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WHAT'S INSIDE

Some Time in 2009

House and Senate bills proceed

by Deborah McAdams

WASHINGTON

Analog TV broadcasting will end in 2009. Just when in 2009 depends on the compromise hammered out between the House and Senate DTV bills.

The Senate bill ends NTSC signals April 7, 2009, after college basketball championship games. The House version cuts power at the crack of Jan. 1, 2009, when two of the biggest games in college football are scheduled—the Orange and Rose Bowls.

The respective bills should reach the House and Senate floors as part of budget reconciliation packages around the time this magazine hits the street. A conference committee will subsequently work out the differences.

Besides setting disparate hard dates, each bill allocated different sums for converter box subsidies, digitizing translators, emergency communications and even when to commence spectrum auctions. The House bill denotes Jan. 7, 2008; the Senate bill starts them three weeks later.

D2A CONVERTER SNIT

Both bills subsidize the digital-to-analog converter boxes necessary for NTSC receivers to continue working after the shutoff. However, where the Senate simply earmarked $3 billion for a program, the House got down in the weeds, parsing out $990 million for boxes, administrative costs and "consumer education."

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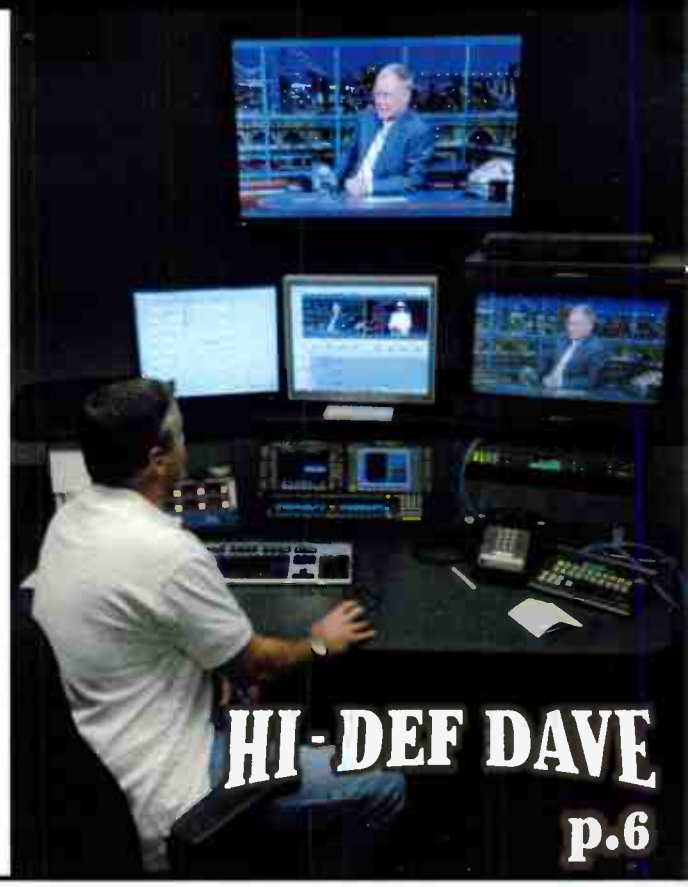

Getting Serious About Mobile TV

Competition heats up for the small screen

by John Merli

WASHINGTON

A mobile TV wholesaler from down under with the unconventional moniker of Crown Castle is hoping that size matters—and the smaller the screen, the better. Mix in Apple's recent launch of its latest iPod music player that comes with its own set of tiny-TV options and EchoStar's introduction of its handheld PocketDish media player, and suddenly the competition for the small screen just got a whole lot more interesting. Now all everybody needs is users.

EchoStar's PocketDish

BAPTISM UNDER FIRE

Crown Castle Mobile Media, the low-key company's U.S.-based wireless unit, owns its own towers and serves as a conduit (in more ways than one) to various carriers, providing cell firms—which already provide more typical services such as voice, cameras, and now music downloads—with the latest add-on derived from the second-oldest of all electronic media: television.

Crown Castle's DVB-H (digital video broadcasting-handheld) technology is now undergoing its first real baptism-under-fire with consumers in the Pittsburgh market, near Crown


Apple Video iPod

MOBILE, PAGE 24

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Inside Production

It's the end of a long, hard day at a small production company, and a wave of tribulations washes me out to dreamland. The old steam-powered Mac in Edit Room Four took five hours to compress a four-minute program. A faulty patch deleted the blue channel... p. 32

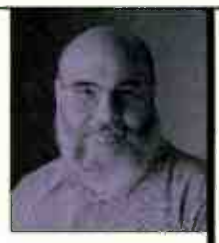
Doug Lung

RF Technology

Last month, I looked at the technical arguments in the debate over how to determine whether a household can receive a local network affiliate's DTV signal and thus is not allowed to receive a distant network DTV signal via satellite. This month... p. 33

Andy Ciddor

Let There Be Lighting



After a year as a lowly studio lighting technician, when I was finally admitted upstairs into the inner sanctum of the control room, I was impressed by all of the consoles, monitor bays and oscilloscopes that belonged to the video engineers. At the time... p. 35

FROM THE EDITOR

A Date for Digital

How many of you have attended a session or meeting where the moderator asked those in attendance when they thought the analog signal would be shut off? If you have, you know that no one ever said it would be 2006; the optimists among us opted for a date around 2010 or so, the pragmatists suggested 2015, while the pessimists, of course said "never."

Well, now Congress has pinpointed the date of the analog shutoff down to a four-month period between January and April 2009. The press has characterized the dates to coincide with significant broadcast events: The House version of the DTV bill wants to end analog broadcasts after the completion of particular college bowl games on New Year's Day; the Senate version sees the NCAA basketball finals in April as analog's last gasp. Both involve significant revenues from broadcast rights. (Did anyone note, however that the proposed shutoff dates coincide with the beginning of a new Congress, after the next presidential election? Perhaps the politicos know something we don't.)

Whatever. Now the date has been clarified. In the past, such efforts to secure a hard deadline were met with skepticism, but this time it's different; with NAB's agreement to a 2009 deadline last summer, the path has been cleared for a final analog shutdown.

Against this backdrop, the rush is on for broadcasters and the cable interests to make their case for (and against) multicast must-carry and other assorted loose ends that will need to be addressed. It's no secret that apart from the analog-to-digital converter issue, multicast must-carry is priority #1 for broadcasters, and rightly so. The House version of the DTV bill deals a significant blow to broadcasters by allowing cable operators to downrez high-definition programming. Perhaps this is a precursor to the must-carry battle, but whatever the outcome, allowing cable operators to downrez HD material could be a disaster for HD.

The arrival of a successor to outgoing NAB President Eddie Fritts coincides with the hopeful resolution of (some) of these outstanding issues. Regardless of the successes Mr. Rehr may have had in his old job, the broadcast industry has changed drastically since NAB last had a new president, and we wish him all the best in helping the industry take its final steps into the digital age.

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

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

Not Ready for Primetime

Dear Editor:

I feel that I must respond to the letter you received in the Sept. 21 issue of **TV Technology** ("Nearly Full") challenging your use of the word "dire" to describe the current state of DTV. I think it was best word you could have used and I feel that many have voiced in many ways the problems that still exist.

DTV is largely a manufacturer-driven concept (follow the money!) that attracted much support from people who stood to benefit from it. Engineers and consumers I have talked to still have many basic questions. I live in south Florida where we have an occasional hurricane. Many times we have to rely on over-the-air radio and portable analog TV receivers when we lose power and with it, our cable TV. I have not seen a lot written about small DTV receivers to fill this need. Stations in our area do a wonderful job covering natural disasters. Where would I go to buy a handheld comparable to my analog one? Would the batteries last as long? I suppose I could connect a set-top box to my small TV, but come on!

A lot has been written about copy protection, (broadcast flag etc.). As I have commented before, "If a picture and audio can be displayed, it can be copied, period." The answer is enforced copyright laws or is that too easy?

As far as the transition, the problem is, how are we to force DTV on the poorer people who cannot afford a new set and those that cannot receive a strong signal? Few state the real problems but the hints are there.

As a retired broadcast engineer with almost 50 years in the business, and one term on the SMPTE Board of Governors I have no irons in the fire. Don't get me wrong, digital has a lot to offer—someday. Frankly I don't think DTV is ready for primetime. "Dire" is too soft!

David A. Ginaven
Boynton Beach, Fla.

'Bugged' About It

Dear Editor:

In the article, "On the 'Cutting' Edge of MPEG-2," (August 3, 2005), Claudia Kienzle quoted Andrew Steele: "Fox is also using the BP5100 for channel branding, for example, inserting the local station's bug over the national logo bug without leaving the the MPEG-2 domain."

If that were true, the lower-right corner would look like crap, i.e., the Fox white transparent bug and on top of that the local affiliate bug. Ouch! Those damn bugs are bad enough, but to have two at the same time?

Nope, the Fox bug is not sent out during most programming. The feed is actually clean (I'd love to be able to record that feed). They control the insertion of the local bug. During programs like "American Idol," the Fox bug is applied in L.A. and the local bug is not inserted.

As to why that program has to have the network bug is beyond me. Until earlier this year, the local affiliate bug was in the wrong location. It was too far left and too far up. I had been complaining for a while but was told that Fox controlled it and that nothing could be done. That was until I got my hands on the Fox bug location spec and pointed it out to both Fox and the local station. Within 48 hours a new bug was created and correctly placed into the splicer. I guess the local station never really looked at the spec to verify that the placement was correct, since Fox has no idea if they goofed it, unless the station tells them.

Personally, bugs and snipes should be outlawed. With DTV, the viewer knows what station they are watching, as the receiver tells them. The need for those damn crappy bugs is over.

Mike Brown
Madison, Wis.

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HD Move Puts Letterman Team on the Curb

Production was tethered to a truck during renovation

by Deborah D. McAdams

NEW YORK

For the average visitor, the northwest corner of 53rd and Broadway is most notably the home of Rupert Jee's Hello Deli, the sandwich joint cum set piece of the "Late Show with David Letterman." To Howell Mette, vice president of engineering at CBS Broadcasting, this stretch of side street represents the show's recently completed transition to hi-def.

The Hello is around the corner from the Ed Sullivan Theater, home of the Letterman show for the last 12 years. Gesturing toward general bustle in front of Rupert's, Mette conjures the specter of the 53-foot Game Creek expando that served as the "Late Show" control room while the TV infrastructure inside the building was torn to smithereens.

"The truck was parked here from late March to August," Mette said. "CBS cut to the truck in April during NAB."

Four months later on Aug. 29, the show made its hi-def debut in 1080i.

Going from standard to high definition is a fairly common occurrence nowadays, but each conversion has unique demands. With Letterman, the show had to continue uninterrupted in a gutted facility.

"Other productions may have moved," said Jerry Foley, producer and director of the "Late Show." But Letterman is a performer, he said, "who's very dependent on his surroundings. It would be unfair to him to upset that for technical needs."

Foley said the CBS engineering team "got it." They brought in a truck and moved the production crew to the curb—after some serious planning.

POINT A TO POINT HD

Mapping out the logistics for the $20 million project began in 2002, when CBS bought three Canon-equipped Ikegami dual-mode HDK-790Es and eight HDK-79E handhelds. At the time, the network downplayed the notion that a move to HD was imminent. The purchase was referred to as "future proofing," while other factors were weighed—chiefly, how to convert the production plant in a 76-year-old officially designated landmark. The Ed Sullivan Theater, built in 1927, was first renovated to accommodate the "Late Show" in 1993. To convert Letterman to hi-def, the building was retrofitted with fiber, from the control room in the basement to the editing suite on the seventh floor.

"The plumbing had to be cleared out of the shaftway to get it done," Mette said.

While the control room was taken down to cinder block, production continued in the Game Creek mobile unit, which was conjoined to the seventh floor with an unearthly umbilical of coax.

Meanwhile, the basement space comprising an employee lounge, the control room, audio and videotape—roughly the size of a two-bedroom apartment—was reconfigured. The wall of the videotape room was moved three feet, apparently ending the necessity of sliding into the space sideways. A small employee lounge was converted to accommodate lighting and video control. A new Calrec Alpha 100 was installed in the audio room in anticipation of doing 5.1 at some point next year.

Upstairs, the editing room itself was temporarily moved. Mark Spada, supervising editor on the "Late Show" prefers the spacious new suites.

"We were in a closet for three months," he said. "We worked back-to-back. It was guerilla editing."

While the new arrangement is a bit more civilized, it also represents the most dramatic shift in the workflow. The show was previously live-to-tape and cut to time. It's now ingested into an Avid Unity system and cut on an Avid Nitris DS.

"We were in a closet for three months. We worked back-to-back. It was guerilla editing."

—Mark Spada, "Late Show"

"The nonlinear conversion was the biggest change," Foley said. "We were cutting tape before. The advance has been in our ability to edit faster and turn around video during the show. When Dave throws a pencil and it gets stuck in a wall we can replay that instantly."

ON THE STREET

The show itself is a montage of such signature spontaneous moments and prerecorded segments like "Guess What's Under the Robe," where an innocent bystander was challenged to identify a large lump under a justice's robe worn by Rupert the deli owner. (It was four pounds of raw bacon.)

CBS engineers put A/V boxes throughout the building for doing offstage segments. The Hello has a box right outside; there's another on the roof to catch big street tricks, like the guy who flipped a snowmobile on

A view of the production switcher and virtual monitor wall from behind the technical director in master control.

53rd. There are a total of 46 camera locations and 11 camera control units, all connected via a fiber-optic patch-bay designed by John Ferder, director of CBS studio and post-production systems engineering, and his crew.

The prerecorded material is ingested into Grass Valley Profiles configured with two channels for recording and six for playback. It's edited on eight Media Composer Adrenaline systems, also networked to an Avid Unity system. The Adrenalines, also used for iso camera edits, will be updated to Avid HD AirSpeeds in the first quarter of next year.

The Profiles are controlled from four DNF Controls shotboxes; three in videotape and one at Tim Kennedy's cockpit in the control room. Kennedy, technical director of the "Late Show," rides shotgun with Foley during the show at the helm of a Sony MVS8000 switcher that can route a signal five ways from Sunday. The console itself is made up of configurable modules, allowing Kennedy to put the functions he uses most within reach. Take the monitor wall controls…

The control room is dominated by three 70-inch Barco Solaris monitors driven by an Evertz MVP. Kennedy is no different than any other guy with a giant new TV, even though his are comparatively Testarossas. The transition here is from the channel dial to the remote. He no longer has to wander back in the racks and unplug something to change a monitor view.

In the course of the show, the production team has to be prepared for Letterman to request just about anything, from a U-matic clip to an on-the-spot graphic—created on Macs outfitted with Pinnacle Deko HD software. There are also 17 cameras available during the shoot, although seven are typically used. After Kennedy wrangles the multitude of sources into a coherent piece, Spada pulls it to do the final edit, which typically involves cutting to time.

Letterman tends to start and end on time, given, "it's Broadway," Foley said, relating Letterman's sentiment. "There are a lot of other shows people can go to. The band plays exactly at 5:30."

The live show begins at 5:30 p.m. Tuesday through Thursday. On Mondays, two shows are recorded; one at 4:30 p.m. and another at 7 p.m. for Friday.

On a good night, the editors will cut a few minutes, add bumpers and black slugs for commercial insertion. Working right behind Spada, another editor creates three copies on Sony HDCAM SR tape; two of which are carried over to the CBS Broadcast Center on West 57th. Eventually, the goal is to air the show from the production facility at the Ed Sullivan by feeding it to the Broadcast Center via fiber. An impromptu test run on Oct. 3 was successful.

Next up for CBS: "The Early Show." The A/V boxes in front of the General Motors Building at 5th and 57th, where "The Early Show" studios are located, has been wired with fiber for HD, Ferder said.

"The control room has to be out of service to go HD," he said. "We're looking at strategies for 'The Early Show,'" though no definitive date has been set. ■

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Sound Advice for Sports

HDTV, 5.1 demand better placement, more versatile mics

by Claudia Kienzle

HAMILTON, N.J.

As broadcasters migrate to HDTV and 5.1 channel surround for live sports, it's becoming especially vital for them to capture a variety of sounds—from game action to ambience—that they can mix into a rich soundscape.

The swish of the basketball into the net; golf spectators clapping at a great putt; the clatter of hockey sticks on the ice; and the quarterback calling a play are all sounds that help put the viewer into that environment for a better viewing experience.

"The ability to capture particular sounds in a very noisy sports venue boils down to the right choice and placement of microphones," said Steve Savanyu, market manager for broadcast, theater, and installed sound, for Audio-Technica in Stow, Ohio.

ACOUSTICAL TAPESTRY

Audio-Technica offers a range of microphones ideal for live sports, including the AT849 stereo boundary mic, which can be put on the glass at hockey games; while AT UniPoint Series miniature condenser mics can be hidden under sports apparatus or along the side lines.

Audio-Technica's high-end shotguns, including the AT4071a and AT4073a, have been designed to be relatively short compared to competing products on the market, yet they offer the same angle of pick-up and acceptance of a much longer microphone.

"This smaller size enables users to put the microphone on smaller cameras, as well as placing them in shots where they could be visible or a distraction to athletes," said Savanyu. Audio-Technica also offers stereo shotguns, the AT835ST and AT815ST, as well as the AT895 adaptive array microphone, capable of picking up desired sound at a distance while rejecting noisy ambient sound.

ENVIRONMENT MATTERS

When determining the type and placement of microphones, the first consideration is the acoustical environment at a particular sports venue, including noise levels, reverberation, and type of game sounds.

"For tennis or golf, you could use an omni-directional handheld microphone, such as our SM63, because the field of play is quiet. But, for NASCAR, where the ambient noise levels can exceed 120 decibels, an omni would be useless. For noisy environments, you need a unidirectional microphone like the SM58," said Tim Vear, senior applications engineer for Shure in Niles, Ill.

Another challenging acoustical environment is a swimming and diving venue where noise levels can exceed 100 decibels if spectators are clapping or yelling. "Because of all the hard surfaces around the pool, sound energy persists and bounces around the room, which essentially magnifies it," said Vear. "Again, a unidirectional mic is preferred in such a reverberant space."

For placing microphones near the sound event, such as under a base, or on the backboard, or inside the football players' helmets, Vear said you need a very small, durable microphone. "The challenge here is that condenser mics are small and sensitive, but not particularly durable," said Vear. "Whereas, dynamic microphones are larger and less sensitive, but they are more durable."

(R to L) Tim Pirrello, field producer/director of photography, of AMS Production Group interviews Eric Zeto, chief engineer for Paul Tracy of Forsythe Racing.

Shure's SM93 is a small, omnidirectional condenser mic that could be considered for this application. "And if rules don't allow you to place a microphone near the game sounds, then this is where you need a shotgun, such as our SM89, for long-distance pick-up with high ambient noise rejection."

CHASING THE RACE

Dallas, Texas-based AMS Production Group uses Sennheiser microphones for its reality TV show, "Race Car Driver," which follows racing champion Paul Tracy and his Forsythe Championship race team as they move between qualifiers, race events, race car pits, and parties on the worldwide Champ Car circuit. The series premiered on SuperStation WGN in September 2005.

"Racing is one of the toughest environments you can put microphones in," said Joshua Moore, AMS' production manager. "After testing microphones from many vendors, we found that the Sennheiser Evolution G2 Series gave us flexibility to cover fast-paced action with broadcast-quality sound; as well as high durability at a good price point." The Evolution G2 series includes SKP100G2 and SK100G2 body-pack transmitters and one ME2 Omni lavaliere microphone.

"We created custom rigs for our six transmitters to attach them to our Panasonic SDX-900 DVCPRO with four-channel audio tracks and DVX-100A mini-DV cameras. We also mounted the receivers on a T-bar so operators could capture sound and monitor the signals without holding microphone gear." said David Marks, AMS senior audio engineer.

AMS uses EK100G2 receivers, capable of 1,40 frequencies within a 36 MHz switching bandwidth for greater tuning flexibility.

Also in use are Sennheiser ME66 shotgun mics, with a highly directional, super-cardioid/lobar pick-up pattern for picking up desired sound in a noisy live environment. "Shotgun mics are ideal when we can't get close enough to the action," said Moore. "We can zoom in with our cameras, and put the shotguns closer to the sound source."

After introducing the ECM-678 top-of-the-line shotgun microphone at NAB, Sony Electronics brought out a more affordable model, the ECM-674, at AES. "While the ECM-674 is half the price, the characteristics of this microphone are similar to the ECM-678. The ECM-674 has a bit narrower frequency response so it's not going to extend quite as low or high; but yet the overall performance is still exceptional for the price range," said Paul Foschino, senior national marketing manager for Pro A/V products for Sony Electronics, in Park Ridge, N.J.

"When you zoom into a subject, you also want to capture the corresponding sound to support the video. These two new shotgun mics can also be affixed to poles and pointed in the direction the cameraman is shooting," said Foschino. "They have been designed to push your ability to capture sound a good distance from the camera, while rejecting noise from the sides of the microphones."

ENVELOPED IN SOUND

SoundField microphones, such as the SoundField Mark V, have a unique four capsule design that enables a single mic to capture all the ambient sound needed for mono, stereo, or surround sound mixes of 5.1 channels and beyond.

"You can place a single SoundField microphone between the crowd and playing field and pick up the entire 360-degree sphere of sound, without phase distortion," said Todd Peterson, marketing communications manager for Trans Audio Group, in Las Vegas, Nev. SoundField microphones are routinely used by the Premiere Soccer League, in the U.K. for live soccer broadcasts. Trans Audio Group is the exclusive U.S. importer of SoundField microphones. ■

Just Like Being There...

For live coverage of Fox Sports' "A" NFL games and NASCAR events, the choice and placement of microphones is critical to audio protection, especially for 5.1 channel surround sound.

"My philosophy for mixing and micing sound is different for each sport," said Fred Aldous, senior audio mixer for Fox Sports in Los Angeles. "For NFL, I put the viewer in the stands at the 50 yard line, keeping the sound of the action and announcers right in front of them, with an occasional camera mic to get them closer to the action. I also make 360-degree sound field with my crowd reaction mics so they also have the ambience of the crowd around them at all times."

For NFL, Aldous says that the complement of microphones includes two DPA 4006 omni-directional condenser mics; two DPA 4023 compact cardiod; and the Audio-Technica 825S for micing the crowd reactions and ambience for surround sound. Wireless mics include the DPA 4066 wireless headset for the field reporters, as well as the DPA 4061 miniature omni-directional microphones with a Sennheiser SK 250 to mic umpires.

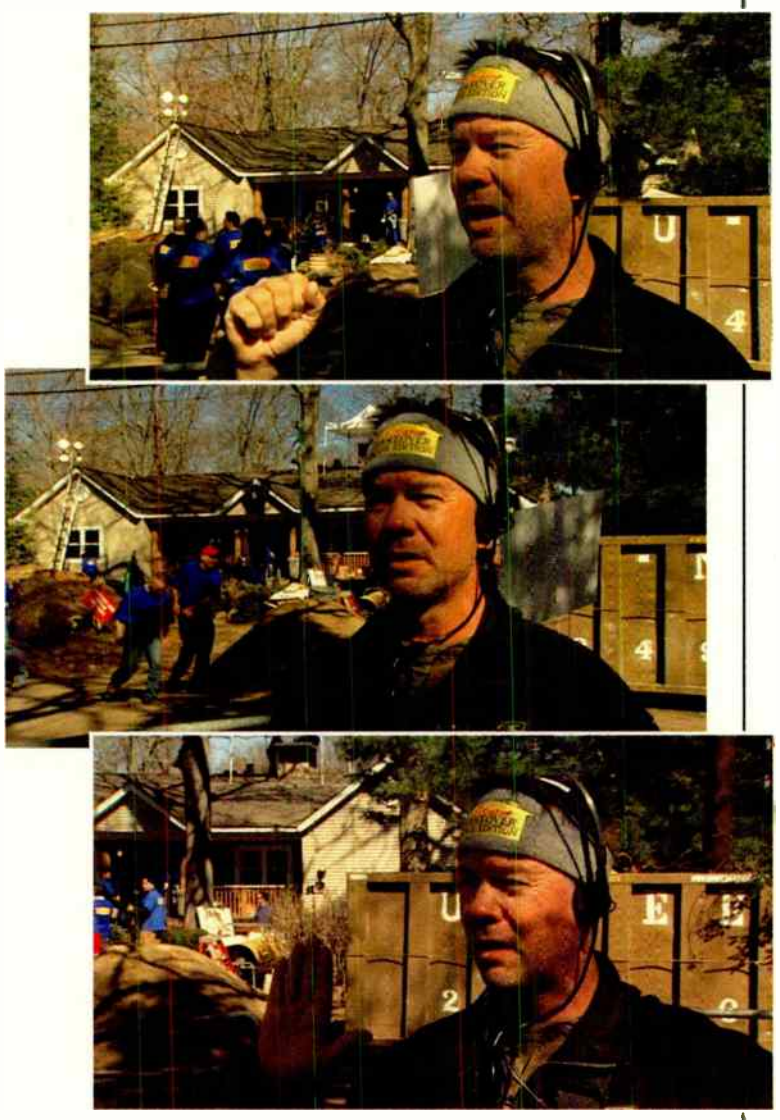
"For NASCAR, I mix the sound so that the perspective is consistent with the camera shot on the track, so that viewers can see and hear everything close-up," Aldous said. "I also make transitions between all of the mics and the roar mics, which are assigned in a 360-degree sound field, giving viewers the sensation of being at the track. Also, by panning the lead mics in the direction that the cars are moving, I can create the image in surround that the cars are actually zooming through the viewers' rooms."

For effects on the "speed shot" cameras, Aldous uses the DPA 4007, a high performance condenser mic for close micing, as well as the Sennheiser MKH 516s for crowd sounds.

Claudia Kienzle

SONY

THE NEW WAY TO PRODUCE.



File-based production: the new reality in reality TV.

The new way to produce is substantially faster and easier, according to Patrick Higgins, director of *Extreme Makeover: Home Edition*. "In nine days we shoot 350 hours to bring a 42-minute show together. So I'm a big proponent of anything like the XDCAM™ system that's going to make our jobs a lot easier."

"I love scrolling through the camcorder thumbnails to see a shot really quickly, then going from playback to recording instantly. Then there's no worry about backing up a tape or recording over footage. It's an amazing, practical advantage. The camera is also phenomenally fast. I'm seeing light levels that I can't see with my naked eye."

"We shoot in the rain; we shoot in the snow, below 30 degrees or 115 degrees. Also, when you're building a house there's all sorts of dust, dirt. We cannot wait for the environment to work with us. We have to work within whatever environment we're in. We've had zero problems with our XDCAM camcorders."

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Patrick Higgins,
Director of *Extreme Makeover: Home Edition*

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2009

CONTINUED FROM PAGE 1

Democrats on the House Commerce Committee agitated to the end to put more money toward D2A converters. At a markup session that lasted nearly eight hours, Reps. Ed Markey (D-Mass.) and John Dingell (D-Mich.) pushed amendments to send D2A vouchers to every household in the country, but the bills were shot down by majority Republicans. The final package provides for two $40 coupons to unspecified "qualifying" households until the D2A fund is exhausted, potentially leaving millions of consumers to fend for themselves.

"This bill will put pressure on a future Congress to move the date yet again," Markey said. "It represents an unconstitutional taking of private property without compensation. Thirty-million analog sets were sold last year; 18 million were sold this year. You're going to shut them off in three years?

"If someone came in and took the TV set you bought in 2006 for $500 and threw it out the window, you've have them arrested."

Rep. Fred Upton (R-Mich.) countered that 80 percent of TV households have cable or DBS, and a universal subsidy would just confuse people. Rep. Steve Buyer (R-Ind.) blasted Markey's "takings" argument and unsucessfully proposed eliminating the D2A subsidy altogether.

Of the $990 million ultimately designated to D2As, $160 million is for administration and education, leaving $830 million to pay for converters. That amount would cover all 20.8 million U.S. households that rely exclusively on over-the-air television (according to Government Accountability Office estimates) for one coupon, but not for two. The program is first-come, first-serve, with a one-year request window that ends the same day the bill shuts down analog transmitters—Jan. 1, 2009. All coupons will expire three months after being issued.

The bill defines a D2A as a relatively stripped-down box "that does not contain features or functions except those necessary" to receive and display DTV signals on an analog-only set. The language represents a "get" for the Consumer Electronics Association, which earlier scoffed over broadcast lobby efforts to establish D2A performance standards. The CEA also dodged a D2A power consumption constraint proposed by Markey, who conjured a cataclysmic draw on the nation's energy grid. Markey's proposal was dissed in favor of another by Rep. Mary Bono (R-Calif.) that set maximum standby D2A power consumption at 9 watts—about what current prototypes use.

The House bill also requires TV set makers to start labeling analog-only sets six months after passage:

"This television has only an analog broadcast tuner. After Dec. 31, 2008, television broadcasters will broadcast only in digital format. You will then need to connect this television to a digital-to-analog converter box or cable or satellite service if you wish to receive broadcast programming... etc."

Retailers will have to start displaying a similarly worded warning in stores 45 days after passage of the bill, and cable operators will have to include it in mailings.

Broadcasters will have to run twice daily PSAs on the analog shutdown, between 8 and 9 a.m., and 8 and 9 p.m. Committee chairman Joe Barton (R-Texas) indicated he's not married to the timeframe, and that it could be subject to negotiation in conference.

In conjunction with labeling, the bill moves the ATSC tuner mandate deadline for TVs bigger than 13 inches up to March 1, 2007, instead of the current end of '07.

CEA chief Gary Shapiro congratulated the committee for establishing a hard date but said nothing about the labeling requirement, the acceleration of the tuner mandate, or the stripped-down D2A clause.

DOWNCONVERSION OK'D

Cable won the must-carry battle in the House bill, which allows downconversion at headends. The bill provides for digital must-carry "without material degradation" on systems with capacity of at least 550 MHz through Jan. 1, 2014. Yet at the same time, it allows cable operators to carry high-definition broadcast signals in standard definition.

This was everything the cable lobby wanted, but National Cable and Telecommunications Association chief Kyle McSlarrow nonetheless characterized the requirement as a compromise.

"We are willing to make this significant concession expressly to facilitate Congressional action returning broadcasters' analog spectrum for important uses like public safety and to facilitate the consumer transition," McSlarrow said in a prepared statement.

Other allocations in the House bill include $300 million to digitize low-power TV stations and translators; $500 million for emergency comms, and $30 million for New York broadcasters who lost transmission plants on 9/11. New transmitters will be placed on the top of the planned Freedom Tower, but not until a year after the 2009 deadline. The New York funds were wrangled by Rep. Elliot Engel (D-N.Y.) in lieu of a deadline waiver for the New York stations.

Rep. Jay Inslee (D-Wash.) slipped in an amendment ordering the FCC to issue a Report and Order on unlicensed devices (ET Docket No. 04-186) within a year of the bill's passage. The FCC will also have to issue progress reports on TV channel assignments, which will be frozen between July 31, 2007 and Jan. 1, 2009.

SENATE SIDE

Because of parliamentary rules in the Senate, its DTV deadline bill included no details on multicasting, down-rezzing and public education. Sen. Ted Stevens (R-Alaska), chairman of the Senate Commerce Committee, said those items would be addressed in separate legislation.

Instead, the Senate bill consisted primarily of spectrum auction proceed allocations.

It designated (after the $3 billion D2A subsidy program) $200 million to digitize LPTV stations and translators; $1 billion for state and local communications interoperability; $250 million for a national alert and tsunami warning system established in the WARN Act; $250 million for enhanced 911; $200 million for hurricane relief; and $75 million for essential air service. These items, totaling $4.9 billion, are in addition to the $4.8 billion that must go into the Treasury according to budget reconciliation law.

Stevens did not mince words about what was driving the Senate DTV bill. Both the House and Senate are under the gun to come up with a combined $105 billion in tax and spending cuts. Thus Stevens was adamant at the committee markup session when other members tried to mess with his hard date.

Responding to a proposed amendment from Sen. John McCain (R-Ariz.) to roll the date back to 2007, Stevens said doing so would affect auction proceeds.

"We've asked the CBO about this... they said it will not raise the $4.8 billion required under budget reconciliation. And they told us 40 million digital converters would cost an additional $1.2 billion." Stevens urged his colleagues not to support McCain's amendment, and most did not. It was shot down 17-5.

Another amendment raised the initial amount going directly into the Treasury from $4.8 billion to $5 billion, meaning that $9.9 billion of the anticipated $10 billion in auction proceeds is spent. However, given that the private sector places the value of the spectrum closer to $20 million, the amendment also provided that any auction proceeds in excess of that $9.9 billion go into the Treasury as well. That amendment was approved, but not before Sen. John Kerry (D-Mass.) made a 20-minute play for the nonexistent funds.

During the same markup session, the committee approved of the WARN (Warning, Alert, and Response Network) Act of 2005. WARN directs the establishment of a national alert system across broadcast, cable, Internet, DBS, radio, cell phones and just about any other comms device short of two cans and a string. Another bill requiring the disclosure of video news releases was also OK'd.

Both bills will go the floors of their respective houses, and differences will be worked out in conference before a final package is passed. ■

Rehr to Lead NAB

David Rehr walks into NAB as its new president and chief executive officer Dec. 5. His choice was rumored for weeks before the NAB Board announced it toward the end of October.

Rehr is president and chief lobbyist for the National Beer Wholesaler's Association, a position he held since 2000. He succeeds Eddie Fritts, who led the NAB since 1982 and is considered to be among the most visible lobbyists on Capitol Hill.

David Rehr

The National Beer Wholesaler's Association represents more than 2,200 businesses that distribute malt beverage products.

Rehr is credited by some as being good at generating funds. He made the top lobbyist list this spring in The Hill, a newspaper covering Capitol Hill, which wrote, "Under Rehr's leadership, the beer wholesalers' political action committee has grown to be the fifth most generous in politics, doling out over $2.3 million in the last election cycle."

Rehr was senior vice president of government affairs at the NBWA before becoming president. Previously, he served as director for federal governmental relations, House, for the National Federation of Independent Businesses; he also worked for former Republican Rep. Vin Weber of Minnesota and as a staff member for the House Small Business Committee.

Fritts will continue to serve as a consultant to NAB through 2008.

Rehr pledged to aggressively promote broadcasters' interests on the Hill and at the FCC.

According to a summary released by NAB, in meeting with board members, Rehr said, "I know how to make a message simple to communicate with a busy policymaker. I know how to form lasting relationships with members of Congress and ask for support when I need it."

Leslie Stimson

An IT Bill of Rights.

A Guide for Broadcasters To No-Compromise, File-based Server/Storage Systems

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BAS Update

Working Together on the 2 GHz Relocation

Sprint Nextel outlines process for broadcasters, manufacturers

by Michael Degitz,
Vice President of the Sprint Nextel Global Initiatives and Spectrum Group

Editor's Note: The following column is the first in a quarterly series of articles from Sprint Nextel detailing progress on broadcasters' relocation to the 2 GHz BAS.

RESTON, VA.

On behalf of Sprint Nextel, I'd like to thank TV Technology for providing this space to share information and pro-gress on the 2 GHz relocation, an issue of great importance to many. Many of you know that the FCC has mandated 800 MHz band reconfiguration in order to eliminate 800 MHz public safety radio interference. This effort will eliminate radio interference at 800 MHz from commercial mobile radio service operators and provide the clearer communications police, fire and EMS need to serve and protect our nation.


Michael Degitz

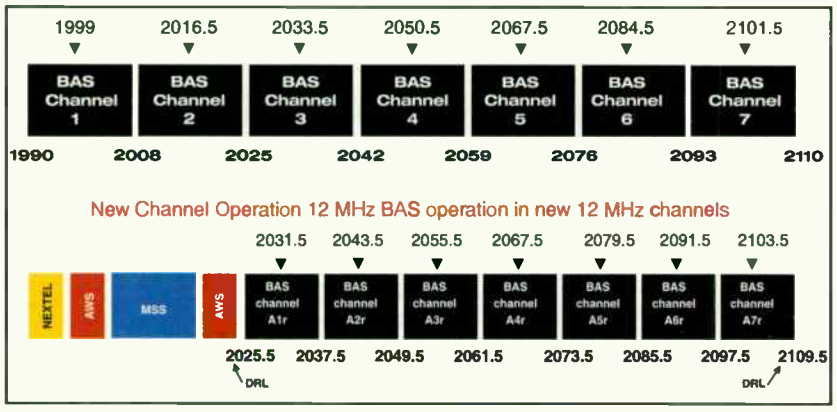
To make this possible, and in consideration for both returning 8.5 MHz of spectrum in the 700 MHz and 800 MHz bands as well as funding the 800 MHz band reconfiguration, Sprint Nextel was allocated 10 MHz of spectrum, 5 MHz of which the FCC had originally licensed to certain Mobile Satellite Service (MSS) providers. As many of you know, years ago, the FCC mandated that Broadcast Auxiliary Service (BAS) licensees using the current 1990-2110 MHz band have to convert from the current seven-channel 17 MHz channel plan to a new seven-channel 12 MHz channel plan, which extends from 2025 to 2110 MHz and replace or upgrade their equipment to operate on the new frequencies. This was done to make way for new entrants, such as MSS and now Sprint Nextel. In its 800 MHz Report and Order released last year, the FCC ordered that Sprint Nextel facilitate the 2 GHz relocation in addition to the 800 MHz band reconfiguration and imposed specific deadlines to get this important undertaking completed. Sprint Nextel is funding the costs related to the effort to provide current BAS band users with comparable facilities on their new spectrum allocation.

The relocation process officially kicked off in February 2005 and is scheduled to be completed by September 2007. To meet this aggressive timeline, Sprint Nextel has a dedicated team of industry experts overseeing the relocations and working internal cost estimates with industry organizations that represent licensees' interests.

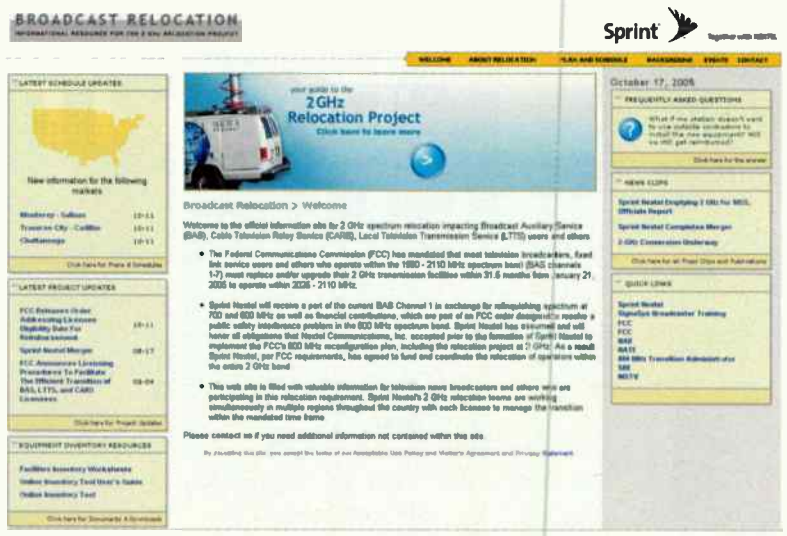
OVERVIEW OF THE PROCESS

Sprint Nextel has divided the country into eight regions. Multiple markets within each region will be relocated at the same time, maximizing the use of resources and enabling the relocations across the country to occur efficiently.

The relocation process with each broadcast licensee has eight steps and takes anywhere from five to eighteen months, depending on the size of the market and weather conditions. Generally, relocation activities follow in this order:



Broadcast relocation to the new plan



The first step for broadcasters is to visit the Sprint Nextel Web site on the transition, *www.2ghzrelocation.com* for information about the general process.

Market Kick-Off: The broadcaster and Sprint Nextel meet to develop a marketwide relocation project plan and timeframe, and hold discussions regarding project procedures as developed in a Broadcaster Information Guide, which will be given to the broadcaster at the initiation of the market kick-off. The broadcaster should also use this time to plan a self-inventory of equipment and services, conduct research and talk with others to understand the general process and their responsibilities.

	Number	Percentage
Markets initiated	74	36%
Stations engaged in relocation	438	42%
Inventories submitted to Sprint Nextel	323	31%
Inventories completed-submitted, verified and returned to the broadcaster	101	10%
Quote packages under review	14	1%
Contract signed, PO approved	1	0%

Progress to date

Inventory and Verification Process: The broadcaster completes a self-inventory in the 2 GHz Relocation Inventory Tool (*http://inventory.2ghzrelocation.com*). Once completed, vendors from the broadcast industry perform inventory verification so that nothing is forgotten. Once the broadcaster reviews the verified inventory, they can request quotations from equipment manufacturers and service providers required for the relocation process.

Broadcaster/Sprint Nextel Compensation Agreement: After the broadcaster has gathered internal cost estimates and quotations from equipment vendors and installation companies, discussions of compensation will be held with Sprint Nextel to reach a contract agreement.

Equipment Order Submission: The broadcaster submits a purchase order for needed equipment to its regional Sprint Nextel project manager for approval. Following approval, the broadcaster submits

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BAS Update

Upgrading ENG Vans During the Transition

2 GHz shift provides opportunity to do more

by Craig Johnston

SEATTLE

The Sprint Nextel-sponsored BAS upgrade for broadcasters' 2GHz microwave equipment might seem found money for stations, but van builders **TV Technology** spoke to point to an opportunity to save even more money by scheduling other ENG van work at the same time.

THE FIRST STEP

But first, a quick review for those unfamiliar with the upgrade process: The van builders have signed on with Sprint Nextel as official vendors for the upgrade; however, stations actually take the first step.

"The station will provide an inventory of the broadcast equipment in the vehicle or they will contract to have somebody provide that inventory," said Steve Williamson, director of sales for Frontline Communications of Clearwater, Fla. "Then we will go out into the field, to the station, and physically audit that equipment to see that the inventory list is accurate."

The process requires close coordination with Sprint Nextel.

"We have put dedicated crews into the field, and we anticipate we won't even see their faces for two to three years," said Thomas Jennings, broadcast sales manager for Auburn, Mass.-based Wolf Coach, Inc. "They're going from station to station, doing the inventories and other evaluations of the vehicles."

After submitting reports to Sprint Nextel, the company meets with the station to determine the value of the hardware and what they're going to have to replace, according to Ron Crockett, president of Shook USA in San Antonio.

"Then we come back to the plant and do the manufacturing phase, which is to build custom nycoil cables and bracketry if necessary," said Howard Kirsch, director of sales and marketing for E-N-G Mobile Systems, Inc. in Concord, Calif. "The third stage is to go out on-site or to a facility we've contracted with to do the install itself and the checkout."

The extent of work on the vans varies, according to Frontline's Williamson.

"There are vans that don't need anything at all... that are already digital ready and compliant," he said. "Other vans need complete transmitter replacement and nycoil replacement."

A technician with Shook Mobile installs a new digital-ready microwave nycoil in a client's van.

Crockett compared the process to the negotiations between the medical profession and insurance companies.

"It's a little like an insurance deal: you go in and get the process done, and the hospital and the insurance company sort it out between them how much is going to get paid. Hopefully you walk out without having to pay anything."

WHILE YOU'RE AT IT...

However, stations might be penny-wise and pound-foolish to let Sprint Nextel pay for the BAS upgrade and otherwise sit on their wallet.

Craig Strom, assistant director of engineering for WLS-TV in Chicago described an interesting portion of Sprint Nextel's Broadcaster's Guide.

"One of the things they talk about in there is how you can up-buy," he said. "For instance, if you have a 2-gig transmitter in the truck, you can have Nextel replace it with a 2-gig digital transmitter, or if the station wants to pay the difference in cost for adding 7-gig to it, there's a procedure for doing that.

A technician from Wolf Coach upgrades an ENG van.

"If Nextel's buying you a new $40,000 transmitter, putting another $3,500 into 7-gig seems like it's worth it." He said WLS plans to do exactly that.

Another item to consider is the mast itself. Stations may have been waiting to put a taller, or stronger antenna into the van. Depending on how much Sprint Nextel has to provide, they may already be paying for the antenna, radios and nycoil cables to be removed.

"You basically loosen four bolts, pull the old mast out, put the new mast in and put four bolts back and the air system and you're back in business," Crockett said.

"A key upgrade will be a mast safety system, D-Tec or Sigalarm," said Williamson. "That's a great time to upgrade the van or the truck to include a mast safety system, because you're rebuilding the nycoil or replacing the nycoil, so you're able to install or replace the wiring required for the mast safety system."

The same goes for a mast camera, according to Jennings. "Pulling the extra wires in the nycoil is a no-brainer for the integrator to do at the time, and it really has no major cost impacts if you're doing it while you're replacing the nycoil anyway."

Sometimes stations put off upgrades just because they don't want to take the truck out of service to have them done. Since the BAS upgrade process will entail at least some van downtime, it might be an opportunity for stations to move ahead with up-to-now deferred modernizations.

"Since now your front end is going to be all digital, why not make the truck an SDI truck altogether?" said E-N-G Mobile's Kirsch. "But that means changing the infrastructure of the truck, and it would be a pretty big proposition."

Last but certainly not least is safety.

"Some of these vehicles haven't been looked at by any vendor, the vendor who built them or any other vendor, since [the station] took delivery of them," said Jennings. "So it's a great opportunity to have a skilled eye look at the van, see how they're wearing, see what potential maintenance and/or safety issues may be, and fix all of those things at the same time."

Money is always tight, and there may be a great deal of pressure to do what Sprint Nextel's paying for and nothing more. But stations may also want to look at this opportunity, when someone else is footing the bill for disassembly and reassembly of the major infrastructure of their ENG vans, to step up with a few more dollars and save some serious cash. ■

Digital Microwave: Not Really Better or Worse

Along the digital BAS microwave transition road there are many pluses, including spectrum conservation, equipment standardization and the resolution of interference issues. However, as with most technological paradigm shifts, there are also some negatives.

Transition progress was the subject of a panel discussion at last month's MSTV DTV update. It was reported there that problems do exist.

WLS-TV in Chicago was an early adopter of digital ENG microwave. According to WLS's Craig Strom, his station's experience with digital microwave is not conclusive.

"It's not better or worse; just different," he said. "Our operators use COFDM or VSB daily, but fall back to analog when problems occur." He added, "Not a show has gone by without cutting back to analog."

Strom observed that many of the problems could be traced to analog interference. "It doesn't handle this at all."

He remarked that on the other hand, digital microwave has some inherent strengths, including a greater tolerance for dynamic ENG environments such as multipath situations.

Strom commented that digital microwave radio is complex to build up, operate and maintain. He said that new tools such as bit stream analyzers will have to be acquired by broadasters for diagnosing problems with the new equipment.

James O'Neal

Work Progresses on DRL Standard

ATSC works to provide for automated ENG transmitter control, more efficient use of BAS

by Jerry Whitaker

WASHINGTON

The ATSC Specialist Group on Digital Electronic News Gathering is making progress on developing a specification for the DRL (Data Return Link) system for ENG use. This work, which began in February in the TSG/S3 committee, is being led by Dane Ericksen of Hammett & Edison Consulting Engineers, who represents the Society of Broadcast Engineers on this project.

ABOUT DRL

Prompted by a suggestion from the SBE, the FCC, in ET Docket 95-18 Third Report and Order (Nov. 10, 2003), created two 500 kHz DRL bands at the lower and upper edges of the re-farmed 2,025-to-2,110 MHz TV broadcast auxiliary service band. Forty 25 kHz DRL channels were created—20 in the lower DRL band, and 20 in the upper DRL band. The purpose of these channels is to allow a feedback or return link to be established from an ENG-RO (receive-only) site to an originating ENG truck. The link is intended to allow automatic transmitter power control by ENG trucks, and more efficient use of the seven 2 GHz TV BAS channels.

However, ET 95-18 did not adopt technical or operating rules for DRL channels. There is, accordingly, a need for the appropriate technical specifications to be developed, including: Basic system parameters such as modulation type, occupied bandwidth, radiated power, emission mask, and frequency stability; protocols and signaling and operational issues such as data transmitted, priority of messages, and station identification.

With proper implementation of a DRL system, only the necessary amount of ENG output power is used to achieve reliable transmission. This facilitates more efficient use of the current ENG spectrum by minimizing the likelihood of interference in a given market. It should be noted that any location may become frequency-congested in response to a major news or sporting event.

With proper implementation of a DRL system, only the necessary amount of ENG output power is used to achieve reliable transmission. This facilitiates more efficient use of the current ENG spectrum by minimizing the likelihood of interference in a given market.

ABOUT S3

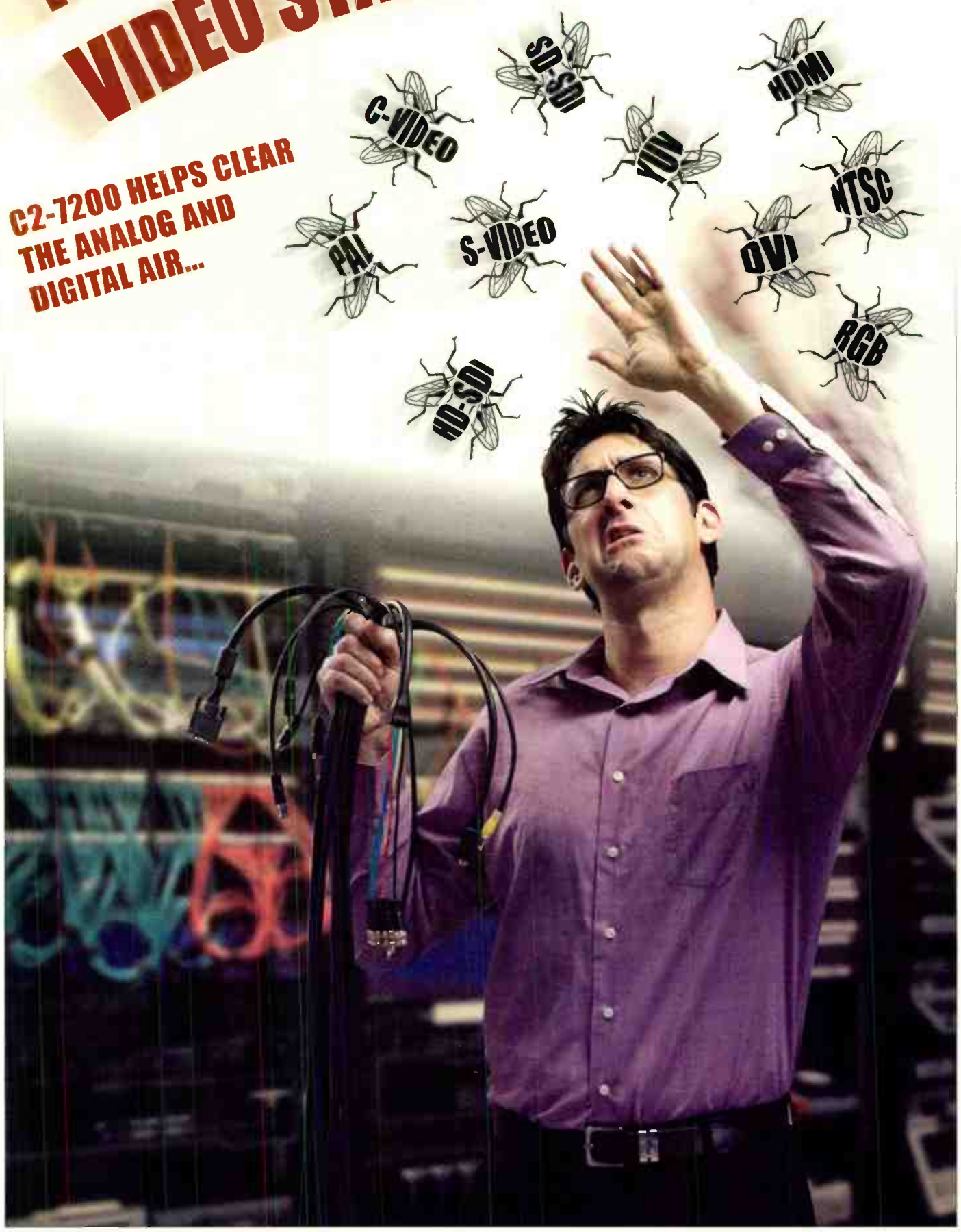
TSG/S3 is working to develop a standard that provides the necessary specifications to construct a DRL system. The document will further specify the mechanisms necessary for basic identification and power control of TV BAS transmitters, in either an automatic or manual mode. At this point, the S3 work is focusing on defining transmission parameters only. Specific receiver implementations would be left to the discretion of vendors.

The DRL system consists of a 2 GHz DRL microwave transmitter and

DRL, PAGE 20

TROUBLED BY THOSE PESKY VIDEO STANDARDS?

C2-7200 HELPS CLEAR THE ANALOG AND DIGITAL AIR...



C2-7200 makes the transition from analog to digital a lot easier. With two completely independent video processing and scaling engines and two video mixers, it really is two complete units in a single 1RU box. Its ability to handle digital or analog signals from video or computer sources makes the C2-7200 the new benchmark for HD converters. Channel branding is a snap with its keying and windowing capability. Visit our website or give us a call at 800-721-4044 for full details.

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Sprint Nextel

CONTINUED FROM PAGE 12

the purchase order to the appropriate vendor.

Vendor **Fulfillment**: The broadcaster begins internal planning for equipment installation, while the vendor is fulfilling the purchase order, and files a license modification with the FCC. Since Sprint Nextel has been actively pre-purchasing inventory for this project from the major manufacturers, it is anticipated that normal delivery times will be four to eight weeks.

Equipment Installation: Broadcasters use a phased approach to install their new equipment based on a "narrow-in-place" plan (12 MHz BAS operations using existing channel plan).

regional SBE, SMPTE, state and regional broadcasters' association events being held in your area. Often, there will be a representative from Sprint Nextel there to give a presentation and answer questions.

John Owen of Sprint Nextel discusses engineering issues with broadcasters at a market kick-off meeting in Springfield, Ill.

Channel Relocation: On a market-wide agreed-upon date, all broadcasters in the market convert to new mode of operation. Most often, the relocation will be overnight during a weekend to cause the least disturbance to broadcast operations.

Closing: Sprint Nextel completes reconciliation of payments from broadcaster's submitted receipts.

PROGRESS TO-DATE

As of Oct. 5, 74 TV markets have been kicked-off, including New York, Atlanta, Los Angeles, Denver, Washington, D.C. and Chicago. More than 400 television licensees around the country are now engaged in the relocation process. Relocations are scheduled to take place starting in January 2006, with three to five occurring each month. Obviously, there is a long road ahead, but we are encouraged with the initial success.

IINITAL STEPS FOR LICENSEES

Check to see if there are any

Once the relocation process officially kicks-off in your market, someone from your station (or someone your station hires) needs to perform an inventory, note all the equipment including transmitters, receivers, antennas, control systems and related hardware, as well as their corresponding model number. This information then needs to be fed into an online inventory form found on the Sprint Nextel 2 GHz Web site where each piece of equipment will be given an ID number. This station-prepared inventory will then be checked by a verification vendor.

Relocations are scheduled to take place starting in January 2006, with three to five occurring each month.

By participating in this important initiative, broadcasters are not only helping safeguard emergency communications for first responders, but are also advancing technology and stability for broadcasters in the long term. Broadcasters are understandably focused on completing this relocation quickly and efficiently, and we at Sprint Nextel share these priorities. Sprint Nextel is a proud participant in this effort and looks forward to working together with licensees. ■

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DRL

CONTINUED FROM PAGE 16

antenna situated near the height of the central receive antenna. Some vertical separation between the DRL transmitting antenna and the ENG receiving antenna should be used, to minimize the coupling between the outgoing DRL signal and the incoming ENG signal. This vertical separation should not be too large or different line-of-sight conditions will exist for the two antennas. DC and control information is supplied to the microwave transmitter via a specified cable interface. A 2 GHz DRL receiver is utilized at the ENG truck, which interfaces with the ENG transmitter.

As currently planned, there will be two basic operating modes of the DRL system:

- **Beacon mode**: The initial operating mode of the DRL system in which the communication link is established and the general operating parameters are set.
- **Transport mode**: An operating mode of the DRL system in which data is relayed between the ENG-RO site and the ENG truck.

The current S3 work is focusing on developing the beacon mode, with the transport mode to follow.

In beacon mode, an RF watermark signal is transmitted at full power and serves three purposes:

- Homing beacon;
- Signal identifying the responding ENG-RO site;
- Provide data on the receive carrier level of the incoming digital feed.

Once a DRL link has been established, the transport mode may be used.

In transport mode, the RF watermark information will be transmitted at a reduced power level (approximately 15 dB lower) so as to permit the transmission of private data from the ENG-RO site to an ENG truck (or other ENG platform).

The transport mode is intended to accommodate a situation where an ENG truck has line-of-sight to an ENG-RO site, but not to the station's main DTV transmitting antenna. For this situation, the ancillary data portion of the 8-VSB broadcast signal might not be available for communication from the DTV station to an ENG truck. However, a DRL channel, originating from an ENG-RO site that does have line-of-sight to the ENG truck could then be used for data transfer, albeit with a smaller throughput than that available using the station's DTV signal.

The draft DRL specification is being written now within the S3 specialist group. Interested persons and organizations are encouraged to participate in this work. The S3 effort, as all other standards development work at ATSC, is open to those with a direct and material interest. Most of the document development and revision is done via e-mail reflectors and scheduled conference calls, so participation in the work does not require attending face-to-face meetings, which can often be a travel burden. If you are interested in contributing to this work, or offering suggestions on operational issues, please contact the author or Dane Ericksen.

Detailed information on current work within ATSC is available from the ATSC Web site, *www.atsc.org*. ■

Jerry Whitaker is vice president of standards development for the Advanced Systems Television Committee. He can be reached at jwhitaker@atsc.org.

Maintaining Integrity For Fiber Optics

Cleanliness, simplicity key to connectivity

by Mary C. Gruszka

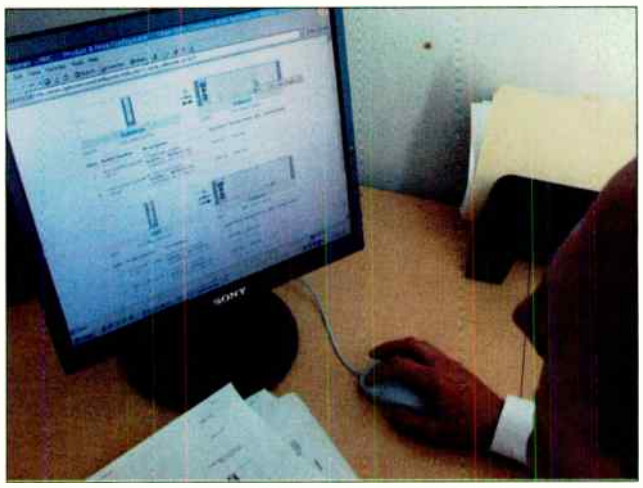
NEW YORK

The way to ensure quality and integrity of fiber-optic connections is to "keep it clean, keep it clean, keep it clean." So advises Dave Bastable, director of business development for Fischer Connectors.

To keep connectors clean, "use proper tools," Bastable said. "You just can't blow on it. That almost never works, and don't use shirtsleeves."

Other tips include: use the dust cap when the cable isn't connected, and mate the dust caps together when they aren't in use to prevent dust from accumulating in them.

"It's gotten almost too easy to use fiber," said Val McOmber, product manager for LEMO USA. "Think of the end of the fiber like a camera lens. You don't want to do to fiber what you wouldn't do to an expensive camera lens. Cleaning is essential. You have to get the light through. Get rid of dust and especially finger oil."



Opticomm's Product Configurator allows the user to design his own fiber optic transmission system online.

LEMO provides two cleaning products—DSC cleaning tool and the WST cleaning kit. The DSC tool is made with an alcohol spongy reservoir and includes dry cotton buds. The threaded end of the tool allows the extraction and reinstallation of the F2 contact alignment device. The WST kit includes two cotton buds, one dry and the other moistened with alcohol in a sealed package.

Joe Commare, vice president of marketing and international sales for Telecast Fiber Systems in Worcester, Mass., found cleaning products from the Specialized Products company to be very useful, including the HUXCleaner, a pocket-sized pen-type in-adaptor ferrule cleaner that performs about 500 cleanings. Another Specialized product is the CLETOP fiber-optic connector cleaning cassette.

"There is no longer an excuse for not cleaning the connectors," Commare said.

Canare developed the Telecast FC series SMPTE hybrid connectors with cleaning in mind.

"The biggest problem that we were seeing was the inability to clean connectors in the field," said Beth White, marketing specialist for San Fernando, Calif.-based Canare. "People are more likely to do it if the connectors are easy to clean. Our connectors offer a removable alignment sleeve and insulator. This exposes the ferrule to make cleaning the female connector as easy as the male."

Another way to improve quality is to "reduce the skill level needed to make a proper termination," Bastable said. "Make it simple. A complicated process means more variability."

To that end, Fischer Connectors, in partnership with Corning, offers the 1053 HDTV camera connector, a SMPTE hybrid connector that can be terminated in the field or studio.

"You still have to work in a clean area, but all you need to do is strip and clean the fiber, insert the fiber in the connector and crimp," Bastable said. "You don't have to use epoxy and optical polishing compound. That is done at the Corning factory as a preassembled [Uni-Cam] fiber optic contact inside the connector."

FIELD-TERMINATED CONNECTORS

There's some difference of opinion on long-term reliability of field-terminated connectors. McOmber from LEMO said that the ability to pass the light signal through the connector entails aligning the cable in the connector by centering the ferrule.

"There are some processes that lend themselves to ease of termination, but

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Fiber

CONTINUED FROM PAGE 21

there are long-term quality issues," McOmber said. "Butt joints can dry up in handling and attract dust particles, causing them to degrade with time and temperature. There's more control in factory-made connections, in the polishing, centering, and making sure that the hole is correct. It's a more permanent connection."

The contacts in Fischer's field terminated connectors are manufactured by Corning Cable System. "They have been installing them in the field for over 20 years and currently have over 30 million installed, without issues that I know of," said Bastable.

McOmber from LEMO acknowledged that factory connectors aren't as practical in the field (from a maintenance point of view), and the company is looking into this. "We want to maintain quality without loss of performance that is built into the SMPTE specs," he said.

Neutrik recently introduced the OpticalCon fiber optic connector that features automatic sealing covers and gaskets. According to the company, "OpticalCon uses conventional LC connectors, which are easy to clean, and has a push-pull locking mechanism," according to the company.

LEMO Fiber Optic Connector Video Inspector for fiber-optic contact inspection

Once a connection is made, Canare offers a means of testing a SMPTE hybrid cable, the Model FCT-FCKIT, which includes a handheld master unit, a loop-back unit, and cleaning sticks.

White described the testing process: "Connect the master unit to one end of the cable, and the loop-back unit to the other end. The master unit sends out a signal and reads what comes back. Acceptable return loss depends on the length of the cable, so you would need to know the length. The master unit also indicates a pass/fail on the electrical lines. The electrical test will tell if the line is broken, but it won't tell if there is a short."

Telecast Fiber provides the SG5070 SDI-HD/SDI video signal generator with both video and optional fiber optic outputs. It can be installed in a Viper II frame, or used as a standalone diagnostic tool.

"With this generator you can make sure that whatever you have will deal with 1.5 Gbps," Commare said. "If it will pass HD, it will pass anything."

For broadcasters, SC/ST-based connectors are still the most popular type of connectors, according to Bob Sebesto, business development manager for BeldenCDT Electronics Division in Richmond, Ind.

At broadcast facilities, "we're starting to see more of the LC, which has a small-form-factor (SFF) type," Sebesto said. "Typically you'll find these in the IT departments or wherever density is an issue."

In response to the growing demand, Belden introduced the Optimax LC in 2004. Optimax LC, like the other connectors in the Optimax line, according to the company, is the only no-epoxy, no polish field connector to feature a spring-loaded ferrule, allowing the connector to be mated with any LC connector on the market.

Optimax was developed as a field-installable high performance connector to eliminate the need for the traditional epoxy grind and polish, reducing labor considerably, according to Sebesto.

"When you get good at it, you could put [the connector] on in a minute, whereas it used to take more than 10 minutes," Sebesto said.

MANAGING IT ALL

Quality of a fiber system depends on the quality and implementation of the design. On the implementation side, care must be taken in installing the fiber in and between racks.

ADC makes a variety of cable management panels and trays and distribution frames to keep fiber wiring neat and patchcords out of harm's way. Fiber raceways ensure that a correct bend radius is maintained and that fiber cables don't get stacked on top of each other. ADC also offers fiber optic patchcords, connectors, and the TracerLight identification system.

What if there was a tool to help system designers keep track of all the variables in developing a successful fiber optic system?

Opticomm has developed the Optiva transmission platform and the Optiva Configurator to do just that.

"What we are offering is a new platform that has the ability to send the maximum number of signals over each wavelength [on the fiber]," said Allon Caidar, vice president of business development for Opticomm Corp. in San Diego. The system incorporates electrical signal multiplexing upstream of the fiber. Once in that realm, even further optical multiplexing can be applied.

The Canare FCT-FCKIT is used for testing SMPTE hybrid cables.

Another key feature of the Optiva transmission platform is that it "lets the customer define the exact configuration of the system. They can pick the cable, connector type, and what type of signals," Caidar said. All the cards in the Optiva frames communicate with one another, and each card can be multiplexed with one or more additional cards.

Optiva Configurator "makes sure that the designer follows all the critical steps to ensure that the system will provide the characteristics they need," Caidar said. "It makes the system design easier and more accurate."

Configurator takes into account such factors as budget loss, distance requirements, connectors, and the number of fibers required for the types and number of input signals. As a final output, it provides a system diagram and a full bill of materials.

Keeping up with the care and feeding of a fiber optic system will ensure its long-term reliability and integrity. ■

Telecast to Launch Digital Cobra

Telecast Fiber will soon release the Digital Cobra that first digitizes RF before passing it through fiber.

"It's more difficult to manage analog signals," says Joe Commare,vice president of marketing and international sales for Telecast Fiber Systems. Analog signals don't like back reflections caused when light reflects directly back from flat polished connectors.

"Analog has relatively short optical link budgets and you have to be aware of in-line patches," Commare said. "Having lots of cables barreled together is not good."

The new Digital Cobra is desiged to overcome these issues. "We can use standard ST-type connectors and need not worry about angle polish," Commare said. "The link budget is dramatically improved and the systems are far more stable and reliable and less prone to issues in the glass like too many patches or dirty connectors."

Mary C. Gruszka

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Mobile

CONTINUED FROM PAGE 1

Castle's American home base of Canonsburg, Pa. It's been testing its mobile TV service in the market for approximately a year with plans to eventually take its mobile TV services national.

DVB-H is an open industry standard engineered to deliver mobile broadcast digital TV in the U.S., Europe and Asia. Crown Castle has selected Windows Media Audio, Windows Media Video 9, and Windows Media Digital Rights Management 10 as the software backbone of DVB-H, which the firm demonstrated at NAB2005. Along with Nokia, other equipment and service partners include Axcera, Thales, Kathrein and SES Americom. Additional trials are being conducted in Germany, Finland, the U.K., Australia and France.

At a demonstration of its technolopgy at the IEEE Broadcast Symposium here last month, Crown Castle President Michael Schueppert said that one of the unique features of the Pittsburgh trial is the use of L-band spectrum; no broadcast TV channels had to go dark. The system operates within a 5 MHz channel in the 1.670 GHz region, formerly set aside for weather balloon telemetry. With the advent of weather satellites, it had gone largely unused and is now cleared nationwide.

"I want to thank the FCC for freeing up spectrum for this purpose," Schueppert said. "The FCC is letting the marketplace decide the best use."

A 200-watt transmitter is being used for the Pittsburgh trial. With antenna gain, it delivers a two KW EIRP. The service has the potential to reach an estimated 750,000 people in the Pittsburgh area. Nokia provided its model 7710 handset units with a DVB-H tuner built in for evaluation of the trial service.

Another feature of the Crown Castle field test is the use of satellite linkage for delivery of program content to the "cell" transmitter, instead of leased terrestrial connectivity. Such delivery allowed the system to be easily demonstrated to the Symposium audience. A temporary Ku-band antenna at the conference site delivered digitally encrypted signals to a demodulator and a low-powered L-band transmitter located in the presentation area. The same audio and video signals seen in Pittsburgh were available for viewing by the audience on the Nokia devices.

When asked about the number of channels that the system can accommodate, Schueppert said that with the technology in use, 10 would be possible. "Possibly four or five times that, but we promised 10 channels 'hand of heart,'" he said.

He also commented on the operational features of the delivery system.

"They want it to work just like TV—to work anywhere, simple to operate, TiVo features," he said.

In mid-October, Crown Castle reportedly signed an agreement with Verizon Wireless, the second-largest cell carrier in the nation, to deliver live TV content (starting with about 10 channels) to phones and other handhelds by early 2006, using Crown Castle's network. Neither Crown Mobile nor Verizon Wireless would confirm reports of a long-term deal.

"We're always on the lookout for opportunities to further differentiate our network quality and service from our competitors'. But at this point we don't have anything to announce," said Verizon Wireless spokesman Sheldon Jones.

In late September, Intel demonstrated a multichannel TV broadcast to Windows-based mobile devices equipped with DVB-H receivers, a U.S. first, (previous U.S. demos had tapped local transmissions from UHF frequencies). The demo used Crown Castle's network infrastructure on the 1670 MZ wideband.

PORTABLE VIDEO FROM APPLE & DISH

Apple's much-anticipated announcement of the launch of its video iPod in

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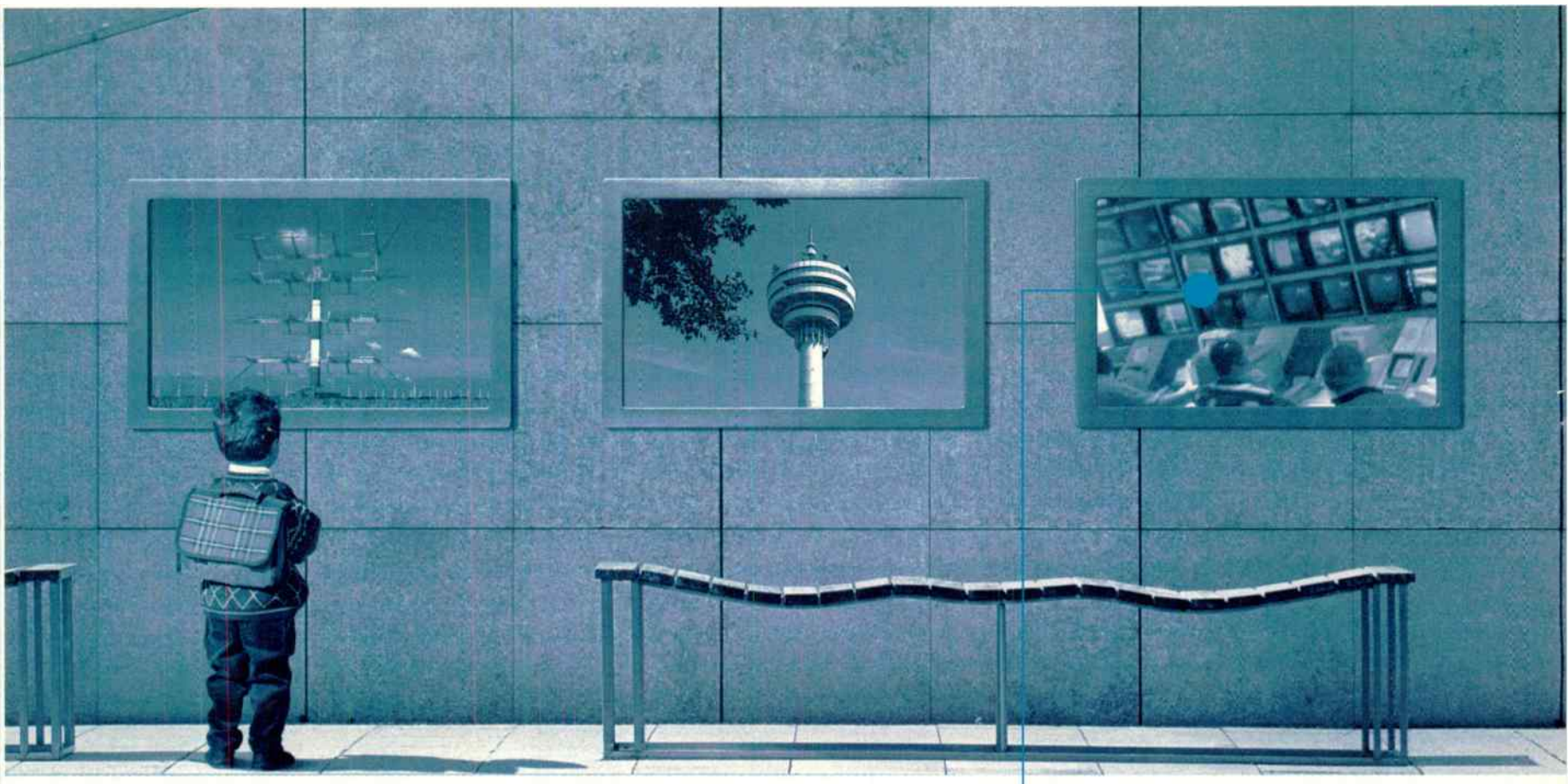
Digital video broadcasting doesn't get any better than this

THALES



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Mobile

CONTINUED FROM PAGE 24

mid-October was hardly a surprise, but reaction was swift, many heralding a new era of mobile TV.

The iPod Video features a 2.5-inch color screen that displays music videos, video Podcasts, home movies (using Apple software, of course) and recorded TV shows. (No Crown Castle-like "live TV," for the moment). The new iPod holds up to 150 hours of video, along with thousands of songs, as usual, and it's priced no higher than the original music-only units.

In conjunction with the launch, Disney-ABC announced it would sign on as an iPod content provider. (Three ABC shows—"Desperate Housewives," "Lost," and "Night Stalker"—are available online from Apple iTunes for $1.99 an episode.)

The agreement, which reportedly was not revealed to ABC affiliates prior to the iPod launch, caused some initial concern. Deb McDermott, former chairperson of the ABC Affiliates Board and president of Young Broadcasting, which owns five ABC affiliates, refused to speculate on the possible impact on her stations, if any, of the iPod Video. "My only concern right now is what type of impact it may have on on-air viewing," she said.

The same week Apple launched its video iPod, EchoStar's Dish Network announced the availability of its handheld PocketDish, which downloads and plays video, in addition to thousands of songs and photos. Three initial models come with 2.2-inch, 4-inch or 7-inch LCD screens. EchoStar says the units can download or record content from a PC or Mac, a digital camera or a USB stick—as well as from traditional DVD players, camcorders and VCRs.

EchoStar also touts fast video transfer speeds when attaching its PocketDish to its regular home-based DVR hardware via a USB 2.0 connection, where it says an hour of Dish Network programming could be transferred to the handheld's hard drive in about five minutes. (Thus, a typical-length motion picture will take about 8-10 min. to capture.)

THE THIRD SCREEN

Considering the ubiquity of TV today from living rooms to kitchens to offices to sports bars, why is there the consumer desire, if any, to take TV on the road, and in extremely miniaturized form? "Because the cell phone is quickly becoming the third screen *after* the television and the computer," says telecom analyst and author Jeff Kagan. "And this is just the beginning. Crown Castle's plan is to launch a more expansive offering."

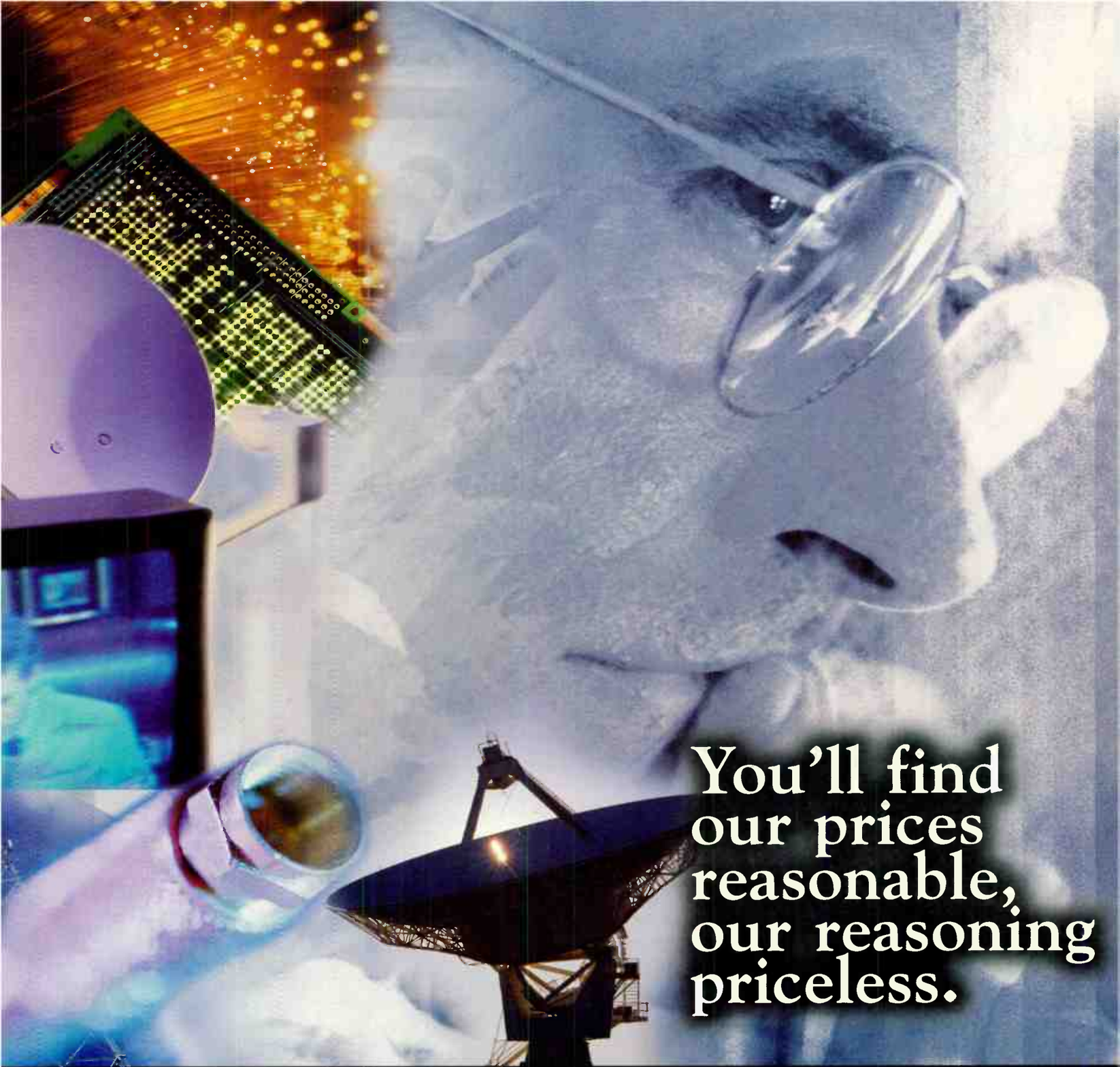
Kagan said that mobile television is the next big thing consumers (especially gadget lovers) are going to help unfold, and eventually mobile TV will be mainstream enough to make a difference in how television is produced and marketed. "TV is not forward-thinking [but] we are beginning to see changes now. Blending with the Internet, television and telephony are going to share the network and that will open up a whole new range of services in coming years. But there first has to be a big market banging on the doors to wake up TV executives," Kagan said.

The reason consumers want their cell phones to do more is because that's the way the industry is designing it, according to Kagan.

"The [mobile] industry sees wireless as a natural extension of the wired world we're connected to. Today we see two distinct wireless customers developing: the customer who wants a phone; and the customer who wants assorted other features on the phone, as well.

"We're just in the beginning of the transition of what these phone devices are going to eventually turn into," Kagan said. "We don't yet know which pricing model the industry will settle on—and it is not going to be for every customer—but for those who want it, mobile TV will be big." ■

James O'Neal contributed to this report.



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Advocates Await FCC Rules on DTx

Broadcasters learn from Penn State, Indianapolis distributed transmission tests

by Sanjay Talwani

WASHINGTON

Distributed Transmission, or DTx—in which a station uses several synchronized transmitters on a single-frequency network—can improve coverage, save power and free up spectrum. And following successful tests at WPSX at State College, Pa., and in Indianapolis, broadcasters now await FCC rules for routine licensing of DTx networks.

At the project at Pennsylvania State University, DTx advocates ironed out the bugs and folded their changes into the ATSC standard, which was approved in 2004.

DTx promises better coverage in places where sparse population or geographical challenges such as mountain ranges pose coverage problems. By transmitting from multiple points on the same frequency, and by managing and synchronizing those signals, broadcasters are able to send their signals where the viewers are, using less power than they would with a single, higher-powered stick. And unlike translator networks that use multiple frequencies, a DTx network can free up some of that spectrum on the nation's 5,000-plus translators as analog shuts down.

FLAT EARTH TESTS

Tribune Broadcasting is conducting DTx field tests to determine reception in relatively flat terrain. With assistance from Harris and Dielectric, a distributed transmission network was built for Tribune station WTTK, which serves the Indianapolis/ Kokomo market.

"We wanted to learn about the interference between distributed transmitters," said Andy Bater, director, RF Systems Engineering for Tribune. "As an added bonus, we wanted to see what the real impact was on various receivers."

Tribune conducted "flat earth" tests for DTx in Indianapolis last summer. The tests are ongoing.

According to Bater, WTTK "did not cover Indy well at all." For the DTx test, Tribune added a second transmitter at its WXIN tower in Indianapolis. "We now have two transmitters, one at [our STA site] in Windfall, 34 miles north of Indianapolis, that we've reduced slightly, and the [2 kW ERP] site in Indianapolis."

After visiting numerous sites in the area to test receivability, Bater concluded that DTx signal strengths must be within range of the most powerful signals because viewers will only install antenna systems large enough to receive a majority of the stations in a market. Bater also concluded that directional receive antennas are an important factor in DTx reception.

"Even a small amount of directionality helps with mutual interference, moreso with later generation receivers," he said.

Bater says they learned a lot from the tests and that Tribune "has identified, outside of the [Indianapolis] market, two additional markets where distributed transmission would make a lot of sense."

AWAITING FCC ACTION

With such progress in the field, broadcasters now await FCC final rules before investing in DTx. Broadcast consultant Merrill Weiss, who developed the technology, has produced a memo, based on meetings with FCC staff, to guide stations through the FCC's interim rules to obtain a STA.

The FCC didn't respond to requests for comment, but at presstime, the commission was scheduled to consider issuing a Notice of Proposed Rulemaking (NPRM) for DTx at its meeting in early November.

Rich Schwartz, director of marketing for Axcera, a Lawrence, Pa.-based manufacturer of broadcast transmitters, says the technology is waiting for the FCC to reach permanent rules on DTx to make licensing routine.

"At this point there's no question we need the rules," he said. With broadcasters pushing to meet the DTV maximization deadline of July 2006, many who would consider DTx will hold off, said Schwartz.

Weiss says he's been developing and filing DTx-related applications. "Yes, we are waiting for the rules," he said. "At the same time, there's no reason that a station can't go ahead and file under the interim policy."

At Harris Corp., Director of TV Strategic and Business Development Dave Glidden said that the company continues to work on DTx and expects to be ready with products when the market demands it.

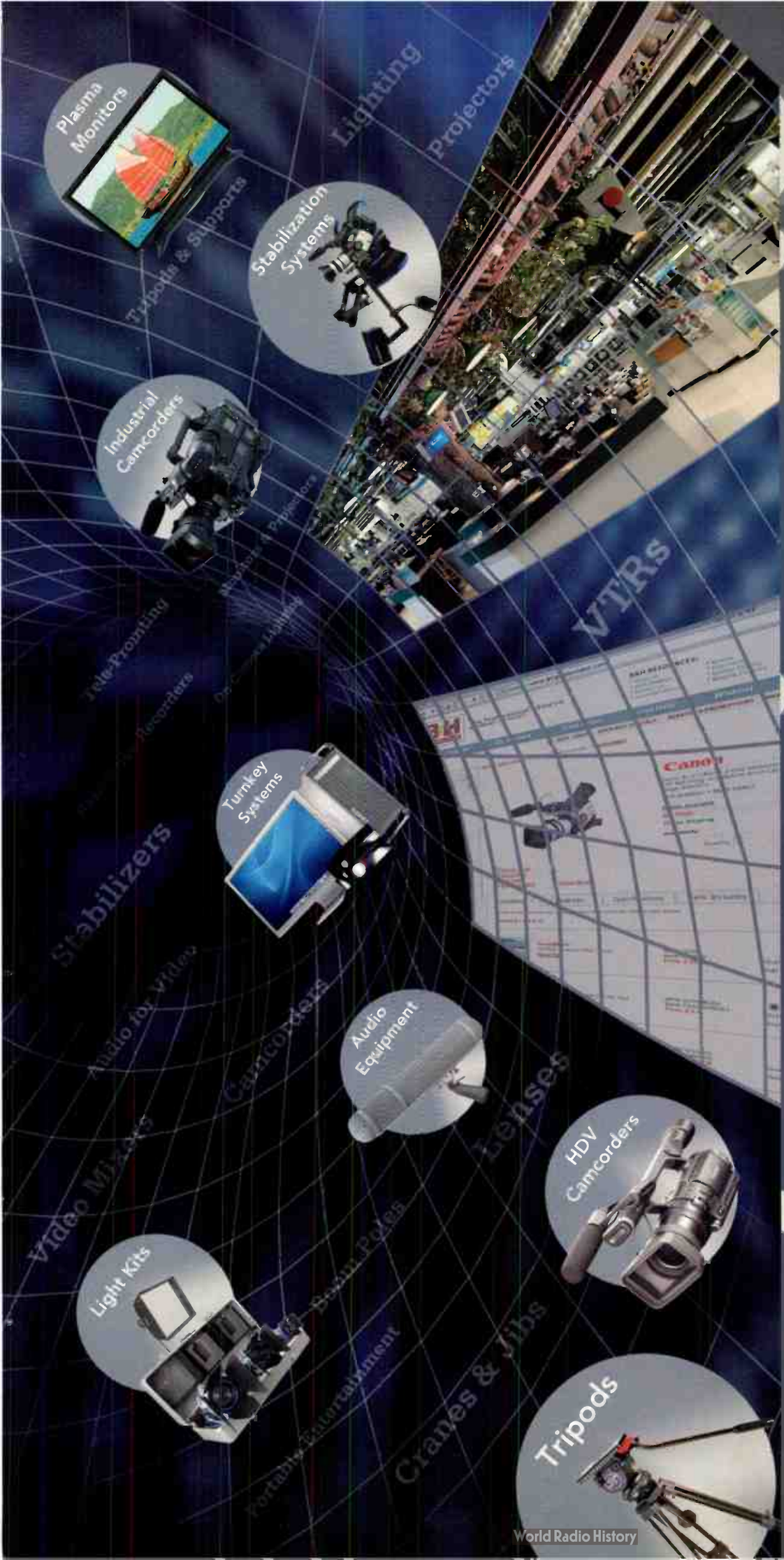
At Thales, the ADAPT IV exciter supports most current transmission standards, including COFDM and various DVB standards, but software upgrades will enable the VSB enhancements such as DTx and E-VSB, said Joe Turbolski, director of sales and marketing operations for Thales. "So essentially the hardware platform is prepared for it," he said. "But there's still some software development that we'd have to take in order to be fully compatible and compliant."

Looking ahead, broadcasters now focused on full-power DTV will soon be making revenues on the digital signal and will turn their attention then to signal enhancements, especially, he said, once analog goes dark. "At that point the broadcasters are going to be more willing to look at technologies that may or may not enhance their coverage footprint."

The Penn State experience, Schwartz said, demonstrated the type of place where DTx may improve coverage—in areas of challenging terrain, or sparse population, such as the Midwest and Rocky Mountains.

"Anyplace where there's wide-open areas with nothing in them, there's no reason to cover those areas with a signal," Schwartz said. "So why should you put up a 60 kW digital transmitter when you can put up five 1 kW transmitters and cover 95 percent of your population?"

"Probably there are stations that are likely to apply the technology that won't do it until the FCC comes out with rules, because they don't have the pressing need to be pioneers, while there are some stations that can benefit so greatly from DTx that they're willing to press ahead," said Weiss. ■



INTO THE SOURCE

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3D on Big Screens and 'Little'

Hollywood and TV enter the third dimension

by Jay Ankeney

HOLLYWOOD, CALIF.

As Disney's "Chicken Little" scampers across the big screen this month, he carries with him Hollywood's hope that revolutionary technology will help reverse its record box office slump. With ticket sales down seven percent for the year to date, many studios and exhibitors are looking to see if new 3D digital cinema presentations will bring audiences back into theaters.

Currently, approximately 80 commercial digital cinemas have opened nationwide, but on Nov. 4, Disney released its first all-CGI animated feature, "Chicken Little" in 3,000 theaters nationwide, of which 85 in 25 top markets were specially equipped Disney Digital 3D installations.

"We feel the addition of these 85 theaters into the digital exhibition marketplace will spur the public's interest in digital presentations in general," said Chuck Viane, president of Buena Vista Pictures. "It is our intention that 16 of the 18 films we plan to release next year will be distributed in the digital format, with at least one, 'Meet the Robinsons,' also in 3D."

STANDARD FINALIZED

The big hope is that the excitement of digital 3D presentation will ignite the public's interest in digital cinema in general. When the Digital Cinema Initiative (DCI), formed by a consortium of studios, released its final specifications for theatrical digital equipment July 20, distributors could finally look forward to unified presentation standards and several projector companies and server manufacturers announced alliances to finance digital cinema installations to present their product.

Already Buena Vista Pictures Distribution and Access Integrated Technologies' Christie/AIX unit have entered into a non-exclusive agreement to supply feature films for DCI-compliant 2D and 3D digital projection systems in approximately 2,500-4,000 systems installed over the next two years by Christie/AIX throughout North America. The debut of "Chicken Little" in the Disney Digital 3D process involves servers from Dolby Digital Cinema and digital projectors from both Christie and Barco presenting 2K (2048 x 1080) resolution images with DLP light engines which many, but not all, consider the rival of today's 35 mm release prints. That's why the DCI specification also includes 4K resolution.

© Disney Enterprises

Disney's first all CGI-animated feature "Chicken Little" is being shown in 3D in 85 specially equipped theaters.

In October, Sony delivered the first of its 4K (4096 x 2160) SXRD projectors, the model SRX-R110, to the first of six Landmark Theaters.

"This is the first commercially available 4K projector to hit the market," said John Kaloukian, general manager of display systems for Sony Electronics. "Not only can the SRX-R110 provide 2K presentations today, but with 4K capabilities it also future-proofs theaters when the highest resolutions are required. This will give movie fans a theatrical experience they cannot approach even with our 2K Qualia Series line of home projection systems. Theatrical servers capable of feeding 4K streams should be available by next March."

Sony also has big plans for 3D digital cinema projection. "We are very involved with 3D acquisition already," Kaloukian said. "Our CineAlta cameras are the system of choice for 3D production so we will be just as involved with the exhibition of 3D as we are in the creation of it."

There should be an increasing number of titles to feed the 3D digital cinema chain with directors such as Robert Zemeckis, Robert Rodriguez, Randal Kleiser and Peter Jackson already having declared intentions to produce future features in that format. George Lucas intends to use a process called "Dimensionalization" developed by In-Three to convert the first three "Star Wars" movies to full 3D for its 30th anniversary in 2007, and James Cameron's Lightstorm Entertainment is working on his fourth 3D production, tentatively titled "Battle Angel."

"Digital 3D presents something to the consumer that is very easily identifiable," said Jon Landau, producer at Lightstorm Entertainment. "We think theater exhibitors looked at the advent of 2D digital cinema and wondered if their patrons would notice a distinguishable difference from a first run 35mm print. 3D digital cinema helps make the improvement obvious."

3D MEDIUM

The move toward 3D entertainment is not limited to the big screen, however. In a joint promotion with Paramount Television and TV Guide, on Nov. 21, NBC will broadcast a 3D episode of its supernatural hit drama, "Medium." The visions seen by Patricia Arquette's Allison DuBois character will appear in three dimensions to those wearing the special 3D glasses distributed in the November issue of TV Guide and from NBC's Web site.

The effect was created by Sensio in Montreal, Canada which also oversaw the 3D sequences in Robert Rodriguez's "The Adventures of Shark Boy and Lava Girl." For the NBC broadcast, Sensio's sequences will be seen using the red lens/blue lens "anaglyph" approach to 3D. But they also market the Sensio 3D stereoscopic video processor for home theater DLP projection systems in 35 countries that can present full color 3D programs from a library of 15 standard definition DVDs.

However, Sensio's process could work with any broadcast signal, and is poised to be included in either the Blu-Ray or HD DVD high definition disks about to appear on the market.

"We feel that the addition of 3D to the television viewing experience will take [viewers] one step past even HDTV," said Richard LaBerge, vice president of marketing and sales at Sensio, "and may become part of broadcast television sooner than we think."

There is also a 3D process for television that does not rely on special glasses. It's called "autostereoscopic" and can be seen only on purpose-designed LCD screens. During a demonstration at September's Internationale Funkausstellung consumer electronics trade fair in Berlin, German TV manufacturer Grundig presented live 3D television on a special lenticular screen that was shot with custom stereo HD cameras developed by Cobalt Entertainment of Hollywood, Calif. Signals from Cobalt's twin cameras are equally suited to digital cinema applications and could be encoded into an MPEG-4 stream to be saved on DVDs or hard disk.

"The forthcoming release of 'Chicken Little' will help drive the public's awareness of digital 3D's potential both in theaters and eventually on home TV," said Marty Shindler, CEO of The Shindler Perspective, Inc., a management consulting firm whose clients include companies specializing in digital cinema. "Just as 1927's 'The Jazz Singer' introduced audiences to sound, and movie goers got excited about widescreen CinemaScope after seeing 1953's 'The Robe,' films like 'Chicken Little' may herald the advent of a whole new era of digital 3D entertainment." ■

PBS Launches ACE at WMHT

New York public broadcaster first in line to debut IT-based automation system

by James E. O'Neal

SCHENECTADY, N.Y.

PBS's ACE automation and control system got off to a successful launch last month, but not quite from the planned "silo."

ACE, developed by PBS and a consortium of technology firms, is designed to deliver programming and remotely manage resources for all 349 PBS member stations. Iowa Public Television was scheduled to be the first adopter, with a startup originally planned for Dec. 7, 2005, but it was a real estate matter that moved the clock to Sept. 26 and pushed the actual location to the East Coast.

WMHT, the PBS station in Schenectady, N.Y. was tapped to be the first station to fire up ACE. WMHT was in the process of relocating to a new building, making it easier to launch ACE as part of the move.

Deborah Onslow, president and general manager at WMHT, said that her station had a deadline of Sept. 26 due to the move and had to be up and running. "We had really expected to be number four, behind Iowa, and the others," she said.

Onslow reported that some bugs and glitches had initially surfaced, but there were no real show stoppers and that ACE was functioning as planned.

"We aren't doing anything terribly complicated yet—just our analog and SD channels and the PBS HD channel," she said. The station was planning to add a feed for local cable outlet shortly.

WMHT launched ACE after moving to its new facility in late September.

All the pieces were there from the start, Onslow said. "It's very comprehensive, but very complex. The station's traffic department had to change the way they created logs, but have received very good on-site support. We're at the kindergarten level now, but are looking at getting to the high school level."

WMHT shouldn't be the new kid on the block for long. According to Bill Hayes, IPTV director of engineering, the Iowa startup is now slated for late November. However he recently reported that some unexpected issues with both ACE and the IPTV infrastructure might require a deployment pushback. Initially, IPTV plans to offer one HD channel, one SD channel and a downconversion of that feed for its analog distribution. Multicast channels would come later.

André Mendes, chief technology integration officer for PBS and TV Technology columnist, said that PBS Hawaii would follow IPTV. After that, Hampshire Public Television would join the ACE ranks.

THE MANY PARTS OF ACE

ACE is a seamless combination of many technologies—servers, automation, remote sensing, signal switching, communications links, extensive software and more. Recognizing early on that there is no single company or organization with a high level of expertise in all of these disciplines, PBS formed a consortium consisting of the PBS Technology & Operations group along with 10 private sector firms—Accenture, Ascent Media, BroadView Software, Intel, MassTech, Microsoft, Miranda Technologies, OmniBus Systems, SES Americom and Omneon Video Networks, which provided the video file server used at WMHT-TV.

"We're really pleased that all of our efforts are paying off," said Geoff Steadman, vice president, of marketing for Sunnyvale, Calif.-based Omneon Video Systems. "We're finally seeing the results of a lot of testing and validation that went on at PBS and look forward to seeing WMHT grow into the full ACE implementation."

ACE would not be possible without automation and OmniBus Systems was selected for this essential element. "We were there for the startup and we plan to be personally involved in every one of the other launches," said Dave Polyard, senior vice president of sales and marketing for OmniBus. ■

INSIDE PRODUCTION Walter Schoenknecht

What If It All Burned Down Tonight?

It's the end of a long, hard day at a small production company, and a wave of tribulations washes me out to dreamland. The old steam-powered Mac in Edit Room Four took five hours to compress a four-minute program. A faulty patch deleted the blue channel from a component analog spot dub. And it smells like a power supply is going down somewhere in the machine room.

It is here, at the feathered edge of consciousness, that the thought arises, part nightmare, part dream: What if it all burned down tonight?

I'd get the call from the alarm company, and find the shiny red trucks watering down the rubble of the old plant. Except for a few recognizable shapes poking through the ashes, it's all obliterated—no more cameras, computers, VTRs... nothing.

AN UNCERTAIN TRAGEDY

In some ways, it would be sad. I'd lose my collection of plastic hotel room keys. My 3-inch stack of yellow Sticky Notes would spontaneously combust, and I'd have to go look up the pixel dimensions of a 16:9 PAL frame all over again.

I'd take the good with the bad, though. The analog audio/video router would be gone, gone, gone, and I'd never have to replace those leaky power supply capacitors again. There'd be an awful lot of laminate countertops incinerated, our last big stylistic throwback to the '80s. The last half-dozen of our CRTs would go kaput, their picture tubes imploding in the inferno.

And the G4s would melt. That's the good news. Because short of a cataclysmic loss, why else would you discard perfectly serviceable computers? I mean, computers that could still boot in less than 15 minutes? And how could you dream of acquiring new, state-of-the-art technology if the old stuff still powered up each morning?

So that's the dream scenario: Our production hardware vanishes overnight, the insurance company pays off, we start over. How differently would we build out a 2006-era production business?

How differently would we build out a 2006-era production business?

First, there's the matter of "philosophy of infrastructure." I'll go out on a jargon-encrusted limb here and say that broadcasters have it easy: Every manufacturer, developer and systems integrator offers a "clear roadmap" for a "format-agnostic broadcast infrastructure," a technology paradigm, if you will, based on servers, network switches, and database software. Decidedly non-TV words like "ingest" and "client terminal" pepper the broadcast outfitter's catalog, while such words as "tripod" and "microphone" are conspicuously absent.

Down here in Production Land, we have a philosophy of infrastructure, too: If you buy it, it has to make money.

Let's start with the fundamentals. One of the hottest trends in TV is the so-called "IT infrastructure" approach, and it's right on the mark. After all, it's all gonna wind up as bits and bytes somewhere in the production process. Fiber backbone? Copper gigabit network? HDTV-capable broadband coax? One-hundred-and-ten ohm AES audio lines? As with every other aspect of our hardware, the selection you make will remain current for about 10 weeks, after which you'll wish you had chosen the next hottest trend.

My solution: wireways and cable trays which run everywhere—to every room in the shop—and which require nothing more sophisticated than a screwdriver to access. No snakes, no busted ceiling tiles, no fiberglass rashes. There's no question here: You *will* be adding, removing and changing the wires and cables you install. As the saying goes, change is the only thing that remains certain; don't fight it, but instead plan for it at every turn.

I'd try to apply a similar ethic to the four pillars of the daily grind—shoot, edit, sound and graphics.

DIVERSITY RULES

Once upon a time, homogeneity seemed to be an overarching goal. An "all Betacam facility" or "an Avid house" would be an orderly, logical, structured environment from which to work, one which removed life's little uncertainties. Over the years, however, brutal reality has taught us that you can't necessarily depend on a single choice—technology, format or philosophy—to carry you through all kinds of situations. Our new facility would have to accommodate that uncertainty.

I'm thinking of a space where multiple edit rooms don't really need to be all the same brand; Final Cut HD where it makes sense, Avid Nitris elsewhere, for instance. Sharing identically codec-ed media sounds ideal, but in practice, it's not always necessary on a project-by-project basis.

If I had a chance to recast our camera lineup, I think I'd want one or two big, beautiful cameras, format-agile, if possible. And then I want a fleet of smaller cameras, HDV units like the Sony Z1U, which records DV and DVCAM as well. I wouldn't buy many open-face lighting instruments. These days, they tend to sit unused in their cases while we repeatedly drag out the Chimeras and Rifas and little fresnels. And, of course, a ton of accessories, both camera and grip. That's one area where we don't demand that our purchases generate billable income.

As for sound and graphics, there isn't an awful lot of hardware to buy these days—software defines your capabilities. A good prefab announce booth and an expensive mic, sure; but everything else revolves around software, an industrial-grade computing platform and an appropriate space to work in. In fact, I think I'd try to allocate more workspaces for nothing in particular... just a comfy place where you can stick a processor and monitor—application TBD. I sure wish I had one or two right now, for tasks like compression and DVD authoring.

Of course, there are the other little mistakes I'd love to correct—more air conditioning, better power, a larger tape library. But the big revelation is that our highly specialized, purpose-built facilities weren't the most forward-looking thing we could have done; it's clear now that flexibility rules the day, and is the one thing that's likely to remain essential.

No, I'm not really praying for fire, flood, earthquake or other cataclysm, just dreaming. The real question is whether, given the opportunity, I would consciously try to shape and direct the changes that affect us, or whether this dream, like so many, evaporates into the ether at dawn, its lessons unlearned.

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RF TECHNOLOGY

Doug Lung

How Hard is it To Receive DTV? Part II

Last month, I looked at the technical arguments in the debate over how to determine whether a household can receive a local network affiliate's DTV signal and thus is not allowed to receive a distant network DTV signal via satellite. This month, I'll finish the discussion with more details on the debate and reply comments from Meintel, Sgrignoli and Wallace (MSW) on behalf of NAB.

Much of last month's column was devoted to the technical arguments made by Hammett & Edison (H&E) supporting EchoStar's assertion that the FCC DTV planning factors and methodology used to determine whether a household received local analog TV service, are not appropriate for determining DTV service.

MSW noted an inconsistency in EchoStar's argument, that a correctly pointed outdoor antenna should not be required for a household to be considered as one receiving service from a local DTV TV station.

In its filing, H&E argued that reduced signal due to antenna pointing must be considered, and that much stronger signal levels are required for reception using indoor antennas.

MSW responded that without the use of directional outdoor antennas, there would have been "no way to give all NTSC stations an extra 6 MHz channel without causing excessive interference to each qualifying television station during the transition." MSW noted an inconsistency in EchoStar's argument, that a correctly pointed outdoor antenna should not be required for a household to be considered as one receiving service from a local DTV TV station.

ANTENNA ARGUMENTS

"As pointed out in our initial Engineering Statement, outdoor directional antennas that are properly and carefully pointed provide better and more reliable performance for *both* terrestrial DTV and DBS services," MSW told the FCC. "Since DBS antennas must be properly mounted outside, it is reasonable to assume that antennas for terrestrial DTV reception will be (at least in some areas of weaker signal strength) likewise need to be mounted outside."

MSW took issue with H&E's measurements of consumer DTV set sensitivity. H&E tested four consumer DTV receivers and one professional receiver and determined that their sensitivity did not meet the FCC planning factors of -81.2 dBm for VHF and -84.2 dBm for UHE MSW argued that one reason the H&E tests did not yield the same sensitivity as the planning factors was that H&E measured the sensitivity using over-the-air signals, instead of traditional test methodology in a well-controlled laboratory environment. Laboratory tests use a well-defined 8-VSB RF source with SNR values greater than 30 dB, an absolutely constant DTV level and minimal splatter, no multipath or antenna-like signal spectrum tilts, and no adjacent channel signals before carefully attenuating the signal to the threshold of errors. MSW said that H&E did not cite the level of multipath or interference present in the over-the-air sensitivity tests. Three of the

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DTV

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receivers used in H&E's tests are likely fourth-generation receivers, missing the planning factors by only 2.3 dB at VHF, and a maximum of 3.8 dB at UHF.

"How much of this problem is due to any existing short delay multipath or interference cannot be determined from their test data," MSW said.

MSW explained that a number of design issues, such as high tuner noise, lack of enough IF gain, equalizer noise enhancement due to a poor algorithm, and internally generated beats within the RF and IF band ccould cause variations in receiver sensitivity. Receivers that handle multipath and interference well may have a noise figure of 10 dB rather than 7 dB. As MSW pointed out in its original comments, these variations are small enough that a mast-mounted preamplifier can mitigate them.

MSW argued that the 90 percent time variability parameter used in FCC DTV coverage studies is valid and that there is no need to change to 99 percent time variability for determining household eligibility to receive distant DTV signals by satellite. MSW noted that the entire DTV allocation process was based on "certain key assumptions" and 90 percent time variability was one of them.

"According to H&E, the 99 percent time variability requirement would require a 17.5 dB UHF correction factor, based on the six tests they elected to report," MSW said. "Since stations cannot deliver these additional dB without violating the commission's limits on ERP, it is difficult to see how stations can fairly be penalized (through loss of viewers) for not meeting this brand-new standard."

MSW explained that 90 percent time-variability does not mean there will be a DTV signal failure 10 percent of the time (or 36.5 days per year), since the assumed loss of service is only at the outermost limit of the service area and is not a "typical" figure across the station's entire service area, and that the potential time or duration of these outages is unknown. MSW said many outages are likely to occur during parts of the day when no one is watching or be so short there is only a momentary service interruption. Finally, MSW reiterates that the number of outages can be substantially reduced through the use of a mast-mounted preamplifier.

Late in August, EchoStar filed additional data from H&E to rebut MSW's comments and reply comments. H&E did not respond to MSW's comments on receiver sensitivity, nor did H&E strengthen its justification for a 99 percent time variability. H&E did note, however, that an argument by MSW that signal strength is typically worse during the day when signal measurements are likely to be made than at night when most viewing occurs did not match its findings, which showed three stations it measured were typically stronger during the day while one was typically stronger late at night. The typical hourly variation for all stations monitored over a 24-hour period was less than +/- 1 dB.

BOTH SIDES NOW

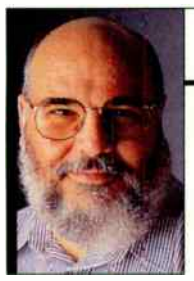
If you took time to read the comments on both sides, you probably noticed that H&E and MSW used different studies or in the the case of 8-VSB field tests, a different subset of the results to justify the EchoStar and NAB positions. While the two engineering firms argue over details, they agree on key technical points. Both agree antenna pointing makes a difference. H&E says antennas are not pointed correctly and this has to be accounted for when determining service. MSW says that FCC allocation rules assume antennas are aligned correctly, just as satellite antennas have to be aligned correctly.

To support EchoStar's position, H&E focused on how people typically receive analog TV—whether in a strong- or weak-signal environment—and used this data to justify a higher standard for determining DTV service at households with satellite TV. MSW, backing up NAB's argument that the planning factors are fine and only minor adjustments to the analog methods are needed, showed that with some effort, field tests show DTV reception can be achieved at locations predicted to receive an adequate DTV signal based on existing FCC planning factors.

The main difference is EchoStar and H&E would require stations to deliver a strong enough DTV signal to a household so that little or no effort is required to receive it, perhaps even using indoor antennas, before distant signals are not allowed. NAB and MSW argue that FCC rules require viewers to make some effort to receive the DTV signal. This could include rotating the antenna (using the antenna positioning output available on newer ATI VSB decoder chips, for example), installing a mast-mounted preamplifier or perhaps even replacing their DTV receiver with a later model.

I have not discussed the arguments on the procedures for measuring the strength of DTV signals and some other important topics. For the full story, visit the FCC "Search for Filed Comments" page at *http://gullfoss2.fcc.gov/prod/ecfs/comsrch_v2.cgi*. Enter "05-182" in the Proceeding box to retrieve a listing of all comments filed in this proceeding. You may also be interested in reading the comments submitted by Z Technology, the well-known manufacturer of 8-VSB field measurement equipment. View them at *http://www.ztechnology.com/pdf/shvera.pdf*.

Questions and comments are always welcome and appreciated. E-mail me at dlung@transmitter.com.



LET THERE BE LIGHTING — Andy Ciddor

Creating the Picture, One Pixel at a Time

After a year as a lowly studio lighting technician, when I was finally admitted upstairs into the inner sanctum of the control room, I was impressed by all of the consoles, monitor bays and oscilloscopes that belonged to the video engineers. At the time, I was working very hard to take what I had learned in lighting for the stage and parley it into a career in TV, and so decided to ignore all that video stuff while I got on with learning my trade. I did, of course, have to learn a great deal about video control on the way to becoming a competent lighting director, I had always thought of video (like audio) as somebody else's business.

The High-End Systems DL2

In later years, as an inveterate knob-twiddler with time on my hands, waiting to broadcast late night news and sports hostings, I eventually figured out how to drive every one of the video processing, compositing, effects, storage and captioning devices in the neighborhood. I even learned to drive the Ampex HS-100 video disc while it was still alive. At the time, I had no intention of putting this knowledge to any use.

Somewhere along the way, lighting also became video, a process that continues to evolve in unexpected directions. In hindsight, it was a natural step for LSD's 1998 Icon M fixture, with its DLP-based configurable gobo, to give rise to the High End System DL device—a robotic luminaire merged with a video projector. The most recent of these, the DL 2, takes the idea a step further by including a video camera and an infrared light source, for capturing video images in the dark.

What continues to make no obvious technical sense is the now-established trend to produce video servers and processors that are controlled by a DMX512 datastream from a lighting console. Certainly, it makes sense to have the capacity to tightly integrate two of the most important visual elements of a production. However, the decision to map an open-ended panoply of video transport and processing functions, into an 8-bit protocol with a 512 byte packet size, an indeterminate delay between packets, and no form of error detection or correction still leaves me slightly bewildered.

Now, no music, awards or big event production would dare go to air without screens displaying the outputs of several Hippotizer, RADlight, Maxedia, ArKaos, Catalyst, etc, media servers, to swirl, pixelate and otherwise munge video material, usually in synchronization with the music.

That the controlling DMX datastream is generated by a console designed to deal with 8-bit dimmer levels and some arbitrarily assigned 8- and 16-bit control functions for robotic luminaires makes this decision even more indecipherable. It seems akin to the idea of undertaking neurological microsurgery with the controls of a Bobcat excavator. Nevertheless, the idea has caught fire. Now, no music, awards or big event production would dare go to air without screens displaying the outputs of several Hippotizer, RADlight, Maxedia, ArKaos, Catalyst, etc, media servers, to swirl, pixelate and otherwise munge video material, usually in synchronization with the music.

THE ROAD TO LEDs

The next step along the road has been the adoption of the LED as a light source. Despite some bold attempts to give the contrary impression, LEDs remain Next Year's Light Source, as they have for a well over a decade. It really is going to be while before we're lighting major productions with LED keylights and fill lights. While we wait for that day to arrive, LEDs have reached a point where they now come in some good base colors for RGB mixing, and with a brightness sufficient for them to be easily seen as point sources behind panels, with no appreciable thermal or optical inertia. Also, in many cases the LEDs can be controlled individually or in quite small clusters.

Inventive lighting designers have taken to placing arrays of these fixtures in direct view of the audience and sweeping colored patterns across them, as part of the overall color and texture of their designs. If we add tubes, ribbons, spheres, cubes, floor panels and lengths of fabric, all fitted with small clusters of separately DMX-addressable LED sources, we begin to see a complete design environment that can be controlled, point at a time, for color and intensity. This of course is also the recipe for a video screen.

Matrix lighting controllers of varying levels of sophistication have been around for decades. They have been used in applications as diverse as electronic signage, sweeping staircases in musicals and those big color chase effects in the thousand parcan rock 'n roll concert rigs of the late 1980s. Indeed, many of today's high-end lighting consoles have very sophisticated matrix control capabilities as part of their effects repertoire.

The situation before us today has become possible as the result of the con-

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INSIDE AUDIO | Dave Moulton

More About the LFE Channel & Subwoofer

Some of the more alert readers among you may recall that in my August column I wrote about the low-frequency effects channel in multichannel video and music production, and made some observations about how it fits into the end-user environment. I took some audio signal level and spectrum measurements of two commercial film releases on DVD—"Das Boot" and "Shaft"—observing the various channels to show something about the relative levels and spectrum of the main, surround and LFE channels.

Dave Weinberg, publisher and editor of the Boston Audio Society magazine "Speaker," and a quite dedicated and knowledgeable audiophile, wrote, "It is my understanding that the LFE levels as recorded on transmission media, be it DVD or film in Dolby Digital, DTS, or SDDS, is designed to be recorded 10 dB low and boosted during playback by 10 dB... Thus the relative levels you mention and show in your graphs for the LFE are 10 dB lower than playback sonic level in the room."

Oops! I had measured levels directly from the DVD player's analog outputs, referenced to 0 dBV. In production, I send all channels to the monitor console at "unity" gain (I don't need a subwoofer so I just send the LFE channel to left and right). Being an old-school kind of guy, it never occurred to me that those DVD channels would be different, although I've heard mention of the idea that the LFE is down 10 dB.

So, I wrote back to Dave, saying, "I'm aware, of course, of the notion that we should raise the level of the LFE channel by 10 dB..." I went on to argue that my measurements *still* showed what I said they showed, which was that the subwoofer signal content wasn't a very important part of the home theater audio experience, relative to the spectrum and amplitude of the main channels.

To which Dave replied, "The 10 dB LFE boost is because the recorded levels are dropped by 10 dB for the soundtrack recording and transmission to the theater. If you want the same relative levels with the other channels as originally created, then the LFE needs to be boosted on playback, which consumer processors handle automatically. In my Lexicon, for example, with the band-limited pink noise level calibration signal, the directions are to set the measured level to 75 dB SPL from each channel, including the subwoofer channel. The processor ensures the LFE level is properly adjusted to match the original mix as transferred in DD or DTS onto the DVD."

This got me to thinking. Why wouldn't there be a level correction inherent to the DVD and the DVD player? Why would we configure a

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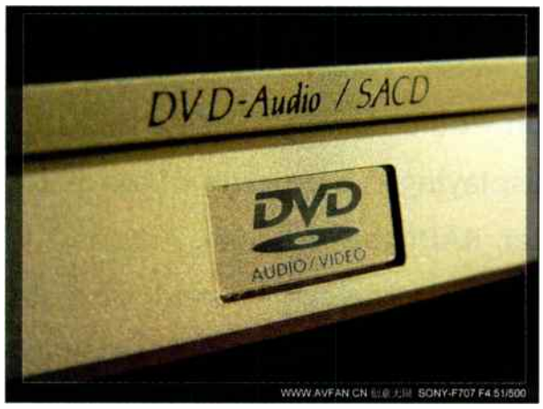

Being an old-school kind of guy, it never occurred to me that those DVD channels would be different, although I've heard mention of the idea that the LFE is down 10 dB.

Pixel

CONTINUED FROM PAGE 35

vergence of bright, highly responsive light sources, independent pixel-level control over color and intensity, high-speed video processing systems and affordable control networks that can address thousands of subpixels at something approximating video frame rates. LDs are beginning to do such things as matching the content of a full-definition video screen in the set with low-resolution echoes of the same images that diffuse across an entire stage.

Artistic Licence's Colour-Tramp was probably the first control system designed specifically to turn an LED array into a near real-time low-resolution video display. During the development of Colour-Tramp, which currently controls up to 20 DMX universes (10,240 channels), Artistic Licence realized that actually getting the channel allocations correct for such a complex system was a significant problem. To this end they have developed the Visual-Patch system which uses a video camera, in conjunction with RDM (Remoted Device Management, the bi-directional addition to the DMX512A protocol), to switch on each device in turn, and map its address into the video image.

Such systems will have to remain low resolution for quite a while, as to achieve even a standard definition (640 x 480) display with its nearly 1 million sub pixels (307,200 each of red, green and blue), would require a processor pumping out 1,800 universes of DMX512. Besides, I'm just too busy at the moment to come down with my Lil DMXter to find out why that pixel in the stage floor is stuck.

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

LFE

CONTINUED FROM PAGE 36

consumer system to have a "wrong" level on playback, and to depend on a consumer processor to automatically make up that level error?

WHAT DOLBY SAYS

So I called Steve Venezia, manager of DVD/DTV broadcast support at Dolby.

Here's the gospel according to Steve, and supported by the Dolby 564 decoder manual. When a production monitoring environment is calibrated, the subwoofer itself is calibrated so that a band of noise between 20 and 120 Hz sent to it is measured to be 10 dB greater than the reference broadband level measured at each of the main speakers. These are each typically set at 85 dBC SPL. Note that it is the subwoofer that is being calibrated, not the LFE channel (which is not adjusted), and it as measured using a real-time spectrum analyzer driven by a microphone at the mix position. With that calibration in place, we mix to taste, including the LFE channel, and no further correction to level is done in the production chain.

It stands to reason that when we want to listen to said production, we'd like to have a similar setup. No problemo. All we need is to own all the appropriate test gear and have the requisite skill set and knowledge base! But what's really interesting is that the power of that narrow band of frequencies for the subwoofer is highly dependent on room acoustics and the efficiency of the subwoofer itself. A simple 10 dB change in level sent to the subwoofer isn't going to do what we want. It is probably too much boost. In fact, the 564 manual says, "If an RTA is not available, setting the subwoofer channel 4-6 dB high, as measured by an SPL meter, provides an approximate level. For example, set the subwoofer channel to 89 dBC SPL when the center channel measures 85 dBC."

FOR THE END-USER

So, once again, for reasons that are sweetly reasonable in production, we've gotten to a level of complexity that is going to be beyond the end-user.

Joe and Jane Sixpack are *not* going to own an RTA, a variable bandwidth noise generator, an SPL meter, a test mic *or* an audio engineer! Therefore, they are *not* going to be able to configure their home theater correctly. They'll have to set the subwoofer level by ear, with no meaningful references.

CEDIA-certified installers have a slightly better chance of getting it right, because they go in with a set of instructions and some instrumentation. Hopefully, the instructions they get from the manufacturers are close to correct. Unfortunately, what Lexicon apparently told Dave Weinberg doesn't sound quite right.

LFE FOR FUN & PROFIT

Steve Venezia also pointed out to me that it is reasonable to think of LFE as standing for "low frequency enhancement" rather than "low frequency effects." It is there, in film and video, to fill in the bottom end for sonic FX; It has little place in music. From my standpoint, as I said in the August article, the use of the subwoofer as a cost-cutting way to use five small satellite speakers is a usage that we can't reasonably produce for (although we would be wise to check our work on same). As an enhancer to supplement full-range speakers and give us just a little extra oomph each time the world ends, the subwoofer works fine, particularly if we approach it conservatively. Thanks for listening.

Dave Moulton would like to thank Dave Weinberg, Steve Venezia and Jeff Riedmiller for their attempts to keep him out of even worse trouble. You can complain to him about anything at his Web site, www.moultonlabs.com.

USER REPORT

Avid Adrenaline Is A Big Time Saver

by Ken Eluto
Freelance Television Editor

NEW YORK

My current project is "The Bedford Diaries," a new prime-time drama produced by Barry Levinson and Tom Fontana that explores New York City college life. The show stars Matthew Modine and is scheduled for mid-season on The WB network.

There are two of us editing "The Bedford Diaries," and we work with two assistants. To edit the show, we use four Avid Media Composer Adrenaline Version 2.16 systems running on the HP 8000 platform, connected with Avid Unity MediaNet. We're now in the midst of cutting our seventh show on Avid's newest Media Composer release, and I'm pleased to report that our experience with the Adrenaline systems and our Unity-based workflow has been fast and stable from day one.

I've been editing on Meridien-based Avids for years, and the first thing I noticed when I started cutting with Adrenaline is that it's fast! There are more real-time effects, which of course is the most obvious speed improvement, but the less obvious processes like scrubbing through the timeline, bringing up bins, saving and generally moving things around are noticeably quicker. The all-important trim tools that make editing second nature on an Avid are much, much faster in this release. With deadlines getting tighter on TV series, being able to shift edits and sequences around really eases the process of working with directors and producers who have low tolerance for rendering. Adrenaline lets us give them instant gratification.

PLAYS WELL WITH FILM

The show is shot on film, and we're editing in 23.976 fps. Avid has historically paid close attention to its handling of film-based projects, and the Adrenaline system retains this legacy by removing pulldown artifacts and automatically syncing audio and video (AutoSync), so we don't have to deal with adding or subtracting frames to keep the project in sync. Since we're delivering in HD for different international standards, having a one-to-one relationship to the film master lets us avoid artifacts during the conversion.

Featurewise, I was of two minds about the new locator menu that kept popping up. It's an optional feature, and at first I just kept it turned off, but I ended up finding it really useful for making notes on the timeline. I also haven't yet figured out how to scroll the timeline. If that feature is not available, I'd ask Avid to bring it back in the next release. Otherwise, all of the features that I expected to see are in there—and they're faster.

Ken Eluto, freelance TV editor, edits with Adrenaline.

Bottom line? It's not new bells and whistles that jump out at you when you use Media Composer Adrenaline—it's the efficiency. Speed is the biggest hallmark of this system—sheer processing power that's obvious in the smallest of tasks. Little efficiencies, like the locator window, and big efficiencies, like the day-after-day reliability of Media Composer and Unity, have made this technology work for us.

Ken Eluto is a freelance editor of television episodics, films, and documentaries. He has worked with Levinson/Fontana for nearly 10 years, editing shows including "Homicide: Life on the Street," the HBO series "OZ," and the Fox series "The Jury." For more information contact Avid at 800-949-2843 or visit www.avid.com.

USER REPORT

Quantel Revamps NRK News

by Geir Børdalen
Head of News Technology
NRK, Norway

OSLO, NORWAY

NRK, Norway's public broadcaster, serves the country's population of 4.5 million through a network of 12 regional offices in addition to its Oslo headquarters. The latter encompasses all central news operations and production facilities for both NRK television and radio. NRK produces 22 television news broadcasts a day.

The Oslo center has for many years been based around Digital Betacam technology, and we decided to go digital for a number of reasons. We needed to be quicker to air and to make it easier for our journalists to access the raw material and do editing for themselves. To do that, we needed to involve the journalists more closely in the production process. We wanted to get rid of waiting lines for edit rooms. We needed several people to be able to work with the same material simultaneously. We wanted a common user interface from basic journalist shot selection all the way to craft editing. We wanted to eliminate the "Who's got the tape?" problem.

Geir Børdalen is in charge of news technology at NRK.

Finally, we needed to be able to refresh material from bulletin to bulletin.

We set up a project group to investigate all the available systems on the market. This group included not only the engineering staff, but also a producer and journalist. It was aimed at getting us a system which would work at a creative as well as technical level. Our craft editors also played a key role in the choice—judging the candidates on user interface and toolset. The choice was Quantel, overwhelmingly.

Our system is based on four Quantel sQ servers, each with four video ports and a total IMX50 storage of 400 hours (and 400 hours of co-located browse storage). There are 124 sQ Cut editing packages on journalists' desktops, nine sQEdit Pro/Plus systems for craft editing and a Paintbox.

System connectivity is via a dual fibre gigabit network. The system is integrated with our 1,650 client ENPS newsroom system via a MOS gateway, and the whole operation runs under OmniBus Columbus automation.

QUANTEL, PAGE 40

Every Evolution A Revolution

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USER REPORT

Bay News 9 Changes with VertigoXmedia

by Steve Weitekamp
Director of Operations
Bay News 9

ST. PETERSBURG, FLA.

Bright House Network's Bay News 9 and Bay News 9 en Español underwent a lot of changes in 2005. These 24-hour local news channels serving Florida's Tampa Bay region started the year in overcrowded facilities and with outdated technology. That was to change, as construction of new headquarters in St. Petersburg was well underway. Along with the increased space would come new technology that would help streamline our operations and improve our on-air look.

Bay News 9 and Bay News 9 en Español are programmed on a newswheel format. This allows us to record news segments, combine them with other elements such as studio lead-ins and then play them out in sequences predetermined by our producers. Wheel segments are constantly updated throughout the 24-hour period and playlists shift, depending upon story priorities. Having a robust and agile graphics automation system would allow us to easily update previously aired segments.

In evaluating newsroom graphics automation systems, we studied the workflows of other channels using news wheel formats. VertigoXmedia had Xmedia Suite installations in several of these facilities, and each demonstrated the company's success in integrating its technology with other equipment. Our new facility opened on June 27 with no disruption to our broadcasts. We're still in the process of expanding and enhancing our graphics, but so far the new system has been dependable and feature-rich.

VertigoXmedia in use at the new Bright House Network's St. Petersburg, Fla. facility.

STREAMLINED WORKFLOW

The workflow is much easier for producers, as they now have access to more elements for their stories directly from their desktops.

That workflow starts with producers writing a slug for an upcoming news segment and selecting Vertigo graphic templates to accompany the story. We're using the Xmedia Suite for full screen, over-the-shoulder, lower third, logo bug and ticker graphics. These are all easily accessed from the template library. The director then uses the control room workstation to call up the templates and key them over the video.

Xmedia Suite's automation capabilities are instrumental in the production of our tickers. Xmedia monitors our AP ENPS system for updates on weather and stocks and automatically updates graphics data without operator intervention. We still manually insert graphics into the playout stream for our other templates, but plan to automate this too.

While the learning process for any new system takes time, our editorial staff has already adapted to Vertigo's user-friendly interface for graphics creation. The system easily handles the high volume and changing pace of a 24-hour news operation. Since news graphics can now be created at producer or reporter workstations, we've been able to free up the graphic artists who previously prepared them. These artists are now able to focus on producing animations, special projects and graphics items not related to specific news stories. This has contributed to greater newsroom efficiencies.

We've been working closely with Vertigo's design team to update our graphic automation process and expand our collection of templates. Their designers and software engineers have been responsive and patient throughout the entire process of creating, reviewing and sometimes reworking the templates. Still, we're only just beginning to utilize Xmedia Suite's many available features.

The thought of transitioning to an entirely new facility was daunting, but broadcasting with state-of-the-art newsroom automation systems has been a complete success. We are very excited about what the future holds for us, as we continue to explore Xmedia Suite capabilities. Our new system has allowed us to experience new levels of efficiency and creativity.

Steve Weitekamp is director of operations for Bright House Networks' Bay News 9 and Bay News 9 en Español. He may be contacted at Steve.Weitekamp@baynews9.com. *The opinions expressed are the authors alone.*

For more information contact VertigoXmedia at 877-4-VERTIGO or visit www.vertigoxmedia.com.

Quantel

CONTINUED FROM PAGE 38

Finished material is kept on the system for about three months before being archived. This makes media management a key issue and critical for operations, so there is always at least one media manager on duty. We run scheduled recordings from a number of wire services, and it is the media manager's job to manage space by deleting all surplus material. The Quantel sQ system is the only one that allows us to do this without first having to re-record the clips we want to keep.

Speed to air is also paramount. The sQ has proved itself to be the fastest system available. It is also incredibly flexible—we have changed news stories in running orders down to just seven seconds before air. The system workflow enables journalists to take charge of the whole process rather than just creating their script and seeing it through to editing. Some journalists are now cutting their own stories. Many are cutting voice-over pieces, shortening stories, adding elements to stories and cutting headline pictures.

With the new system, we're doing more stories quicker, looking better and re-versioning them much faster. We're much quicker to air and there's a buzz around the place. I think both the journalists and the craft editors are enjoying their jobs more—a case of great story tellers having new tools to tell those stories even more powerfully.

Geir Bordalen is in charge of news technology for NRK in Norway. The opinions expressed are the author's alone. He may be contacted at geir.bordalen@nrk.no.

For more information contact Quantel at 703-448-3199 or visit www.quantel.com.

USER REPORT

HD Jobs Get Blackmagic Design Boost

by Mike Curtis
Independent Consultant

AUSTIN, TEXAS

I have been working in digital media production for about 15 years, and the general trend has been for me to be two to three years ahead of my clients. This has taken me from digital retouching to interactive media, from there to compositing and motion graphics work, and now to digital filmmaking, where I work with everything from DV to film-originated material.

I started working with HD before it became really viable for indies. The first FCP-compatible HD card cost more than $10,000 and it just wasn't feasible to do in-house indie work. Then along came the Blackmagic Design's DeckLink HD cards, and eventually the even better DeckLink HD Pro series.

I purchased my first DeckLink HD Pro Dual Link card last summer, and have been very happy with it. It has allowed me to work with everything from DV up to and including 10-bit RGB 1920 x 1080 footage for my film originated work. I'm looking forward to acquiring a Multibridge product to handle 2K when my clients start wanting that as well.

At this point I'm routinely working with DV, DVCPRO50, HDV, DVCPRO HD (Varicam), and HDCAM material. I'm developing a workflow for film-originated material as well, that will use 10-bit RGB 1920 x 1080 footage. Whether captured over FireWire or the HD SDI inputs, I get everything I need, especially the 24p footage for the indies. The ability to monitor SD or HD 24p signals on a 24p or 30i monitor is vital to my workflow. I can even take 24p HDCAM and monitor it on a 30i standard definition monitor if needed.

Mike Curtis is an Austin Texas-based consultant.

GREAT FOR DETAIL

When I'm doing finicky/picky critical detail work, I also use a BlackMagic HDLink connected to an Apple 23-inch Cinema Display to monitor HD work. It allows me to see smooth, consistent, full-resolution playback that I couldn't get using Final Cut Pro's Digital Cinema Desktop Preview. This is especially useful for HDV, with its huge pixel dimensions. If I didn't have a DeckLink HD Pro card, I wouldn't have any way to see that signal on a broadcast monitor at all. The colors are *not* the same between computer and broadcast. For critical color decisions, the component analog outputs on the DeckLink HD Pro have been a godsend.

We also use it in After Effects to get a video preview out for an accurate color representation on our broadcast monitor when doing graphics or compositing. I'd love to see improved controls on the video out of the DeckLink HD cards, and better calibration on the HDLink, but they work well enough for now.

The DeckLink and HDLink definitely save huge amounts of time, effort and money. I can capture, monitor, edit, preview and output any digital format I care to work with. I also use it for field acquisition, which saves us the $2,000-a-day rental on an HDCAM SR deck. It provides an even smoother workflow than working with the deck.

After spending 15 years in digital media production, Mike Curtis is now an independent consultant. His clients include Compaq, Dell, Ford Motor Co. and IBM. He may be contacted at mikedcurtis@mac.com.

For more information contact Blackmagic Design at 702-257-2371 or visit www.blackmagic-design.com

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PRODUCTS & SERVICES SHOWCASE

USER REPORT

Motion 2 Spells Ad Campaign Success

by John Dames
Creative Director, Principal
coreaudiovisual

NEW YORK

Apple's Motion 2 was initially attractive to us because of the way it worked–logical workflow, a huge number of quality workhorse FX, and of course, real-time previewing. Granted, it was different than After Effects, the mainstay of our compositing work, but it was fun to experiment with. It wasn't until we were tapped to produce a three spot motion design-driven TV campaign, complete with a five day live-action shoot component, in under a month that we really "got" Motion 2.

Here is a brief breakdown of why and how we used Motion 2 in this production.

As the production began, the main job here at coreaudiovisual was to begin compiling effects and motion design ideas that reflected not just the storyboards, but also the evolution of ideas from the job award to the shoot. Once we got the footage in our hands we would have less than three weeks to produce the spots. Therefore, it was critical to start developing working assets that could be integrated quickly.

Naturally, those first ideas were with tools we felt comfortable creating in–Maya, Cinema 4D, even some After Effects work. But we were shocked to realize that with Motion, we could actually dump our FCP edits (including cuts) directly into a motion project and conversely place a motion project directly into an FCP timeline. It was a huge leap forward, as previewing ideas happened simultaneously with edit changes and allowed our editing and design stations to work together in real time to zero in on the look and feel of the new Pontiac "Mesmerize" campaign.

IMAGES TURNED TO LIQUID

One of the main effects we used in the campaign is a motion plug-in we've developed called REYA. It allows us to turn images into liquid, which can obey a control image. For example, it allowed us to make certain sequences of the car footage look as if the highlights were flowing over the car itself. This technology was created months before for use in 3D applications, but within three days our programmer was able to get it functioning within Motion as a real-time effect.

We used several Motion particle system tricks in the campaign, but frankly particle systems are difficult to control and animate properly. Luckily, Motion 2 had some control tricks that we used to great effect. For example, you can add a control behavior to any Motion attribute you wish–in the case of particle systems we used the randomize, oscillate and MIDI functions extensively. The first two are just different ways of adding controlled chaos to a system–but MIDI actually allowed us to "perform" animations on a Korg MIDI controller and record those as keyframes. With the MIDI behavior, we were able to add a human factor to many effects that simply cannot be keyframed.

John Dames used Apple's Motion 2 to create a highly successful Pontiac ad campaign.

Motion 2's real-time features are just the tip of the iceberg. While Motion 2 lets you see your creations faster, the toolset, effects, content library, behavior system, generators, plug-in framework and integration possibilities are the real accelerants.

The Pontiac campaign was a huge success for the client. Sales skyrocketed, and the newly introduced Solstice—the focus of the initial campaign—sold out within 45 minutes. Pontiac tried something new and challenged us, and in turn we asked a lot from Apple technology. I'm happy to say it worked.

John Dames is a creative director and principal at coreaudiovisual, a motion design and effects studio with offices in New York, St. Louis and Los Angeles. He may be contacted at dames@coreaudiovisual.com.

For more information contact Apple at 800-MY-APPLE or visit www.apple.com.

USER REPORT

Canopus Speeds Transition

by Dan Billings
Engineering and Technology Director, Waterman Broadcasting

FORT MYERS, FLA.

The transition from tape to digital is happening now at broadcast stations all across the country. At Waterman Broadcasting's NBC and ABC affiliates in Fort Meyers, Fla., WBBH and WZVN, we learned a lesson in speed and efficiency when we made the move to the BitCentral Précis End-to-End Play-to-Air system with Canopus EDIUS Pro 3 nonlinear editing software. We needed a system that would best take us into the digital domain and get us in a good position for the move to HD.

The Canopus EDIUS Pro 3 editing system helps us quickly produce a substantial amount of content by interfacing directly with the Précis system to create an entirely tapeless ingest, edit and playback solution. This system gave us the ability to immediately upgrade to a file-based, ingest to air, news workflow by providing the news team with the tools to quickly and seamlessly integrate local and national news programming for our market.

PICTURE QUALITY

Getting away from the old tape architecture has created some significant payback. The ability to retain picture quality is one crucial benefit of going to an all-digital workflow. From the camera, through the EDIUS Pro 3 editing station, and out to air, the all-digital BitCentral workflow combines with Canopus broadcast-quality integrated MPEG-2 encoding software to provide all the advantages of a digital file-based system without the least compromise in picture quality. Because of the reduced size of MPEG-2 files, it is easy for us to transfer content using standard network architecture.

Installing the new system while still maintaining the legacy tape architecture made the transition easy. Our station personnel have quickly adapted to the more efficient workflow, which is a major benefit in the news landscape where time is a critical resource.

Dan Billings with the Canopus EDIUS Pro 3 editing system.

EDIUS Pro 3 provides us with native editing and real-time processing of uncompressed SD, HD, HDV, DV, MPEG-1 and MPEG-2 formats, so we will be able to continue with EDIUS when we make the transition to HD. We don't have to be concerned with differing formats or go to the trouble of transcoding–whatever we need to edit, EDIUS Pro lets us do it. In addition to the advantages a mixed format editing environment brings to the workflow, EDIUS Pro 3's well-organized feature set and user interface provides us with an efficient editing experience.

Ultimately, the proof is found in our ability to air very high-quality segments in far less time. This gives producers more flexibility and control over their stories and has improved our bottom line.

Dan Billings is director of engineering and technology at Waterman Broadcasting and may be contacted at danb@water.net.

For more information contact Canopus at 888-899-EDIT or visit www.canopus.com

USER REPORT

Grass Valley Streamlines Editing At RAI

by Sal Paglia
Chief Engineer
NY Bureau, RAI Corp.

NEW YORK

RAI Corp., a division of Italian broadcaster RAI Television Networks, has maintained a North American news bureau in New York City for more than 40 years. We support five networks here: RAI 1, 2 and 3; RAI News 24; and RAI International, as well as other RAI subsidiaries.

After more than a year of planning, equipment integration and construction and with help from The Systems Group of Hoboken, N.J., we moved to a new all-digital facility in July 2005.

Sal Paglia, chief engineer for RAI's New York bureau, provides support for five networks from a new all-digital facility.

The RAI Corp. production teams often have to turn around live segments on very short notice. With our earlier tape-based systems, this took a tremendous amount of leg work. When a journalist had to go on the air, we had as little as 10 minutes to put together a communication link, get a studio up, gather tapes and stack and queue them for playback.

Our legacy facility had a tape room and four linear A/B suites, two of which were combo control rooms for the two studios. Feeds were recorded in salvos on four decks. Everyone had to have a copy. Tapes were stacked everywhere.

A DIGITAL NEWSROOM

RAI Corp.'s concept of a digital newsroom was to create a synergy among the journalists, producers and the production staff. The goals were to stimulate creativity, motivate productivity and promote longevity of assets.

We designed an end-to-end Grass Valley system, consisting of five Grass Valley NewsEdit XT desktop nonlinear editing systems, two NewsEdit LT field laptop systems, 200 hours of NAS storage, 1,000 hours of low-resolution browse storage, four M-Series iVDR servers (supporting eight channels of ingest and eight for play-out), an Ingest Station, a Smart Bin Server and a NewsBrowse asset management package.

We can record six simultaneous channels and have two for backup. The Smart Bin Server then takes over and transfers files to our NAS devices, which are mapped to the NewsEdit workstations. Finished sequences are pushed to the M-Series and/or NewsQ Pro for scheduled playouts, or are used as roll-ins for live feeds to Rome. If there's a major breaking news event, we can go live to three networks with three different journalists at the same time. Finished pieces, raw footage, and B-roll images are archived on optical discs.

EDITING IN THE FIELD

Two NewsEdit LT laptop editors are being used in remote locations where editing is necessary. A recent story covered was the Rolling Stones concert at Giants Stadium. A pool feed was available, but there wasn't any power. As we didn't have any portable decks, we got creative and put together a field pack with a Grass Valley NewsEdit LT system, a DV bridge and an Anton/Bauer battery pack. This self-contained package was able to record the footage, let us edit in the field, and feed content back to Rome.

The complete edit field kit travels in two cases, allowing quick setup. The NewsEdit LT has a feature called Playout Channel, which allows you to stack clips and sequences from your bins and play them out directly. Roll-ins are flawless. You basically have a video server in the field.

Sal Paglia is chief engineer for RAI's New York Bureau. He may be contacted at paglia@raicorp.net. The opinions expressed are the author's alone.

For more information contact the Grass Valley editing products division at 530-478-3624 or visit www.thomsongrassvalley.com.

BUYERS BRIEF

3Designer from **Orad** is an authoring software package designed to create both 2D and 3D graphics and animation. It may be used to create templates for broadcasting applications, ranging from news, elections, sports, weather segments and business reports. 3Designer supports SD and HD and transparently converts between the two. For election returns, sports and other applications requiring computation of statistics, mathematical functions for computing percentages and other operations are built into the program. 3Designer allows importation of 3D objects, textures, flip books and animations from other software applications including 3D Studio, Max, Maya and Softimage. The program can provide an unlimited number of layers in the scene and supports easy object addition to a scene via 3Designer's object hierarchy structure. A multiple object editor allows simple control of all object attributes, such as layers, camera, lights, transformations, shadows and textures. The program is Windows-based and features simple and intuitive user interface.

For more information contact Orad at 212-931-6723 or visit www.orad.co.il.

USER REPORT

Fastrack Provides Best of Both Worlds

by Michael Shore
Senior Editor, Director of Technical Operations
All Mobile Video

NEW YORK

A producer friend of mine called to ask me about editing his latest pet project. "This one is easy; it will only take a couple of hours," he claimed. "It's a multicamera high-def shoot and we have to add all of the graphics in post. We also have to shorten the show by 30 minutes and we have to deliver a few hours after the show ends," he added.

The best approach in a situation like this is a "hybrid" environment—a solution that takes advantage of the speed of video servers, but is not hampered by traditional NLE drawbacks; in other words, a solution that gives you the best of both worlds.

To that end, All Mobile Video has built two state-of-the art mobile edit suites. Although originally designed as linear edit suites, we have significantly increased their power with the Editware Fastrack linear/nonlinear hybrid edit system.

THE POWER OF FASTRACK

To understand the power of Fastrack, let's look at the specifics in my scenario. The multicamera show can be captured on both videotape and video servers. All material is captured live, so there is no back-end digitizing. I can access the material on the video servers and start editing while the show is still in progress! Through Fastrack, I can even see into the EVS network, and use any clip or recording on any machine.

The Fastrack user interface can be either numbers-based EDL or a drag-and-drop GUI. I can simultaneously use videotape machines for playback, recording, or both (remember pre-read?), just by dragging them around on the timeline. I do not have to stop editing and wait for something to be digitized, I just play it from tape. I can use my existing switcher, DVE and mixer, so everything is real time. The edit format is agnostic, making it the perfect choice for both HD and SD projects, including 24p.

Michael Shore at the All Mobile Video Fastrack hybrid editing facility.

MANY OPTIONS AND FEATURES

I have the option of recording my edits to videotape or server, or I can build a timeline that can play live to air. The timeline interface is straightforward, allowing me to expand or contract anywhere on it and have everything else "ripple" into place. I have full speed control over all of my server channels and tape machines. I can store and recall switcher events right on the timeline. If I use a MIDI controllable mixer, I can adjust the faders on the mixer surface and the editor will learn my actions in the timeline. Conversely, I can build keyframes in the timeline that I can drag around and have the mixer follow. I can even add CG events automatically.

The point here is to choose the right tool for the project. Most producers are unwilling to give up the freedom of nonlinear editing. The Fastrack allows you to use discrete pieces of equipment and leverage their individual strengths. Don't assume that because you have always done something one way, it is the best way.

My producer friend began to smile. "So we can start to edit as soon as the show begins?" Absolutely. "And we can make changes even after we get to the end of the show?" Of course. "This is great," he said. "Now we'll have time to cut the international version too!"

Michael Shore is senior editor and director of technical operations for All Mobile Video in New York. The opinions expressed are the author's own. He may be contacted at Mshore@amvchelsea.com.

For more information contact Editware at 530-477-4300 or visit www.editware.com.

BUYERS BRIEFS

Magic Bullet Editors 2 is a new software tool from **Red Giant Software** designed to impart a "film look" to video products. It can add grain, color shift, scratches, splotches, and will even simulate projection artifacts—flicker and gate weave. There are more than 50 preset looks available with Magic Bullet, including such entries as "bleach bypass" and "1932 three strip Technicolor." The user is free to create his or her own customized "look" too, as the product provides wide latitude in both gamma and color adjustments. Transitioning from color video to monochrome and back is easy. Compression Correction is also part of the package. Just as the name implies, this feature removes compression artifacts in SD and HD.

Four categories of video customization are avaliable—subject, lens filter, camera and post. Magic Bullet Editors 2 is a plug-in for several popular editing tools, including Final Cut Pro Version 4.1 or later, Premiere Pro v1.5, Vegas 5.0 or later and Avid Xpress or Media Composer. Red Giant is in the process of adding support for other editing software.

For more formation contact Red Giant Software at 260-625-5343 or visit www.redgiantsoftware.com

Vizmoz Talking Headz is a plug-in from **Vizrt**, allowing an animated 3D character's lip movements, facial expressions and gestures to be automatically aligned and synchronized to a real-time voice. It also converts text into spoken audio. The plug-in is available for use with Vizrt's 3D animation software, VizArtistT. It creates facial expressions and lip-synced movements for animated characters. Broadcasters can create and add 3D talking characters to live and recorded productions.

For more information contact Vizrt at 212-560-0708 or visit www.vizrt.com.

Weather Radar

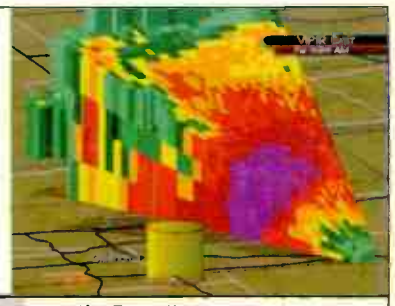
VIPIR Display System

Baron Services, Inc.
4903 Research Drive
Huntsville, Ala. 35805

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

KEY FEATURES

- Volumetric Display System
- Storm Track Movements in Full 3D
- Indicates Areas of Possible Tornadic Activity



USER	Richard Wirdzek WCBI-TV 662-327-4444	Jennifer Broome WOAI-TV 210-226-4444	Tom Terry WFTV 407-841-9000	Jennifer Zeppelin KCNC-TV 303-830-6343
HAS IT PERFORMED AS EXPECTED?	Overall, yes	Yes, and it gets better every month. The BAMS model nailed landfall of Hurricanes Dennis, Emily, Katrina and Rita.	The VIPIR has proved very valuable to us, especially during the hurricane season.	It's performed better in some areas than expected.
WHAT FEATURES DO YOU LIKE THE MOST?	Radar capabilities. Access to velocity and multi-level data is key during severe weather. Access to SCIT algorithms enhance our severe weather tracking capabilities	The Baron Button, Flood Threat and SCITS are excellent tools, along wih Micro Trak, which helps you track storms minute by minute.	Level II Nextrad sweeps are great and also the Baron Button. The BAMS forecast model is also very helpful.	The 3D cylinders that pop up showing where tornados have developed. Also storm tracking into the next hour.
WHAT FEATURES DO YOU LIKE THE LEAST?	Adjusting the Vipircast output (temps, precip rate) is a bit shaky. This may be more of a model issue than anything else.	I really like the entire system. They take our feedback and upgrade features pretty much on a monthly basis.	3D radar has to be used sparingly; as you tilt the earth, the radar image gets separated from the ground. Makes it difficult to tell where it's raining.	Small concerns dealing with terrain.
HOW LONG HAS IT BEEN IN SERVICE?	Two years	Since 2004	More than five years	Two years
ANY MAINTENANCE OR OPERATIONAL PROBLEMS?	Most have been with beta releases If problems occur, newer executables are developed immediately.	If there are hardware or software issues, they are quickly resolved.	No more than any other weather system.	Terrain issues are the biggest. We've had some problems in not picking up snow or rain in the foothills and mountains.
HOW WOULD YOU RATE THE MANUFACTURER'S SERVICE/SUPPORT?	Excellent. Very good interactive support as well.	On a scale of one to ten, technical support is a ten.	Baron has great technical support and not just by telephone.	Excellent. Customer support and training courses are great.
WHAT WAS THE DECIDING FACTOR IN PURCHASING THE SYSTEM?	To be number one in the market for severe weather coverage.	The radar and severe weather capabilities.	Not involved in this step. Possibly the 2004 demos.	This one had all the bells and whistles.
WAS THIS A REPLACEMENT FOR AN OLDER SYSTEM, OR A NEW PURCHASE?	It was an additional purchase.	A new purchase.	Not at the station before the purchase.	It replaced our old ADC radars.
WHAT OTHER BARON PRODUCTS DOES YOUR STATION USE?	FasTrac and StormWarn.	The StormWarn crawl system.	FasTrac and StormWarn crawl.	WSI weather graphics.

For more information, contact Baron Services Inc. at 256-881-9911

USER REPORT

Bilingual Inscriber HD Shines At NHK

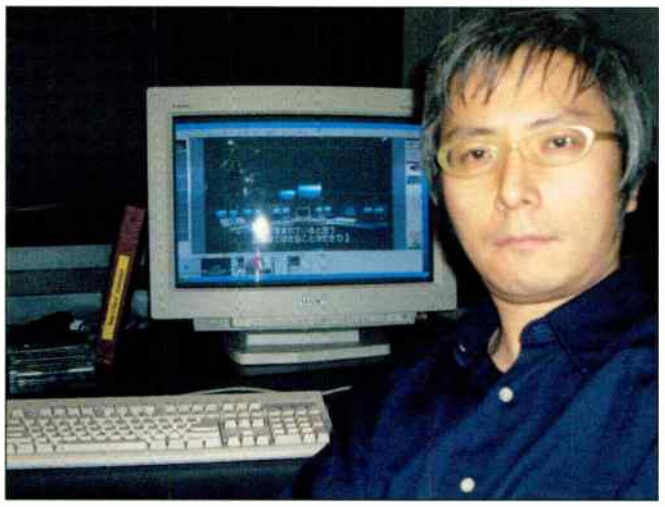
by Hacci Morihata
Director of Technical Operation for NHK's New York facility

NEW YORK

Working at NHK Enterprises America in New York is a unique challenge. We provide extensive coverage of North America, Canada and South America for our Japanese-speaking viewers. This requires ingesting and repackaging complete shows with new graphics and subtitles for rebroadcast both in Japan and North America.

The demands of our job dictate that we work as efficiently as possible in order to reduce turnaround time. We also do our work in high definition. While HD is still catching on in the Americas, our parent company, NHK, is the largest broadcaster in Asia. NHK has been conducting high-definition research and development on Hi-Vision since 1964 and now almost 80 percent of general television programming in Japan is broadcast in HD.

We were looking for a character generator for our HD editing suite at our production office in New York. Most of the manufacturer's systems that we looked at seemed focused on usage for live broadcasting and did not appear to have the added flexibility we also needed for use in a post-production suite. We required more versatility than most character generator systems could offer and decided to investigate Leitch's Inscriber Inca Studio HD.



NHK's Hacci Morihata values the availability of dual language operation available with the Inscriber.

INSCRIBER OPTIONS HELP

Inscriber offered several options for the system that let us best fit the system to our particular applications. Our previous experience with Inscriber came from using a Velocity nonlinear system about four years ago, so it was interesting to see what their current product line had to offer. We work on a wide range of programs and use Inca Studio HD in our post-production facility to produce many documentary programs. As an example, one program called "New York Streets," featuring the people of New York, is produced on a weekly basis. The fact that Inca Studio HD delivers real-time, multilayer operation provides us with improved efficiency and increased design creativity. Through the comprehensive suite of design tools provided, we can quickly create titles, animations and clean up logos with the video-aware paint module.

The Inscriber system gets a regular workout, as we also produce an international version of a nature and historical program on a monthly basis. As I write this, we are currently finishing a documentary about the building of the United Nations. It is called "The Work For Peace" and was scheduled to air on PBS in late October. All of these programs require added graphic elements and titles, as well as subtitles. The Inca Studio HD provides all of these and has become an integral part of much of our work.

There is an additional feature available with the Inscriber that is particularly important to us. The Leitch Inca Studio HD system that we purchased was equipped with ready to use Japanese characters on a Japanese OS. Given the bilingual nature of our work, this functionality is very important to us and is used almost on a daily basis by those of us involved in editing sessions.

Hacci Morihata is director of technical operations at NHK's New York facility. He has worked in post production for 15 years. The opinions expressed are the author's alone. He may be contacted at morihata@nepamerica.com.

For more information contact Inscriber at 800-363-3400 or visit www.inscriber.com.

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In item 16, indicate the date of the issue in which this Statement of Ownership will be published.

Item 17 must be signed.

BUYERS BRIEF

The Clarity5000 by **Pixel Power** is a high-definition character generator, stillstore and clip player based on completely new architecture. The Clarity5000 is available in both single- and dual-channel configurations. While offered as a hi-def device, the Clarity5000 can also support SD operation in 525 and 625 lines. The HD capabilities include 1080i/50, 1080i/60, 1080sf48, 1080p24, 1080p25 and 720p60 scan rates. The dual-channel version can output HD and SD simultaneously. Dedicated preview channels are provided. The clip player option can play out two streams of HD clips or up to four streams of SD clips. Squeezeback is available for HD and SD internal sources and live inputs.

The Clarity5000 records and plays back up to four audio channels and provides de-embedding, ducking, group mixing and re-embedding capabilities. There are fault-sensing bypass relays on the internal downstream keyers. The Clarity5000 unit runs Clarity Version 7 software and is compatible with all major newsroom automation systems. It occupies 5 RU of space.

For more information contact Pixel Power at 954-943-2026 or visit www.pixelpower.com.

USER REPORT

Parhelia APVe Is A Wise Graphics Choice

by Thor Wixom
Independent Producer

PROVO, UTAH

During my ten years in video production, I have noticed that the most difficult purchasing decisions are usually the most common, especially when it comes to video editing systems.

Of course there are as many opinions out there as there are options, but having been around the production block a few times, I enjoy helping others avoid common pitfalls by sharing what has worked for me.

Last April, I found myself shopping for a video editing system at the NAB convention. I knew how much I had to spend. What I was unsure of was how to get the most bang for my buck.

I had heard that Adobe's new version of Premiere could work as a software-only editor with real-time previews. This opened the possibility of saving money on acceleration hardware and applying it to a more powerful host computer. I was skeptical, but after spending a few hours at the Adobe booth, I was a believer.

Independent producer Thor Wixom used the Matrox Parhelia APVe grahics card in editing "Desert of Eden."

With a fast enough computer, Premiere Pro could do real-time previews of just about anything I could ever imagine throwing at it. The only thing it lacked was an external NTSC preview. To achieve this in the past, I had always paid top dollar for accelerator cards.

THE MATROX SOLUTION: EDITING AND GRAPHICS

My search ended when I visited the Matrox booth. Not only did they offer accelerated solutions for SD and HD editing, they also had a graphics card called the Parhelia APVe that could output real-time previews to an external NTSC monitor. I was ecstatic! What's more, the Parhelia APVe PCIe x16 graphics card could also run two computer displays, and was competitively priced with any of the other dual display graphics cards. Since I was already going to spend a portion of my budget on a display card, by purchasing the Parhelia APVe, I could take advantage of the real-time previews in Premiere Pro. I

MATROX, PAGE 50

Matrox

CONTINUED FROM PAGE 49

could see my edits on an NTSC monitor and apply the money that I would be saving toward a more powerful host computer. My next visit was to the AMD booth.

To my astonishment, I discovered that with the money I saved in the graphics area, I could afford to purchase the fastest and most powerful PC on the market: a dual-core, dual-processor Opteron system.

A FEATURE-LENGTH MOVIE

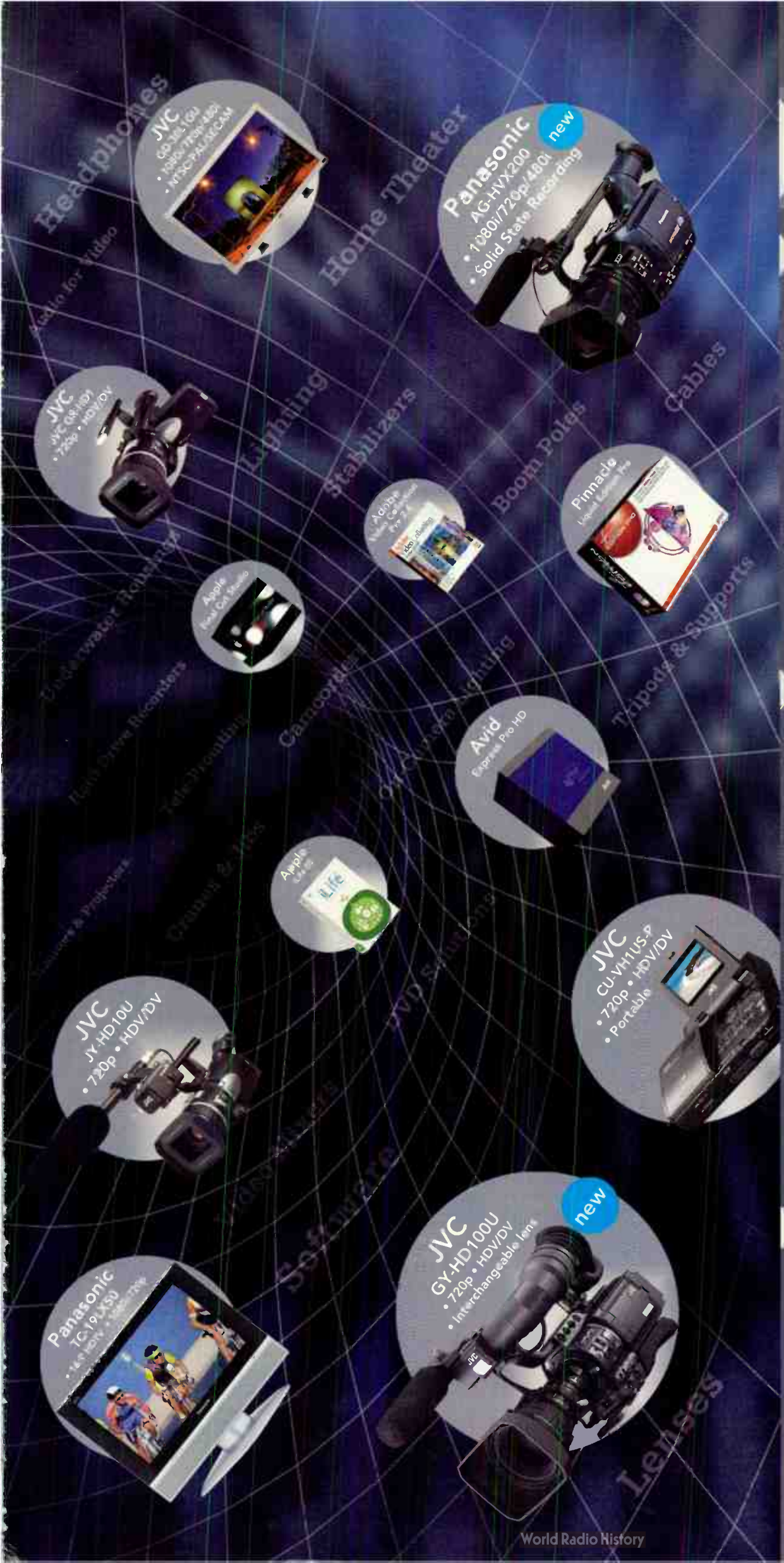
In just a matter of weeks, I was putting my new system to the ultimate task, editing a feature-length movie entitled "Desert of Eden" that I had written, produced, and directed. To say the least, my new system performed like a champ! I finished the project in about six weeks and submitted it to the 2006 Sundance Film Festival.

In conclusion, I can only say how amazing it was to simply buy a host computer, install the Parhelia APVe and Adobe Premiere Pro cards, and be able to immediately edit a feature film. In the future, should I decide to upgrade to a more powerful Matrox editing solution, I can do so with confidence, knowing that the Matrox Parhelia APVe graphics card will work seamlessly with any accelerator card in the Matrox family. Until then, it's good to know that I can take advantage of the solid performance of the Matrox Parhelia APVe at such an affordable price.

Thor Wixom has produced more than 15 extreme sports movies, and recently completed his first narrative feature "Desert of Eden." You can find out about more about him and his productions by visiting www.invictusproductions.com. *The opinions expressed above are the author's alone.*

For more information, contact Matrox at 800-361-4903 or visit www.matrox.com.

PRODUCTS & SERVICES SHOWCASE



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USER REPORT

WKYT-TV Graphics Receive Duet Boost

by Jamie Pyles
Chief Engineer
WKYT-TV/DT

LEXINGTON, KY.

WKYT-TV is the CBS and UPN affiliate in Lexington, Ky. I'm the chief engineer and have been with the station for 18 years. I've handled all facets of studio broadcast production, including audio and camera operations. One aspect of our broadcast production that has remained consistent throughout this time is that we have always been Chyron users. We used the INFiNiT! for news graphics until just last year.

There was another important ratings period in November, so we decided to improve our on-air look and to upgrade our capabilities from an operational standpoint.

We were looking for a machine that would give us clip player control to achieve lower thirds with animations, full screens with movement, split-screens with movement and also animations for our city map to help pinpoint story locations for viewers. In the past, we'd used the Chyron Maxine and INFiNiT!

The Chyron Duet HyperX SD was selected and exceeded our expectations. It enabled the station to upgrade and enhance our 3D graphics production, for not only our news but also for production of simple spots that require animations with graphics and JPEG images.

Since our move to the Duet HyperX, I've had family members and friends comment that they've noticed the station's on-air look is much crisper and that story text is easier to read.

DUET IS USER FRIENDLY

In addition to helping us with our graphics production, Chyron systems are very user-friendly, making it easy on our technical staff. The Duet HyperX is Windows-based and most of our operators grew up using Windows operating systems. I've noticed that even operators who have never run graphics before caught on to this system very quickly.

WKYT-TV chief engineer Jamie Pyles with the Chyron Duet HyperX SD.

Chyron's customer service has been great. A couple of months ago, we had some setup issues with our morning show—things that our operators hadn't seen before. We contacted technical support and they had it figured out within 15 minutes.

Despite the Duet's superior speed and graphics capabilities, we continue to use our older equipment as well. We still have the Chyron IV and we are also using an INFiNiT! character generator on our mobile unit for University of Kentucky basketball remotes and network football games. After 16 years of service, we had Chyron refurbish the INFiNiT! and it continues to get the job done. We use the Maxine for bugs on our UPN digital channel.

Right now, we're doing our news in SD, but I'm sure that we'll be making the switch to HD. Although that switchover is probably some time away, I know we'll have no problem, since the Duet HyperX SD is versatile and can be easily upgraded to handle HD. We've been working with Chyron products for nearly two decades and that's unlikely to change anytime soon.

Jamie Pyles is chief engineer for WKYT-TV/DT in Lexington, Ky. The opinions expressed are the author's alone. He may be contacted at 859-299-0411, or by e-mail at jpyles@wkyt.com.

For more information call Chyron at 631-845-2000 or visit www.chyron.com.

REFERENCE GUIDE

VIRTUAL SETS

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

MANUFACTURER	MODEL	TRACKING METHODOLOGY	COMPUTERS (OTS OR PROPIETARY)	CAMERA/LENS MODIFICATIONS	SPECIAL KEYER RECOMMENDED?	AMOUNT OF VIDEO LATENCY	FEATURES	PRICE
For-A 714-894-3311 *www.for-a.com*	digiWARP-EX2 digiStorm	Capable of interfacing to all types of tracker.	Windows XP	None required	For-A VRP-70HS or Hanabi series mixers	Three to four frames	Available in 2D or 3D versions for any HD or SD	From $45,000
Darim Vision 925-251-0178 *www.darim.tv*	VS2000	Trackless	PC-based	None required	Powerful chroma keyer is built into the system and the user interface	Three frames	Complete Turnkey system. Only one operator needed. Large studio effects achieved in a small space. Special cameras not required	$25,000 to $75,000
Hybrid MC 0033146730066 *www.hybrid-mc.com*	Easy Set, Easy Reality Trackless	Mechanical, IR, utlrasonic, trackless	PC-based on Linux, Windows	None required	Any	Zero	2D, 3D, SD/HD, external control, grahics on air, text generator	From $35,000
Orad 212-931-6723 *www.orad.tv*	ProSet	Xync Infra Red	HDVG	Yes	Internal keyer for HD and external key	Three frames	Free camera movement including dolly, handheld crane, SD/HD-compatible, Up to two high-res HD inputs, up to eight SD inputs.	From $200,000
Serious Magic 916-985-8000 *www.seriousmagic.com*	Ultra 2	Tracking is simulated, footage shot with static camera is tracked into scene automatically	Windows	N/A	Keying compositing included	N/A	High-quality keying, compositing, color-correction and drag-and drop virtual sets	$495 for Ultra 2 Set libraries are $395
Vizrt 212-560-0708 *www.vizrt.com*	Viz Virtual Studio, others	Mechanical or any third-party system	OTS	N/A	No, off the shelf	Two frames	Real-time processing in SD or HD	From $49,000

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ANTENNAS

Want to Sell

Want to Sell

Sony Betacam SP UVWB, 3 batts & AC chrgr, comes w/hard case, 600 hours, $2500. Glen, 208-735-1970 or 208-420-9779.

Sony DXC-D30 w/PVV-3 docking camcorder, $9500; Panasonic AJ-D700 DVCPRO Camcorder, $2995; (4) Panasonic AW-E750 2/3" 3-CCD convertible camera w/lens, $5950; Sony DXC930 color video camera, $2995. 818-788-4700 or www.tvprogear.com.

CAMERA ACCESSORIES

Want to Sell

Cartoni Beta Head & Single Stage Sticks, $1750; Sachtler Vario-Ped 2-75, $12500. 818-788-4700 or www.tvprogear.com.

EDITING EQUIPMENT

Want to Sell

Avid Adrenaline Assurance, new, $21500; Avid Symphony Version 3.5 on IBM Intellistation, $15500. 818-788-4700 or www.tvprogear.com.

AUDIO PRODUCTION

Want to Sell

Bittree & ADC Audio and Video Patch Panels from $300; Stantron 45RU racks from $450; Mackie 1604 VLZ Pro, new, too low to quote; Mackie 1604 VLZ, used, $625; Mackie CR1604, used, $350; Tascam M-2600 MK II 16-Channel Mixer, $1,750; Sony MXP-390 Mixer, $1,000; Digidesign 888, $650; Sony PCM7040 DAT, $3,990; Crown D75 and D150 amps, low $$; DPS Stereo Audio Syn-chronizer, $1,000; Panasonic SV-3700 DAT, $200; Panasonic SV-3800 DAT, $300; Alesis M1 Active Speakers, $295/pair; HHB Circle 5A Studio Monitors, pair, $950; Wohler Amp 1-A, $425; Wohler AMP-1A-VTR, $550; Wohler AMP-1AP, $450; Wohler Amp-1APF, $450; Wohler AMP-1APS, $450; Wohler MSH-8AL Audio Level Meter, $900; Wohler VMQ-4, $500; Audio Monitor Neumann U87 Ai Studio Microphone, $1795; AKG C 414 B ULS Microphone, $1,250. 818-788-4700 or www.tvprogear.com.

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M/A-COM 7 GHz, 13 GHz and 23 GHz, broadcast-quality radios in-stock. Excellent for STLs. Refurbished, repaired, retuned, tested and warranted. Save thousands of dollars over new radios. Antennas and waveguide also available. 100% Customer satisfaction. Massachusetts Microwave (978) 635-1556. www.massmicrowave.com.

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Sony PVM1954Q, $1250; Sony PVM-20M4U, $1750; Sony PVM-20M2U, $1600; Sony PVM-1944, $1000; Sony PVM-1354Q, $600; Sony PVM-1351, $450; Sony PVM-14M4U, $1095; Sony PVM14L2, $1295; Sony PVM9L3, $900; Sony PVM8042Q, $400; Sony PVM8044Q, $500; Sony PVM8045Q, $700; Sony PVM5041Q, $450. 818-788-4700 or www.tvprogear.com.

SIGNAL PROCESSING

Want to Sell

Leitch FR-684 Dual PS 2RU Frame, $295; Leitch FR-884 Dual PS 2RU Frame, $295: Leitch Mix-7091 Multi-function digital frame, $400; Leitch 6804 Mounting Frame w/Pwr sply, $250; Leitch SPG-2602N Pulse Gen, $1,250; Grass Valley Series 8900 Frames w/redundant pwr sply, $600; GVG 8501 Video DA's, $125; GVG 8551 Audio DA's, $100; Sony BVX-D10/BVR-11, $3,990; Leitch DPS-290 Component TBC, $1,200; Leitch DPS-465 TBC/Digital Component Synchronizer, $2,250; Leitch DPS-470 Digital Component AV Synchronizer, $2,990; Leitch DPS-575 Digital Processing Synchronizer, $4,750. 818-788-4700 or www.tvprogear.com.

STATIONS

Want to Sell

Class A television station for sale, located in Kokomo, IN. WKGK-TV chnl 50, this is a commercial TV station & is the last & only TV station located in Kokomo, IN, we are now accepting bids for the sale of this valuable Commercial Television License, contact Sister Sue Jenkins, 317-920-1000 or 317-283-5800 or srsue@megsinet.net.

17A PPP **Class-A UHF TV station for sale in Muskegun MI, market 38.** On-air for 14 years, owner retiring. Can be see on web at http://hometown.aol.com/wmkg/index.html, please submit all offers, asking $750,000. This station could possibly be moved to a larger city. Bud, 231-733-4040.

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SWITCHERS

Want to Sell

Videotek Prodigy Component Switcher, $2995; Videotek RS-12DVA SDI Routing Switcher, $600; Miranda Digipath 16x16 SDI Router (w/remote panel), $3,500; Leitch 4x4 MB Routers, $175; GVG Ten X, $600; Kramer 5X4 A/V Switchers, new, $475. 818-788-4700 or www.tvprogear.com.

TELEPROMPTERS

TEST EQUIPMENT

Want to Sell

Leader LV-5100 Component Digital Waveform, $3990; Videotek TVM-821D SDI Waveform/Vector, $3,495; Tektronix WFM601M SDI Waveform, $5,500; Tektronix WFM601i SDI Waveform, $5000; Tektronix WFM601 SDI Waveform, $3,990: Tektronix 17503wfm/vec, $2250; Tektronix 1765 NTSC/PAL Wfm/vec, $3450; Tektronix 1730D SDI vector, $2000; Tektronix 764 Digital Audio Monitor, $1500; Tektronix 760a Audio Monitor, $1000; Videotek VTM-100 On Screen Monitor, $1,850. 818-788-4700 or www.tvprogear.com.

TEST AND MEASUREMENT

Want to Sell

TRANSMITTERS/ EXCITERS

Want to Sell

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

VIDEO TAPE TRANSFER

VTRs/VCRs/ RECORDING MEDIA

Want to Sell

Sony UVW-1800, lw hrs, $5000; Sony PVW-2800 from $5000; Sony BVW-70 from $5000; DSR-1500A, new, $5150; Sony DSR-45, new, $3895; Sony VO 9850 w/timecode, $1200; Sony VO 9800 w/timecode, $1000. 818-788-4700 or www.tvprogear.com.

HELP WANTED

nep

NEP Broadcasting is seeking experienced Mobile Unit Engineers to monitor broadcast operations at remote sites, perform preventative maintenance, trouble-shooting, execute changes and engineering updates on the mobile unit. Degree, training, 3+ years experience in broadcast technology, equipment, facilities, and production or any combination will be considered. Maintenance engineering background a plus. Please send resume and salary history to NEP Broadcasting LLC, hr@nepinc.com, Fax: 412-820-6045, 2 Beta Drive, Pittsburgh, PA 15238. www.nepinc.com.

Senior Engineer-Transmitters: Iowa PublicTelevision is seeking applicants for a Senior Engineer position to work primarily in the Transmitter/Translator area. This position will oversee the operation, repair, maintenance and construction of proposed and existing television equipment at the transmitter/translator sites. Work hours will be varied. Requirements: Must have extensive knowledge and experience in the operation of transmitters and translators. Salary range: $42,203 to $63,876/annually, plus full benefit package. Closing date: December 2, 2005. You may request an application form by: **Mail:Human Resources, Iowa Public Television, P.O. Box 6450, Johnston, IA 50131. Telephone: (515)242-3117; Fax: (515)242-4113; Email: Humanresources @iptv.org. Or complete and print an application form from our Web site, www.iptv.org. EOE/AAE.**

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TV TECH BUSINESS

Autodesk to Acquire Alias for $182M

SAN RAFAEL, CALIF.

Autodesk has inked a deal to acquire 3D graphics company Alias for $182 million in cash. The deal—which is expected to close within four to six months—is subject to closing conditions. For the fiscal year ending June 30, 2005, Alias revenues were $83 million. The Alias acquisition is reportedly the company's fourth this year and second largest in the company's history.

Alias FBX, which is used to exchange 3D content, and Maya, Alias' Academy Award-winning 3D application, will be added to the Autodesk film and video and interactive game lines.

There will likely be layoffs as a result of the acquisition, but until the deal closes, Autodesk cannot project how many redundancies might occur, according to Kevin G. Clark, who works in the Autodesk media and entertainment division.

Tandberg Television to Buy GoldPocket

SOUTHAMPTON, ENGLAND

Tandberg Television is acquiring GoldPocket Interactive, developer of digital and interactive media products, for $78.5 million.

The deal—a combination of cash and Tandberg shares—is expected to close by December 2005.

Tandberg Television does not anticipate layoffs from either company as a result of the deal, according to Lisa Hobbs, senior director of marketing.

Los Angeles-based GoldPocket is expected to bring in $12 million in revenue for its fiscal year 2005.

Earlier this year, Tandberg Television acquired N2 Broadband, a provider of open platform on-demand technologies. The deal opened up opportunities to international markets through its partner sales organizations worldwide.

Tandberg Television will now have offices in Atlanta, Denver, Los Angeles and New York.

Pro-Bel Acquires Vistek

READING, ENGLAND

Pro-Bel is acquiring Vistek Electronics Ltd, a privately held U.K.-based supplier of interface products to the broadcast industry. Financial terms of the deal were not disclosed.

"The merger will significantly expand Pro-Bel's offering to the global broadcast market and will also extend our reach into the cable and satellite market," said Pro-Bel CEO Graham Pittman in a news release announcing the acquisition.

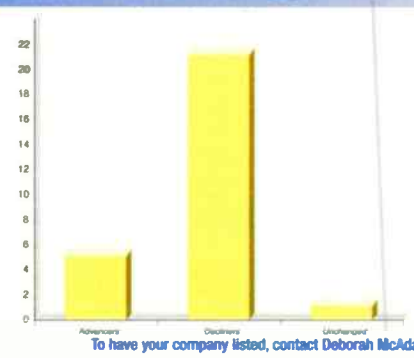
Pro-Bel—which manufactures routing switchers, signal processing, master control, and automation technologies—has been in business since 1977 and has been steadily growing ever since, driven by increased market share, according to the company. Vistek will celebrate its twentieth year in business in 2006.

Pro-Bel customers include Turner Europe, Reuters, King World, among others.

Bourne End, England-based Vistek develops a range of modular infrastructure products including rack frames, control systems, signal distribution, HDTV products, switching, video and audio conversion, multiplexing, video and audio processing and test and measurement equipment.

At NAB2005, Vistek unveiled a modular SD to HD upconverter, and HD lip sync tool, and HD audio multiplexing tool and a method of compressing a composite analoge video signal (CVBS) into the data space normally occupied by a standard SDI signal.

WIN-LOSE RATIO



TOP ADVANCERS BROADCAST STOCKS
Oct. 7 - Oct. 21)
Fisher + 2.45%

TOP DECLINERS BROADCAST STOCKS
Oct. 7 - Oct. 21)
Young - 20.52 %
Belo - 7.94%

TOP ADVANCERS TV STOCKS
Oct. 7 - Oct. 21)
Avid + 4.11%
Belden + 1.26%

TOP DECLINERS TV STOCKS
(Oct. 7 - Oct. 21)
Harmonic - 24.68 %
LSI Logic - 7.01 %

To have your company listed, contact Deborah McAdams at dmcadams@imaspub.com.

TV Tech STOCKS as of October 21

Company Name	52-Week Range	October 7	October 21	% Change
Avid	35.78 - 68.35	38.7	40.29	4.11%
Belden	17.65 - 24.59	19.11	19.35	1.26%
Ciprico	3.66 - 5.00	4.47	4.2	-6.04%
Harmonic	4.25 - 12.40	5.51	4.15	-24.68%
Harris	26.94 - 42.48	40.21	38.03	-5.42%
Leitch	6.72 - 13.97	13.9	13.96	0.43%
LSI Logic	4.32 - 10.75	8.99	8.36	-7.01%
Sci. Atlanta	26.28 - 39.89	36.01	33.03	-8.28%
SeaChange	5.07 - 19.75	6.81	6.84	0.44%
Tektronix	20.97 - 33.59	24.95	23.5	-5.81%

Broadcast STOCKS as of October 21

Company Name	52-Week Range	October 7	October 21	% Change
Acme	3.30 - 7.45	3.9	3.9	0.00%
Belo	21.12 - 26.45	22.68	20.88	-7.94%
Emmis	15.29 - 24.49	20.86	19.51	-6.47%
Entravision	7.14 - 9.50	8.05	7.6	-5.59%
Fisher	42.56 - 52.60	45.77	46.89	2.45%
Gray	9.67 - 15.74	10.05	9.91	-1.39%
Hearst Argyle	23.73 - 26.48	25.32	24.28	-4.11%
Nexstar	5.01 - 5.05	5.3	5	-5.66%
Lin TV	12.37 - 19.70	13.22	12.94	-2.12%
Paxson	0.37 - 2.15	0.44	0.42	-4.55%
Sinclair	6.60 - 9.75	8.61	8.4	-2.44%
Liberty	34.32 - 48.05	46.81	46.54	-0.58%
Univision	23.52 - 32.94	25.99	24.7	-4.96%
Young	2.70 - 12.50	3.07	2.44	-20.52%
Tribune	33.53 - 44.32	33.44	30.91	-7.57%
Meredith	44.51 - 54.57	50.56	48.78	-3.52%
EW Scripps	44.73 - 52.91	49.31	46	-6.71%

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