief marketing officer

creative services arm, Illuminate Arts, which will provide design services for all media outlets including theatrical feature film production, television, broadband delivery and even PDAs.

Key to Illuminate's attitude about customer service is its policy that its Client Services department will assign every new client an in-house producer who will individually shepherd each project through their systems from the time it comes through



Bruce Cathcart is a senior Avid Nitris editor at Illuminate

and president.

"Illuminate is more than a brand consolidation," he said. "Our new company will be based on workflow integration that will provide producers with a tremendous efficiency in creating digital media for both television and feature films."

"This will extend from digital dailies through either HD or 2K film-out finishing."

Providing customer support to the whole group will be the company's

**"Our ability to service the industry from script to screen comes from the unique mix of personalities and facilities we have put together when forming Illuminate."**

**—Steve Wiener, Chairman, Illuminate**

the door to final mastering and delivery. Since Illuminate will provide services from hiring the production crew through all post production and ending in final delivery, this personalized concept-to-completion service is one aspect that differentiates Illuminate from many similar production facilities.

"One of the biggest challenges in this business is what I call 'trying to keep the all frogs in the wheelbarrow' because of the difficulties some producers face when trying to deal with a multitude of vendors," Sullivan said. "We will keep all of these processes together under a unified management team so the handoff is seamless from department to department."

### SCANNING TECHNOLOGY

A great advantage to combining the facilities that comprise Illuminate is that they are emphasizing new digital content creation concepts without the baggage of legacy production techniques.

"Our ability to service the industry from script to screen comes from the unique mix of personalities and facilities we have put together when forming Illuminate," said Chairman Steve Wiener. "Anyone can buy equipment and hook it up, but what really matters is the ability to combine people and technology to create a unique workflow package that provides the best results for a given production budget. We cre-

ate custom solutions for our clients."

Illuminate is in the process of completing a series of national TV spots for The Tasty Baking Company's Tastykake pastries. Since it is being shot in Super 16mm, Illuminate's vice president of creative services, AJ Ullman, will be overseeing the total project to make sure it gets the necessary "look" the client is after. The footage will be color corrected on a Thomson Grass Valley Spirit Telecine by image specialist Andrew Drapkin.

"Once everyone involved is happy with the visual imagery in the spots, I will personally take it through the rest of the compositing/effects editorial process," Ullman said. "This will include creating the final deliverables involving some new Digital Rapids compression systems we are just in the process of installing."

Illuminate has a full line of Sony F-900 CineAlta high-definition cameras that can be rented for field production and standard definition Sony cameras for use on their stages. In post, Illuminate offers both Apple Final Cut Pro and Avid Nitris and Symphony HD systems for editing and color correction with Autodesk Lustre.

But soon Illuminate clients will also be able to access technology unavailable elsewhere that is being developed by its own R&D department. This will include a new 4K scanning system being created exclusively for them by two-time Scientific and Engineering Academy Award winner, Les Dittert.

### COMING SOON: 12K

"This scanning system has already been tested by some of the Hollywood labs and it has proven better than anything else out there," said CMO Sullivan. "With Dittert's design the system will be able to grow as DI capabilities increase. In fact, if digital cinema demands it we're sure Les will be up to handle 12K before anyone else is can deal with 6K."

A major new animated series posted at Illuminate called "Afro Samurai" produced by Fuji Television Network and starring Samuel L. Jackson will start airing on Spike TV. They have also finished the Saturday morning "Bratz Babies" animated series and later in the year, they will complete mastering on two new "Care Bears" features for theatrical release.

There are many options for producers to choose from when bringing their creations to the screen. But Illuminate promises to offer a new level of competition based on a streamlined workflow that will give producers one door to knock on for their complete production needs. ■

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# Sony's 4K Projector Flying High

## D-cinema demos highlight company's SXRD technology

by Jay Ankeney

VAN NUYS, CALIF.

Was it the medium or the message that brought overflow crowds to a 64,000-square-foot hanger at the Van Nuys airport for the triumphant climax of the national tour of "One Six Right" last month? While half the audience was there to watch Brian J. Terwilliger's HD visual homage to his love of flying, others were Hollywood professionals eager to see this indie documentary shown on Sony's SXRD 4K digital projection technology.

"For those involved with theatrical distribution, this was a significant demonstration that someone on an independent budget can produce a movie that will attract a wide audience even if it does not undertake the cost of traditional mass release print distribution," said Gary Mandle, product manager for digital cinema systems from Sony.

A celebration of flight and the contribution general aviation has made to

the development of the U. S. aviation industry, "One Six Right" was shot and produced using Sony CineAlta digital

professional videotape on a SRW-5000 HDCAM SR VTR that accommodates the 5.1 surround audio soundtrack.



Brian J. Terwilliger showed his "One Six Right" aviation documentary on the Sony 4K projector.

Prior to its presentation in Van Nuys, Terwilliger had exhibited "One Six Right" at 12 Landmark Cinema theaters nationwide, including Atlanta, Dallas, Chicago, San Francisco, Seattle, and at a special screening on Capitol Hill.

When a Los Angeles digital cinema theater could not be made available,

Terwilliger finished the tour in the general aviation hanger right next to runway "One Six Right" where the whole project started.

"We used two of our SRX-R110

projectors to fill the 48-foot screen in the hanger," said Andre Floyd, marketing manager for SXRD systems at Sony Electronics. "Each puts out 10,000 ANSI lumens from twin xenon lamps and we felt this would be required to let everyone see the film with the clarity it deserved."

Sony's SXRD (Silicon X-tal Reflective Display) display devices deliver 4,096 Hx2160 V-pixel resolution in a 1.85:1—more than four times as many pixels as full HDTV's 1920x1080 in 16:9. In addition to the 10,000 lumen SRX-R110 and the 5,000 lumen SRX-R105 models, 2006 Sony introduced its latest 18,000 lumen SRX-R220 projector at ShowEast in Orlando, Fla., last fall.

Its enclosure also features built-in rackspace for Sony's LMT-100 4K Media Block and attached RAID storage unit or room for a compatible server from another manufacturer.

Currently, most of the more than 2,018 digital cinemas worldwide use DLP technology from Texas Instruments at 2K resolution from projectors made by Christie, Barco or NEC. But a dozen of the almost 300 screens in the Landmark Cinema chain have opted to up the visual excitement to 4K through Sony SXRD systems and this has begun to attract the attention of independent filmmakers.

"4K projection reveals all of the detail in every image we shot," Terwilliger said. "Although the documentary was mastered in HD, we felt that the on-screen resolution provided by the SRX-R110 projectors in the Van Nuys hanger would be the best presentation medium for the enthusiastic west coast fans this film has attracted."

Although Sony was a major sponsor of the national tour, and others such as Apple, Syncro Aircraft, and the Los Angeles Airports helped fund the Van Nuys screening, the original HD production was financed entirely by sales of its DVDs over the Internet.

During a recent side-by-side assessment with 2K technology for digital projection conducted by the Entertainment Technology Center's Technical Advisory Board, the SRX-R110 4K projector met or exceeded every specification relevant to the Digital Cinema Initiatives projector requirements for theatrical exhibition, including color gamut, brightness and general performance.

Following the assessments, 20th Century Fox, Warner Bros. Studios, Paramount Pictures and Sony Pictures Entertainment all expressed approval of SXRD 4K projection technology for exhibition of their content in commercial theaters. ■

## Sony Debuts F23 Electronic Cinematography Camera

BURBANK, CALIF.

When Sony unveiled its F23 electronic cinematography camera at the Band Pro Media Forum recently, what was immediately clear is the form-factor is that of a film camera, not its distant ancestor the Betacam. The change is more than cosmetic, said Rob Willox, Sony director of marketing for professional content creation products.

Willox said that standard film camera accessories such as bridge plates, matte boxes and follow focus units can be attached to the camera without modification. It will support 4:4:4 1920x1080 RGB imaging with three 2.2 megabit 2/3-inch progressive CCD imagers and Sony's first 14-bit A/D converter. The system supports 1080/23.98p, 24p, 25p, 29.97p, 50p, 59.94p, 50i and 59.94i.

Sony's film magazine-line SRW-1 digital 4:4:4 recorder can be docked directly to the top or to the rear of the camera. The F23 will follow an upgrade pattern set by Sony with its F900 high-end HD camera, introduced six years ago. Customers have been able to upgrade original F900s with improvements the company has made over the years.

One promised improvement is 4K imaging in the F23, which could lead to a 4K path from acquisition to projection. "We don't have a definite time frame," said Willox.

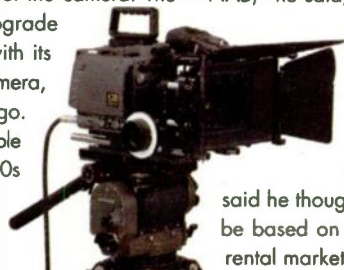
He noted the need for new imagers, new signal processors, and what he termed just

plain more raw horsepower in the camera. "Don't look for it in a backroom at this year's NAB," he said, "perhaps late 08 or 09."

There was no announced price for the F23 at the introduction. Amnon Band, president of Band Pro, a leading reseller of Sony cameras, said he thought the camera price would be based on where the F23 fit into the rental market.

He said he thought the F23 would rent for "under the [Panavision] Genesis, yet above regular CineAlta. We hope we're going to be just about where the [Thomson] Viper rate is."

Craig Johnston



Sony's F23 d-cinema camera

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## Canada

CONTINUED FROM PAGE 1

programming in English and French nearly two years ago in Toronto and Montreal, is funded largely with tax dollars appropriated by Parliament.

American programming has always been a key scheduling component for Canadian broadcasters (including content that often features native Canadians such as Mike Myers, Michael J. Fox, William Shatner, Jill Hennessy, Dan Ackroyd, and the late Peter Jennings and John Candy, to name a few). U.S. imports are also popular with Canadian advertisers seeking to reach the largest Canadian audiences.

Canadian broadcasters were always required to air a certain percentage of Canadian shows, but the CRTC changed its rules several years ago to allow broadcasters to include reality TV and entertainment magazines, for example, in their quotas of Canadian shows (i.e., a Canadian interviewer talking with American movie stars in Los Angeles.)

Meanwhile, one Canadian investor signaled its interest in the burgeoning HDTV market in Canada last month by applying for a license to launch free HDTV broadcasts. HDTV Networks, a Vancouver, B.C.-based investment firm wants to deliver hi-def programming over-the-air to viewers in Canada's eight largest media markets, including Vancouver, Edmonton, Calgary, Winnipeg, Toronto, Montreal, Toronto, Ottawa and Halifax.

The company is a subsidiary of CSR Investments, which also controls Canadian Satellite Radio Inc. and XM Satellite radio brand in Canada.

Commercial Canadian broadcasters routinely air U.S. shows and insert local advertising in them, a practice known as "simultaneous substitution." Local stations say the often-lucrative practice helps subsidize the production of Canadian programs. The practice (dubbed "simsubs") is allowed by the CRTC as a means of protecting the commercial revenues of Canadian



Charles Angus, member of Parliament, is Heritage Critic for Canada's New Democratic Party and an outspoken supporter of HDTV growth.

broadcasters and usually only occurs when both local and distant signals are carrying the same (or similar) programming simultaneously.

#### HIGH INTEREST IN HI-DEF

For its part, Canadian consumer interest in HD is high. At least that's according to Rogers Cable, the country's largest cable operator, which reported in late 2006 that in the past year, its HD subscribers more than doubled to over 200,000 households—from a population about one-tenth of its southern neighbor's.

(In 2006, according to Nielsen Media Research, there were less than 12.8 million TV households in Canada, compared to more than 110 million U.S. television households.)

Meanwhile, while several Canadian channels now air some HD content (TV Technology, April 6, 2005), the new format's overall growth may pose a less tangible, albeit more significant,

Heritage Critic for Canada's New Democratic Party, Angus said his nation needs to get on with HDTV "to stay in the game" competitively.

"I agree [with broadcasters] there is no business plan right now for HDTV, and that we also have to have this discussion in Parliament to ask the question, 'Where do we want Canada's broadcasters to be in the 21st cen-

**"Parliament has a commitment to a public broadcast system—a strong CBC for TV and radio—and without a plan that includes HDTV, the market is going to be seriously compromised."**

**—Charles Angus, Canadian Parliament**

dilemma than the lack of a business model.

According to Dr. Rebecca Sullivan and Dr. Bart Beaty, associate professors of media at the University of Calgary, HD also poses a serious threat to Canadian "cultural sovereignty," and for the most part, America inadvertently is to blame.

According to their new book, "Canadian Television Today" from University of Calgary Press, the Canadian viewer's heavy menu of American programs fed by Canadian cable (and U.S. signals penetrating the U.S.-Canadian border) would skew more American because most HD shows will originate in the United States.

#### COMPETITIVE ADVANTAGES

"Given that the shift to HDTV does not generate revenue or boost profit margins, or excite audiences, the only incentive for [Canadian] broadcasters to make this transition is competition—or more like cooperation or even collusion—with the United States," the authors charge in their book.

Beaty said once American broadcasters go fully HD in the next couple of years, "Then the product becomes different. Unless Canadian networks also go HD, they can no longer substitute the channel and block American commercials."

He said he believes the CRTC has become "obsessed" with HDTV. Sullivan said she does not think the new formats alone will attract viewers.

"To suggest the Canadian viewer will be drawn away from TV simply because it is not in HD is ludicrous. HDTV is the technological 'McGuffin' in this whole thing. It's not necessarily relevant to the bigger issue," she said.

Charles Angus said he believes it is relevant. A member of Parliament and

tury?" said Angus, who is a musician, writer and occasional contributor to CBC arts programs.

"The biggest problem for sovereignty would be if we don't produce quality shows in HD here in Canada," Angus said. "So much of [the] TV market here is along the Canadian border with the U.S. If the American market is switching over, we have to seriously think about it, too. Parliament has a commitment to a public broadcast system—a strong CBC for TV and radio—and without a plan that includes HDTV, the market is going to be seriously compromised. And the last thing we politicians should do is try to hold back technological change."

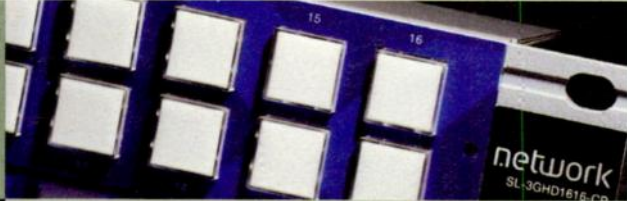
Some commercial broadcasters have suggested imposing fees on cable and DBS firms for use of broadcast signals to help pay for the transition—an approach that Rogers Cable told the CRTC in December is "a disastrous idea."

Cable mogul Ted Rogers testified that a lone exception for imposing a fee might be for the CBC. But he warned any fee imposed on cable simply would be charged directly to his subscribers via another line item in their monthly bills, according to The Globe and Mail newspaper.

As the debate continues, at least one Canadian group may have found a way to make money from HD. According to the CBC Web site blogger, the CRTC has already approved a license for "BabyHD."

The programming, which sounds a lot like the Teletubbies on the BBC and PBS, would offer ad-free HD shows "targeted to viewers younger than three."

As the CBC's blogger notes, "Welcome to the Earth, Suzie. Here's your credit card." ■



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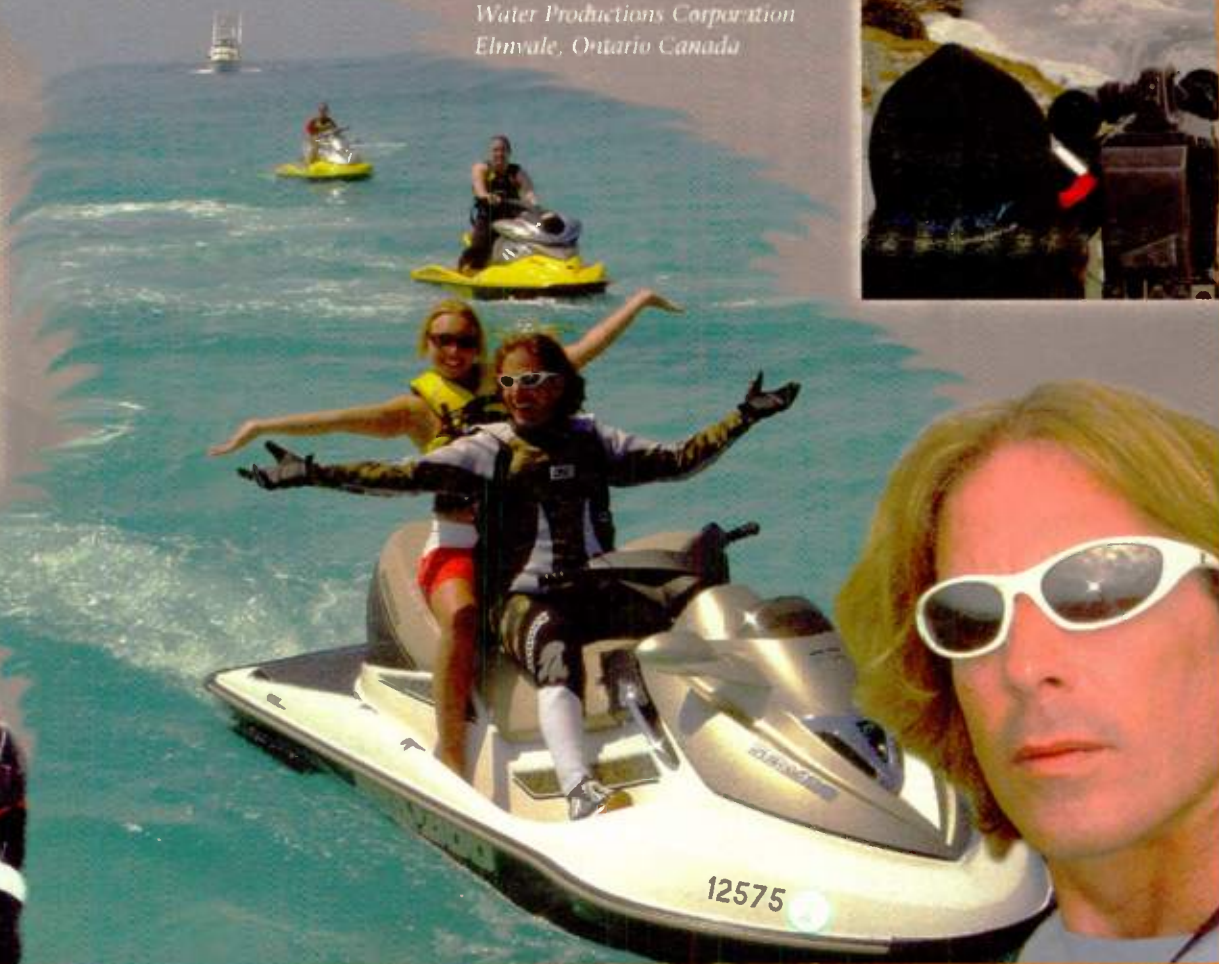
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## Tower

CONTINUED FROM PAGE 1

County, Colorado," the bill text contains only 113 words: "Notwithstanding any applicable state or local land use or condemnation laws or regulations, and subject to all applicable federal laws and regulations, any person that holds an approved Federal Communications Commission permit to construct or install either a digital television broadcast station antenna or tower, or both, located on Lookout Mountain in Jefferson County in the State of Colorado, may, at such location, construct, install, use, modify, replace, repair, or consolidate such antenna or tower, or both, and all accompanying facilities and services associated with such digital television broadcasts, if such antenna or tower is of the same height or lower than the tallest existing analog broadcast antenna or tower at such location."

Passage of S.4092 immediately sparked a public statement from Canyon Area Residents for the Environment, vocal local opponents to the tower.

"Colorado Sens. Allard and Salazar, under the cover of darkness intro-



The primary antenna farm on Lookout Mountain, with homes in the foreground.

duced and passed in both houses of the U.S. Congress a bill to pre-empt local land-use decisions and force the Lake Cedar Group tower on Lookout Mountain.

"The bill allows any of the broadcasters on Lookout to put up anything the FCC approves, regardless of Jefferson County land-use laws. It will not matter if the radiation harms our health, interferes with our equipment or causes our real estate values to crash.

"This bill destroys everything we

have worked for during the last decade and subordinates all our property rights to the broadcasters. It is a huge violation of the 10th Amendment.... We have been sacrificed by those we thought represented us."

The statement said the bill ignores the findings of a

five-year Colorado State University study of 500 Lookout Mountain residents, which stated that "increasing amounts of RF (at levels 100 times less than the FCC says is safe) cause increasing biological changes in our body, plus the sworn testimony of numerous scientists, physicians, and engineers."

plish in the legislation."

That attorney, Dave Stark of Faegre & Benson, with offices in Minneapolis and Denver, is handling Lake Cedar Group's appeals of Jefferson County's repeated denials of the zoning change that would permit tower construction.

The case most recently was remanded back to the county commission in May by Jefferson County District Judge R. Brooke Jackson, who ordered the commissioners to make a final zoning determination, which didn't happen before Congress got involved.

"We've been waiting since May for the commissioners to take action," Stark said. "This federal legislation now pre-empts all state and local land use regulations and condemnation proceedings."

His last point is critical because the City of Golden, at the foot of Lookout Mountain, in June filed for condemnation of the Lake Cedar Group property in a move to block tower construction.

**"We are finally going to move forward with all due speed to build a tower."**

**—Marv Rockford, Lake Cedar Group**

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"Sen. Wayne Allard demonstrated extraordinary leadership in a bipartisan effort to break the deadlock over construction of the consolidated tower on Lookout Mountain," said Marv Rockford, spokesperson for the Lake Cedar Group, a consortium of four Denver stations that wants to tear down their existing analog towers and erect one consolidated tower. The four stations include KCNC-TV (CBS), KMGH-TV (ABC), KUSA-TV (NBC), and KTVD-TV (formerly UPN, now MyNetworkTV).

### LEGISLATIVE ORIGINS

Asked about the source of the legislation, Rockford said, "We have been in touch with the entire Colorado Congressional delegation for years, keeping them informed about the progress or lack of progress in getting county approval to build the consolidated tower. They're interested in what's going on here because Denver has stood in the way of a full rollout across the country of the transition to digital TV."

Rockford said the legislation was written by the staffs of both Sens. Allard and Salazar. "We worked with them to make sure the language fit the situation here. Our legal counsel provided guidance on the language that would do what they wanted to accom-

Despite commission opposition to the consolidated tower, Jefferson County filed a suit to block condemnation of any county land outside Golden city boundaries. Lake Cedar Groups also asked for the condemnation suit to be dismissed. The new federal legislation would void the case.

### OPPOSITION REACTION

CARE President Dick Bartlett said Congress does not have the right to usurp county control over local land use in favor of a few private property owners. He argued that S.4092 violates the 10th Amendment, which limits federal control of state governments.

"It is a fundamental principle of the Constitution that Congress has the power to pre-empt state and local laws," Stark said. "Congress has expressed a clear intent to pre-empt local laws with this bill."

"The language of the bill is pretty straightforward," Rockford said. "This is obviously a federal mandate for the construction of a federally licensed broadcast facility. The federal government has already established a precedent of pre-empting local zoning jurisdiction over microwave cell phone towers, and this is no different."



The Lookout Mountain bill came as a total surprise to local officials, said Assistant Jefferson County Attorney Eric Butler. "We're still reviewing the bill and trying to determine its implications for our land-use policies, and there's some uncertainty as to exactly which telecommunication providers on the mountain this legislation will apply to," he said.

For example, Denver PBS station KRMA-TV originally was part of the Lake Cedar Group, but KRMA opted for an innovative ground-level DTV transmission array on nearby Mount Morrison to the south. County commissioners denied the requisite zoning change, and that denial is being appealed. Butler said he's unsure how S.4092 would apply to KRMA's presence on Lookout Mountain.

Tribune-owned KWGN-TV also has an analog tower on the mountain that may be effected by S.4092, he said, though he's uncertain about how the bill may affect the fate of the radio and microwave towers there.

"It's premature to say if we have grounds for a legal challenge," Butler said, "but it's obvious the intention is to get the Lake Cedar Group tower built no matter what the county says. Part of our decision on what to do may be based on what we learn about the way the bill was passed."

#### 'STEALTH' TACTICS

Butler said the Library of Congress Web site THOMAS revealed that S.4092 was introduced by Allard Dec. 6, was read three times, and listed as item No. 94 amid 30 bills passed by unanimous consent before the Senate adjourned at 9:30 p.m.

"The whole thing was very stealthily done in the closing hours of the legislative session when no one is really paying close attention," said Deb Carney, legal director for CARE. "The bill clearly was hotlined through the Senate and House without any debate or scrutiny."

She said that CARE didn't know about the bill until Friday when a reporter from radio KGNU called to ask for a response.

"We contacted our Congressman, Rep. Tom Tancredo (R-Colo.). His chief of staff, Mac Zimmerman, said Tancredo had not heard anything about the bill until our call, and that he would have objected had he heard about it. He said the bill was not on their radar. A call to Zimmerman asking for confirmation was not returned before press time.

A clerk for the Senate Republican Conference, which e-mails all hotline notifications, said she could not find any record of a notice about S.4092 on or before Dec. 6. A staff member in the office of Sen. Patrick Leahy (D-Vt.), a vocal opponent of hotlining, also could not find any record of receiving advance notice about S.4092.

Carney charged Allard violated Senate rules for unanimous consent. Senators must be notified in advance about bills that will be hotlined. If there is one objection, a bill cannot be passed without debate.

"I think Lake Cedar Group has been laying the groundwork to do this for a long time," Carney said.

With Jefferson county still opposing the tower, with Golden trying to con-

demn the land, with scientific evidence of the radiation health risks, with engineering evidence that metro Denver could receive as good or better signals from higher antennas located on Eldorado Mountain to the north, "they chose to act late at night in the last days and minutes of a lame duck Congress," Carney said. "That's just not right."

Marv Rockford said he did not know what time of day the Senate

voted on S.4092. "What I do know is that Congress has authorized the construction of the consolidated tower. I cannot speculate on whether there is going to be a legal protest. What I can say is that we are finally going to move forward with all due speed to build a tower on the only suitable site to ensure that the entire community has access to free over-the-air digital television." ■

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## DIGITAL JOURNAL

Bill Hayes

# Keeping Analog Alive

## IPTV juggles responsibilities of dual-transmission network

JOHNSTON, IOWA

The Iowa Public Television network consists of nine full-powered transmitters and eight translators that effectively cover the entire state. Two of the full-powered analog stations are high-band VHF and the remaining seven analogs are in-core UHF stations.

All nine full-powered stations have in-core UHF DTV assignments. The analog VHF stations both have solid-state transmitters while six of the UHF analogs have very old integral cavity klystron transmitters. One of the analog UHFs was acquired from a community college a few years ago and has a low-power solid-state analog transmitter.

Based on our experience with our solid-state VHF transmitters, the age of our analog transmitters and the power levels of our DTV assignments, we purchased seven solid-state DTV transmitters for our UHF analog facilities and two IOT-based transmitters for our VHF facilities. At the end of analog broadcasting, we would migrate DTV service to our high-band VHF transmitters in two markets and keep the new DTV assignments in our U-U markets with the new solid-state transmitters. When analog service ends, the IPTV network would consist of two solid-state VHF DTV transmitters and seven solid-state UHF transmitters. Given the redundant nature in solid-state design, we would see the same higher reliability of service at our UHFs that we have experienced at our VHF's and we would no longer deal with replacing tubes.

Now that we have several years of DTV operation at six of our sites, our analysis so far has revealed some interesting and unexpected data. As our first solid-state UHF DTV transmitters went on line, we experienced some of the typical problems associ-

neers that the devices become more efficient the closer to the red line that they are operated. While this may be true, it appears to fly in the face of the more conservative design approach that in transmitters leads to longevity.

Our cumulative data for the last

agreements, we still expect 20 to 25 years of life expectancy for our transmitters, and this doesn't bode well.

On the other hand, our DTV IOT experience has been somewhat better. We have seen some minor problems associated with a new installation but



The transmitter facility at KDIN, the IPTV station in Des Moines.

**While the DTV conversion was being planned and projects were underway, we were also looking at the condition of our analog service.**

ated with most new transmitter installations.

What has been more surprising is that some of the problems have continued for long enough that they don't appear to be what would typically be described as "infantile" failures. In a number of the solid-state UHFs, we have seen problems related to capacitors that appear to point to insufficient temperature ratings for the devices selected. The designs also seem to run the active devices very close to their maximum rated operating point.

I am not a design engineer, but I have been told by the design engi-

neers that the devices become more efficient the closer to the red line that they are operated. While this may be true, it appears to fly in the face of the more conservative design approach that in transmitters leads to longevity.

Now obviously, the solid-state transmitters spend less time at 0 percent power than the older klystrons, but it still is disturbing how frequently these solid-state transmitters are running with at least one RF pallet out of service.

Even though we have entered into the digital age throughout the industry, complete with its three-year replacement cycles and maintenance

for the most part they are understandable and correctable.

### REPLACEMENT PLAN

While the DTV conversion was being planned and projects were underway, we were also looking at the condition of our analog service. As I mentioned earlier, six of our klystrons are more than 25 years old and even though they continue to operate, their serviceable life has been exceeded and then some. Before Congress mandated the Feb. 18, 2009 analog shutoff date, we were still laboring under the unrealistic 2006 shutoff date and its nebulous 85 percent market penetration,

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while those of us in the industry knew that the actual conversion date was closer to the 2012-15 timeframe.

Over three years ago, IPTV presented a plan to the State of Iowa to replace the existing UHF analog complement of transmitters with new IOT-based UHF transmitters that would allow us to reliably serve Iowans until analog broadcasting ended and those transmitters could be moved to DTV service on the new channels. The side benefit is that it would—for the first time—also provide a backup transmitter at those sites.

IOTs were initially selected because the peak power requirements made solid-state options too unrealistic, and based on some of the experiences I noted earlier, we were beginning to doubt some of the benefits of solid state in this particular application. In addition, since these transmitters would be going into the space occupied by the old integral cavity klystrons. The amount of redesign and expense that would go into adapting the buildings from the glycol-based cooling to high-volume air cooling required by solid states would be excessive. Trust me—that this is not an inconsequential consideration in planning a facility, and we struggled mightily with vendors trying to get this right.

#### THE MODIFICATION PLAN

Much to my surprise, the analog replacement plan that we presented was accepted allowing us to replace all six of the integral cavity klystron transmitters. As I write this, we are getting ready to release the RFP for the replacement transmitters.

The specifications call for the six transmitters to be delivered and set up for analog operation, but they are to include all of the components necessary to convert the transmitter for DTV operation in the field.

That has always been part of the plan for these replacement transmitters, although at the time, we expected them to spend considerably more of their initial operating life in analog service; who knows what will happen as the 2009 deadline approaches?

The only real change is that we have determined that at the end of analog broadcasting, the IOTs will become the primary transmitter at each site and the solid states will fulfill the back up role.

In addition to the concerns that I expressed earlier, there is also the fact that in a backup role, unless it is a hot standby, an IOT transmitter would be shut down for long periods of time and the time to cycle the transmitter on would be excessive.

So, we'll be taking down fairly ancient single-ended klystron transmitters and replacing them with new IOT-based transmitters. Obviously,

there will be some time involved in pulling out the old system, preparing the room for the new transmitter and then installing and proofing the new transmitter, what happens to the service area.

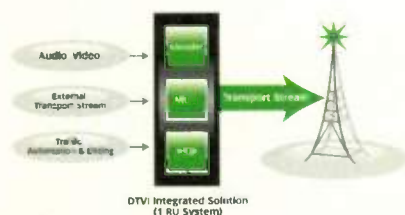
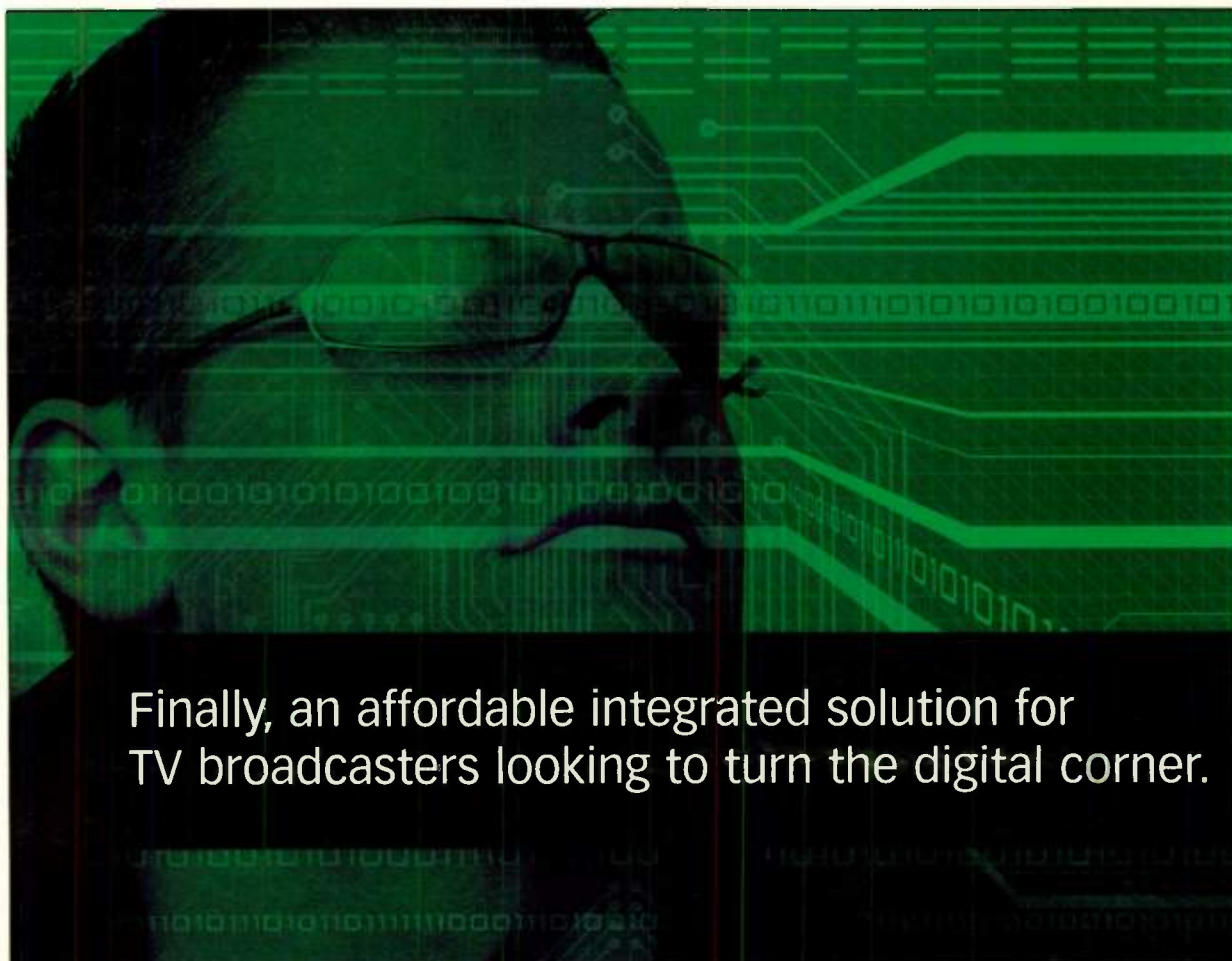
This is where we get into what I am sure some of my RF engineers consider being one of my more creative ideas. IPTV currently has a contract for replacing all eight of our existing

translators which have all been displaced. We have CPs to change channels and increase the power at those sites. I have accelerated the purchase of one of the 5 kW units and we have purchased a truck.

We will install the translator in the truck and drive it to the site to function as the auxiliary transmitter that will fill in for the main while it is replaced. Since we will be doing this

at six sites scattered throughout the state, making this a mobile system seems to me to be the best alternative. Time will tell whether or not this is an act of genius or lunacy. I plan on writing more about the mobile idea in a future Digital Journal. ■

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



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## RF TECHNOLOGY

Doug Lung

## Signal Testing With USB DTV Tuners

Last year, I provided a quick overview of ATSC USB tuners. This month, I'll provide a detailed comparison of three—DVICO's FusionHDTV5 USB Gold, the AutumnWave OnAirGT tuner and the Pinnacle HD Stick Pro. All tuners include software that allows scheduling and recording programs.

## OVERVIEW

Readers who bought DVICO's FusionHDTV5 USB Gold after reading my September RF Technology column may have been disappointed to find the tuner often crashed the computer, especially when receiving weaker signals. While I sometimes experienced the Windows "blue screen of death," the DVICO tuner was far more stable and sensitive than the V-Box USB receiver I previously used.

Upgrading the FusionHDTV5 USB Gold to the latest driver and software, Version 3.50.01, eliminated the crashes. During testing for this article, I didn't experience any blue screens or crashes while switching between the three tuners. The FusionHDTV5 USB Gold comes with a 22-3/4-inch whip and F-connector antenna that worked very well. When traveling, this is the antenna I use with all the tuners.

DVICO is the only tuner manufacturer to supply a program for checking signal strength that's easy to see from across a room. DVICO Signal Checker displays a large bar indicating signal strength and has a large readout of the signal's SNR (signal-to-noise ratio). (See Fig. 1.)

This makes it easy to optimize antenna pointing and check station performance. The tuner software is easy to use and provides readout of

stations sorted by major channel number. A window can be opened with EPG (electronic program guide) data taken from stations' PSIP data. EPG data is stored as you move from channel to channel, so you can see program listings for channels you are not currently viewing.

The Pinnacle PCTV HD Pro Stick was the first USB tuner I saw in mass market retail stores like Best Buy. As

Version 4.54.1151, installed just before I started this article, greatly improved program stability. No issues were noticed with the small thumb drive-sized tuner drawing too much power from the USB port. The PCTV HD Pro Stick comes with a 23-inch whip antenna mounted on a magnetic base with a thin coax cable to connect it to the tuner. While handy for fixed use, this doesn't work well in airports and carrying a powerful magnet around could cause problems if you put credit cards in the same case!

The PCTV HD Pro Stick doesn't have a signal checker program, but pressing Alt-I puts two color graphs in the upper

multicast channels. KLCS in Los Angeles has four multicast signals, but only one has a program guide.

AutumnWave was kind enough to send me their OnAirGT and OnAir Creator tuners for testing. They sell these tuners on their Web site and also on Walmart.com. For this review, I tested the OnAirGT. It is slightly larger than the other tuners, but still small and light enough to attach to the back of my laptop screen with hook and loop fasteners.

It includes an 11-1/2-inch whip antenna with an F connector that attaches directly to the tuner via a short F-to-phono plug adapter. I installed the latest software off the AutumnWave Web site. This installation requires installing drivers and the AutumnWave program separately. Unlike the HD Pro Stick, no serial number or registration was required.

DTV signal information, both in a cell phone-like signal bar scale and a dB scale showing SNR, is displayed whenever ATSC signals are being received. (See Fig. 2.)

Unfortunately, the readout is even smaller than the HD Pro



Fig. 2: Autumn Wave OnAirGT

right corner of the video display; one for strength and one for quality. Both have a scale of zero to 100.

This display can be used for antenna pointing, but the size of the numbers and low contrast make it hard to see from a distance. Pinnacle's Media

Center software is used for viewing and recording TV. As far as EPG is concerned, forget it unless you subscribe to Pinnacle's guide service. PSIP EPG data is not displayed. A one-year subscription is included with the device, but it is useless for many

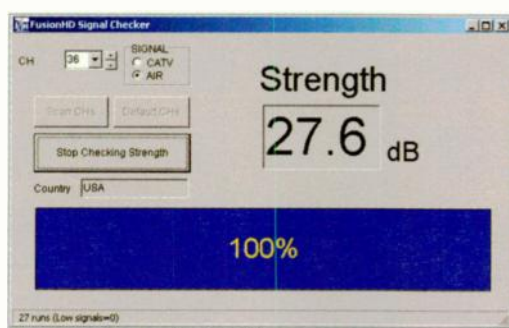
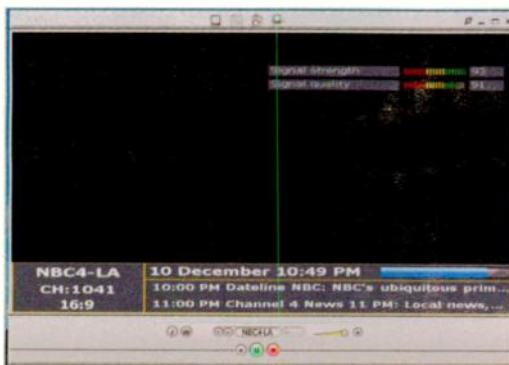


Fig. 1: DVICO Signal Checker



Pinnacle operating screen

with the DVICO tuner, the first software release had problems with excessive CPU use and it wasn't really possible to view HDTV signals on my 1.83 GHz Pentium M Thinkpad.

Later software releases, including

Stick graphs. This isn't an issue if you are aiming an antenna within arm's reach of the computer screen, but it can be frustrating if the antenna is further away.

Station PSIP EPG data for all channels, including multicasts, is available on the channel display, but only EPG data for the program channel currently viewed is displayed. You can add channels that aren't detected in the scan manually, which is useful if you know a station is available but need to tweak the antenna to receive it.

When adding channels manually, a window is displayed showing lock sta-

TUNERS, PAGE 33

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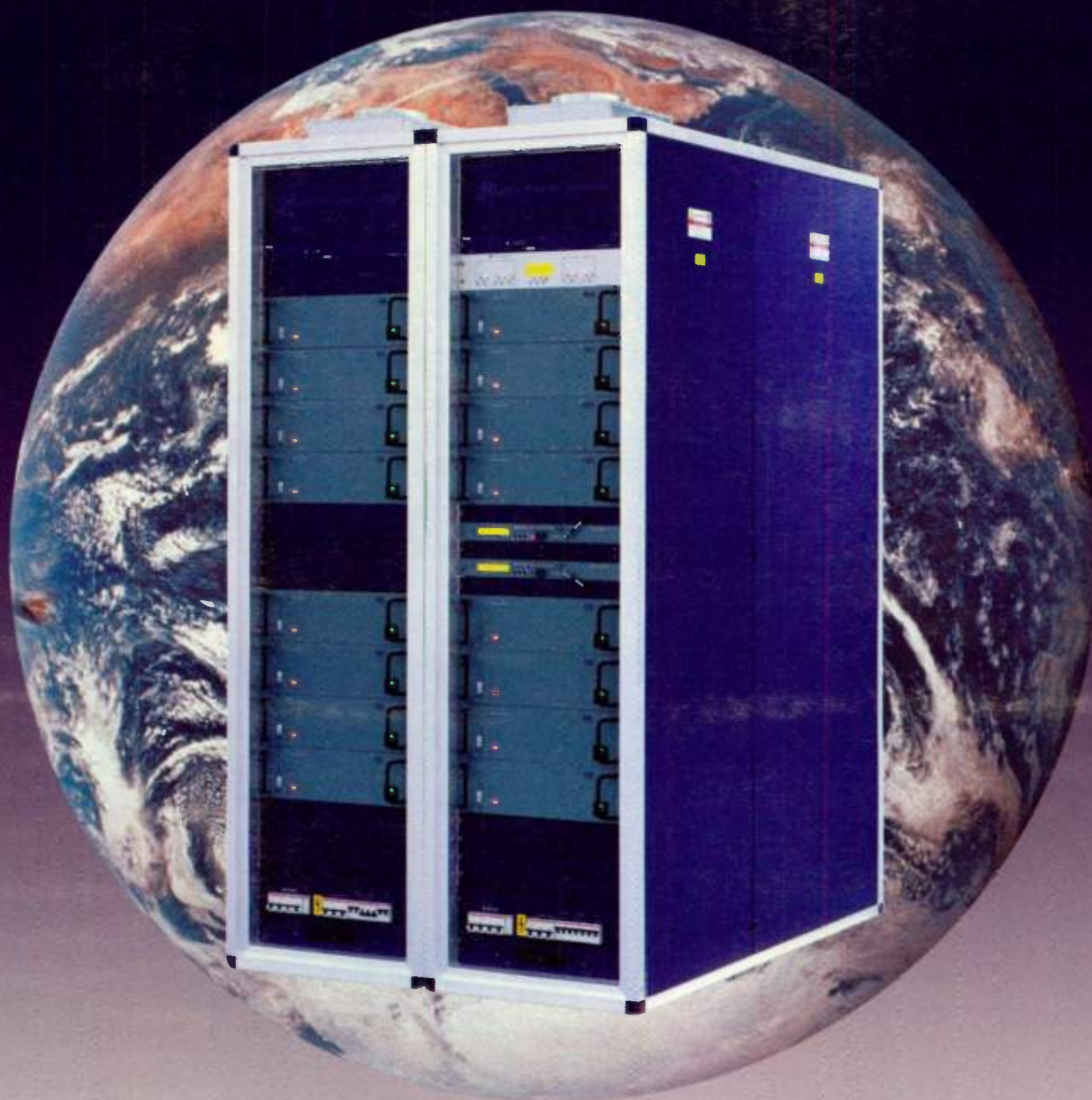
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## ATSC OUTLOOK

**Jerry Whitaker**

# ACAP Interactive TV Summit Coming Up

The ATSC is organizing a half-day seminar on the Advanced Common Application Platform for interactive television.

Set for Jan. 30, the ACAP Interactive TV will be held in conjunction with the 12th Annual Hollywood Post Alliance Technology Retreat in Palm Springs, Calif.

The ACAP specification, developed as the result of a harmonization effort between the ATSC DASE (DTV Application Software Environment) and the CableLabs OCAP (Open Cable Application Platform) specifications, is the culmination of extensive efforts by a dedicated team of specialists from dozens of organizations representing diverse industry segments.

ACAP provides consumers with advanced interactive services while providing content providers, broadcasters, cable and satellite operators, and consumer electronics manufacturers with the technical details necessary to develop interoperable

services and products.

The ACAP Interactive TV Summit will outline the basic elements of ACAP and update attendees on a landmark

field trial of the ACAP standard currently being developed by the ATSC Planning Committee. Led by Dan Berkowitz of NBC Universal, the project is designed

to illustrate how ACAP can be used to enhance the viewing experience. The seminar will feature presentations by many of the organizations participating in the ACAP field trial, including major content producers. The program schedule is given below.

In addition to the seminar, a demonstration is planned for the HPA retreat showing practical ACAP applications. The demonstration will include interactive television applications developed for some well-known U.S. network programs, shown running on both ACAP (over-the-air DTV) and OCAP (cable) platforms.

### ABOUT THE FIELD TRIALS

The overall goals of the ACAP field trial being organized by the ATSC Planning Committee are:

- To raise awareness for broadcasters of content and business opportunities afforded by interactive television.
- Raise awareness for local stations of content and business opportunities.
- Demonstrate the interoperability of ACAP and OCAP.
- The Planning Committee ACAP field trial project is divided into two primary elements.

Phase 1, intended to prove interoperability of ACAP and OCAP for interactive television in the United States; and Phase 2, consisting of field trials of ACAP applications broadcast over the

Tuesday, 30 January 2007		
11:30 a.m. – 5 p.m.	Registration Open	
1 p.m. – 1:15 p.m.	Welcome and Overview of ATSC Activities An Introduction to ACAP	Jerry Whitaker, ATSC David Cutts, Strategy and Technology
1:45 p.m.	ACAP and Data Broadcasting	Mike Dolan, TBT
	This presentation will cover the integration of ACAP with ATSC video, audio, and data services, including an overview of the newly published ATSC standard A/102.	
2:15 p.m.	Deploying ACAP Services	Jeff Bonin, Alticast
	Based on the Korean experience, this session will give insight into the planning and deployment of ACAP services in IPTV and how it can be applied in the U.S.	
2:45 p.m.	ACAP Field Trial Project	Dan Berkowitz, NBC Universal
	An update on ACAP ITV applications broadcast to ACAP and OCAP set-top boxes.	
3:15 p.m.	Coffee Break	
3:30 p.m.	ACAP/OCAP Interoperability	Darren Forster, Softel-USA
	ACAP and OCAP both draw heavily from the Global Executable MHP specification. This presentation will cover Softel-USA's experience in recent related projects.	
4 p.m.	Creating Content	Ed Skolarus, Fox
	This session covers work underway in Fox's ACAP field trials.	
4:30 p.m.	PBS Content	Lewis Zager, PBS
	This presentation will discuss models for interactive TV from the PBS perspective.	
5 p.m.	Enhancing The User Experience	Graham Jones, NAB
	An outline of what interactivity means to broadcasters and consumers.	
5:30 p.m.	End of Session	

Table 1

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air to ACAP and OCAP receivers. Some of the key organizations participating in the project are listed in Table 2.

Sharp, Philips and Intel are also participating in the project.

# ABOUT INTERACTIVE TV

The ACAP seminar comes at an important time in the move toward interactive television. With the ACAP field trial gaining momentum, content producers looking for ways to improve the viewing experience for a

and Internet access. Rather than concentrating just on Web services, the goal is to deliver a better television experience

# REGISTRATION

The ACAP Interactive TV Summit will be held at the Westin Mission Hills Resort and Spa, 71333 Dinah Shore Dr., Rancho Mirage, CA 92270. Additional information can be

found on the HPA Web site; [www.hpaonline.com/](http://www.hpaonline.com/).

The Hollywood Post Alliance is the trade association representing the Southern California-based professional community of businesses and individuals who provide expertise, support, tools and the infrastructure for the creation and finishing of motion pictures, television, commercials, digital media, and other dynamic media content.

Additional information on the ACAP standard can be found on the ACAP Web site: [www.acap.tv](http://www.acap.tv).

If you or your organization would like to participate in the ACAP field trial project, contact the author at [jwhitaker@atasc.org](mailto:jwhitaker@atasc.org).

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

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Ensequence	NBC
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Softel	
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Sun	
SysMedia	
Triveni Digital	
TTA	
Unisoft	
Vidiom	
Zenith	

Table 2. ACAP and OCAP field trial participants

variety of programs—from games shows to scripted dramas to news.

Thanks to the ongoing transition of television from analog to digital, it is now possible to efficiently combine video, audio and data within the same signal. This combination leads to powerful new applications.

For example, computers can be turned into traditional TV receivers and digital set-top boxes can host applications such as interactive TV, e-commerce and customized programming.

The term interactive television is broad and not entirely well defined. However, it certainly includes the following general categories—customized news, weather and traffic; stock market data; sports scores and statistics; games; online real-time purchases; and video-on-demand.

The backdrop for iTV growth comes from both the market strength of the Internet and the technical foundation that supports it.

With the rapid adoption of digital video technology in the cable, satellite, and terrestrial broadcast industries, the stage is set for the creation of an iTV segment that introduces to a mass consumer market a whole new range of possibilities.

Technologies are readily available that support interactive features for game shows, sports and other programs, interactive advertising, e-mail,

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# LET THERE BE LIGHTING Just How Long Is a Foot-candle?

**Andy Ciddor**

**L**et me begin by stating the blindingly obvious fact that light is our stock-in-trade; something we manipulate every working day as we craft our pictures. Yet despite this, many of us don't know all that much about how to measure, specify and describe it.

Your light meter may be calibrated in foot-candles, or worse, in lux. Luminaire specifications quote candela, footcandles, lux, and lumens, while lamp specifications talk about initial lumens or lumens per watt. Let's examine what these units measure.

To begin with, there's light itself: a stream of photons of various energies. Each photon is a burst of electromagnetic radiation, produced when an electron drops to a lower energy orbit around its atom. The larger the drop, the more energetic the photon, and the shorter its wavelength.

Visible light is the narrow range of photon energies that our eyes can detect. Light sources are systems that pump energy into atoms at levels that will produce visible light as the electrons give up their boosted energy.

This is equally the case whether we heat up the photosphere of a star with a fusion reaction, pass a current through the junction of an LED, create a plasma in a cocktail of metal vapors, heat a piece of tungsten wire,

react a couple of organic chemicals together or burn some candle wax vapor on a wick.

## LET THERE BE CANDELAS

The candela (cd) is the fundamental unit of all photometry and corresponds to the amount of light—quantity of photons—produced by a standard light source. Originally, the standard source was a real candle. Today, it's a theoretical construct, like most measurement standards. At least the candela has almost exactly the same value as an original standard candle. Every other measurement related to light is derived from the candela.

The lumen (lm) is the unit of luminous flux, luminous flux being the amount of light radiating out from a light source through a specific solid angle or cone of space. In the case of the lumen, the amount of light is one candela, and the solid angle is one steradian (which happens to be a cone with an angle of approximately 65.5 degrees). You may sleep more soundly

tonight knowing that exactly  $4\pi$  steradians fit into a sphere.

Lumens are the units used to measure the output of lamps and luminaires and thus can be used to evaluate the brightness of both fixtures and light sources. The efficiency of light sources is assessed by comparing the energy input in watts with the luminous output in lumens (lm/W).



**You may sleep more soundly  
tonight knowing that exactly  $4\pi$   
steradians fit into a sphere.**

These numbers will haunt you soon, as laws governing energy-efficient light sources move beyond the street, home and factory and into studio and location shooting.

The more familiar lux (lx) is a unit of illuminance. It measures the amount of light reaching a surface. An intensity of one lux is produced by one lumen striking an area of one square meter. Of course, there is a much more familiar unit of illumi-

nance: the foot-candle (fc).

Although the metric system was first recognized by the United States in 1866, and by the U.S. federal government in 1975, the United States is one of only three countries on the planet that have not implemented it. (Liberia and Myanmar—formerly Burma—are the other two.)

The foot-candle is a truly wonderful hybrid unit, using a metric measurement for luminous flux, in combination with the venerable imperial square-foot for the unit of area. As there are 10.76 square feet to the square meter, one foot-candle is the equivalent brightness to 10.76 lux.

I have always found that a conversion factor of 10 is perfectly adequate when it comes down to actually using

the numbers for lighting. My guess is that there is way more than 10 percent variation between television light meters anyway.

While film cinematographers are constantly having their exposure meters recalibrated, then shooting test footage to verify the results, I've almost never seen television lighting directors send their meters off for a sanity check.

## DO THE MATH

A simple direct application of these measurements is to calculate the expected intensity of a fixture in an unknown situation, or one for which there aren't figures on the spec sheet.

A few moments with a calculator and the spec sheet will give you the beamspread of the fixture at a specific distance. A few more keystrokes will let you derive the intensity at that distance by just working out how many square feet of beamspread will be receiving the total beam lumens from the fixture.

It ain't rocket science, in fact it's barely even eighth grade trigonometry.

If you would like to learn a little more about any of the units or concepts mentioned in this article, almost every introductory college physics book will cover the topic, but more conveniently, there's good coverage in the 21st century's replacement for the home encyclopedia: [www.wikipedia.org](http://www.wikipedia.org).

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/c@TVTechnology.com](mailto:c/c@TVTechnology.com).

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## Tuners

CONTINUED FROM PAGE 28

tus and PSIP acquisition status. This updates continuously, allowing you to move the antenna until the OnAirGT locks and acquires the PSIP data. Overall, the program was easy to use.

### PERFORMANCE

When comparing tuners, the ability to receive signals under difficult conditions is important. All of the tests here were done with indoor antennas in a second-story room near the southeast corner of the intersection of the 10 and 405 freeways in Los Angeles.

The Santa Monica Freeway obstructed the path to the Mount Wilson and Mount Harvard sites. TSReader Pro was used instead of the manufacturers' software to scan and decode channels. Only UHF channels were scanned, as there are no VHF DTV stations in the L.A. market.

The first test used a Terk HDTV amplified log periodic antenna. I found little difference between the tuners, although both the Pinnacle and AutumnWave tuners detected a DTV signal from KVCR Channel 26 in San Bernardino.

During one test, the AutumnWave even locked onto a San Diego DTV sta-

tion on Channel 19! However, neither channel could be decoded with either tuner. As far as picture stability on weak signals, the AutumnWave was best, followed close by the Pinnacle and, slightly worse, the DViCO tuner. Overall, however, the differences weren't that great, especially between the Pinnacle and DViCO tuners.

I realized that to really test these tuners, I needed a bad antenna! I did several tests using the short 11-1/2-inch whip antenna supplied with the AutumnWave receiver. The tuners were mounted one at a time on the back of my laptop screen, using hook-and-loop fasteners. Tests were repeated using the mag mount antenna supplied with the Pinnacle HD Pro Stick.

A 60-year-old National No. 697 power supply (used with my HRO receivers) provided a good base for the antenna. I checked reception both with the antenna fully extended and with it fully collapsed. To make reception harder, in all tests the antennas were oriented vertically. No adjustments were made to improve reception.

The Pinnacle and AutumnWave receivers detected 22 stations on all but the 11-1/2-inch whip and in one test the AutumnWave detected KVCR, for a total of 23 stations. When it came to decoding PSIP tables with TSReader, the three tuners were much closer.

While the DViCO detected fewer

stations, it was close to the others in the number of stations where PSIP tables could be decoded. In terms of decoding PSIP tables and decoding MPEG-2 video, the DViCO and Pinnacle were very close, although overall, the Pinnacle had a slight advantage. The AutumnWave was the best performer, often decoding MPEG-2 video from one or two more stations than the other tuners. Depending on the antenna, it was possible to decode video from eight to 14 stations.

### RECOMMENDATIONS

While the AutumnWave OnAirGT consistently had the best performance, the difference is small enough that the other tuners may be worth considering, depending on your needs.

If you are doing field tests with a laptop and outside antenna, you will appreciate DViCO's signal checker, which makes it easy to peak the antenna and obtain SNR readings. With the latest version of DViCO's ATSC software, you shouldn't have to worry about it crashing your computer. If you want to record or view ATSC signals using Linux software, the FusionHDTV5 USB Gold is the only tuner tested with Linux support.

If you want a very small tuner you can throw in your laptop bag and use wherever you happen to be, it's hard to beat the Pinnacle HD Pro Stick—just

watch where you put that magnetic antenna base. Unfortunately, if you want to do field measurements with it, you will need TSReader to display the SNR and EPG data.

Considering the bugs in early software releases, manufacturer support is critical. AutumnWave is active on AVS Forum and regularly updates their software.

AutumnWave, under the name SASEM, was the first to offer a USB ATSC tuner. DViCO was slow to fix the problems with FusionHDTV5 USB Gold, but the last software release has proven to be very reliable.

Pinnacle has also been offering frequent updates, and perhaps someday we'll see a "PMC Lite" that offers fewer transcoding and Internet radio features but displays EPG data. Adding DTV closed captioning would be nice—none of the manufacturers include it in their software.

Broadcasters looking for a simple way to monitor their ATSC signals should look at AutumnWave's SignalSleuth package, which combines their OnAirGT or OnAir Creator ATSC tuner with Rod Hewitt's excellent TSReader Pro, which I'll take a closer look at next month.

As always, comments and questions are welcome. E-mail me at [dlung@transmitter.com](mailto:dlung@transmitter.com).

# TV News Knows

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## VIDEO NETWORKING

Wes Simpson

# What's Wrong With Network DVRs?

**M**any people are familiar with digital video recorders in either a set-top box from their cable or satellite TV provider, or as a stand-alone TiVo-style box. This technology is very popular. In-Stat reported that 19 million PVR units shipped in 2005, a 60 percent increase over 2004. Some new technology has become available recently, but it has run into severe opposition from content owners.

Called "network DVR" or nDVR, this system replaces the hard drive in every viewer's home with a central file storage system that viewers can use to

record and play back broadcast TV programs.

Tim Dodge of Concurrent, a major supplier of VOD technology, said "From a technology standpoint, the [nDVR] approach has been demonstrated and validated in real world conditions. In fact, Concurrent was the first to demonstrate nDVR technology in a field setting, and we did it over three years ago."

Unfortunately, nDVR has run into a roadblock. It seems that some content owners have decided that this technology should be treated like video-on-demand, not a set-top box system. This difference is significant to service

providers, because the licenses for VOD content are negotiated separately from those for linear TV programming.

This controversy has gotten to the point where lawsuits have been filed, most notably in the case of Cablevision Systems. In May 2006, seven content distributors and program providers sued Cablevision to stop the deployment of a service called "RS-DVR" for remote storage DVR. The seven included CBS, Disney, Fox, NBC Universal and others. The suit charged copyright infringement, among other things, and it's shaping up for a battle that could take years.

Here's what I don't understand. Why are content owners fighting this? They should love nDVR. It can both provide better security for the content and make advertisers less unhappy with DVR technology. Let me explain.

## CONTENT SECURITY

Service providers and content owners have essentially no control over content that has been recorded by a viewer on the viewer's own DVR for later playback. It's a hard drive sitting in a consumer's home with unencrypted content.

Service providers have a slightly more control over DVRs that are embedded in an set-top box supplied by the service provider. At least they can ensure that the digital rights management function is working to protect any copyrighted content while it is on disk. But, it's still a hard drive loaded with content in a consumer's home.

With an nDVR system, the content is stored securely in the service

provider's facility. The service provider can control when and how the video is played out, and can make sure that DRM functions in the set-top are working, and that high-bandwidth digital content protection is valid through to the user's display. Sounds like a pretty secure environment.

**I must admit, I do find myself skipping through most ads, although I have been known to rewind and watch ads that break through the clutter with some real visual appeal.**

Another big controversy surrounding any kind of DVR is the role of advertising in recorded content. Advertisers have two main concerns.

One is ad skipping, where viewers fast-forward through ads and don't view them. Consumers have been accused of using this feature as their primary reason for buying a DVR, but I disagree. I bought mine so I could keep up with serialized programs like "24" and "Rome" in spite of my hectic travel schedule. I must admit, I do find myself skipping through most ads, although I have been known to rewind and watch ads that break through the clutter with some real visual appeal.

Another concern is ad timeliness, where viewers watch programs at times far removed from their original broadcast date. This is a big concern for some advertisers who have their ad campaigns targeted for specific time windows, such as pre-election political ads. On my DVR I still have some shows recorded before the November elections. It's actually quite amusing to see candidates bashing each other when you already know the winner.

To me, advertisers would prefer an nDVR over other DVR technologies. Consider what happens in a normal DVR scenario with an advertisement.

A typical standalone or set-top DVR faithfully records any advertisements along with the program content. Say you record a program on Feb. 12 with several ads for Valentine's Day. You wait until Feb. 17 to watch the program. The sales are over and the ads are completely worthless.

Now, consider the same scenario

with an nDVR and some advanced technology for ad replacement in the server. With this technology, the service provider is able to replace the commercials that were in the original program with ones that are timely and relevant whenever the viewer watches the content.

In this example, when you watch the content on Feb. 17, the server could insert ads for a big President's Day sale. You might actually be willing to watch these inserted ads, and an advertiser might be willing to pay for this privilege.

With nDVR, service providers can also make sure that the some or all of the advertisements aren't skipped during

playback. Since they are feeding the streams, they can control when your fast-forward button works. Of course, if they force too many ads on consumers, they will risk having some grumpy viewers, but if the service is very inexpensive (or dare I say free?), viewers might be willing to put up with a few ads.

All that's needed to make ad replacement a reality is some pretty serious software inside the nDVR server and a legal

framework to govern bumping ads.

Regarding the ad replacement technology, Tim Dodge said "We are working on it, and with our subsidiary, Everstream, the ability to do this technically is there. The question is when the industry will be ready for it?"

On the legal front, the outlook is much murkier, and will probably remain that way until the outcome of the Cablevision case is clearer, or content owners change their minds.

## REWIND FOR REPLAYTV

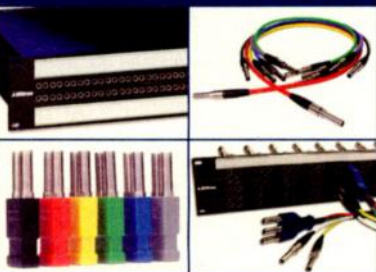
ReplayTV, one of the original competitors to TiVo, has emerged from its own legal wilderness and announced a new software-only DVR service. All you need to have is a PC equipped with a TV tuner card and their software, which retails for \$99.95. After the first year, the program guide costs \$19.95 per

year. You can watch the recorded content on your PC's monitor, or on a TV if you have a suitable video output from your PC. No word yet on any legal filings.

So how about it, content owners? Why not give nDVR a chance to demonstrate improved security for your valuable content, and possibly even make your real customers, the advertisers, significantly less unhappy with DVR technology? You could make some of us DVR fans pretty happy.

Wes Simpson, who loves his DVR, is an independent consultant and the author of "Video Over IP" from Focal press. He can be reached at wes.simpson@gmail.com

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*Rebecca Campbell*

*President/General Manager, WPVI-TV*

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# BUYERS GUIDE

Video Servers & Recording/Controllers

## USER REPORT

### Cablevision Builds IT Workflow With P2

by **Al Clarke**  
Operations Supervisor  
Cablevision

NEWARK, N.J.

**C**ablevision's local programming unit recently took delivery of Panasonic DVCPRO P2 solid-state memory equipment, including four AJ-SPX800 2/3-inch 16:9/4:3 P2 camcorders, two five-slot P2 drives and two AJ-SPD850 DVCPRO 50/25 studio recorder decks.

Our unit covers local news, sports, political elections and community developments throughout Essex and Hudson counties here in New Jersey. Our 1995 vintage equipment was aging and needed to be replaced. As part of our next upgrade, we envisioned developing an IT-based system that would enable fast footage exchange and would make access to footage between each news location more cost-effective.

#### PRIVATE NETWORK

By integrating the Panasonic P2 tapeless solid state system into our acquisition and studio workflow, we

created a private network that connects the editing systems and the play-out server. This provides access to all files and for transfer from any of the sources.

The AJ-SPD850 decks act as our studio P2 recorders, as we have some



Cablevision reporter, Soraida Peres, files a story using Panasonic P2 equipment.

shows that require a studio portion to be edited in post and combined with the field-captured P2 footage. The AJ-SPD850 has five card slots and allows us to transfer footage to the editing base.

Five P2 cards in the recorder pro-

vide about 80 minutes of continuous recording with DVCPRO (40 minutes with DVCPRO 50).

Since the clips come directly from the cards and there is no digitizing process, the AJ-SPD850 keeps everything in the same format with the same high-quality image. It also acts as the recorder for our full half-hour live-to-tape talk shows. These are transferred from the recorder to the editing system to be encoded as MPEG files and then sent by ftp to the server.

#### IMAGE QUALITY

There has been a huge gain in image quality from that provided by our previous system. The P2 recorder

enables us to maintain a consistent format and image quality with field-acquired footage from the AJ-SPX800 cameras. The file-based workflow lessens the amount of image degradation and noise, while reducing the time spent digitizing.

It was very important for us to have a system that would keep the workflow as streamlined and uncompromised as possible.

The P2 recorder maintains the image quality and supports an IT-based workflow, whether footage comes from the edit bay, or from post production. As we continue to embrace a tapeless, file-based workflow, a digital recorder is a natural fit for us.

We're also interested in the AJ-HPM100 P2 Mobile, a field player/recorder recently released by Panasonic, which would extend the effectiveness of solid-state, IT-based recording to the field.

A file-based workflow changes the way you approach acquisition and production by freeing up time dedicated to the technical process of creating your story. It allows you to focus on the story itself and less on the process—and that is where the future is headed.

Al Clark is an operations supervisor for Cablevision. He may be contacted at [aclarke1@cablevision.com](mailto:aclarke1@cablevision.com).

For additional information, contact Panasonic at 800-528-8601 or visit [www.panasonic.com/broadcast](http://www.panasonic.com/broadcast).

## USER REPORT

### HOM-TV Revamps Ops With Leightronix

by **Lynn Meikl**  
Cable Coordinator  
Meridian Charter Township  
Station Manager, HOM-TV

OKEMOS, MICH.

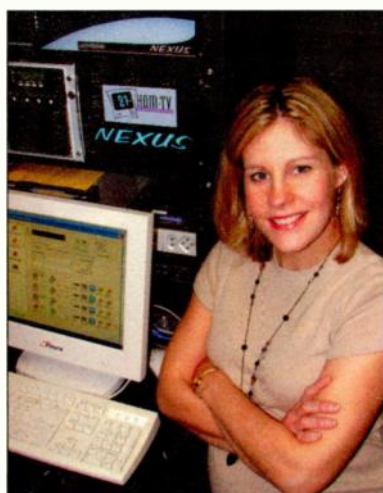
**H**OM-TV is Meridian Township's award-winning government access station located in the Meridian Township Municipal Building here. The station's name is derived from Haslett and Okemos, the two major communities comprising Meridian Township. It is pronounced like the word "home," to emphasize the station's focus on locally produced programming.

Our programming schedule is com-

prised of all locally produced programming, such as a weekly live news show, in-depth interviews, police and fire programs, children's programs, community information and activities, digital messaging and live events.

We broadcast exclusive gavel-to-gavel coverage of various city meetings. Locally produced programming is shot and produced by a team of interns and HOM-TV staff with a focus on the people of Meridian Township and the community.

HOM-TV began broadcasting in 1980 and for over 20 years ran playback operations manually. In 2001, we implemented our first automated playback system through a robotic video-



Lynn Meikl

tape unit controlled by a Leightronix MVP-2000 system controller and digital video player.

In 2006, the decision was made to move toward a digital playback system, as the mechanics of the robotic videotape system had become unreliable.

Key considerations for the transition included the new system's ability to provide reliable digital server playback, legacy control, hardware-based encoding capability, multiple source switching and automation scheduling. Typically, a long wish list will equate to a prohibitively expensive solution. Then we discovered the Leightronix

LEIGHTRONIX, PAGE 38



## USER REPORT

# Tribune Stations Get CDC-Enabled

by Rich Kittilstved  
Director of Engineering  
Tribune WXIN/WTTV

INDIANAPOLIS

The Central Distribution Center for Tribune Broadcasting Co. is located here and is responsible for ingesting and distributing syndicated programming to a dozen stations within our group. Designed to be a centralized repository for content, it ultimately will serve all Tribune stations.

The CDC began operating in 2004 with four Grass Valley Profile XP Media Platform servers. These handled the syndicated programming distribution to numerous Tribune stations and program/spot play-out for two of those stations. They also helped to maximize resources and reduced the number of copies of a particular show that we had to downlink or ingest prior to air.

## EXPANDS WORKFLOW

With the success of those initial Profile XP Media Platform servers and a need to bring more stations online quickly, this file-based workflow was expanded to include two fully redundant, mirrored storage area networks that link 14 Grass Valley K2 Media Servers in a closed loop for a high degree of security and reliability.

We also have several built-in layers of redundancy in the form of dual RAID controllers and media servers. Because the servers are configured in a SAN, the storage capacity of both SANs



Rich Kittilstved

(nearly 10 TB) is available at any moment. When one server is full, data is automatically stored on another K2 within the SAN.

Utilizing an innovative centralcast-ing model, the CDC is now feeding stations in Indianapolis, Chicago, New York, Denver, Los Angeles, New Orleans, Portland, Ore. and Seattle. Each station has installed a dedicated receive system, including a K2 server.

The Grass Valley system can grow as our needs change. Our initial design included enough extra bandwidth on the K2 SANs to accommodate origination of more program streams from our Indianapolis facility. To add more stations, we simply add more media clients to the existing SANs, and we can do this without disrupting systems already in operation.

Programs are sent from the content distributor/owner to the CDC in real time and recorded directly into one of the K2 servers as an MPEG-2 file. The CDC processes and queues it for transmission to the station group. There are also a number of non-real time services that send programming as digital files

which are transcoded and stored.

A file from the CDC's K2 SAN ends up on a similarly equipped, remotely located, server and is ready to go directly to air. The process is completely automatic, saving time and resources. We also use the distribution path to create a copy of any file on the network, so nothing is ever lost.

## ECONOMY IN PREPPING

Only one of the stations receiving each program has to prep it for automation. That station then sends the program metadata back to the CDC, where it is relayed to the appropriate stations prior to on-air play-out. This reduces the prep load at each station. The important part of the workflow is that the CDC and the Tribune stations all have the same file and metadata to enable the automation system to properly play the program to air.

With videotape, we could never handle the workload of multiple stations or have the functionality we have now with the Grass Valley servers. Maintenance has not been an issue for us, as we have a comprehensive Grass Valley Service Contract. Any replacement parts needed get to us by the next business day.

Tribune is so confident in the Media Server platform that plans are underway to install K2 systems and create additional CDC-enabled stations in California and Texas.

Rich Kittilstved is director of engineering for Tribune's regional operating center in Indianapolis. A 30-year veteran of the broadcast industry, he has spent the last 17 years working in various capacities with Tribune. He may be contacted at RKittilstved@tribune.com.

For additional information contact Grass Valley at 503-526-8200 or visit [www.thomsongrassvalley.com](http://www.thomsongrassvalley.com).

## USER REPORT

# Channel One Gives Quantel High Marks

by Chris Edwards  
Director of Consulting Services  
Team

WASHINGTON

Team was founded in 1992 by a small group of broadcast and post-production professionals and has become a one-stop shopping center for broadcast-related services. One of the divisions is Team Sound and Vision, which handles A/V post production and

graphics creations. Another branch of the organization design and builds broadcast facilities worldwide. In 1997, Team entered a new field of personnel management and staffing under the banner of Team People.

Early last year, Team's vice president of engineering, Larry Tyler, informed me of the needs of a new client, Channel One, a news and public affairs content provider for

QUANTEL, PAGE 49

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Shown: Drum model VEG1526 used in Panasonic DVCPRO HD Camcorder model AJ-HDC20 and Varicam model AJ-HDC27.

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USER REPORT

# Focus Enhancements FS-4 Is a Time Saver

by Ryun Hovind  
Independent Post-production  
Supervisor

LOS ANGELES

Anyone covering live events knows they typically entail long nights and tight schedules. Covering the Los Angeles Film Festival was no different. Running from June 22 to July 2, the L.A. Film Fest attracts emerging filmmakers and film masters alike, screening more than 175 narrative features, documentaries and shorts.

We were responsible for producing FesTV, a daily one-hour program highlighting the day's events, as well as providing footage to local media outlets, such as the Los Angeles Times, and on-site festival venues with film clips, footage from parties and interviews with celebrities and filmmakers. Our film crews captured all the action—often returning at 10 p.m. We needed to have footage ready by the next morning, which meant our editors would be facing a long night. We looked at ways to cut down on production time and let our editors get some sleep.

We selected and equipped our team with FS-4 portable DTE recorders from Focus Enhancements. With the FS-4, our crew could record directly to disk via FireWire and then transfer it directly into Final Cut Pro—no more

capturing, file transfer, or conversion.

For most of us, this represented the first experience in recording to disk. I condensed the FS-4's operations into a single page quick guide to help the transition into the new technology and new workflow, and we still continued to use tape as backup. In one case, this allowed us to give the DV tape to a local news team right there on location, while we brought back the FS-4 for our own production needs.

## ELIMINATING STEPS

By eliminating the intermediate steps of capturing and conversion, footage was ready for editing almost as soon as it was brought in. This alone saved us at least an hour in editing time per tape. It was amazing to shoot an event at 9 p.m. and then be editing minutes later.

We'd start capturing a red carpet event at 8 or 9 p.m., and bring the recordings back at 10:00. With tapes, it wouldn't be until midnight that we'd have the footage in and ready for edit. With the FS-4, we were ready to go by 10:20 p.m. Our editing team enjoyed a shorter night—leaving by 3 a.m.—instead of watching the sun come up.

In addition, the quality of the fin-



The Focus Enhancements FS-4 portable DTE recorder

ished product was far better, since editors could focus on being creative instead of capturing onto tape. In my experience, it's essential to just get in there and start editing, especially with

the evening shift. People tend to get lethargic when they need to wait around for several hours capturing on tape. They can get out of the zone before they've even started to edit.

Direct-to-edit technology also allowed us to make more effective use of our computer workstations. We were using powerful stations, but we still couldn't expect to edit and digitize at the same time. I couldn't do much else while digitizing was going on. The FS-4s allowed us to free up workstations, enabling more editors to work on different segments for FesTV at the same time, in addition to making footage available for the newspapers, producer Steven Spielberg and others. In the end, more people were able to get the footage they wanted, and in the format they needed, because we had the FS-4s.

Ryun Hovind is a Los Angeles-based independent post-production supervisor with a background in creative film and video editing. He may be contacted at [ryun@ryunhovind.com](mailto:ryun@ryunhovind.com).

For additional information, contact Focus Enhancements at 408-866-4859 or visit [www.focusinfo.com](http://www.focusinfo.com).

## Leightronix

CONTINUED FROM PAGE 36

Nexus.

The Nexus offered everything necessary, including two video server playback channels, a record channel, fully integrated video/audio switching for airing a fallback bulletin board system and a live studio feed, and device control for media ingest.

### SERVER PLAYBACK

This past October, we made the switch to server playback. Live programming is captured using the Nexus record (encoding) channel. Programs from the MacIntosh G5 and iMac edit suites are exported as MPEG video/audio files and transferred over the internal network directly to the Nexus terabyte RAID 5 storage device.

The move to digital has streamlined the management of the channel and has moved us away from videotapes. All programming is stored online for immediate use and is organized and scheduled by the WinNEXUS software.

Programming is organized in user-

defined folders and easily placed into the schedule with a simple drag-and-drop interface. The error checking refuses to allow anyone to make mistakes.

HOM-TV now has a seamless, reliable playback system that's digital; no more moving parts, no more worries about tapes not cueing up properly or our station being in black.

Customer service is key to a successful product and Leightronix provides that service for its customers. We at HOM-TV appreciate the superior customer service Leightronix has always provided.

The Nexus has given us a great return on investment and is a cost-effective, reliable system that will work for us for years to come. HOM-TV has never looked better or run more smoothly.

Lynn Meikle is the cable coordinator for Meridian Charter Township and the station manager of HOM-TV, Meridian Government Television, in Okemos, Mich. She may be contacted at [meikle@meridian.mi.us](mailto:meikle@meridian.mi.us).

For additional information contact Leightronix at 800-243-5589 or visit [www.leightronix.com](http://www.leightronix.com).

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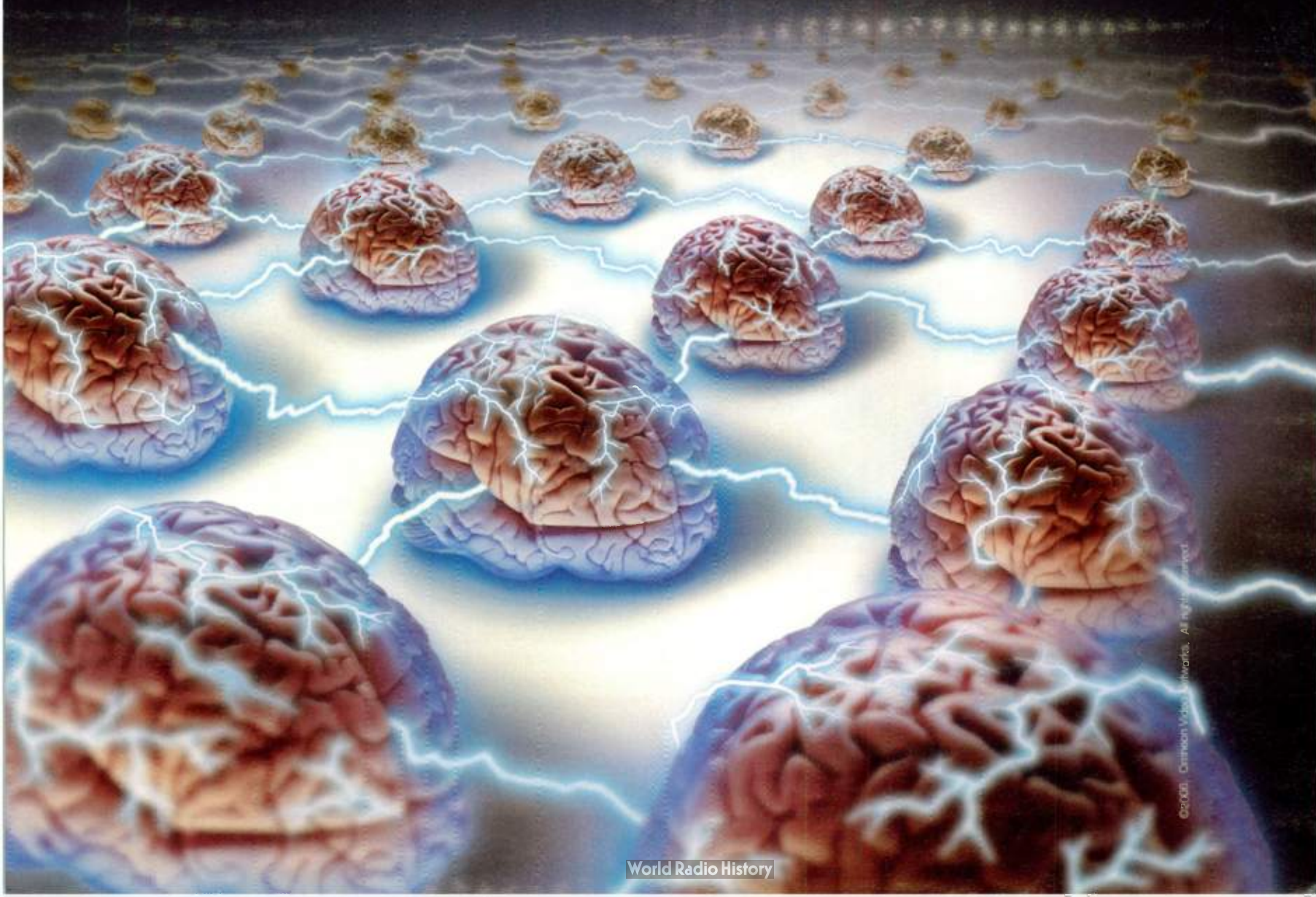


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## USER REPORT

# WHDH-TV Moves News With Avid ISIS

by Jim Shultis

Director of Engineering  
WHDH-TV

BOSTON, MASS.

**S**unbeam Television's WHDH-TV recently took on a new challenge as we created a duopoly with WLVI-TV, the local CW affiliate here. The move wasn't without its challenges, as we added another hour of TV news product to an already busy newsroom pumping out nearly seven hours of news a day.

The quality of our personnel, coupled with the strengths of our Avid tapeless newsroom and the MediaStream 8000, have eased a lot of the burden and allowed us to focus our energies on things other than technical issues.

## DISCOVERED AT NAB2005

I was first exposed to the Unity ISIS at NAB2005, before its public release. The following fall we began talking about it seriously. Earlier that summer we had hooked up our first nonlinear editing systems and realized we needed a way to both speed up the production process and expand it to



Avid ISIS and AirSpeed video server equipment

the entire newsroom, including the promotions and graphics departments. An Avid tapeless production system based on Unity ISIS was the answer for the size of our operation.

Unity ISIS helped because Avid

took more of an IT-based approach and it scaled larger than the traditional fiber-based Unity system.

More importantly, every storage blade of ISIS has its IP address and that makes the system more robust. We've had two instances where a blade went down, but ISIS kept on chugging because it ported over to another blade without any downtime.

With the addition of WLVI-TV, our system is scalable to 500 hours of video storage and by the end of this month we'll be expanding our system capacity to more than 750 hours.

At that time we'll have enough speed and storage capability to work with 17 Avid Adrenalines and software-based editing systems, in addition to a total of 13 AirSpeeds for ingest and play-out.

## KEEP IN MIND

If your facility still hasn't made the move to server-based storage there are some important factors to keep in mind. One headache we found was the need to upgrade infrastructure, as our previous systems didn't allow Avid browse and logging tools to tap into the storage system. We ended up

switching to a Cisco backbone. Also, look at upgrading your acquisition format to one that allows for ingesting of file-based material at two or four times faster than real time.

The advantages of a file-based system are many. We use Telestream FlipFactory as the glue between a BitCentral server we use for ingesting NBC material and a Pathfire server set up for CNN feeds.

Being able to flip different formats into ISIS is the type of feature that producers and writers think is sexy because they can access any material they want. Avid MediaStream 8000, with 500 hours of storage at 8 Mbps, does a great job of handling commercial playback. The reliability and technical support is as good as ever.

As for the future, Unity ISIS gives us a solid foundation for our HD migration that we expect to implement in 2008.

*Jim Shultis is director of engineering at WHDH-TV in Boston, Mass. He can be contacted at [jshultis@whdh.com](mailto:jshultis@whdh.com).*

*For additional information, contact Avid at 800-949-2843 or visit [www.avid.com](http://www.avid.com).*

## USER REPORT

## Doremi Serves Up Texas Video

by Allen D. Aleshire

Director of Public Information  
KHGN Television and Web Services

HARLINGEN, TEXAS

**A**s technology director in 2002 for the Harlingen Consolidated Independent School District, I was asked to design the district's first TV station. I knew the ideal solution for a small station with limited staff had to include as much tapeless technology as possible.

I consulted with Houston, Texas-based Industrial Audio Video for recommendations on automation technologies. Specifically, I needed to find out what was available in video servers. Industrial's Tom Austin, immediately pointed to the Doremi Labs V1 MP2.

## STIRRING INTEREST

We purchased our first Doremi three years ago and our second one last year. School districts from across the Rio Grande Valley came to see

our new technology and asked how it worked.

makes Doremi the ideal server based solution.



Allen D. Aleshire with Doremi servers

Since we combined the public information office, KHGN-TV and Web services into one department, we needed a solution that would enable us to operate a 24/7 station with just three staff members.

We can ingest more than 20 hours of video on each Doremi at 25 Mbps. The quality of video playback, ease of use and reliability of the servers

The days of playing back from multiple video-cassette recorders are over. With network connectivity, we can operate the Doremi servers from our desktop PC. This also makes moving files from one server to the other very easy. The controls look just like those of a VCR. The V1 MP2 provides users with a great deal of flexibility, allowing the server to be used in many different ways, including high-quality slow-motion replay.

We tried a number of solutions available at the time of our first purchase and looked again at available options before purchasing our second unit. We still believe we made the right decision. None of the tested alternatives came close to the quality of the Doremi.

We've received several compliments since the server technology was implemented, including one from one of the campus television departments stating that the quality of the video played out looked better than what the group had submitted!

## SIMPLE AND EASY TO USE

The Doremi Labs V1 MP2 is a very simple unit to install and use. We found support from Doremi to be second to none. The biggest compliment I can pay to Doremi Labs, however, is that they do everything they can to make your purchase a great long-term solution by continuing to improve the technology with firmware updates and other software solutions that maintain the same focus—doing more with less.

*Allen D. Aleshire is director of public information for the KHGN-TV and Web Services operations within the Harlingen Consolidated Independent School District in Harlingen, Texas, where he's been since 1996. He began his career as a media technician at the University of Louisville. He may be contacted at [aleshire@harlingen.isd.tenet.edu](mailto:aleshire@harlingen.isd.tenet.edu).*

*For additional information, contact Doremi Labs Inc. at 818-562-1101 or visit [www.doremilabs.com](http://www.doremilabs.com).*



## USER REPORT

## FFV Outrider CF Takes Checkered Flag

by Jeff Silverman  
President  
Inertia Unlimited, Ltd.

JACKSONVILLE, VT.

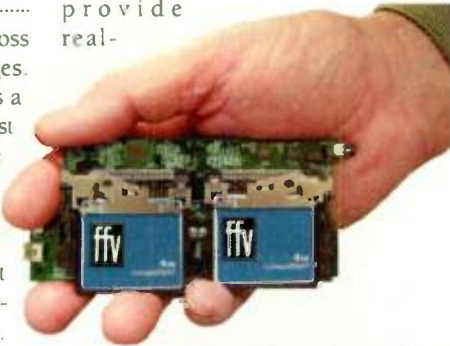
**O**n-body recording in Supercross racing poses many challenges. For one, the sport itself entails a lot of vibration, and the recorder must be designed to perform under these conditions. Additionally, crashes are not uncommon. Not only does the camera have to be able to withstand the impact of a crash, it also has to provide flawless, uninterrupted video during the jarring event.

#### HELMET CAMERA NEEDED

When equipping riders with on-body cameras to capture the action for Supercross broadcasts, durability and performance are primary concerns. That's why NBC Sports turned to us, Inertia Unlimited, for a camera to be placed on the helmet of a rider in the inaugural Jeremy McGrath Invitational.

For the last 10 years, we've been providing broadcast quality specialty

cameras to all the major television networks. As an innovator in the field, we've developed X-Mo, the fastest HD high-speed camera to provide real-



The Fast Forward Video Outrider CF DVR used in the helmet camera.

time output in all video formats. We have also developed other specialty cameras, including the Umpcam for the NFL, the Gohecam for the NHL, poker holecam cams, and even a hotdogcam.

The Jeremy McGrath Invitational was a unique made-for-television, two day Supercross event that took place on Oct. 6 and 7 at the Home Depot Center

in Carson, Calif., and was aired by NBC on Oct. 22. In partnership with NBC Sports, the event featured the top 20 riders in the sport of Supercross as they competed for the largest purse ever offered, \$500,000.

For the event, we created a helmet camera to be worn by rider Ryan Clark. In connection with the helmet camera, we utilized the FFV Outrider CF DVR, an ultracompact board-level digital video recorder that is ideal for on-body recording. It features rugged construction, and delivers uncompromised recording capabilities in extreme environments, including high-vibration, G-force and temperature conditions.

#### RECORDER ADVANTAGES

We chose the Outrider recorder for our helmet camera as it provides several advantages over the tape-based Handycams we had previously used for such events. The Outrider weighs less than one pound, which is important, because you don't want it to interfere with the rider in any way. It also can record up to two hours onto removable

compact flash cards as PC-viewable QuickTime files. This race was not broadcast live, so easy removal and transfer of recorded material was a key factor.

Another key factor for us was ruggedness, which is vital in the extreme environment of Supercross Racing. FFV's Outrider tolerates high-vibration environments, and vibration is a constant in Supercross, especially in a crash. Unfortunately, Ryan Clark was involved in a crash during the race. However, not only did the helmet cam survive the crash in one piece, it provided completely uninterrupted, flawless video of the event.

Jeff Silverman is president and owner of Inertia Unlimited, Ltd., which has provided broadcast-quality specialty cameras to major television networks for 10 years. He's received two Emmys for his camera work. He may be contacted at [Jeff@inertiaunlimited.com](mailto:Jeff@inertiaunlimited.com).

For additional information, contact Fast Forward Video Inc. at 800-755-8463 or visit [www.ffv.com](http://www.ffv.com).

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## USER REPORT

# Video Technics Eliminates Tape

by Sue Eider  
Operations Manager  
WDAY-TV

FARGO, N.D.

**B**efore we made the transition last year to an all-digital tapeless news production environment here at both WDAY-TV and our sister station, WDAZ-TV in Devils Lake, N.D., our existing tape-to-tape environment slowed down our production time and eventually degraded our on-air video quality.

It was clear that it was time to make the leap to digital, and we chose the Video Technics NewsFlow solution to help us.

We felt that their end-to-end file-based workflow on the Apella servers provided us a high-quality, cost-effective solution. It was immediately apparent after implementation that we now have much cleaner and quicker-paced shows.

## CENTRALIZED DATABASE

NewsFlow allows our journalists and editors to create packages in a completely shared collaborative editing environment. By using the VT Proxy Editor application embedded within our ENPS workstations, jour-

nalists have instant access to our centralized database.

They can view user-defined metadata and low-resolution proxies to locate and then perform nonvolatile edits to media via any PC on the network. They can simultaneously browse and edit packages from their

Bringing our packages and content to air has become very efficient and can be done with minimal work. Since we can provide content for both of our stations' newscasts with savings in time and improvement in operating efficiency, we now have fewer human mistakes and errors are almost nonex-

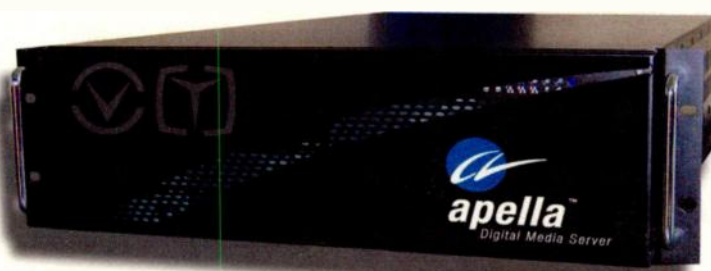
life easier for our field reporters, as they can now take a laptop with them and edit their story on the way back to the station, and then upload it into the server when they arrive.

The aggressive timetable set for our digital conversion demanded the highest level of commitment from our vendor, and the on-site commissioning and training from Video Technics helped to make the project a resounding success. They delivered what they promised and the quick response time from their support team has allowed us to deliver our news product to our viewers daily with no interruptions.

I feel that our workflow and video quality has improved greatly. We produce much tighter shows, and having the clips correctly cued has taken care of much of the human error involved in producing any news show.

Sue Eider is the operations manager for WDAY-TV, and has more than 35 years experience in the broadcast industry. She may be contacted at [seider@wday.com](mailto:seider@wday.com).

For additional information, contact Video Technics at 404-327-8300 or visit [www.videotechnics.com](http://www.videotechnics.com).



One of the Apella video file servers used in the Video Technics NewsFlow system

desktop or laptop, and then seamlessly drag and drop revised packages into the specified ENPS rundown.

By making this conversion, we have been able to reduce stress and frustration caused by the old tape machines in our edit bays. We no longer have the generational quality loss associated with tape, and we can now watch entire packages from our desktop before they air.

istent due to technical failure. Our on-air look has improved tenfold, and Apella servers give us multichannel ingest and play-out.

## FX AND GRAPHICS

The change from tape-based to digital production has allowed us to add special effects and graphics to our news stories within the edit bays, which is something we could never do before the transition. It has also made

## USER REPORT

# Virginia News Facility Powered by Harris

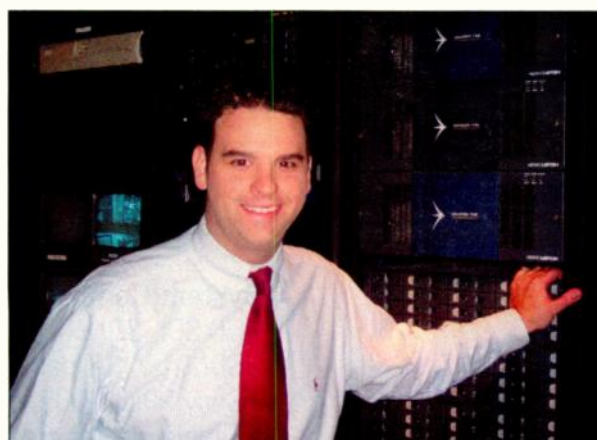
by Jeremy Settle  
News Director  
WCAV-TV/WVAW-LP/WAHU

CHARLOTTESVILLE, VA.

**I**n August 2004, Gray Television signed on CBS affiliate WCAV-TV and ABC affiliate WVAW-LP here. In July of 2005, Gray converted the former PAX station into a Fox affiliate, WAHU-CA. Today, all three stations operate from the same headquarters in an operation collectively known as the "Charlottesville Newsplex."

At the heart of our facility is a Nexio shared storage system from Harris Corp., enabling us to simultaneously run newscasts on all three stations—while allowing each to keep its own identity.

Although our news product was fairly limited at first—two half-hour newscasts at 6 and 11 p.m. on



Jeremy Settle with Harris Nexio video servers

WCAV-TV—our ultimate goal was to become a go-to source for news across three different network-affiliated stations and a news product online.

Like all news operations, we're

challenged with getting a lot of material to air by deadline. Our previous system required that all video be rendered into an MPEG format, so editing was slow and inefficient.

Adding two newscasts on WVAW meant running simultaneous newscasts at 11 p.m. We needed a system

that could accommodate two control rooms in operation at the same time, enable us to get breaking news to air fast and clean, and also one that could scale to accommodate the sizable news product we were planning.

After considering available options, we decided to go with six channels of the Harris Nexio server and NewsFlash nonlinear editors for news editing.

## SMALL INCREMENTS

Nexio is a modular, scalable server that allows a SAN to be built in small increments, making it easy to add channels, bandwidth and storage economically. It supports up to four channels of I/O, comes standard with a Gigabit Ethernet port with ftp server and provides access to shared storage via 2 Gbps Fibre Channel. It also offers a high level of content protection via its patented RAIDsoft technology.

Nexio NewsFlash is a high-resolution craft and news editor that provides direct access to all content on the Nexio SAN. With NewsFlash, all

HARRIS, PAGE 45



## USER REPORT

# KCET Changes Workflow With SeaChange

by Gordon Bell

Vice President of Operations and  
Engineering  
KCET

LOS ANGELES

**K**CET is a Los Angeles PBS affiliate whose mission has traditionally been to serve our diverse Southern California audience through education and enlightened entertainment. With audiences now facing more choices than ever in terms of content they watch and the means by which they view it, we have worked to build a digital workflow and archive infrastructure that addresses existing needs while providing a path for expansion.

## REPLACING EQUIPMENT

When I joined KCET in 1998, the incumbent system consisted of several low-capacity servers that required files to be drawn from a number of different storage devices. It was challenging to program even one broadcast.

Realizing that we needed a better way to do things and seeing that multicasting was a reality, I began evaluating available technology. I consulted with several television operations to find out about their experiences with server providers and the name SeaChange came up a number of times.

We ultimately selected a SeaChange platform consisting of a MediaLibrary 24009e online system with an MLX12004 nearline archive; ten 4012a MediaClient interfaces that give us 10 SD inputs and 20 SD outputs; two MediaClient 5110 HD encoders; and four simulcast SD/HD MediaClient encoders. This provides a playout storage capacity of 45 TB, or roughly 6,000 hours of SDI programming.

One of the key factors in our deci-

sion was SeaChange's RAID Squared cluster technology. This allows full use of the available storage, as opposed to having to run a mirrored back-up system. Also, the servers are essentially agnostic, as the encoder is separate from the storage array. Our storage nodes are not affected even if we have



Gordon Bell

an encoder/decoder go down.

As part of our continuing effort to retain and attract viewers while serving our local area, KCET recently launched a new channel aimed at the California desert communities of Palm Springs and Palm Desert. Even though

the service is programmed entirely differently from our regular KCET PBS broadcasts, the content is still stored in the same MediaLibrary system that serves both KCET and KCET HD (also a different service). The large play-out capacity all but eliminates the need to fiber programming from different storage areas, thereby greatly streamlining our on-air operations. We will use the same system when we launch a Spanish-language service this winter and an Orange County service in the fall of 2007.

## PLANNING AHEAD

Not only will KCET launch new services as we move forward, we will also be addressing how viewers watch our programming. While we still consider other broadcasters to be our primary competition, the ways to win are certainly changing.

The race is on to provide content to as many different platforms as possible, including video-on-demand, Webcasting and mobile devices. To

that end, our existing SeaChange platform can be expanded to include the QuickSilver Agility Workstation, which will allow us to import files directly from our MediaLibrary for use on any platform with the goal of serving viewers wherever they have access to content.

Our initial vision of the new system is now reality, making KCET's workflow faster and easier. We also have a clear path that will allow us to continue to deliver compelling, high quality content and to maintain our longstanding commitment to serving our community.

*Gordon Bell is vice president of operations and engineering for KCET in Los Angeles. He has been in television in the United States and Canada working in both production and broadcast operations. He may be contacted through the station's Web site at [www.kcet.org](http://www.kcet.org).*

*For additional information, contact SeaChange International at 978-897-0100 or visit [www.schange.com](http://www.schange.com).*

## BUYERS BRIEFS

Newstore from **Spencer Technologies** is a single-unit news production tool, featuring eight hours of internal clip storage, which can be increased to 50 hours with external RAID-5 technology.

Newstore functions as both a clip store and still store, as well as a DVE system, linear keyer and VTR and robotic camera controller.

The clip storage functionality accommodates up to 10,000 records and can be expanded beyond that if required. The clip storage database automatically stores date, clip ID and

duration. User fields at provided for title and description of the clip.

Newstore also provides looping of clip material and has a built-in editor for frame accurate of external VTRS.

*For more information, contact Spencer Technologies at 888-246-4127 or visit [www.spencer-tech.com](http://www.spencer-tech.com).*

The MediAdvantage from **Vela** is a high-density video server and supports Spectrum multi-stream encoding and Prism real-time coding operations. The MediAdvantage supports both standard and high definition applica-

tions and offers up to 12 channels of playback.

The unit has six hot-swappable SCSI drive bays and can be equipped with hardware RAID functionality. It offers on-screen GVA display of input signals and supports both LTC and VTIC SMPTE time code.

The MediAdvantage occupies two RUs of space and provides users with playback controls including fast forward, rewind, shuttle and jog operations.

*For more information, contact Vela at 727-507-5344 or visit [www.vela.com](http://www.vela.com).*



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# Harris

CONTINUED FROM PAGE 42

seats can start editing the moment ingest begins, creating a collaborative environment, as well as accelerating time to air. The system supports a wide range of ingest formats, and provides tape-to-timeline ingest, special effects, CG and third-party plug-in support.

On a daily basis, our Nexio server is used in getting video cut for the

news. When photographers and reporters return to the station, they can perform ingest in two areas. Once this is completed, reporters can log their video in an edit bay and write scripts straight into ENPS. When they're ready to publish, they can pull the corresponding outcue for the appropriate newscast from MediaBase, the Nexio clip management interface.

## ALPHA CHANNEL HANDY

NewsFlash has been great for pre-produced teasers. It has an alpha chan-

nel that allows us to create effects that previously had been done in a control room.

We're now using Nexio to produce 33.5 hours of news each week. Our stations are still becoming known within the market and we foresee continued audience growth.

The Nexio system has allowed us to rival the on-air look of much larger market stations. From a technical standpoint, I rarely hear of any problems. And from a news director's viewpoint, having Nexio in my facility

means I don't have to worry about my page-one story making it to air in time.

Jeremy Settle began his career in news at WUSA-TV while still in college at the University of Maryland. He has served as news director at WCAV-TV/WVAW-LP/WAHU-CA since January 2005. He may be contacted at [jeremysettle@wvaw.tv](mailto:jeremysettle@wvaw.tv).

For additional information, contact Harris at 888-843-7004 or visit [www.broadcast.harris.com](http://www.broadcast.harris.com).

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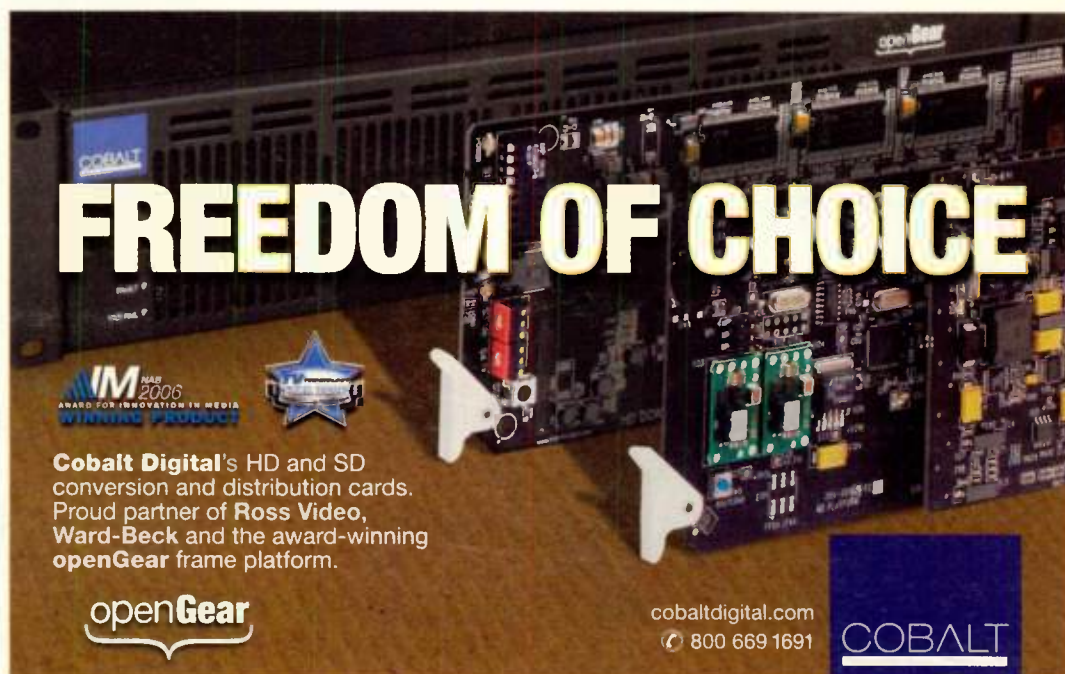
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USER REPORT

# CCTV-5 Readies for Olympics With Quantum

by Gu Jun

Deputy Director, Information and Communications

Department of Technical

Administration Office

CCTV

BEIJING

**N**ext year, the whole world will be watching as China Central Television's CCTV-5 covers the 2008 Olympics from our home in Beijing.

The oldest and still primary outlet for sports broadcasts in China, CCTV-5 delivers more than 1,000 live sporting events each year to more than 300 million viewers 24 hours a day, seven days a week. We also broadcast a full line-up of programming that reuses our pre-recorded sports footage.

Event coverage runs the gamut

from World Cup soccer and international figure skating championships to NBA games.

## TEAM APPROACH

The combination of advanced digital technology, HD capability and a team-oriented approach is the key to the success of our production environment. We have more than 100 editors and producers who view available broadcast content, process it, edit it and re-use it in different programs and formats.

To make a production system of this scale and complexity run smoothly, our core digital work environment is built on Fibre Channel SAN technology, 20 TB of high-performance RAID storage and Quantum's StorNext data management software.

The two critical elements in preparing video content in this fast paced, schedule-driven broadcast

environment are performance and shared workflow. We kept that in mind when we planned our newest generation video editing system, and selected StorNext software as the

performance Fibre Channel speed and enables multiple editors using different applications and operating systems to have direct, shared access to a common set of video files. We gain efficiency, save time and get our content ready for broadcast significantly faster than competitive approaches.

## THREE STORAGE POOLS

At CCTV-5, we use three separate StorNext-enabled storage pools to manage our digital workflow operations. This common, high-performance access to all of our files is the key to keeping productivity high and providing the fastest possible access to content.

The first two pools are used to store ingested content feeds from the field. A high-resolution pool maintains the full video quality version of the incoming footage, while a low-res pool stores proxy versions of the content that our editors and producers use for browsing and building rough cuts.

These rough cuts are used as guides for modifying high-res versions of the content and crafting the final edits. The full video quality piece is stored on the third StorNext enabled storage pool, a render pool, where visual effects, captions, sports statistics and narration are merged to create the on-air version.

This version is then supplied to broadcast servers for creating programming play lists and play-out. Older files are archived to tape storage for long-term retention.

StorNext provides high-speed access to shared files and presents the storage pools as a standard file system interface, so that all of our applications and computer platforms can share the same storage at Fibre Channel speed.

StorNext's ability to let servers with direct access to the SAN provide secondary access to other workstations over our LAN was also extremely important to us. It has expanded the sharing of data to many more editors and has increased our overall efficiency.

Gu Jun is deputy director of the information and communications department of the technical administration office at CCTV in Beijing, China. He may be contacted at gujun@cctv.com.

For addition information, contact Quantum at 800-677-6268 or visit [www.quantum.com](http://www.quantum.com).



Quantum's StorNext product will be a key player in CCTV-5 Olympics coverage

foundation for an infrastructure that could optimize both elements.

StorNext provides the best combination of features. It gives us high-

## BUYERS BRIEF

The MediaBank from Digital Broadcast Inc. is a video file server system that provides encoding, storage and random access streaming of MPEG-2 content. The system has the ability to mix long form with short form program files and allows users to select their own data rates.

The MediaBank features RAID storage and hot swappable redundant power supplies. It stores and plays both still and moving video and is capable of DVD archiving.

The system provides a genlock input, as well as dynamic control of horizontal and subcarrier timing. It features expandable storage and channels and provides RS-422 control to external VTRs being used for ingest.

The MediaBank supports Gigabit Ethernet and provides a migration path from SD to HD video.

For more information, contact Digital Broadcast Inc. at 352-377-8344 or visit [www.digitalbdest.com](http://www.digitalbdest.com).

## Quality Solutions



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CANARE



## USER REPORT

# Omneon Supports New WHSV-TV Services

by Sean Harper  
Chief Engineer  
WHSV-TV / WHSV-DT

HARRISONBURG, VA.

We recently augmented our first HD service, the transmission of ABC network HD content. This was part of a project that also involved the addition of new SD channels, including FOX network, MyNetworkTV, a hub for a ghost station in another market, and we have plans underway to launch FOX HD very soon.

We're using Omneon Spectrum media server systems to support these playout operations, and the modular design of the systems has allowed us to grow at our own pace and build in the redundancy we need for our new channels.

## OMNEON OFFERS SCALABILITY

I've liked the Omneon systems ever since I first learned about them. Perhaps the greatest benefit they offer is scalability, which is ideal for broadcasters in smaller markets.

We didn't have to buy a large chassis to get what we needed. And, to incorporate HD capability into our operations, we simply added an Omneon HD MultiPort module to our infrastructure rather than having to replace existing systems.

For a small station such as ours, the ability to expand operations and play-out capability through a straightforward upgrade is very appealing.

We didn't need to lock ourselves into a particular configuration in order to expand. Instead, we were able to adapt the existing system and add new ports for play-out or ingest as necessary.

In building the backbone of a transmission infrastructure and everything that lives on it, you've got to be sure you invest in the right equipment.



Omneon equipment installed at WHSV-TV

I feel that every dollar has been well spent on our Omneon system. The present Spectrum server config-

uration includes 10-channel SD play-out, two-channel HD play-out and seven channels of ingest utilizing four TB of shared storage.

The HD modules simplify our simulcasting operations by providing support for HD and SD on the same timeline, as well as simultaneous HD and SD outputs.

Our Omneon server system operates under the control of Harris automation, replacing the tape-based system we relied upon previously.

The shift to server-based operations has allowed us to get away from juggling tapes, an issue that would have become even more problematic with the addition of separate networks.

## REDEFINED WORKFLOW

Omneon provides us with a newer and more streamlined environment for the launching of additional networks. The technology has redefined our workflow, allowing us to handle any media type and simplifying our access to those assets.

Our operators have found the Omneon systems to be very intuitive and easy-to-use. After a day or two of training from Omneon, our staff



Sean Harper

felt very comfortable with the systems. In the launch of our multicasting with HD playout, the Omneon gear was the most rock-solid piece of the equation, and we have enjoyed excellent support from Omneon.

The flexibility of the Omneon systems has let us take a smart, building-block approach to our growth. Once the basic system was in place, we're been able to add additional modules as necessary. It's easily scalable and integrates well with third-party systems.

As we continue to expand our use of the server systems, we're looking at integrating them with our Final Cut Pro editing systems for even greater workflow improvement.

Sean Harper is a Virginia native and has been with WHSV for 10 years. He may be contacted at [sharper@whsv.com](mailto:sharper@whsv.com).

For additional information, contact Omneon at 866-861-5690 or visit [www.omneon.com](http://www.omneon.com).

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# 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.


FURNITURE

MANUFACTURER	MODEL	MAIN/TYPICAL APPLICATION	USER CUSTOMIZABLE?	AVERAGE DELIVERY TIME	OTHER FEATURES	PRICE
<b>IMS/AMCO</b> 847-671-6670 <a href="http://www.imsmfg.com">www.imsmfg.com</a>	Modular Enclosure Systems	Data, file servers, transmission, studio editing	Yes	2-3 weeks	Modular, steel-welded construction, 10 standard colors	Call for price
<b>Anthro Corp.</b> 800-325-3841 <a href="http://www.anthro.com">www.anthro.com</a>	AnthroBench, Elevate Wrap, Elevate Corner	B-cast, lab, egr, midi, multimedia	Different sizes available with multiple accessories	Three-day lead time	Lifetime warranty, cable management options, adjustable shelves	From \$999
<b>APWMayville</b> 800-558-7297 <a href="http://www.apw.com">www.apw.com</a>	Stantron Broadcast E-Rack	Broadcast, editing control rooms, A/V	Yes, mix and match components for custom solutions	From stock, two weeks	Lifetime warranty, many accessories and styles, filler panels, drawers, shelves	Call for price
<b>Forecast Consoles</b> 800-735-2070 <a href="http://www.forecast-consoles.com">www.forecast-consoles.com</a>	Imagemasters, MASTERail/ custom	Edit consoles; control rooms, broadcast	On-site, by factory	Imagemasters-5 days; depends on clients' needs	High quality, innovative design, reasonable pricing	Imagemaster Edit Consoles start at \$995
<b>Fusion Consoles</b> 800-557-8861 <a href="http://www.fusionconsoles.com">www.fusionconsoles.com</a>	Crescent, Arc Duo, Target, custom	Broadcast, post production, editing systems	Yes	In stock, ready to assemble; custom, 2-4 weeks	Stylish, mobile, durable	System starting at \$1,000
<b>GKM Broadcast Racks</b> 631-249-7816 <a href="http://www.gkmbroadcastracks.com">www.gkmbroadcastracks.com</a>	Various custom	Broadcast, post production and mobile	Tailored to requirements	2-4 weeks	Welded construction, many colors available	Call for price
<b>Middle Atlantic Products</b> 973-839-1011 <a href="http://www.middleatlantic.com">www.middleatlantic.com</a>	NLE furniture, Digital media desks, racks	Broadcast, NLE, control rooms	Mix and match stock components	Ships from stock	Thermal management, noise isolation, cable management	Call for price
<b>Star Case</b> 800-822-7827 <a href="http://www.starcase.com">www.starcase.com</a>	Star Case-Modular Rack System	Servers, broadcast, field vehicles, video workstations	Yes	Next day	All sizes ship knocked down in three small cartons	\$159, 4 RU; \$264, 43 RU; 30-inch deep
<b>TBC Consoles</b> 888-266-7653 <a href="http://www.tbconsoles.com">www.tbconsoles.com</a>	IntelliTrac, SmartTrac, TracWall	Broadcast, NOC, control rooms, editing, graphics	Yes	2-4 weeks	Trac-based systems from single workstations to control rooms	See Web site
<b>Winsted</b> 952-944-9050 <a href="http://www.winsted.com">www.winsted.com</a> <a href="mailto:info@winsted.com">info@winsted.com</a>	Modular consoles, racks digital desks	Broadcast, NLE, control rooms and security centers	Yes, custom spec. mix and match stock components	In stock, ready for delivery in 24 hours	Free design services	Call for price

RECORDABLE MEDIA

MANUFACTURER	RECORDING MODEL	CASSETTE FORMATS	TIMES	SPECIAL MATERIAL	THICKNESS	FEATURES	PRICE
<b>Carpel Video</b> 800-238-4300 <a href="http://www.carpelvideo.com">www.carpelvideo.com</a>	Digital Recording Media	DV, DVCPRO	All lengths	New Sony, Panasonic and Fuji videotape	N/A	90-day guarantee	Call for price
<b>Fuji Photo Film USA Inc.</b> 800-755-3854 <a href="http://www.fujifilm.com/proav">www.fujifilm.com/proav</a>	Fuji HD331	HDCAM	6 to 124 min.	Ultrafine, high-output metal particles	14 um	Super calendaring technology	Call for price
<b>JVC Corp.</b> 800-582-5825 <a href="http://www.jvc.com/pro">www.jvc.com/pro</a>	M-DV63Pro-HD	DV	63 min.	N/A	N/A	Call for details	Call for price
<b>Maxell Corp</b> 800-533-2836 <a href="http://www.maxell.com">www.maxell.com</a>	HDCAM: 6HD, 12HD, 22HD, 32HD, 40HD, 64HDL, 94HDL, 124HDL	HDCAM	6 min. (M) to 124 min. (L)	Metal particle with Ceramic Armour metal technology	13.8 um	Low error rate, superior durability, superior storage stability	\$38.74 B-6HD to \$204.66 B-124HDL
<b>Panasonic Broadcast</b> 800-528-8601 <a href="http://www.panasonic.com/broadcast">www.panasonic.com/broadcast</a>	AJ-P2C004HG; AJ-P2C008HG	DVCPRO/50/HD AVC-Intra	Various lengths	P2 cards contain SD memory cards, computer controllers, circuit boards and cardbus connectors	N/A	P2 cards recordable up to 100,000 times, and die cast for protection	\$550; \$1,200
<b>Quantegy</b> 334-745-7643 <a href="http://www.quantegy.com">www.quantegy.com</a>	DBC Digital Betacam	Digital Betacam	6 min. (S) to 124 min. (L)	Metal particle, polyu. binders, matrix lubricant additives	10.1 um	ISO 9002 certified, high output, low error rates, reduced debris	Call for price
<b>Sony Professional Media</b> 201-476-8692 <a href="http://www.sony.com/professionalmedia">www.sony.com/professionalmedia</a>	Comprehensive product line	All Betacam, DVCAM Digital Master, HDCAM, HDCAM SR	Various lengths	Advanced metal particle, advanced metal evaporated	Various	Co-development of broadcast media and related recorders	Call for price
<b>Sony Data Storage Division</b> <a href="http://www.sony.com/storagemedia">www.sony.com/storagemedia</a>	LTX400GWW	LTO-3	400 GB (native) 36 hours video at 25 Mbps	Advanced alloy Armored metal Particle (A3MP)	21.5 mm	Ultrathin, uniform coating technology	Call reseller for price
<b>TapeOnline</b> 877-893-8273 <a href="http://www.tapeonline.com">www.tapeonline.com</a>	Blank Recording Media	All popular formats	All lengths	Sony, Fujifilm, Maxell, Quantegy Panasonic, Taiyo Yuden, Rimage, Microboards	N/A	Extensive inventory, low pricing, same day shipping, GSA pricing	See Web site






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## Quantel

CONTINUED FROM PAGE 37

more than 12,000 U.S. middle and high schools. In 1997, Channel One migrated from its Southern California location to Washington, D.C., where it is now housed within Team's facilities and is staffed by Team personnel. It produces a 12-minute news program five days a week that is fed to schools overnight for replay the following morning.

### TEAM ENVIRONMENT

As part of this Channel One relocation, we decided a collaborative working environment was needed where producers could view and edit their material, with editors cutting packages and assembling the daily show.

The system also had to be simple, but very flexible, thus allowing us to evolve with the changing needs of our client. Since the plan required us to be operational within four months, we needed to make some important equipment decisions promptly.

A group of editors had already been evaluating Quantel equipment for our postproduction division and

we were impressed by the simplicity of the interface, the quality of the image and the horsepower these systems offered. After much compari-



Andy Och, Team producer, uses Quantel Newsbox to prepare material for a Channel One newscast.

son-shopping with our existing equipment suppliers, Team decided to purchase the Quantel Newsbox 3 equipped with 110 hours of IMX30 storage and six bidirectional ports.

Channel One's source material is captured in the field on a Sony XDCAM. It's then ingested into the Newsbox server and made available for all of the journalists, producers

and editors to view seconds after the material begins loading. The server actually records two files, the high bit-rate IMX30 and an internally generated browse quality MPEG-1. As the Newsbox shares the same network infrastructure, most users work with the browse version.

Two media managers are in charge of the server. They ingest and play-out everything and monitor free space.

About half of Channel One's show is day-of-air material and the other half is feature

material that producers have spent several days or weeks working on.

### QVIEW AND QCUT

The QView application is a simple but powerful window into the server, and most users are up and running with little more than an hour's training. Building on QView is QCut, which adds additional editing capa-

bilities for those wanting to fine cut their stories. Producers can access either application from their desktop, while simultaneously working with our Avid iNEWS Newsroom Computer System.

Three QEdit Plus systems, working with the high bit-rate media, occupy the edit rooms and offer all the effects you expect with a finishing system.

Each night we transmit multiple versions of the program and produce Web editions directly from the server. Even though we had an aggressive startup timetable, we've encountered very few problems with the system and the support and training has been excellent.

Purchasing the Newsbox has been a good business move. We are able to help produce a high quality newscast while operating much more cost effectively for our client.

Chris Edwards is director of consulting services for Team. He has more than 16 years experience in television and post production, and has been with Team for seven years. He may be contacted at cedwards@teamgroup.tv.

For additional information, contact Quantel at 703-448-3199 or visit [www.quantel.com](http://www.quantel.com).



## USER REPORT

# DNF Controllers Support Cincinnati Reds

by Russell Jenisch

Director of Scoreboard Operations  
Cincinnati Reds

## CINCINNATI

The Cincinnati Reds of Major League Baseball moved from Cinergy Field to Great American Ball Park in 2003. The new stadium, located on the winding banks of the Ohio River in downtown Cincinnati, is designed to pay tribute to the rich history of the Reds, baseball's first professional franchise, and to provide fans with a memorable experience and great view of the game.

## UPGRADES WITH MOVE

The move of the team to this new park gave us the opportunity to upgrade the systems we use for scoreboard operations. Within the new scoreboard control room, on the press level of Great American Ball Park, we put together the big screen show for game-day presentations, which fans see on a Daktronics ProStar video board positioned over center field. Located next to the stadium's main scoreboard,



The DNF Controls ST400 is part of the game clip playback package used by the Cincinnati Reds at Great American Ball Park.

the video board measures 27-by-49.9 feet and provides crisp color video.

We implemented DNF Controls systems in the new facility to enable rapid and accurate clip play-out during Reds games. The systems were familiar to me—as they are to most anyone who has been a freelance director in live sports—and I knew that we would be

able to navigate around them easily and comfortably even in this fast-paced environment. The DNF Controls Shotbox allows us to preload up to 300 different video clips from our server. It gives me single-button recall for elements such as batter head shots, sponsored elements, crowds chants, highlights, movie clips, and other context-specific material. With just the push of a button, I can cue up and play any one of these clips. It's painless, and the fact that I can play out clips almost instantly allows us to provide fans at the park with a tighter, fresher, more energetic show.

The DNF Controls ST300 and DMAT-O sports controllers are also part of our game-day show. One operator works with two ST300 controllers for instant replays. Each ST300 system gives the operator the ability to store and recall up to 100 cue points quickly and easily. System setup and clip play-out are configurable, so we've been able to optimize the system to meet our preferences.

The DMAT-O consists of DNF's most robust controller, the ST400, equipped with sports control software. Our system is linked to our Profile XP to enable replays on the big screen and to simplify building of clip sequences or segments that can be triggered with a single button push. The combination of the DMAT-O and Profile XP allows us to record live action and play-out clips—archived or just-recorded—at the same time using four record and two playback channels.

During the past four years, the DNF Controls systems have been dependable and consistent, with no down time. They've been battle-tested in 81 or more home games each season, and I have confidence that they'll perform well for us for a long time.

Russell Jenisch is director of scoreboard operations for the Cincinnati Red baseball team. He may be contacted at [rjenisch@reds.com](mailto:rjenisch@reds.com).

For additional information, contact DNF Controls at 818-898-3380 or visit [www.dnfcontrols.com](http://www.dnfcontrols.com).

## USER REPORT

## Students Excel With 360

by Rodney Verrill

Executive Director of Video  
Production  
New England School of  
Communications

## BANGOR, MAINE

The New England School of Communications is a 25-year-old college granting associate and bachelor's degrees in communications. Students can concentrate in video production, audio engineering, digital media, radio, sports broadcasting, broadcast journalism or advertising, public relations and marketing.

## SDI &amp; ANALOG

We have a fully operational digital television facility with production control and master control rooms, as well as studios and edit facilities with 45 digital editing work stations and 13 Final Cut Pro edit suites. Our campus cable station runs 24/7 and periodically sends feeds to the Time Warner Cable system throughout the state.

We bought our first 360 Systems



Rodney Verrill

Image Server 2000 as soon as they were being shipped. At that time, no other company could match the flexibility and price these servers offered. We use the Image Server to run the campus cable channel.

It handles our newscasts, sports shows and integrates graphics for our studio plasma displays. As we transitioned our facility to a completely SDI plant, the Image Server distributed analog as well as SDI simultane-

ously. It really helped us reduce the cost of buying conversion gear.

Recently we purchased another Image Server—the MAXX—to handle the operation of our campus network. Going beyond the Image Server's capabilities and affordable price, 360's customer service is second to none.

We're a small private college and engineering cost issues are a concern. The 360 people have been only a phone call away, answering our questions and offering prompt solutions to our concerns. To respond with that level of one-on-one attention is unheard of. I can't say enough about their customer service.

Our ENG crews shoot directly to hard drive, we edit on a nonlinear system and the file is transferred over

the network to the Image Server. This allows us to teach our students where the industry is headed. We need to be on the cutting edge, not the bleeding edge. We want our students to be trained on the latest systems, but not on equipment that's not in a typical workplace. That's the case with our Image Servers.

## PLACEMENT RATE

Our student placement rate for industry jobs is about 74 percent. We're placing students all over the country—in traditional TV jobs, with Internet companies and in independent production houses. We're training them for a wider scope of video production and Internet-based jobs that just didn't exist 15 years ago. We're always expanding—now we're building a remote production facility that will need another Image Server.

Rodney Verrill is the executive director of video production for the New England School of Communications in Bangor and has 20 years of experience within the industry. The opinions expressed are those of the author alone. He may be contacted at [rod@nessie.nescom.edu](mailto:rod@nessie.nescom.edu).

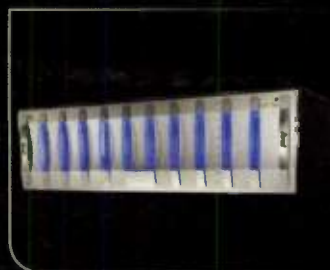
For more information, contact 360 Systems at 818-735-8221 or visit [www.360systems.com](http://www.360systems.com).





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USER REPORT

# Discovery Resources Chooses AheadTek

by Matthew Walter

Owner and President  
Discovery Resources

BRISBANE, CALIF.

**D**iscovery Resources operates a production studio, as well as brokers new and used equipment to our worldwide broadcast and professional customers. We use AheadTek products to keep both our studio tape machines and our customers tape machines up and running. AheadTek has the best heads available in terms of quality, pricing and durability.

## KEEPS RECORDERS GOING

Our production facility, Catapult Studios, is located near San Francisco, and offers extensive capabilities and services, including a live digital SD and HD video/audio studio, online and offline video editing and graphic creation, as well as complete multi-track audio recording with multiple sound isolation rooms and soundtrack composition and mixing. We use both

multichannel digital disk recorders and tape-based video and audio decks of various formats. We use AheadTek to make sure the videotape decks are up and running with quality functioning heads.

Discovery Resources also handles the brokering of used broadcast video equipment, purchasing surplus equipment from our broadcast and professional customers. To keep our clients happy, we have to make sure the equipment we sell is functioning correctly.

Of course, this wide range of equipment includes VTRs of all kinds. AheadTek has been, and continues to be, instrumental in providing only top-notch quality heads for these machines. They are also consistently working with our "we need it here yesterday" kind of requirements, time and time again.

## NEEDED EXTRA SERVICE

I remember when I first contacted AheadTek, and was directed to Pat Johnston. We had a special situation in which we needed not only to purchase

some replacement heads for a Sony BVW-70, but also to know which of our studio's DigiBeta heads was the new spare and which was the used one.

We sent these heads along with the Sony BVW-70 Betacam SP deck to AheadTek. Pat Johnston took care of having the DigiBeta heads checked for remaining head life, as well as having AheadTek technicians replace the heads and adjust the tape path in our BVW-70 deck. This was a terrific help to us at the time, as we needed all our engineers at that moment for customer equipment servicing. I was very impressed that they went out of their way to perform for a brand new client, services beyond what they normally offer, and executed them professionally and quickly. We continue to rely on them, and I would highly recommend AheadTek as a cost



Matthew Walter

effective and service oriented supplier for VTR spare parts.

*Matthew Walter is the owner and president of Discovery Resources, established in 1994. Walter has been in the equipment brokering business for more than 20 years. He may be contacted at [mw@discoveryresources.com](mailto:mw@discoveryresources.com).*

*For additional information contact AheadTek at 800-971-9191 or visit [www.aheadtek.com](http://www.aheadtek.com).*

## BUYERS BRIEFS

The BK-2500 from **Baystor** is a stream based hard drive recorder/player that has an integrated DVD recording deck. It supports SDI, composite, Y/C and DV25 video formats and can convert raw A/V files to and from DV 25 files.

The unit features a real-time MPEG-2 encoder and programmable recording and playback. It offers proc amp control for input and output video.

The BK-2500 allows archiving of A/V material with embedded VBI information including closed captions and SMPTE timecode, with such information written to DVD recordings produced. It provides both RS-422 and TCP/IP LAN control of both recording and playback functions.

For more information, contact Baystor in the United States at The Karden Group Inc. at 813-645-8599 or visit [www.baystor.com](http://www.baystor.com).

The Sport from **BUF Technology** is a combination replay controller/video server that is contained in a tabletop package.

The unit features a 120 GB hard drive that provides nearly eight hours of recording time.

The Sport uses Motion JPEG compression, with a compression rate that can be varied between 4:1 and 20:1. It has inputs for composite and Y/C video and can be optionally equipped for SDI. Audio inputs accept balanced stereo signals.

The Sport operates with or without an external reference signal and has two separate two-line LCD status and control screens. The internal logic structure allows users to set up to 1,000 cue points.

It occupies no rack space, as it is self-contained, with the exception of the 12 V power supply.

For more information, contact the BUF Technology at 858-451-1350 or visit [www.buftek.com](http://www.buftek.com).

The BR-DV6000BU from **JVC Professional Products Co.** is a Pro DV video recorder/player that is compatible with full size and MiniDV tapes and operates in both PAL and NTSC standards. It has an front panel 2.5-inch LCD monitor for displaying video, time code and various status indications.

The machine is designed for compatibility with a full range of nonlinear editing systems, with both

IEEE-1394 and RS-422 machine control capabilities.

The BR-DV6000BU also has special circuitry (digital automatic error correction) that allows it to play back DV and DVCAM tapes of varying quality levels, even tapes that are out of spec due to worn heads or misaligned record transports.

With the optional SA-X65U card, the BR-DV6000BU can provide an SDI output along with embedded or discreet AES/EBU.

For more information, contact JVC Professional Products Co. at 800-852-5825 or visit [www.jvc.com/pro](http://www.jvc.com/pro).

The AV61 from **Hotronic** is a video recorder with removable/interchangeable recording media. It can record up to 10 hours.

The AV61 supports both SDI and analog NTSC/PAL signals and also provides four channels of audio recording with more than 80 dB of signal to noise ratio.

It can provide simultaneous analog and digital video playback signals and has a built-in time code generator.

The AV61 offers RS-422 remote control and GPI capabilities and

stores and passes vertical blanking information such as closed captioning and VIT information.

It accepts digital audio inputs at four different sampling rates.

For more information, contact Hotronic, Inc. at 408-378-3883 or visit [www.hotronics.com](http://www.hotronics.com).

The DSR2000A from **Sony Electronics Inc.** is a DVCAM editing recorder with i.LINK interfacing. It is designed to support all DV format recorded tapes, including those recorded in LP mode and can play DVCPRO tapes without an adapter.

The machine provides preread editing capability, allowing editors to execute a visual transition with effects between two VTRs, as well as audio mixing and channel swapping.

The DSR2000A has a built-in jog/shuttle dial to facilitate two-machine editing and incorporates a standard RS-422 remote control interface.

The VTR is also capable of four-channel independent audio editing.

For more information, contact Sony Electronics Inc. at 201-930-1000 or visit [www.sony.com/professional](http://www.sony.com/professional).



# EQUIPMENT EXCHANGE

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TV Technology's Equipment Exchange provides a FREE listing service for all broadcast and pro-video end users. Brokers, dealers, manufacturers and other organizations who sell used equipment on an occasional basis can participate in the Equipment Exchange on a PAID basis. All free listings run at the discretion of the publisher. Call 1-703-998-7600 for details. Submit your free listings on your letterhead and state the make, model number, a brief description, sale price and complete contact information and mail it to: TV Technology, PO Box 1214, Falls Church VA 22041

## AUDIO PRODUCTION

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46	Canare Corp of America	<a href="http://www.canare.com">www.canare.com</a>	44	Pineapple Technology, Inc.	<a href="http://www.ptibroadcast.com">www.ptibroadcast.com</a>
45	Cobalt Digital	<a href="http://www.cobaltdigital.com">www.cobaltdigital.com</a>	58	Production Hub	<a href="http://www.productionhub.com">www.productionhub.com</a>
44	Compuvideo Co., Ltd.	<a href="http://www.compuvideo.com">www.compuvideo.com</a>	44	RF Central LLC	<a href="http://www.rfcentral.com">www.rfcentral.com</a>
31	Digital Broadcast, Inc.	<a href="http://www.digitalbcast.com">www.digitalbcast.com</a>	45	RF Central LLC	<a href="http://www.rfcentral.com">www.rfcentral.com</a>
29	DMT USA, Inc.	<a href="http://www.dmtonline.us">www.dmtonline.us</a>	43	Riedel Communications	<a href="http://www.riedel.net">www.riedel.net</a>
41	Doremi Labs, Inc.	<a href="http://www.doremilabs.com">www.doremilabs.com</a>	13	Sony Broadcast & Professional Group	<a href="http://www.sony.com">www.sony.com</a>
27	DTV Innovations, LLC	<a href="http://www.dtvinnovations.com">www.dtvinnovations.com</a>	20	StreamBox	<a href="http://www.streambox.com">www.streambox.com</a>
38	Electronics Research, Inc.	<a href="http://www.eriinc.com">www.eriinc.com</a>	49	TBC Consoles	<a href="http://www.tbconsoles.com">www.tbconsoles.com</a>
59	Evertz Microsystems Ltd.	<a href="http://www.evertz.com">www.evertz.com</a>	30	Tekserve	<a href="http://www.tekserve.com">www.tekserve.com</a>
33	Frezzolini Electronics	<a href="http://www.frezzi.com">www.frezzi.com</a>	11	Thomson/Grass Valley	<a href="http://www.thomsongrassvalley.com">www.thomsongrassvalley.com</a>
28	Hamlet Video International Ltd.	<a href="http://www.hamlet.us.com">www.hamlet.us.com</a>	7	Troll Systems Inc.	<a href="http://www.trollsystems.com">www.trollsystems.com</a>
60	Harris Broadcast Communications Division	<a href="http://www.harris.com">www.harris.com</a>	44	Videoframe, Inc.	<a href="http://www.videoframesystems.com">www.videoframesystems.com</a>
44	Hoodman Corporation	<a href="http://www.hoodmanusa.com">www.hoodmanusa.com</a>	15	Vinten, Inc.	<a href="http://www.vinten.com">www.vinten.com</a>
32	K5600, Inc.	<a href="http://www.k5600.com">www.k5600.com</a>	26	Wohler Technologies	<a href="http://www.wohler.com">www.wohler.com</a>
1	Leitch Inc.	<a href="http://www.leitch.com">www.leitch.com</a>	45	Xintekvideo, Inc.	<a href="http://www.xintekvideo.com">www.xintekvideo.com</a>

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# TV TECH BUSINESS

## Granite Files to Reorganize and Go Private

NEW YORK

Granite Broadcasting followed through on an anticipated bankruptcy, voluntarily filing for Chapter 11 reorganization last month.

The petition, filed in United States Bankruptcy Court for the Southern District of New York, included a plan already negotiated with the company's secured debt holders that will take Granite private, the company said. Granite owns and operators and/or manages 23 stations in 11 markets, covering approximately 6 percent of U.S. TV households.

In November, the company warned that it may have to file for reorganization in light of a cash shortage of \$90 million on payments due in December.

In its most recent quarterly report to the Securities and Exchange Commission, the company said it had a \$19.7 million interest payment and a \$70 million loan payment due Dec. 1, while its cash position amounted to a little more than \$18.2 million, with an accumulated deficit of about \$514 million.

Granite markets include San Francisco and Fresno, Calif.; Detroit, Mich.; Buffalo, Syracuse, Utica, Binghamton and Elmira, N.Y.; Fort Wayne, Ind.; Peoria, Ill.; and Duluth, Minn.-Superior, Wis. The stations are affiliates of NBC, CBS, ABC, CW and

MyNetwork TV.

Regarding the bankruptcy filing, Granite Chairman and CEO W. Don Cornwell said, "We have been candid about the company's need to restructure its corporate balance sheet. In that regard, we explored a wide range of alternatives, including the sale of stations formerly affiliated with The WB Network in San Francisco and Detroit.

"Our ability to sell those stations on an acceptable basis was directly impacted in January 2006 by The WB Network's announcement that it would cease operations. This unexpected and damaging decision forced us to seek other alternatives."

The restructuring is expected to be completed in the first half of 2007.

## Tampa Microwave Acquires New Product Lines

TAMPA, FLA.

Tampa Microwave has acquired the spectrum analyzer, carrier monitoring and signal intelligence receiver assets of Morrow Technologies Corp. of St. Petersburg, Fla.

The deal includes intellectual property, trademarks and capital equipment associated with the SIGINT and spectrum analysis/monitoring products have become the property of Tampa Microwave, who is owned by E2G Partners LLC of Tampa, Fla.

"MT's expertise in RF microwave design and DSP-based signal processing and analysis creates opportunities for new products that blend the best technology that Morrow and Tampa Microwave have to offer," said Eric Guerrazzi, managing director of E2G Partners LLC and president of Tampa Microwave.

Morrow Technologies Corp. will continue doing business with its Janus Digital Displays product line under the direction of its president, Sharon Morrow.

## Panavision Supplies Panasonic

SECAUCUS, N.J.

Panasonic Broadcast Audio has inked a deal to supply more than \$2 million in high-definition products from Panavision and Deluxe Entertainment Services Group through 2007. The agreement includes cameras, recorders, production monitors and plasma displays.

"In the past few years, we have seen Panasonic products reach into 'film-style' television production, one of our core businesses," said Bob Beitcher, president and CEO of Panavision. "As HD origination expands around the world, it makes logical business and technology sense for Panavision to offer a range of Panasonic equipment to our customers."

Both tape-based and P2 storage technology will be part of the equipment package, and monitors will include a range of LCD technology sizes, as well as Panasonic's 65-inch plasma display.

## Ciprico Names New President and CEO

MINNEAPOLIS

Ciprico Inc., a data storage provider based in Plymouth, Minn., has appointed Steven D. Merrifield as its new president and CEO.

Merrifield replaces James W. Hansen, Ciprico's chairman of the board of directors who has served as CEO since September 2004. Hansen will remain chairman.

Merrifield most recently was senior vice president of Hitachi Global Storage Technologies, where he was also a member of the executive committee and board of directors. Prior to joining Hitachi, Merrifield was a senior executive at IBM.

## Chyron Partners To Create Mobile TV Software

MELVILLE, N.Y.

Chyron has partnered with Los Angeles-based Madison Road Entertainment to launch a new advertiser-supported mobile TV software suite and Web-based platform in 2007.

The companies said the partnership was formed to address an increasing demand for multiple media content delivery systems, as the traditional audiences that advertisers target spend more time out of home and connected to new forms of content delivery.

Both companies agreed to develop and market a series of software application tools that will connect advertisers with viewers through various devices and networking protocols including cell phones, out of home networks and the Internet.

Chyron will offer the Web-based services solution to these emerging markets through its business unit, ChyTV.

## Harris Hits \$100 Million in Satellite Antenna Orders

MELBOURNE, FLA.

Harris Corp. has reached the \$100 million mark in antenna orders for commercial satellites during 2006.

The unfurlable mesh antennas have been ordered by satellite manufacturers in both the U.S. and Europe and are used on satellites to transmit voice, radio and television broadcasts worldwide.

The Harris antennas feature a reflective, gold mesh surface and are stowed much like an umbrella for launch. In orbit, they deploy to form a large aperture with adequate surface area to enable communications with even the smallest of handsets, according to the company. The antennas cover L- and S-band frequencies.

Russ Haney, president of national programs at Harris Government Communications Systems Division, said the company is supporting more and more commercial ventures that are providing diverse communications services ranging from satellite radio to mobile telephony and emerging mobile video.

The company employs about 14,000 people, including 200 engineers who support its spaceborne unfurlable mesh antenna programs.

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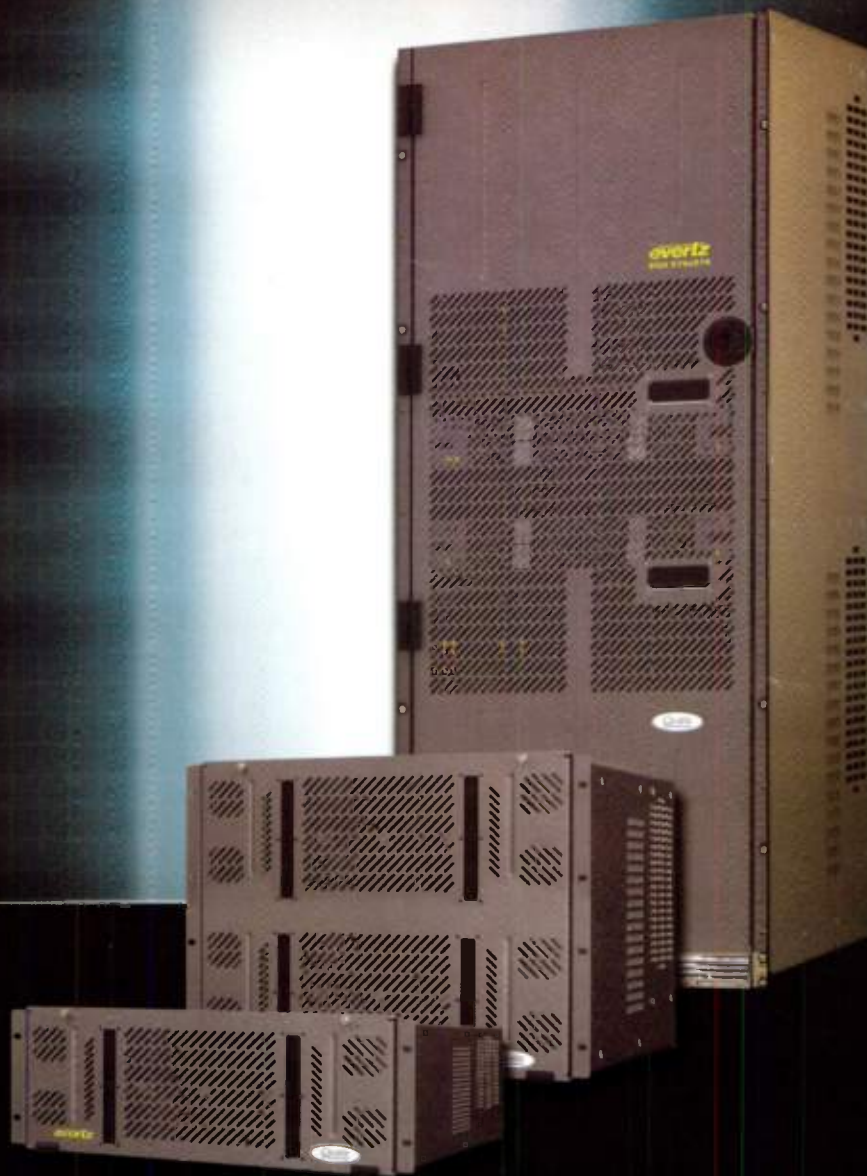
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