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TV TECHNOLOGY

Serving the Broadcast, Cable, Production, Post Production, Business and New Media Markets

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WHAT'S INSIDE

Telecom Reform Takes Shape

Pesky consumers remain the greatest unknown

by Deborah D. McAdams

WASHINGTON

Time is running out for lawmakers to pass a 2006 analog deadline bill and not leave millions of Americans without television reception.

Consumer electronics manufacturers need up to 18 months to build and distribute enough digital-to-analog converter boxes to assure that millions of households will not lose television signals. That leaves about three months for lawmakers to write, markup and pass a bill to end analog transmissions by Dec. 31, 2006.

"I think I've got enough votes in the House," said Rep. Joe Barton, (R-Texas). "We've got to have some help in the Senate."

It was in the Senate where the last hard-date bill flamed out. That bill, introduced by Sen. John McCain (R-Ariz.), gave most broadcasters until Jan. 1, 2009 to power down their analog transmitters. (Stations in the 700 MHz public safety spectrum had until the end of 2007.) McCain's hard-date bill was eventually reduced to a Sense of Congress statement that there ought to be a deadline.

"I believe that a hard date will make analog TVs go away."
—Rep. Joe Barton, (R-Texas)

OTA ONLY

Barton, head of the House Commerce Committee, has since taken the lead on establishing a deadline, but many details remain amorphous. The prickliest problem is what to do with folks who get television exclusively over-the-air. Debate continues on whether or not the government should subsidize D-to-A converters for OTA-only households. The current cost estimate—just for the boxes—is around $1 billion, provided those devices are $50 apiece. Consumer electronics makers have testified before Congress that they can make $50 boxes, but not before the target Dec. 31, 2006 deadline.

Carl McGrath was chief technology officer of Motorola last July when he told lawmakers

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CBC Launches HDTV Broadcasts

Service limited to Montreal, Toronto

by Scott Lehane

TORONTO

After years of moving at a snail's pace, the Canadian HDTV market took a big step forward March 5, when CBC/Radio-Canada lit up its Toronto and Montreal over-the-air HDTV services. The national public broadcaster, which operates English and French radio and television networks as well as Internet services across the country, will provide both HD television services in Canada's two largest cities in 1080i on a 24/7 basis.

"Our overall plan has been to ease our way into digital trans-

CANADA, PAGE 10

HD/SD SIGNAL PROCESSING

Miranda

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NAB2005 UPDATE

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NAME: Doug Lung

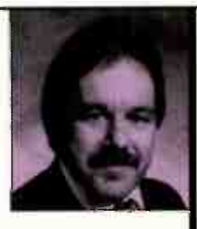
COLUMN: RF Technology

In early February, most broadcasters had to pick the DTV channel they will use once the DTV transition is complete, and analog broadcasting ends. Within a week, the FCC made available on CDBS the dtv_transition and...Page 71

NAME: Karl Paulsen

COLUMN: Media Server Technology

The deployment of networking technologies is reaching deep into the content space, making it possible for the user to enjoy new experiences using a flexible set of alternatives. To help understand what is evolving in the...Page 72



NAME: Randy Hoffner

COLUMN: Technology Corner

Traditionally, most professional color television cameras have been three-sensor devices that produce red, green and blue signals that are electrical analogs of the light that enters the lens and falls on the sensors. Today, these signals...Page 81

FROM THE EDITOR

Hats Off to Charlie

Every year around this time, the Consumer Electronics Association hands out its "DTV Pioneer" awards to the entities and individuals they believe have done the best job of promoting, producing and reporting on the DTV transition (the magazine you're currently reading was nominated for such as award in 2004). I'm not a member of the nominating committee, but if I was, I would have nominated an unlikely figure for 2005: Charles Dolan.

The 78 year-old founder of Cablevision, the New York-based cable operation is turning out to be one of the biggest promoters of HDTV in history. And, what's even better, he's putting his money where his mouth is.

Unless you've been on another planet recently, you're probably aware of the industry soap opera that is VOOM. The high-definition television satellite service was launched in 2003 to stifled yawns, and despite heavy ad campaigns, (including half hour infomercials for insomniacs), the company had only signed up approximately 26,000 subscribers in a little more than a year.

In January, Cablevision declared VOOM to be a massive waste of money and announced that it would shut down the service after reporting that it had sunk more than $650 million in the venture. After the company announced plans to sell the satellite and related assets to EchoStar, it was assumed that that was the end of VOOM and that it would take its place on the pantheon of similarly doomed ventures like DivX and AM stereo radio.

But the story didn't end there.

VOOM became a cause celebre for the senior Dolan, who is threatening to break up his Cablevision empire for the sake of saving VOOM, which he believes is the future of television. Over the past two months, he has fired three directors and replaced them with allies, among them, the inimitable John Malone, quite possibly the greatest of all cable mavericks, (although Malone has indicated that he is not as enthusiastics about VOOM's prospects).

In early March, the Cablevision board voted to suspend the shutdown of VOOM until the end of the month to give Dolan time to come up with the funds and support, so in this rapidly changing story, it is unknown how the plot will resolve itself.

Who will prevail, the elder Dolan or his sons, who want to wash their hands of the money-losing venture? What will become of the subscribers? What will EchoStar end up with? What does this say about the future of HDTV?

The story has all the juicy plotlines of a good old-fashioned dimestore novel, complete with the requisite heroes and villains; many analysts are siding with the younger Dolans, who only see dollar signs, but my money is on the elder Dolan, who has a long and successful history of bucking the odds and perhaps a more accurate vision of the future. Stay tuned.

Tom Butts
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LETTERS

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What is Quality?

Dear Mario:

While I sit here in my Atkins induced haze, I had to thank you for saying in your Feb. 16 article ("Numbers, Fingers, Toes and Quality") what I have been trying to tell all the young (and not so young) smartasses I work with that, just cause it say digital doesn't mean it is! "Digital is better!" "No, it's different" I tell 'em.

So here is my gripe about digital TV and all the great "quality" we are supposed to get. Hey, Daihatsu built cars of "incredible quality" and where are they now? I mean what does "quality" mean? Nuthin' as far as I'm concerned. It's like saying we will have weather today. Yah? No shibaska Sherlock. (I'm in a Psych. Ph.D. program and I really write my papers like this.)

Ya oughtta see the crappy digital service that our local cable company puts out. But everyone jes be a figgerin that new is better so they don't even know enough to complain that you can get better "picchers" with rabbit ears.

But that's not even my real beef. What is my real beef is, whatever happened to 1525i hi-def TV? What I saw at NAB a few years ago sure ain't the junk I see in the stores now! (I have loonies who I work around that think that not only is digital hi-def, but that 480p is too! Proving once again that ignorance is bliss?!) Or am I the looney?

Peter J. Anninos
Producer/Director United States Air Force
Seal Beach, Ore.

Mario replies:

Geez! Do I really have to choose between the two sides of your "or" in your last sentence? Good luck with your psych papers.

As for HD, I don't recall any 1525i. There was a 1575i proposed once (three times NTSC). There was also quite a bit of 1125i. 1125 is the total line count of signals that have 1080 active lines. So 1125=1080 (how's that for new math?).

There's already 2160-line Super HD and 4320-line Ultra HD; 1080-line HD is being delivered by a bunch of stations.

Whether it looks good or not depends on a bunch of factors:

- spatial and temporal detail in the scene
- compression encoder
- path conditions (multipath characteristics and carrier-to-noise ratio)
- antenna type, height, location, and orientation
- receiver RF front-end characteristics (sensitivity, selectivity, attenuation, phase noise, etc.)
- 8-VSB decoder
- MPEG-2 decoder
- scaler
- display characteristics
- display size and viewing distance
- viewer visual acuity

I've probably left some out.

Ayup, "digital" doesn't mean quality. But, if all goes well, digital can deliver some danged fine pictures.

Your pal,
Mario

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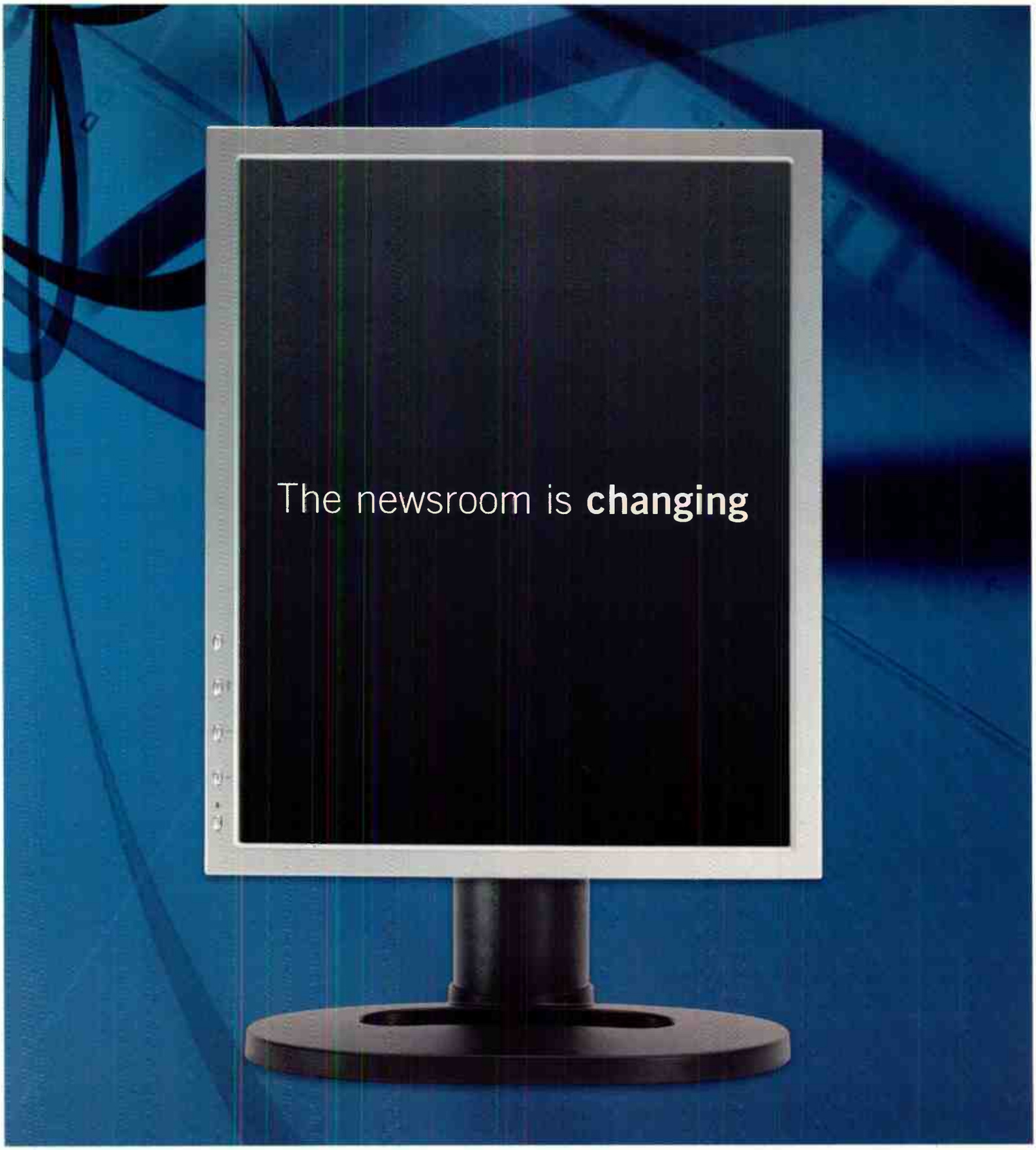

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DISH, TVG Launch Horseracing Channel

LOS ANGELES & ENGLEWOOD, COLO.

EchoStar's DISH Network and TVG Networks have teamed up to launch an interactive horseracing channel.

The Interactive Horseracing Channel gives fans the latest in news and information about horseracing and allows them to place bets via the DISH Network satellite network.

The Kentucky Derby, Belmont Stakes and Breeders' Cup World Thoroughbred Championships are all available on the TVG ITV Horseracing channel.

"Customers in many states can enjoy live TVG horseracing and wagering with convenient access to track schedules at their fingertips," said Scott Higgins, director of Interactive TV programming for the DISH Network.

The service is available to DISH subscribers in California, Idaho, Indiana, Kentucky, Louisiana, Maryland, Massachusetts, North Dakota, Ohio, Oregon, Washington and Wyoming.

Besides racing news and betting options, viewers have access to live odds, picks and handicapping information and race results.

To make wagers, viewers—who are at least 21 years old—must obtain a TVG Network wagering account and establish a TVG Network account.

iTV

Broadcaster, Newspaper Create Video News Bureau

PROVIDENCE, R.I.

CBS affiliate WPRI-TV, together with The Providence Journal, has tapped Telecast Fiber Systems to provide its point-of-view (POV) system to help create a news bureau at the newspaper.

The Bureau Link POV system has a 10/100 Ethernet path that provides WPRI staff with the tools to operate cameras and audio gear from their PCs using a cross-town connection. The return path of the system allows reporters to voice over feeds that the WPRI control room switches up.

"Our news bureau gives WPRI reporters the ability to go live from a location outside our main studio without needing a videographer to operate the camera or a microwave van to transmit the signal back to our station," said Gary Brown, news director, WPRI.

To install the fiber system and indoor camera, The Providence Journal worked with Telecast and broadcast systems integrator By Request Communications, based in Marlboro, Mass. The first live shot occurred on Election Day in November.

Fiber

Playboy Gets Interactive

SAN FRANCISCO & NEW YORK

OpenTV and Playboy Enterprises are launching interactive TV programs for the Playboy suite of TV networks.

As part of the multi-year deal, the San Francisco-based company and Playboy will develop and launch digital iTV software programs in which broadcasters, gamers, advertisers and fans of Playboy TV programming can participate. The interactive applications will be platform-agnostic and will run on any set-top box middleware or iTV technology.

"We look forward to building unique, reliable and stable technologies and applications that increase viewership and revenue," said Tim Evard, senior vice president, and GM, marketing and applications products, OpenTV, owned by Liberty Media.

Playboy also has collaborated with U.K.-based interactive gaming channel PlayJam—owned by Open TV—to create iTV games such as video strip poker, that feature celebrity centerfolds who were also on the "Twelve Babes of Christmas" holiday show on the Playboy Channel.

iTV

Samsung LCD Prices Plummet

SEOUL, S. KOREA

The demand for LCD screens is not keeping up with the production cycle for Samsung Electronics product lines and prices are not expected to reverse until the company's fourth quarter, according to the electronics manufacturer.

The company continues to think big, however, and has announced the launch of its 82-inch LCD screen, measuring 17 inches more than the largest Sharp model, launched in October.

As of late February, the company expected to invest $2.06 billion to fund its second TFT-LCD production line in Tanjeong, Korea.

LCD TVs of 28-inches and larger made up 31 percent of the market and this figure is expected to reach 45 percent in 2005 and 60 percent by 2007, according to Display Search, a market research and consulting firm.

Samsung recently launched what it claims is the world's largest LCD screen for the consumer market.

HDTV

Satellite HDTV Debuts in the Middle East

DUBAI, SAUDI ARABIA

Sony Broadcast & Professional MEA and Harmonic Inc., through its Regional Technology Partner GloCom, recently teamed up with two satellite companies to demonstrate the first HDTV satellite transmission to the Middle East region.

A Sony HDW-750P HD camera shot pictures from the floor of the CabSat 2005 show in Dubai and the signal was encoded using Harmonic's MV450 HD encoder and transmitted to an Arabsat satellite using a flyaway satellite terminal from Samacom, a provider of satellite communication services in the Middle East. The signal received from the Arabsat satellite was displayed live in the Arabsat and Samacom booths on the show floor.

Satellite

Stringer to Head Up Sony Worldwide

TOKYO

Howard Stringer, chairman and CEO of Sony Corp. of America for the past eight years, has been tapped to head up Sony Corp. worldwide. Stringer replaces Nobuyuki Idei, who served as CEO for five years. Stringer, who is also vice chairman and COO Sony Entertainment Business Group now takes on the role of chairman/group CEO and representative CEO, Sony Corp.

Perhaps Stringer's background in entertainment and technology will help bring the company back on top, competing again with the hottest technologies like the Apple iPod that merges electronics with content.

Stringer, originally from Wales, will be the first foreigner to run the Japan-based electronics giant. Prior to joining Sony in 1997, Stringer had a 30-year career in journalism, serving two years as executive vice president, CBS, and executive producer for "CBS Evening News with Dan Rather" for three years and also "CBS Reports" for five years.

Another shakeup at the company includes the replacement of President Kunitake Ando by Ryoji Chubachi, an executive deputy president who leads the electronics parts and production operations. Chubachi will also serve as CEO of the electronics business worldwide.

Additionally, Katsumi Ihara—who currently serves as CEO, executive deputy president and group CFO—will assume the role of Representative CEO, executive deputy president and Group CFO, Sony Corp.

The management change will take effect immediately, but the changes will not become official until June 22, as they are subject to the approval of shareholders, according to Sony.

Transitions

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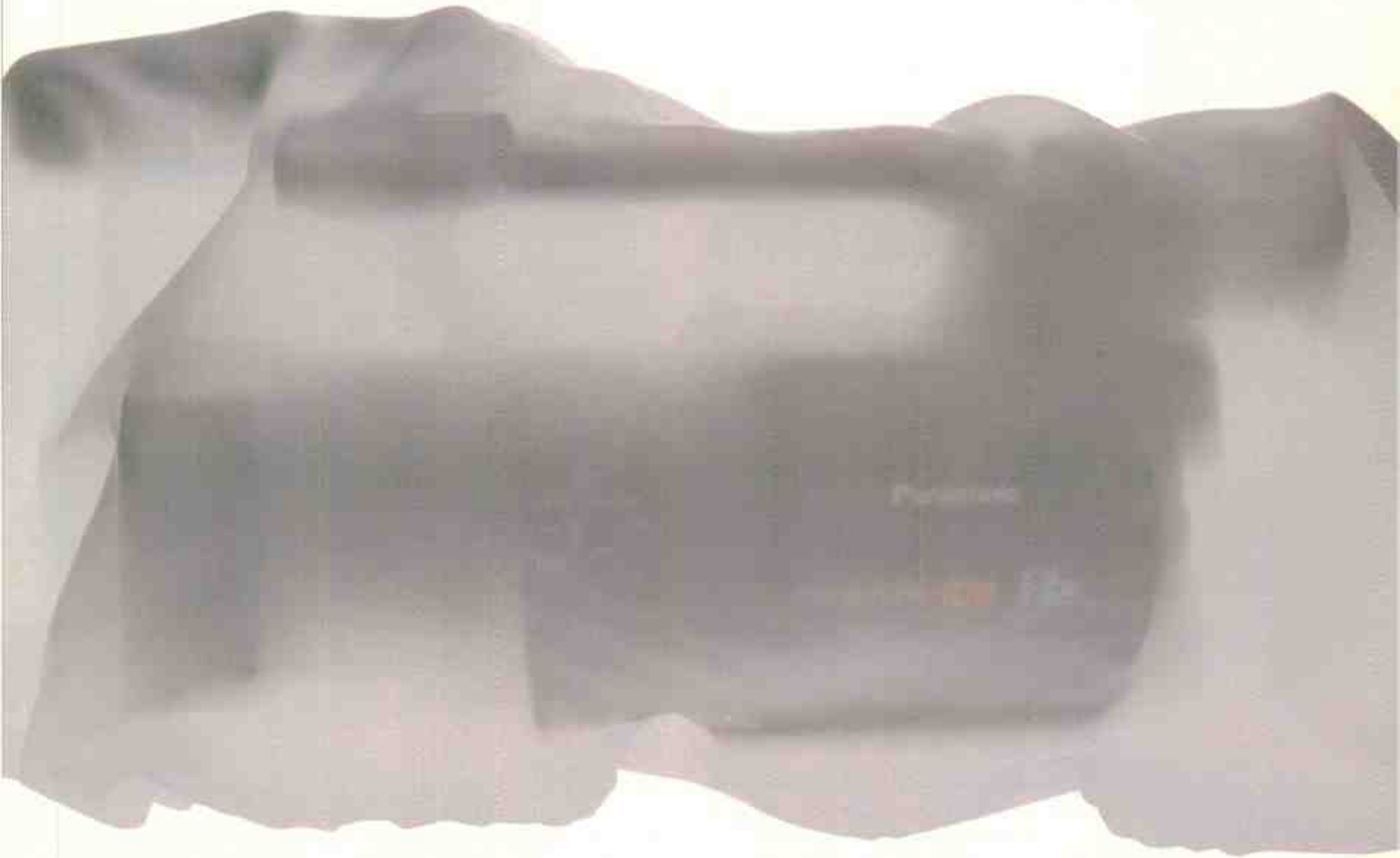

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DVCPRO HD P2

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Sony XPRI Finishes Enron Film

NEW YORK

The Sony XPRI NLE system was recently used to finish "Enron: The Smartest Guys in the Room," produced by HDNet and 2929 Entertainment.

New York-based post-production house, Framerunner finished the film at its post facility.

The original footage was shot in the Sony CineAlta 24p format, according to editor Don Wyllie.

"The real challenge was dealing with the archival news footage that came to us in several different formats," he said.

The XPRI system, a native HDCAM editor, is based on an open-source platform, making it compatible with other third-party plug-ins and technologies, like Adobe AfterEffects.

"We exported a clip into AfterEffects [version 6.5] directly from the sequence, applied an effect to it and rendered it out," Wyllie said. "That capability allowed the workflow here to be very efficient and fast."

The system captures native HDCAM footage at 140 Mbps over SDTI or compresses a baseband HDSDI stream down to the HDCAM 140 Mbps.

D-Cinema

Panasonic, Canon Capture American Idol in HD

HOLLYWOOD

Lively, and sometimes lousy, renditions of pop songs are all captured in HD this season on the Fox reality show, "American Idol," the first series entertainment show taped and broadcast in HD and 5.1 audio for primetime.

Certain onstage and backstage portions of the show are shot using a Panasonic Varicam in 16:9 720p. The Varicam's 24fps progressive scan, time-lapse recording and variable frame rates give the TV show a film-like quality.

American Idol Productions has been renting three Varicams since August 2004 and is using them for auditions, to shoot in the contestant's hometowns and for the intense on-screen competitions.

"American Idol" is shot at CBS Television City, which has selected five Canon lenses to capture the show in high-def. Four XJ25 x 6.8B IE-D HD studio lenses and one Canon HJ11ex 4.7B WRSE/WASE wide-angle HD portable lens capture onstage performances on Sony HDTV cameras.

The XJ25 HD lens—also known as the Digi Super 25xs—uses the Canon Power Optical System design technology, including the new optical "X-Element." With a zoom ratio to 25X and a focal length from 6.8-170mm, the Digi Super also is engineered to achieve optimal SD performance. The Digi Super employs a "constant angle of view" while focusing (also known as CAFS—Constant Angle Focusing System), and a digital memory selection for a variety of servo pre-sets.

The Canon HJ11, meanwhile, is among the widest HD lenses on the market. CBS purchased the WRSE/WASE version, which features Canon's Crossover Technology for shooting in both 16:9 and 4:3. CBS Television City uses this lense on a portable Sony HDTV camera in a variety of configurations, including handheld, jib-mounted and Steadicam.

HDTV

Sinclair Challenges Media Ownership

WASHINGTON

Sinclair Broadcasting recently filed a petition with the U.S. Supreme Court to review a previous judgment by a lower court on media ownership rules.

Sinclair's arguments are three-fold; the broadcaster is asking the high court to determine whether the United States Court of Appeals for the Third Circuit mistakenly overruled the D.C. Circuit by instructing the FCC to continue enforcing the eight-voices test; whether the Third Circuit is in conflict with the Telecommunications Act of 1996—which requires the FCC to eliminate unnecessary rules; and whether the court contradicts free-speech rights of TV stations while not imposing the same restrictions on cable, satellite and Internet companies.

In June 2004, the Third Circuit decided that the FCC should keep enforcing the eight-voices test, which means that at least eight independently-owned and -operated full power TV stations remain in a designated market area after a proposal for consolidation is made.

The Hunt Valley, Md.-based broadcaster argued that this ruling hurts its ability to compete with other big markets and negates a previous rewrite of the ruling by the FCC that would have relaxed media ownership restrictions.

In 2002, Sinclair brought a suit to the D.C. Circuit Court of appeals, against the eight-voices test and the court ordered the FCC to justify the "test" or eliminate it. The commission was unable to justify the test but said that "it is not necessary in the public interest to promote competition;" yet in June 2004, the Third Circuit Court of Appeals in Philadelphia ordered the FCC to continue using the eight-voices test.

Meanwhile, public interest groups and law firms including the Washington, D.C.-based Media Access Project (MAP) have been fighting against media consolidation and promoting media diversity. MAP supports the 1945 Supreme Court declaration that "the widest possible dissemination of information from diverse and antagonistic sources is essential to the welfare of the public, that a free press is a condition of a free society."

Sinclair currently provides sales and services to 62 stations in 39 markets, including Fox, WB, ABC, CBS, NBC and UPN affiliates.

Lauren Evoy-Davis

FCC Grants DTV Construction Extensions

WASHINGTON

While lawmakers in Washington continue to debate over a hard analog shut-off date, the FCC found that 43 stations had a legitimate reason for not having a DTV signal on the air.

In early March, the commission adopted an order granting six-month extensions for 43 noncommercial stations to complete the construction of their DTV facilities. The waivers were granted based on "demonstrated inability to complete construction by their current deadline."

The FCC decided that those 43 stations made reasonable and diligent efforts to construct, but were delayed by circumstances that were either unforeseeable or beyond their control. Details about the stations and those circumstances were forthcoming, but not available, at press time.

The order also found that two stations failed to adequately justify further extension of their DTV construction permits. These stations were admonished and given six months to complete their DTV facilities.

Deborah McAdams

Federal Frequency

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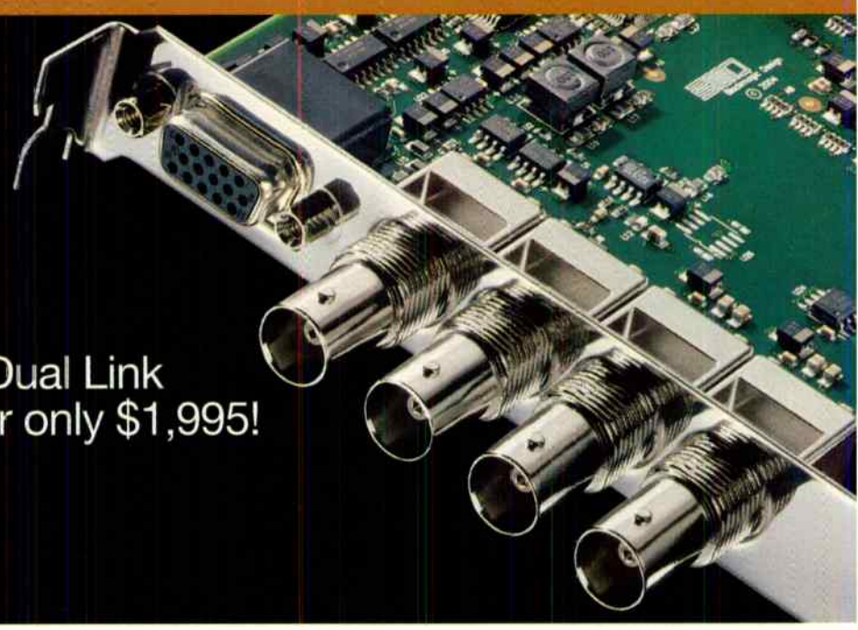

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Blackmagicdesign

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Canada

CONTINUED FROM PAGE 1

mission and HD production, as much as possible, by making those expenditures part of our normal capital replacement cycle," said Ray Carnovale, vice president and CTO of CBC/Radio-Canada. "Our strategy has not been to lead in this case, but to adopt HD at a prudent rate, as we could afford it."

Carnovale explained that the English network is run from a master control center in Toronto, while the French network is run from Montreal. In Toronto, the company will transmit from the CN Tower, and in Montreal, from its tower atop Mount Royal. The HD broadcasts will have a unique playlist from the analog channel, but under Canadian regulations, the company is only allowed to schedule 14 hours per day of unique HD programming.

In Toronto four private broadcasters are already on the air with a digital signal, but in Montreal, CBC/Radio-Canada will be the first to market.

NATIVE CONTENT

The Toronto private broadcasters, CityTV, Omni Television, CTV and Global, rely heavily on American HD programming, but as Canada's national public broadcaster, CBC/ Radio-Canada airs very little foreign programming. So, the availability of Canadian HD-originated content will be an issue initially.

And although CBC/ Radio-Canada has scheduled some unique HD-originated programs, including CBC Television's popular documentary series "The Nature of Things," the sitcom "The Newsroom," as well as an upcoming 10-part documentary series, "Hockey: A People's History" and "Getting Along Famously," initially most of the content will be upconverted from SD.

CBC/Radio-Canada's Toronto Broadcast Centre will serve as master control for the corporation's English-language HD services.

"There'll be a substantial amount of upconversion, but upconversion can be exceptionally good, especially if we're starting with anamorphic 16:9 masters," he said. "You can get some very impressive results."

CBC/Radio-Canada expects to have an HD mobile production truck ready for the road by June, and Carnovale believes Canadian HD production will grow at a healthy pace. "There'll be more and more day-by-day and week-by-week."

As for the decision to opt for 1080i, Carnovale explained, "We feel that the spatial resolution improvements of 1080i more than outweigh the temporal resolution advantages of 720p, because the 720p improvements aren't evident the vast majority of the time. I'd rather have sharper pictures the majority of the time, than better temporal resolution on those few shots where it might actually make a difference."

NO MANDATE

Although Canada has adopted the ATSC standard, broadcasters north of the border face an entirely different regulatory regime. Canada's regulator (the CRTC) is encouraging broadcasters to convert to high definition. So, although multicast channels are allowed, they have to be licensed as a separate channel and are not guaranteed carriage on cable and satellite.

However, the CRTC decided early on that the must-carry rules for a broadcaster's main digital channel would mirror the old analog rules.

"Certainly the great thing about the Canadian approach to digital TV is mandating mandatory carriage," said Carnovale.

Michael McEwan, president of CDTV (the equivalent of the ATSC), explained that, "Overall, the Canadian DTV strategy was to lag behind the Americans by a couple of years. The Americans took the edge off in terms of new technology—figuring out what worked and what didn't work—and the costs started dropping. They bore the brunt of that initial phase, and we saved the Canadian industry and consumers a lot of money by doing that. Now the challenge for us is that we want to finish the transition around the same time."

"Our strategy has not been to lead in this case, but to adopt HD at a prudent rate, as we could afford it."

—Ray Carnovale, CBC

That lag time has yielded one unexpected benefit. LG Electronics recently revealed the results of a nationwide survey conducted by Decima Research that found there's already a huge installed base of HDTV-ready sets, in spite of the fact that to date, there's been very little to watch.

Overall, 16 percent of Canadian homes already have an HDTV-ready set. By comparison, Forrester Research estimates there will be 12 million HDTV-ready televisions in the United States by the end of 2005, translating to approximately 10 percent of American homes.

CANADA, PAGE 18

DTV Border Interference Issues Remain

What impact will the CITY and CBC DTV operations have on U.S. TV stations along the U.S-Canadian border? According to the FCC's CDBS files of Feb. 27, 2005, the CBC has DTV channel 64 (CBLT) in Toronto and channels 64 (CBFT) and 61 (CBMT) in Montreal. Based on an agreement between the FCC and Industry Canada on the use of the 54-72 MHz, 76-88 MHz, 174-216 MHz and 470-806 MHz bands for DTV broadcasting along the common border, the only CBC station affected is CBMT in Montreal, which has a requirement that the effective radiated power (ERP) has to be equal to or less than that of channel 62. No call letters or location was specified for channel 62.

CBC's antenna sits atop the CN Tower in Toronto, one of the world's tallest structures.

According to the agreement, the entry for CITY-TV is "-10 dB to Batavia NY after transition, Batavia -3 dB to Toronto." This is confusing as WPXJ-DT, the Buffalo, NY PAX affiliate, is on channel 53 now, but can't remain on that channel after the transition. WPXJ-DT chose to elect its final DTV in round two of the FCC channel elections.

With many Canadian DTV stations operating above channel 51, interference concerns with new users of the out-of-core spectrum are still being resolved. In an Oct. 22, 2004 letter to former Sen. Ernest Hollings (D-SC), concerning interference to 700 MHz public safety channels, FCC Chairman Michael Powell said the FCC was working with Canada to "realign" vacant Canadian DTV and analog channels that posed potential interference to public safety operations in Washington state. The letter notes that Canada moved vacant DTV channel 68 in Victoria, BC to channel 43, as well as reassigning analog channel 68 in Vancouver, BC to analog channel 41 and reassigned Victoria BC analog channel 66 to analog channel 46.

As the DTV transition in Canada has started much later than the transition in the U.S. and is likely to finish much later as well, this is likely to have an impact on many users of TV broadcast channels, whether broadcast or new services, even after the U.S. DTV transition ends.

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Video Services Competition Heats Up

GlobeCast, Eagle Broadband launch IPTV solution for the little guys

by Robin Berger

SAN ANTONIO

France Telecom subsidiary and satellite services provider GlobeCast and Eagle Broadband have teamed up to offer a turnkey Internet protocol-based TV service targeting small- to mid-sized telcos.

"IPTVComplete," a multiyear deal between the two was announced in front of a primed crowd in February at the National Telecommunications Cooperative Association annual expo in San Antonio, Texas. NTCA represents about 600 independent telephone companies, who are facing intense competition from providers of IP, satellite and cable services.

"This is a big deal for many of the small phone companies that are out there," said Joe Savage, managing director of Beaverton, Ore.-based telecom consulting firm Telecom Think-Tank, who hadn't heard of any other one-stop "content and system and services solutions" packages. "There are 1,400 mom and pops and telephone co-ops that are potential customers for this."

Savage said that the program would solve many issues, including licensing for Internet protocol, methods for rolling out and supporting the new technology, as well as IPTV content licenses, which, he noted "are very rare."

Although he was not surprised the new service was launched, Savage was surprised that it surfaced with Eagle Broadband versus, for example, Microsoft, which teamed up with Alcatel to offer an IPTV solution to deliver content over broadband networks around the same time. At deadline, the Microsoft-Alcatel solution did not offer content licensing.

"Prospective customers were saying they really need help securing the IP content rights for a full channel lineup and for a way to deliver these video services more cost-effectively," said Randy Shapiro, Eagle Broadband's vice president of marketing.

The master control room at Globecasts' Los Angeles hub.

> **"We want to make it flexible enough to meet any need from any kind of broadband provider."**
>
> **—Randy Shapiro, Eagle Broadband**

FIRST OUT OF THE GATE

Based in League City, Texas, Eagle Broadband provides IP video content rights expertise delivering IP video services and IP set-top boxes. GlobeCast contributes its carrier-class IP network and global IP satellite distribution capabilities.

The duo insisted that their product is the industry's first turnkey IPTV services solution that enables telephone companies, municipalities, utilities, universities and real estate developers to rapidly deliver more than 200 channels of the highest quality IPTV video services anywhere in America.

Shapiro said Eagle Broadband determined this exclusivity based on research—and talking to "hundreds of people about it," including industry analysts.

The joint venture would deliver "the largest package of standard, premium and high-definition television programming, video-on-demand, pay-per-view and digital music available" in the U.S., according to the providers. And it would include "full IP multicast video content rights for distribution over fiber, DSL and other private IP networks."

In addition to the panoply of features, the providers cite savings of "$1 to 2 million or more in upfront capital expenditures." This estimate, they stated, would be otherwise necessary to "design, purchase and install an IP headend, as well as secure the necessary video content rights, provision circuits; [to] aggregate content, operate and maintain the headend; and [to do] the many other tasks required to launch and operate a competitive IPTV service offering."

The providers insisted their approach would also save time, claim-

VIDEO SERVICES, PAGE 36

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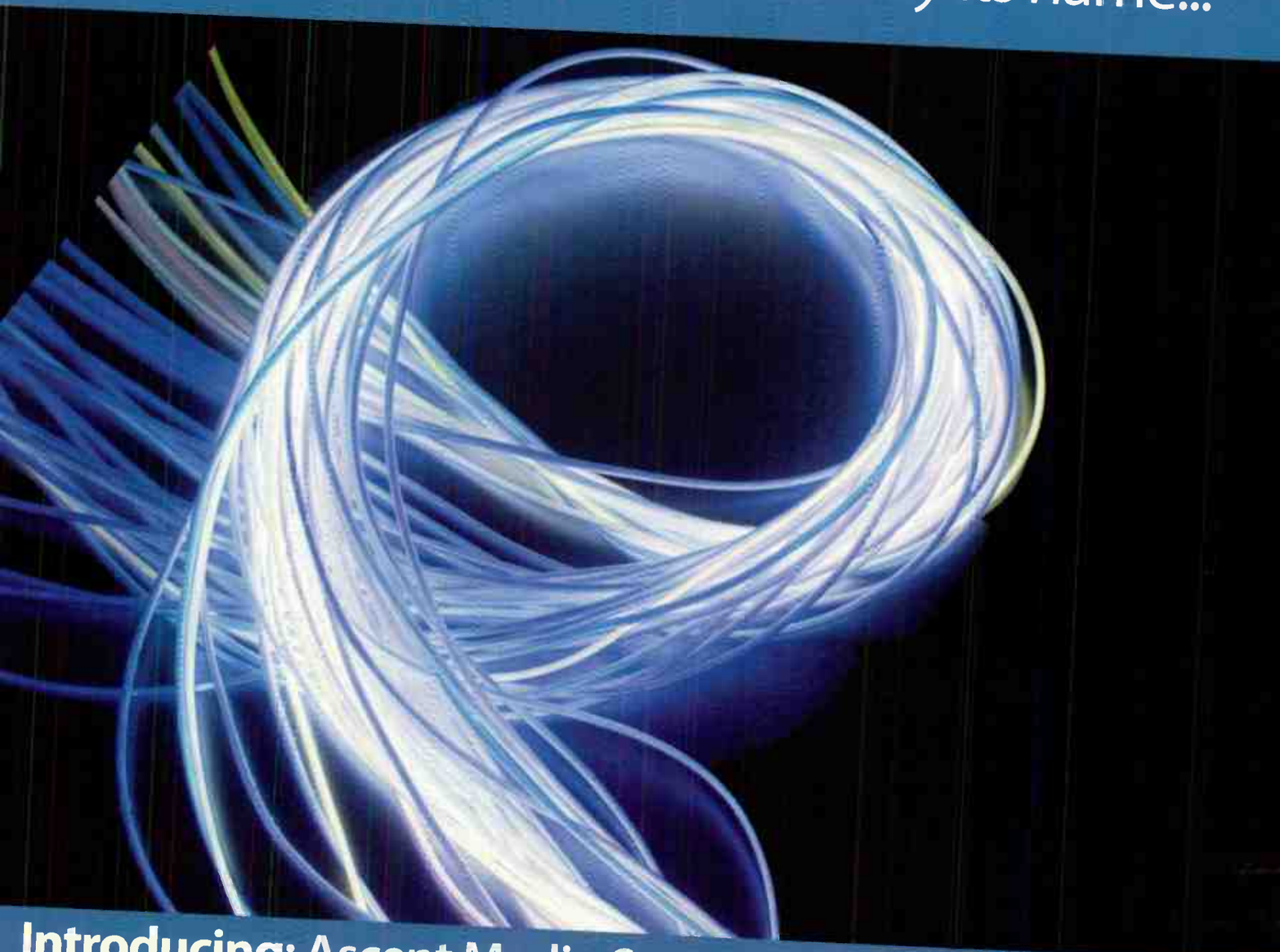

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Canada Battles Satellite Pirates

Cross-border gimmicks help evade the system

by Scott Lehane

TORONTO

The Canadian government is coming under increasing pressure from broadcasters, producers and the satellite industry to change its Radiocommunications Act to deal with the burgeoning problem of "gray-" and "black-market" satellite TV.

The black market refers to people who use a compromised or "hacked" smartcard to receive satellite TV for free. And although satellite companies frequently try to shut off these cards with Electronic Counter Measures (ECMs), the pirates have become increasingly adept at using the Internet to distribute software updates to overcome ECMs.

The gray market, which has become an equally pervasive problem, refers to Canadians who use a phony U.S. mailing address or P.O. Box south of the border to subscribe to DirecTV or Dish Network, rather than the two nationally authorized satellite services—Bell ExpressVu and Star Choice. The problem with the gray market is that U.S. broadcasters only buy American distribution rights to their programming, and hence the practice is depriving producers of revenues from a lucrative secondary rights market.

CATCH 'EM IF YOU CAN

DirecTV routinely shuts off Canadian subscribers when they can catch them, but it's easy to set up a U.S. postal address

Many Canadians would rather get their satellite TV from DirecTV or Dish than from Canadian DBS provider BellExpressVu.

and enforcement is extremely difficult.

The satellite industry was dealt a major blow recently when a Quebec judge ruled that the provisions in the Radiocommunications Act that outlaw piracy, contravene the guarantees of freedom of expression in Canada's Charter of Rights and Freedoms. "It's a major issue," said Pierre Pontbriand, vice president of communications for the Canadian Association of Broadcasters (CAB). "The federal government has decided to appeal. It's not something that can be left hanging."

After being originally charged in December 1998 for illegally accessing DirecTV, Quebec residents Jacques D'Argy and Richard Theriault were acquitted in September 2000 by Judge Danielle Côté. In June 2001, the Quebec Superior Court rejected a government appeal. But in May 2002, the Quebec Court of Appeal overturned the acquittals and sent the case back to Côté. This time, Côté ruled on the freedom of expression argument and struck down parts of the Radiocommunications Act. Although the ruling only applies in the province of Quebec, and Côté placed a one-year moratorium on its implementation, numerous constitutional challenges from satellite pirates have been working their way through the provincial courts since the late 1990s. In 2002, the Supreme Court of Canada was asked to rule on whether U.S. satellite signals are protected in Canada. Now the debate is focused on the argument that freedom of expression includes the right to receive information, and it's an issue that may be back before the Supreme Court soon.

THAT SUCKING SOUND

In the meantime, the problem has swelled to huge proportions. It's estimated that between 750,000 and 1 million homes north of the border are receiving illegal satellite signals. (In a country with little more than 10 million households, that's a very high percentage.) "These estimates are quite conservative," stressed Pontbriand. "It takes over $400 million per year from the Canadian broadcasting system—revenues that would go to producers, distributors, broadcasters, authors, writers and musicians." Some estimates are as high as a billion dollars per year.

Although many U.S. shows are picked up by Canadian networks (for example, CTV airs "The Sopranos" in Canada), and the major U.S. TV networks—ABC, NBC, CBS, Fox and PBS—get carriage on a basic tier across the country, most of the U.S. specialty channels are not approved for distribution in Canada, where they would compete with similar Canadian specialty services. Hence instead of the "History Channel," Canadians can get "History Television," and instead of ESPN, there's TSN and CTV SportsNet.

After years of being blocked out of the Canadian market, Fox News was just recently approved for distribution in Canada.

Where U.S. and Canadian networks overlap programming, the U.S. advertising is replaced with local advertising in a process called "simultaneous substitution." (Every year at Super Bowl time, the issue comes to a head, as Canadians hear news reports from south of the border about all the wonderful Super Bowl spots that they can't see.) The Coalition Against Satellite Signal Theft (CASST), a group that includes the CAB, the Canadian Cable Telecommunications Association, the Canadian Film and Television Production Association, Canadian Motion Picture Distributors Association (CMPDA), as well as performers rights organizations and U.S. satellite distributors—DirecTV and the Dish Network—has been pressuring the government to rewrite the law to close the constitutional loophole, as well as to stiffen the penalties for piracy.

Luc Perreault, co-chair of CASST explained that "It's just a minor cost of doing business for these guys. We arrested someone recently in the Montreal area, and it was the third or fourth time we've arrested that person. We have to have stiffer financial penalties so we can bankrupt these people and make it so it's not worthwhile trying to break code."

Meanwhile there's a lot of money to be made, and the pirates invest heavily in R&D. Indeed, with penalties that often amount to little more than a fine, there's a growing perception that the country has become a haven for pirates.

"It's not a perception, it's a fact," Perrault admitted. And although the coalition typically has approximately 25 lawsuits going on at any given time, enforcement has become increasingly difficult with the advent of the Internet. "These people are really smart. They know how to hide Web addresses and they're making it really difficult for us. A lot of the guys on the Web are resellers. We're really after the ones who manufacture."

A bill to stiffen the penalties died on the docket last year when a federal election was called. But the coalition has been lobbying hard to get the bill reintroduced and to outlaw the downloading of "malicious code." ■

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Broadcasters Challenged by Golf in HD

Fans support HD on the course, but criticisms arise over some coverage

by Susan Ashworth

AUGUSTA, GA

It seems that in the world of golf, the more traditional, the better. Take this rule of etiquette, for example: "No spectator is entitled to make any observation whatever respecting the play, or walk before the players, or remove impediments or, in short, to interfere even in the most distant manner with the game while being played."

And that particular not-so-short rule—like many in the game of golf—goes all the way back to 1875, courtesy of the standards body known as the Royal and Ancient Golf Club.

Skip forward 130 years, and little has changed.

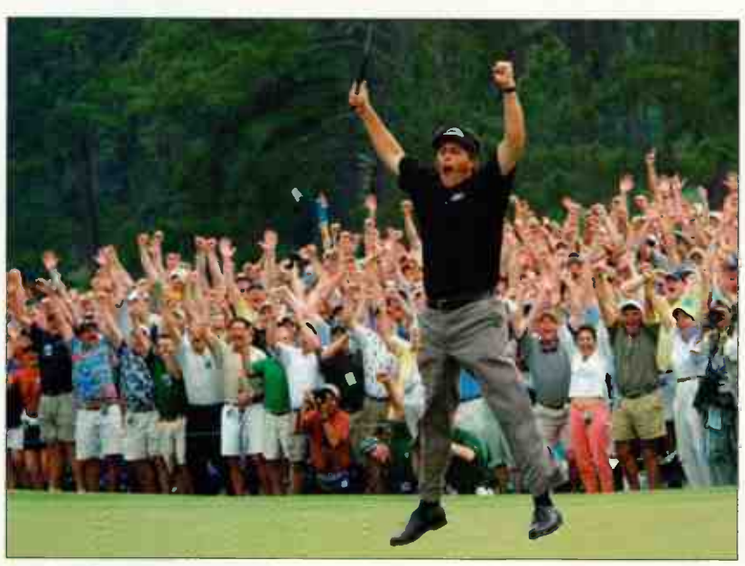
But despite the sport's reluctance to sway from tradition, one technical innovation has seemingly been embraced wholeheartedly by golf aficionados nationwide.

After all, bringing the wonders of high-definition technology to the course hardly spoil the game—if anything, it seems to bring a sometimes quiet, slow-moving game to thrilling, color-saturated life. And when CBS decided to change the way it covered this traditional game by airing its first images of golf in high definition in 2000—especially of the much beloved Masters Golf Tournament, held each April in Augusta, Ga.—viewers were anticipating something fantastic.

And like most initial viewers of HD, they weren't disappointed.

"To see [CBS'] coverage of The Masters was incredible," said one viewer on an Internet blog after an HD version of the tournament aired. "You could pick out individual blades of grass on some shots."

Tiger Woods reacts to a missed putt.



Phil Mickelson jumps for joy after winning the 2004 Masters.

'A GREAT NATURE SHOW'

Skip ahead five years. After CBS's initial HD coverage of The Masters in 2000, some viewers watching The Masters and other tournaments began to wonder if the coverage had changed.

"The coverage that I've seen since then has not been nearly as good," that same viewer said. "I don't know if it was the specific truck, the fiber in the course or what."

That criticism is undoubtedly due to the complex nature of covering golf itself.

Most agree that HD makes for a fantastic viewing experience. As one viewer said, "I love football on HD, but golf almost seems like it would be a great nature show with sports thrown in." But executing the coverage of a sport like golf is cumbersome and challenging.

The challenge begins with the coverage area itself. For anyone who has ever played this game—also called "a good walk spoiled"—the two-inch ball rarely lands exactly where it was intended.

Unlike more traditional sporting events such as football or basketball, golf is not always confined to a manageable arena. The Augusta National Golf Club is a several-hundred-acre course with the network covering more than 90 players on 18 holes.

And the situation is doubly tricky at Augusta, where the drink napkins are colored the exact shade of the grass so that if dropped, they won't show on television. Same goes for technology on the course, said Bob Seidel, vice president of engineering of advanced technology for CBS. "It's challenging because they require no cables be seen by the public."

To adequately provide coverage of this tournament, CBS has built an underground conduit of cabling and fiber that spreads across the entire course. In 2004 the network finished its fiber run, and now has fiber connectivity at all 18 holes on the course. This year the CBS network will use Telecast Fiber System SHED adapters with HDX camera power units and Cobra fiber-optic triax extenders at any of those 18 holes to provide tee shots, green shots and fairway drop shots to viewers.

But despite overcoming the technical issues of actually reaching every hole on the course, CBS still faces the challenge of providing crystal clear HD coverage of every moment of the event.

worked with partners such as Boeing and Ikegami to develop possible solutions to the issue. At this year's Masters, held April 7-10, CBS will again use a mix of SD and HD cameras.

Equipment from Telecast Fiber will be used to cover the Masters in HD.

CBS will use a large cache of HD cameras, but will also employ a handful of standard-definition roving wireless cameras to catch shots that aren't near a fiber conduit. The challenge of using HD wireless cameras, Seidel said, comes down to radio frequency. "The radio frequency isn't wide enough to support uncompressed HD at 1.5 Gbps." During test runs in which CBS employed the uncompressed signal, engineers found that the uncompressed HD signal lengths were 800 MHz, compared to an average of 17 MHz for a standard-definition signal.

TWICE THE TIGER?

One solution was to send a compressed HD signal, but that can cause up to 10 frames of delay between the acquisition of the image and the arrival of video and sound back at the truck. In order for the video to match the feed being sent from other uncompressed signals, the production team would have to also delay other RF cameras, as well as the announcers. "Otherwise, you might get to see Tiger Woods tee off twice," joked Seidel.

The network continues to work on further reducing the delay, and has

From the viewer's perspective it's a little disconcerting, Seidel agrees, but "it's the best option for now."

During its Master's coverage last year, CBS used more than 50 cameras in various positions—in fixed positions on certain holes and in mobile locations across the course, with some cameras assigned to specific holes and others assigned to specific players.

CBS continues to express its commitment to the technology, and is broadcasting an average of 25 hours per week of HD programming. This year marks the Tiffany Network's sixth year of presenting the majority of its primetime lineup in high definition. After initially airing The Masters in HD in 2000, CBS Sports added the PGA Championship to its HD roster in 2004. The network also broadcasts several Super Bowls and many regular season NFL games in HD.

Despite some criticisms, CBS has a fan base for golf in HD that remains strong. "I'm really looking forward to golf in HD," said one viewer. "It has so much to offer, the different grasses, the fine sand bunkers, the contrast of the ball on the greens, the depth and texture of the greens, the contrasting fairway cuts and the many fine details that make golf such a great game." ■

Canada

CONTINUED FROM PAGE 10

Steve Preiner, director, LGe Canada explained that, "Although 16 percent may seem like a high adoption rate for HDTV-ready televisions, we were not overly surprised, as that figure is in line with the sales numbers we have been seeing over the past couple of years. It's impossible to say for sure why Canadians appear to be purchasing HDTV-ready televisions at such a rapid rate and so much faster than Americans."

"It's not price-point. It's not the Canadian dollar," said McEwan. "I'm at a loss to say what the reason is, except to say that historically Canadians buy more home theaters on a per capita basis than any other country in the world, and so I'm not surprised."

NO SHORTAGE

Another key difference in the Canadian rollout is that unlike the United States, spectrum scarcity isn't as much of an issue in most of the country. Hence there's not a fixed analog turn-off date and no mandated deadlines.

"I'm sure Industry Canada [a government-level cabinet that regulates communications, among other things] would love to have the spectrum back to lease it out, but having said that, there's still lots of available spectrum in Canada compared to the United States," McEwan explained. "So we have a market-driven approach and that's a very positive thing. It lets the industry go at its own economic pace."

CBC/Radio-Canada has also received a license for a Vancouver English HDTV service, and it has pending applications for a French service in Quebec City and both English and French DTV channels in Ottawa.

But according to Carnovale, that's where the company's rollout plans end, at least for now.

With a population density that is less than four percent that of the United States, Canadian broadcasters face some serious economic challenges trying to bring digital TV to the country's remote rural communities. In fact, it took a huge government-funded initiative in the 1970s and 80s to build out analog coverage for those areas.

"You can cover 70-75 percent of the population with about 15-20 transmitters, but if you want to get the other 25 percent, you've got to build 400 transmitters," explained McEwan. "And I'm not sure the industry can afford that infrastructure. So maybe we're going to have to find another way of delivering HD programming to rural parts of the country."

"We have a market-driven approach and that's a very positive thing. It lets the industry go at its own pace."
—Michael McEwan, CDTV

At present, it seems unlikely that the government is prepared to fund another massive infrastructure project to subsidize the transition.

"The economics aren't there to build the system out. It simply won't happen. So we're going to have to be innovative about this," said McEwan.

Some of the proposals that would maintain the idea of free local television include a subsidized cable or satellite box to deliver the local channels that viewers currently receive over the air, or huge tax incentives for broadcasters to increase their digital penetration.

But as yet, there is no consensus, and the issue of how to cover the other 9.8 million square kilometers, beyond the major urban centers remains unresolved. ■

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Telecom

CONTINUED FROM PAGE 1

that his company could do a $67 box by 2007, with "sufficient demand." McGrath also said that DTV transition legislation would have to be passed by mid-2005 "to meet the 2007 goal without disruption."

Dr. Jong Kim of LG Electronics more recently told a Congressional subcommittee not to anticipate a $50 box until some time in 2008, "assuming industrywide demand of tens of millions of units by then."

Box makers have said they are already gearing up to build the simple converter boxes, but an estimate of how many will be needed has yet to materialize. According to the Government Accounting Office, about 21 million U.S. households rely exclusively on OTA television—not exactly what the average layperson would consider "tens of millions." Moreover, if a subsidy were limited to poor households (with incomes at twice every level, for example), about 9.3 million would qualify, according to GAO estimates.

That doesn't mean that nonqualifying households wouldn't buy converters, but it also doesn't mean they wouldn't buy TVs with built-in tuners—if they can find them.

Adding to the ambiguity of potential demand, the CEA is angling to get the second phase of the digital tuner mandate dumped. Instead of having to put tuners into all TVs 36 inches and larger and half of 25-to-35-inch TVs by July 1, the CEA wants a consolidated deadline of March 1, 2006.

"Funding of a formal study would be helpful to establish the precise number of OTA households."
FCC report on OTA households

OTA HOUSEHOLDS

Once lawmakers figure out who qualifies for converter subsidies, they'll have to have some idea where these people live. According to the FCC report on OTA households, the market demographics vary widely. OTA reliance is about 30 percent in the Dallas, Minneapolis and Salt Lake City markets, while Palm Springs, Calif., and Parkersburg, W.V., have the lowest proportion of OTA households in the country at 6 percent.

The FCC report suggested two options for shutting off analog signals. The first is the sudden and simultaneous end to analog transmissions preferred by lawmakers. The second, "fade to black," would phase out analog transmissions market by market and allow OTA households to continue receiving emergency information and local programming.

"Given the importance of an accurate assessment, funding of a formal study would be helpful to establish the precise number of OTA households on a market-by-market basis, and to forecast how those numbers are expected to change over the next several years," the report said.

The House Commerce Chairman has a much simpler formula in mind.

"I believe that a hard date will make analog TVs go away," Barton said at a gathering of broadcasters in Washington, D.C.

He did not indicate what he would do with his own analog TVs, including one that he bought over the holidays with a $300 gift certificate. ■

The Government Accounting Office estimates that approximately 21 million households rely exclusively on over-the-air television reception.

McCain Remains Force in Broadcast Regulation

WASHINGTON

Sen. John McCain (R-Ariz.) has long been the bane of broadcasters on Capitol Hill, once accusing them of "one of the great rip-offs in American history." Frustrated that many broadcasters missed their initial digital deadlines, McCain growled that loaned spectrum for digital signals was a "$70 billion giveaway."

Sen. John McCain, (R-Ariz.)

It is little wonder then that the Arizona senator got $1,000 from the NAB during the last election cycle, while Congressman Joe Barton (R-Texas) got $8,000. (See "TV Contributors.") However, it was McCain who favored a kinder, gentler transition deadline of 2009, while Barton won't back off of Dec. 31, 2006.

Last fall's power shift left McCain without a committee chairmanship, but he continues to hammer away at broadcast issues. In February, the senator introduced the Localism in Broadcasting Reform Act of 2005, which would require broadcasters to renew their licenses every three years, instead of the current eight-year cycle. McCain's bill was motivated by a study from the Norman Lear Center at the University of Southern California Annenberg School for Communications that criticized broadcast coverage of local elections.

McCain would also like to force programming distributors to make financial disclosures related to boxing matches. He introduced a bill last fall to make broadcasters as well as DBS and cable operators reveal payments from or to fight promoters and other related income to a federal boxing commission. McCain's boxing bill was KO'd in the first round, but he vowed to bring it back into the ring.

Deborah D. McAdams

Barton Reveals Views on Telecom Laws

WASHINGTON

Congressman Joe Barton (R-Texas), itching to craft a new set of telecom laws, gave broadcasters a glimpse of his positions on several issues at the NAB State Leadership Conference held in Washington, D.C. March 1.

On the Fairness Doctrine: "I don't think we need an artificial fairness doctrine that stifles debate."

Ownership: Market forces encourage consolidation, "but it's not good public policy if it diminishes localness."

Must-carry: "I have never philosophically been a must-carry person." It's not necessary in a 200-channel environment, Barton said, telling broadcasters "you're going to get carried unless you're the third or fourth Spanish channel or third or fourth shopping channel."

Retrans consent: "I support you there. I believe you ought to get something for your signal."

Translators/satellite stations: One broadcaster from Utah, who said his state had 500 mountaintop translators that were accessible only five months a year, asked if these would be subject to a hard deadline. Barton said regional allowances would be considered.

Indecency: "Its not fair to subject broadcasters to one set of rules and cable and satellite to no set of rules."

Deborah D. McAdams

TV Contributors

2003-04 PAC Contributions to **Rep. Joe Barton (R-Texas)** from TV/Movie/Music Companies:	
Clear Channel	**$10,000**
Comcast Corp.	**$10,000**
Walt Disney Co.	**$10,000**
NCTA	**$10,000**
NAB	**$8,000**
Time Warner	**$5,000**
Metro-Goldwyn-Mayer	**$1,500**
MPAA	**$2,500**
Sony Pictures	**$2,000**
Universal Studios	**$3,500**
Viacam	**$6,000**

2003-04 PAC Contributions to **Sen. John McCain (R-Ariz.)** from TV/Movie/Music Companies:	
Cablevision Systems	**$10,000**
Comcast Corp.	**$5,000**
NAB	**$1,000**
NCTA	**$5,000**
Sony Pictures	**$2,000**
Time Warner	**$5,000**
Viacom	**$10,000**

Source: The Center for Responsive Politics, based on data from the Federal Election Commission.

MXF Sees Quick Adoption

Standard being implemented across production chain

by Mary C. Gruszka

NEW YORK

The Material eXchange Format (MXF) offers the promise of seamlessly interchanging audio and video material along with associated data and metadata among different manufacturers' equipment. An open standard, the format is available to all, with even free developers' kits available.

MXF provides a wrapper for content, or "essence," in which a description of the essence resides. The MXF file doesn't care what, if any, compression scheme is used on the essence, but it does provide identification of the compression scheme (and many other aspects of the essence) in the form of metadata, allowing a way for that information to be available to applications or equipment.

"MXF tries to solve the file format wrapper problem, to describe how to map a certain essence. It doesn't try to solve the essence conversion," said Tim Claman, Director of Interoperability and Standards, Avid. MXF can be used for file transfers or for streaming across different computer operating systems and networks.

MXF was derived from the Advanced Authoring Format (AAF) data model, and according to the Zero Divergence Doctrine (ZDD), "unless there's a really good reason to make them different, they shall be the same," said Bruce Devlin, vice president, technology for Snell & Wilcox.

Devlin said that MXF stops at cuts-only edits, while AAF is meant for interchangeability throughout the entire post-production process. "By design, we limited what MXF could do."

"MXF is a relatively broad standard; there can be different types of legal MXF files, and it's relatively early in the maturation process."

—Tim Claman, Avid

The implications of MXF implementation to the industry are many.

"It's not just going to HD that's the end game. It's the move to a more IT-centric environment, with the ability to pass metadata around," said Joe Zaller, vice president of strategic marketing and product management for Snell & Wilcox. "With MXF, we are moving away from proprietary systems. If people are locked into proprietary systems, it's very expensive and you need highly specific equipment to interface with. MXF provides the ability to integrate into an IT system."

Over the past year, there has been remarkable progress in implementing MXF in products designed for the whole workflow spectrum—from acquisition to editing, to server storage and distribution, and for archiving.

"What we are seeing is MXF is being adopted very quickly and broadcasters are demanding it," Zaller said. "It will be interesting to see who is not making MXF products."

ACQUISITION & EDITING

Both the Sony XDCAM and Panasonic P2 camera acquisition formats provide MXF files; but there are differences. The obvious one is the encoding of the essence within the MXF wrapper—Sony XDCAM uses IMX encoding, and P2 uses DVCPRO. But there is another difference as well—the MXF operating pattern each company chose to use for its format.

Operational patterns (OP) allow for the huge flexibility of MXF, representing different package and item complexities, for example, a single source clip or multiple source clips for alternate versions of the same program. Item complexity can be designated as single item (1), playlist items (2) or edit items (3); package complexity can be called single (a), ganged (b) or alternate (c). OP nations range from 3c, plus OP Atom.

Tim Claman

Ray Baldock

Bruce Devlin

Hugo Gaggioni

Operating patt Atom separates the and audio essences multiple files but with a common clip metadata for all the files. OP1a interleaves audio ar video tracks into a sing file.

How these two varia tions affect interoperabil ity with nonlinear ed (NLE) systems depen on who you talk to.

"There are no issu with nonlinear editin said Hugo Gaggioni, ch technology officer, S Broadcast. "We Atom inside XDC when we play o tent, we format i it in interlace to b able by humans."

Gaggioni said XDCAM is compa with Avid, Grass Valley, EVS, Quantel, Pinnacle, Leitch, Omneon and SGI.

In general, makers of NLEs currently support or will support both P2 and XDCAM formats.

Pinnacle Liquid, for example, uses an import function to bring in XDCAM or P2 files to the NLE and separate the audio and video tracks, according to Al Kovalick, strategist and Pinnacle Fellow, Pinnacle Systems. Editors scan and browse which files they want to import. "We don't use the Sony thumbnails," Kovalick said, referring to the thumbnails that the XDCAM format provides. "Liq-

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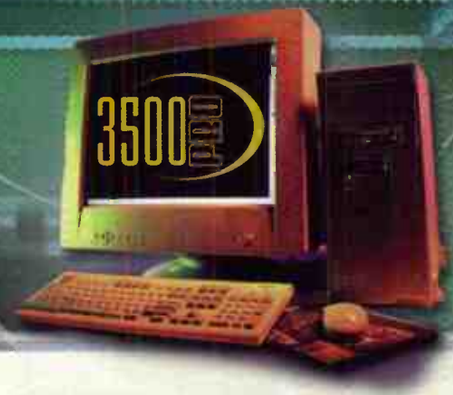

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MXF

CONTINUED FROM PAGE 20

uid outputs [an MXF file in] OP1a."

Avid uses OP Atom as the native MXF format for its edit products. "For complex edits, video and audio need to be separate files," said Claman.

"You can plug a P2 card into an Avid NewsCutter and immediately edit," said Phil Livingston, vice president, technical liaison for Panasonic Broadcast. "The power [of OP Atom] is that it can be edited instantly, which is not true for MXF operating pattern formations that need to be parsed."

There is no actual ingest per se, Claman said. "You don't need to import or convert to look at the file."

For Avid to be compatible with XDCAM, "we had to do some work to read Sony's files. It didn't just magically happen," Claman said. "We can't directly edit the XDCAM disk, but we're able to very easily integrate with XDCAM. We convert [the files] to another operational pattern as an import step. We also had to make an MPEG codec to read the [XDCAM MPEG-4] proxy files."

Avid now provides a transfer agent to output the finished program as an OP1a MXF file, Claman said.

Gaggioni said that it's a fairly trivial issue to convert XDCAM to Avid. "It's done on the fly," he said. "You have to unwrap the material and get the essence out. It's a nonissue at this point."

Other gear used in the editing environment, like character generators, are also going MXF. Pinnacle, for example, provides MXF support for DV25 and MPEG up to 50 Mbps, all in SD OP1a, with some companies developing additional support for other operational patterns. "For a playout server you want one file for the finished story where the audio and video are interleaved," Claman said.

Some servers store files as MXF native; others wrap other file formats inside an MXF wrapper.

Thomson Grass Valley provides the UIM, Universal Interface Module, to for Deko graphics CG and Thunder live production server, Kovalick said. "HD versions will be shown at NAB2005 with support for MXF for MPEG only. In Liquid we support MXF for MPEG and DV."

SERVERS

Next in the workflow chain are the servers for storage, distribution and playout. Most servers today support support MXF for older servers. "The interface package makes our older servers talk over Ethernet and talk over MXF," said Ray Baldock, chief technology officer, Thomson Broadcast & Media Solutions. "This has been popular with our existing customers to get them into MXF without replacing their servers," he said. Thomson Grass Valley also supports its GFX file format.

The Snell & Wilcox MXF Desktop player

Avid is "using MXF as a native file format and also for exchanging files with other vendors," Claman said. "It gives us a new native file format internally at Avid and media files that are open to anyone to look at them."

Historically Avid stored its files as OMF, but not all Avid products, notably Pro Tools, could create them (although they could read them). Avid will continue to support OMF for compatibility with legacy products.

At NAB2005 Sony will introduce a new server with new architecture that will be purely native MXF, Gaggioni said.

For the Omneon Spectrum server, "the code for full MXF support of OP1a was released about a year ago," said Adolfo Rodriguez, director of product marketing, Omneon Video Networks. "We will be improving on that in the next few releases with the addition of more operational pattern support."

According to Rodriguez, the initial "container package" for the Spectrum server is MPEG-2, specifically IMX. "This was driven by the [Sony] e-VTR, the 1/2-inch tape machine that could record natively I-frame only MPEG-2 IMX, 30, 40, or 50 Mbps," he said. This format is also compatible with XDCAM.

Pinnacle put its first MXF MediaStream server on the air 15 months ago at French broadcaster Canal Plus, Kovalick said. "Since two years ago, we decided within the company that every product built is to be MXF-compliant," he said. "If we can build a product that is MXF-compliant and compatible, we can build more interesting solutions."

Leitch servers now support MXF, according to Todd Roth, vice president, technology, Leitch Video Servers. "Overall MXF is in a "beta-test" stage," he said. The Leitch Nexio server processes MXF files while storing the media natively as non-MXF.

"Since two years ago, we decided within the company that every product built is to be MXF-compliant."

—Al Kovalick, Pinnacle Systems

"This more complex approach requires complete parsing of files on input, and generation of MXF containers, headers and metadata keys on output," Roth said. "The advantage of this approach is that different processing techniques can be used, depending on file source or destination. There are too many variables within the MXF file to assume that a single, unchanged file will work in all situations and source/destination combinations. In reality, this additional configurability and complexity is required to make the different MXF implementations work."

Roth said that this approach also

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MXF

CONTINUED FROM PAGE 22

takes into consideration metadata workflow. "Metadata needs to change [along with essence] at each process within a given workflow," he said. "Not only do these changes need to encompass what is done at each particular stage, but the requirements of the next (previous) device in the chain."

One implication for MXF deployment is that it may help do away with the ingest server altogether, according to Zaller. An example is the Snell & Wilcox Comet turnkey ingest solution that Zaller said is based on open standard ingest tools and low-cost storage. "This is an example of a product that is IT aware," he said.

ARCHIVE

Transformed by MXF, archive systems will become simpler, nonproprietary, more flexible and less expensive. That prediction was made by Phil Ritti, vice president, and general manager, Quantum Media Division.

At NAB2005 Quantum will introduce an MXF tape drive, the SDLTv. "The new drive will be like a data NAS," Ritti said. "You can see files as soon as you put the tape in, and drag and drop files. And you don't lose metadata. It's very straightforward to integrate on a network. You don't need all the extra software to get there. Now you have media that you can take anywhere."

Contrast this with the way archives are currently built, with layers of software, an archive manager and SCSI drives. "If one piece goes away, you can't get at your media," Ritti said.

The Quantum SDLTv is enhanced to work with MXF files. "You can store any kind of file with this device," Ritti said. "It pulls key metadata out of the MXF header and stores that in a directory, which you can then look at. The most powerful thing it does is when given a starting and ending timecode, it will create a new MXF file with just that piece of essence in it and hand it back to you."

Companies developing MXF products reported using a variety of tools, from home-grown to those from outside providers.

MXF TOOLS

At NAB2004, Snell & Wilcox made headlines with its free distribution of the MXF Express developer's toolkit and MXF Desktop, which allows users to play back and examine MXF files.

"We're excited about the response to MXF Express," Devlin said. "There are over 1,200 users registered, and there's not one typical user. We have also created the most active MXF discussion site, our forum on our Web site [*www.snellwilcox.com/mxf/*]."

For NAB2005, Snell & Wilcox will update both of these packages, Devlin said. MXF Desktop will add visualization tools so users can see how the file was put together. These same tools will be added to MXF Express, along with updates for interoperability with different vendors' products.

"We're excited about the response to MXF Express. There are over 1,200 users registered and there's not one typical user."

—Bruce Devlin, Snell & Wilcox

Customer expectations for MXF have been high, Claman said. "Users expected to pick up files and move them, but that's not always the case. MXF is a relatively broad standard; there can be different types of legal MXF files, and it's relatively early in the maturation process. Over time the divergence will subside some. But it won't happen overnight."

Although there are still some interoperability issues to be hammered out for the MXF standard itself—metadata, vertical blanking interval, to name two—"customers may have been expecting codec compatibility as well and assumed a library of codecs tied to MXF," Claman said. An MPEG encoder isn't going to read a DV file, no matter how compatible the MXF wrappers are.

"MXF doesn't make a product do more than is capable," said Bob Edge, Chief Applications Engineer, Thomson Broadcast and Media Solutions. The essence has to be compatible as well. "But at least you can see what the format is before transfer." ■

MXF Development Continues

The MXF standards fill up more than 700 pages in more than 20 different documents. Devlin said that some developers have interpreted the specs "just a bit differently," and that there has been some ambiguity.

Based on these discoveries, "we are bringing MXF up to date," Devlin said.

In early March, a series of SMPTE standards meetings took place to address outstanding issues. "There was a good bit of progress in SMPTE and we managed to create a new MXF group to look at interoperability," Devlin said.

According to SMPTE, the MXF Working Group will promote interoperability between MXF implementations. It will provide a platform for users and industry to pose questions and requests for guidance and best practices on MXF implementation, analyze ambiguities leading to MXF variations and propose solutions, identify areas where new MXF standards are required, as well as provide adequate SMPTE due process specifications.

In addition, the working group will prepare a test and measurement guideline, provide a liaison with the AAF, respond to ZDD (Zero Divergence Doctrine) issues, and maintain up-to-date MXF status information on the group's Web site (*www.smpte-mxf.org/*), which is expected to be online in early April.

On the AAF front, Ed McDermid, vice president of business development, North America, Siemens Business Services Media, and director of marketing, AAF Association said that the AAF Association "will deliver the AAF Developers Toolkit Version 1.2 in Open Source, which will include the ability to read and write MXF files. This functionality will be freely licensed to software developers everywhere and available as source code that can be used and modified for developing AAF and MXF applications."

Companies have reported good cooperation among themselves in resolving outstanding issues.

"MXF is the first professional file format that the whole industry can get behind," Kovalick said. "As complex as it is, it is our best choice. The issues of compatibility—they are all solvable.

Mary Gruszka

BUYERS & SELLERS

Videotek, a division of Leitch Technology, will provide its Signal Quality Manager (SQM) for four Telemundo owned- and operated-stations in the NBC Southeast hub.

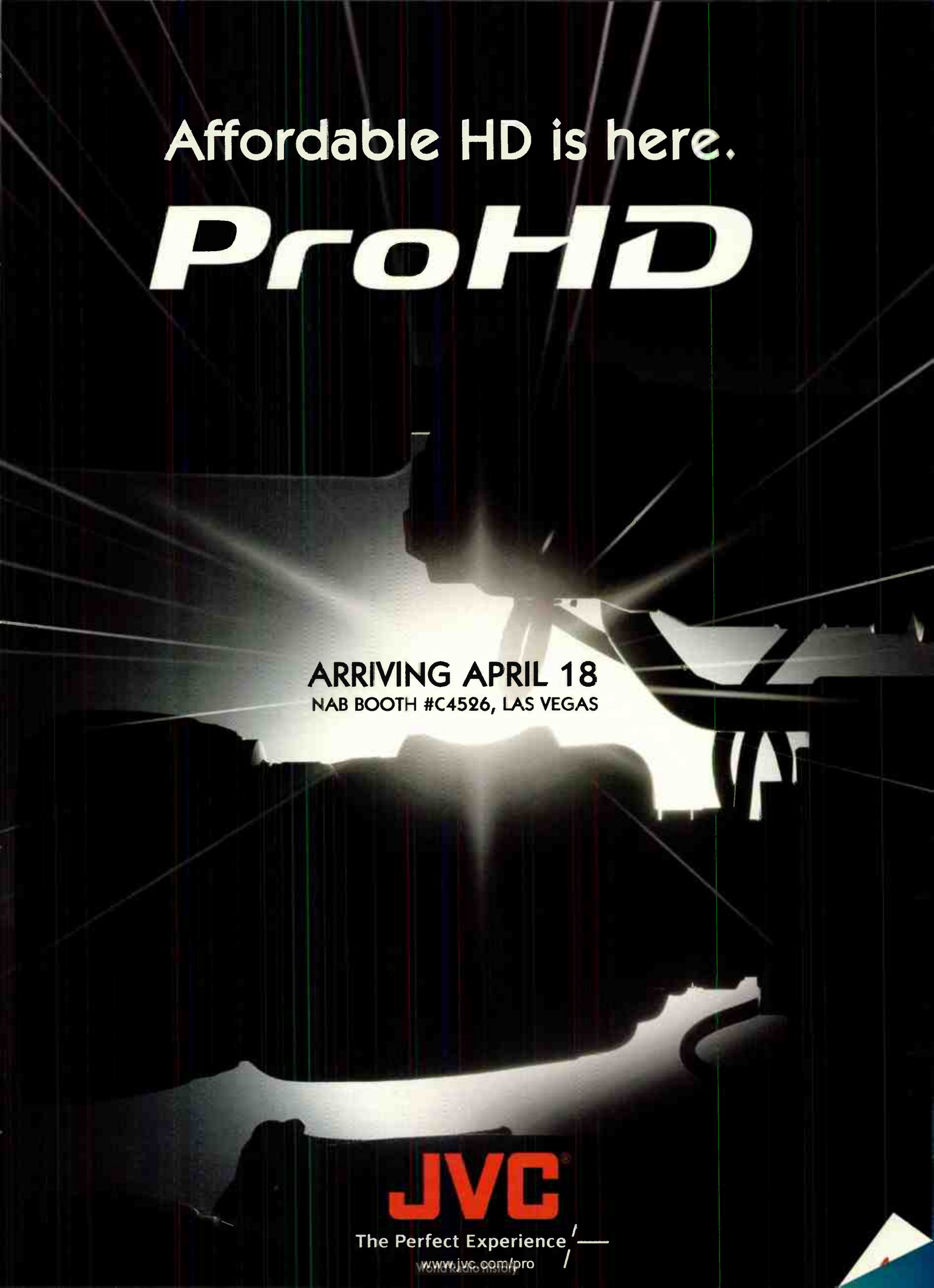
Stations in Houston, Dallas and San Antonio, Texas and Miami, Fla. will receive the SQM system monitors to distribute content and monitor operations for nine digital stations.

The SQM system features the A/B bypass, which allows NBC to automatically bypass to a network feed on an incoming satellite IRD in case of a system failure.

Fort Myers Fla.-based PBS station WGCU-TV has installed a **Crispin** System 2000 automation suite to support satellite, recording, ingest, asset management and control of five channels for on-air playback.

WGCU is also using Crispin RapidPlayX, for playlist monitoring and contro., enabling the station to create and load playlists, edit events, issue playlist commands and monitor the status of events. RapidPlayX loads daily program and record schedules for 24-hour operations, seven days a week.

Crispin also is providing its DeviceServer, Dubber application, Mapper, AssetBase, a Web-based asset manager and LoRez content encoding server for the facility.



Lombardo Sees 'Indecency Disconnect'

Local broadcasters 'tied in knots' over indecency regs, NAB joint board chief says

ARLINGTON, VA

In his 50 years as a broadcaster, he says, NAB Joint Board Chairman Philip Losmbardo, chief executive officer of Citadel Communications, has never seen more concern among colleagues. He's talking about the government's recent scrutiny of indecency.

Lombardo says an NAB task force expects to release a report soon on "responsible programming." The following are excerpts from his speech in February before the Media Institute, a nonprofit research foundation focusing on communications policy and the First Amendment.

"Broadcasters today are living in a state of tremendous uncertainty. The FCC's inconsistent application of indecency rules—coupled with concern over a small number of what some would call "tasteless" programs—has prompted unprecedented anxiety at every level of our business.

In 2004, the FCC levied a record $7.7 million in indecency fines against broadcasters, up from just $48,000 in 2000. Compare that $7.7 million in broadcaster fines to the zero fines levied against cable and satellite providers, and you can appreciate the local broadcaster's growing concern over indecency.

The "indecency disconnect" in Washington is apparent for all to see. At the same time that indecency regulations are being ratcheted up against local broadcasters, cable giants like Comcast and Time Warner are raking in hundreds of millions a year from pay-per-view, hard-core pornography.

BROADCASTER CONUNDRUM

Local broadcasters are being tied in knots by rules that fail to recognize today's evolving multichannel market. Our conundrum was highlighted (in January) when the "S-word" was uttered during a Tsunami Aid concert aired on a variety of NBC platforms. Under FCC rules, broadcast affiliates of NBC, Pax TV and Telemundo are potentially subject to sizeable FCC fines, while NBC cable properties CNBC, MSNBC, USA Network, Bravo, Trio and the Sci-Fi Channel are off the hook.

The breadth of this disparate treatment creates confusion among both broadcasters and consumers. In an era of expanding program diversity, when nearly 85 percent of households receive local television signals from cable or satellite, is it appropriate for only one medium—broadcasting—to face large fines and threats of license revocation?

Does the average cable and satellite customer even differentiate between an over-the-air channel and a cable or satellite channel?

Cable programming targets younger, appealing demographics with uncut Hollywood movies and sexually explicit and violence-laden shows like "Sex and the City" and "The Sopranos." For their part, satellite radio providers XM and Sirius are doing the same by luring Opie & Anthony and Howard Stern away from "free radio."

"If KLKN had been fined over $1 million for airing 'Saving Private Ryan,' the cash flow of our station would have been wiped out."

—Phil Lombardo

NAB Joint Chairman Philip Lombardo

Howard Stern himself blames the indecency crackdown for his switch to a pay satellite platform. Here's a direct quote from the self-described "King of All Media": "I guarantee I will reinvent myself, because I can go further than I have ever gone. You can't reinvent yourself if you've got the government breathing down your neck."

HOW IT BEGAN

Today's indecency rules stem from the famous Pacifica case, when the Supreme Court found that because of broadcasting's "uniquely pervasive presence," restrictions could be placed on the airing of a George Carlin monologue.

You have to wonder if the Supreme Court today would find broadcasters as "uniquely pervasive" as it did in the Pacifica case nearly three decades ago. In 1978, cable TV was in its infancy. Satellite TV was still in gleam in Stan Hubbard's eye. And, of course, Al Gore had not even invented the Internet.

Yet despite all evidence suggesting that broadcasters are less pervasive today—thereby warranting a need for less regulation of speech—policymakers are even more strictly regulating free, over-the-air stations with more content regulation.

I would submit it is our viewers and listeners who suffer the most from the government crackdown. Case in point: after the FCC reversed its own staff and found Bono's fleeting use of the "F-word" to be profane, ABC affiliates in 66 cities across America preempted a Veterans' Day airing of "Saving Private Ryan"—even though the film aired twice previously.

Applying the Bono decision, we calculated that if my company had run "Saving Private Ryan" on our three ABC affiliates, Citadel Communications could have been liable for over $3 million in fines to the FCC.

As a small-market broadcaster, I cannot stay in business paying those kinds of fines; that's a risk that I could not take. So, unfortunately, our stations preempted "Saving Private Ryan."

AMBER ALERTS, CHARITY NEEDS

If local broadcasters are subjected to million-dollar indecency fines, what happens to the tens of thousands of hours of local news and public affairs programming, targeting the specific needs of each community? Or to the countless lives we save each year with Amber Alerts and emergency weather warnings?

Local radio and TV stations generate hundreds of millions annually for charity through radiothons, telethons and other on-air fundraising appeals. The FCC may dismiss the money that local stations raise for charity, but I can guarantee you this: the charities themselves don't dismiss it. Indeed, the charities know that much of their good works would go for naught if not for the specific benefits derived from donated airtime and fundraisers from local stations.

When tornadoes ripped through Lincoln, Neb., last May, my station—KLKN(TV)—aired many hours of coverage without commercial interruption, and scores of viewers thanked us for saving their lives. If KLKN had been fined over $1 million for airing "Saving Private Ryan," the cash flow of our station would have been wiped out. Simply put, we would not have had the resources or the staff to provide this type of coverage.

When you view the current media landscape, it raises a number of questions:

Are policymakers on the verge of killing free-over-the air broadcasting with rules that stifle our ability to compete in today's multi-channel universe?

Should broadcasters be expected to "dumb down" much of our programming to avoid fines and/or possible license revocation, thereby eroding our audience and the advertising base that supports our medium?

Are activist groups trying to drive broadcasters off the air through Internet campaigns based on complaints from people who never actually hear or watch programs they're protesting?

MAJORITY NOT FINED

All of these are difficult questions, and ones that broadcasters have struggled with for years. Nearly a decade ago,

LOMBARDO, PAGE 27

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Consumer Groups Protest Broadcast Flag

Court of appeals hears arguments about the FCC mandate

by Lauren Evoy Davis

WASHINGTON

Consumer groups unwilling to pledge allegiance to the broadcast flag told a U.S. Circuit Court of Appeals judge in Washington D.C. recently that the FCC exceeded its authority in mandating broadcast flag technology that, if implemented, would restrict consumers' fair use of copyrighted digital content. U.S. Circuit Judge Harry Edwards told FCC lawyers during the February proceedings that they had "crossed a line" in mandating use of the flag.

The American Library Association, Public Knowledge, the Electronic Frontier Foundation (EFF) and others accuse the FCC of mandating the flag without permission from Congress.

The case addresses several issues: whether the FCC reasonably concluded that the Communications Act of 1996 grants authority for it to adopt broadcast flag rules, whether the rules that the commission adopted were reasonable and supported in the record, and whether the rules conflict with copyright law.

Jon Cody, legal advisor to the commission, said that perhaps the FCC shouldn't be the first place that the studios and content producers go to for copyright protections.

From a legal and technical perspective, "we're just not very knowledgeable at this point, as an institution, on copyright issues," Cody said.

The answer might be for Congress to give the commission direct authority and additional technical expertise to make decisions like mandating the flag, according to Cody.

On March 15, the appeals court gave consumer groups two weeks to clarify why they have the legal standing to bring the case to court.

The groups must prove that at least one of the members in the case is eligible as an individual to sue and that the protected interests in the case are relevant to the organizations involved.

The Motion Picture Association of American (MPAA)—which argued that a paragraph in the petitioner's brief failed to prove their standing in the case—and the FCC have 10 days to respond to the comments made by the groups that filed the suit.

WIDESPREAD SHARING

The commission determined that because digital programming can be copied with little or no degradation, the broadcast flag—digital coding embedded into digital broadcasts to prevent widespread coping—was needed because Hollywood groups voiced concerns about movie piracy.

Implementing the flag would require manufacturers of TV sets that receive digital over-the-air signals to manufacture decoders that read the flag. The deadline for putting the FCC-mandated digital signals into action is July 1, 2005.

The commission notes that opponents' fears about the effects of the broadcast flag may be overstated.

The FCC said that consumers will still be able to make and view digital copies and that the broadcast flag seeks only to prevent mass distribution over the Internet.

"Preemptive action" is needed now "to forestall any potential harm to the viability of over-the-air television," the FCC told the court.

The flag contains code to prevent people from copying TV shows and sending

Jesse Burns shows off a homemade PVR TV at the Electronic Frontier Foundation.

the programs over the Internet, but consumer groups say that it also prevents people from simply sharing content across devices in the home.

"The marketplace is going to create media fiefdoms," said Annalee Newitz media coordinator/policy analyst for EFF, who called the flag an "anti-consumer mandate."

Content recorded on a DVR for example, wouldn't be playable on an older device that isn't flag-compliant, bulldozing consumers into costly upgrades, according to Newtiz.

"It's understandable that you'd want to have some kind of copy protection to keep people from engaging in massive infringement, but this [sharing content between consumer devices] isn't that," she said.

She compared the broadcast flag to a VCR that has a tape stuck in the machine and users cannot take the tape with their recorded shows to another VCR in the same house, thus infringing on fair use.

For Newitz, the ultimate question is this, "Why does the FCC have the authority to mandate what kinds of devices to market?"

The commission concluded that it has ancillary authority to regulate equipment manufacturers, although the appeals court judges disagree with the way the FCC used its authority.

On the other hand, the MPAA, which has led the charge for imposing the broadcast flag, says the commission is within its rights.

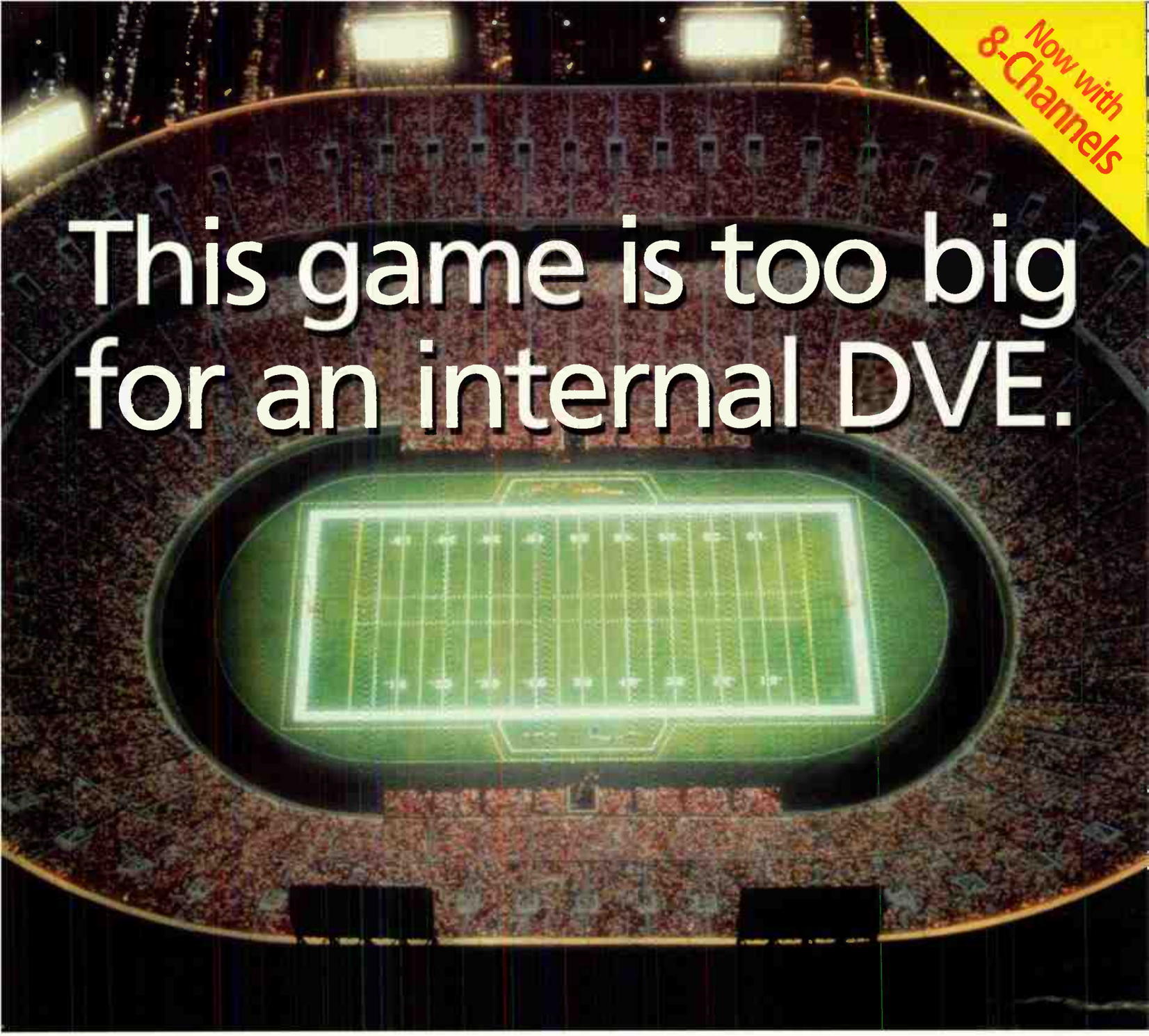
"The MPAA believes that the FCC has the jurisdiction to impose the broadcast flag regulation, which provides protection for digital terrestrial free-to-air broadcast programs from unauthorized redistribution. This is an essential step in facilitating the DTV transition," said MPAA Senior Vice President/CTO Brad Hunt in a statement.

The broadcast flag is only one front on which the MPAA is battling copy protection issues; the association is also busy with the ongoing fight to curb Internet-based movie piracy. In response to recent Oscar-nominated films being traded over the Internet, the MPAA is involved in a third batch of legal filings to prevent future online trading of movies.

ANALOG HOLE

Currently, there is a way to circumvent the broadcast flag. One is to make your own personal video recorder (PVR), which EFF outlines in an "HD PVR Cookbook" posted on its Web site (*www.eff.org/broadcastflag/cookbook/*). The other option is to transmit high quality content over component analog outputs. This is what the commission refers to as the "analog hole," because the flag only protects digital outputs.

"While an immediate 'analog hole' solution is not forthcoming, the window of opportunity for adopting a flag-based redistribution control regime for digital broadcast television is closing," the FCC concluded, because the commission figures that the number of legacy devices isn't high enough to become a major threat to the copyrighted material. ■



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FCC Delays CableCARD Deadline

Consumers, retailers ambivalent about secure access devices

by Gary Arlen

WASHINGTON

What's the difference between one million and 27,000? The answer is not merely a number (973,000), but a far more formidable digital answer.

The National Cable & Telecommunications Association (NCTA) told the FCC recently that its cable operator members had dispatched about 27,000 CableCARDs to owners of digital television sets who requested such cards as alternatives (or supplements) to their digital set-top boxes. At about the same time, the Consumer Electronics Association (CEA) tallied 2004 sales of one million Digital Cable Ready (DCR) sets—the models that can be used with CableCARDs. CEA forecasts another three million DCR sets will move into the market in 2005.

As they say in British subways, "Mind the gap."

'HARD TO GET'

Against that digital disparity comes the FCC's announcement to grant another delay in the deadline for cable operators to deploy only CableCARD-enabled set-top boxes to July 2007. In FCC lingo, the set-top boxes are "navigation devices," and the CableCard—which can be inserted into set-top boxes and DCR sets—performs the conditional-access security function.

The delay however, does not come without strings. The commission gave the cable industry until Dec. 1, 2005 to report whether or not development and deployment of downloadable security is feasible, a timeline for said deployment and a draft of licensing terms. In addition, starting August 1, 2005, NCTA and CEA must provide the commission with bi-monthly progress reports on negotiations for a two-way plug and play agreement and the six largest cable operators must file status reports on CableCARD deployment every three months.

According to the NCTA, only about 27,000 CableCARDs have been deployed.

Commenting that the extension marked the third time the deadline had been delayed, Commissioner Jonathan Adelstein called the decision a "difficult one."

"Given past delays, and even more importantly, the lack of any real alternative to leasing a set-top box for cable subscribers who want access to the latest digital technologies, I was very hesitant to support any further adjustment to the integration ban, absent a compelling reason to do so," he said. "While a close call, I believe the decision provides a justification for a modest extension."

Cable operators have made CableCARDs available to DCR purchasers who requested them, although there has been a perception of "hard-to-get" thanks to low-key information. But cable companies are avoiding deployment of set-top boxes with CableCARD slots, claiming price and loss of control as the prime barriers. Analysts see DCR usage and set-top box availability as a combined process that will determine how viewers have access to future digital telecasts.

The cable industry had lobbied for the postponement, arguing that the price of set-top boxes will climb dramatically if cable operators must buy the special boxes by a specific deadline. Microsoft recently allied with cable giants Comcast and Time-Warner Cable, promising action on the CableCARD deployment if the FCC extended the mandatory deadline into 2007.

Computer companies, including Intel, and consumer electronics companies pushed for the earlier deadline, contending that market conditions would not change to justify the delay. TiVo, which also had been authorized to use the CableCARDS in its devices, wanted the FCC to accelerate the deadline to December 31 of this year.

COMCAST MEGA-DEAL

Amidst this regulatory wrangling, the landscape itself continues to change. Comcast and Motorola, the biggest set-top box supplier, formed two joint ventures in March to develop next-generation conditional access technologies. The agreements coincided with a multi-year contract under which Comcast will buy $1 billion of Motorola set-top boxes, the biggest hardware commitment in Comcast's history. As part of the transaction, Motorola has granted the joint ventures a non-exclusive license for MediaCipher, its leading conditional access technology. The Comcast/Motorola connection is seen as part of the move toward "Next Generation Network Architecture" (NGNA), a technical initiative quietly developed during the past two years by approximately two dozen cable, computer and hardware companies. Although details about NGNA remain tightly shrouded, it is believed that cable companies do not want to lose any control over their current set-top box process while NGNA technology advances toward the market.

Meanwhile, consumers—including the million homes with DCR sets—remain confused about what to do regarding CableCARDs. **TV Technology** randomly queried a handful of retailers about their experiences in selling DCR equipment during the first eight months that the products have been on the market. Their responses were predictably confused.

"We're recommending that customers set up both the CableCARD and cable box," said Frank Roshinski, vice president of video merchandising at Tweeter Home Entertainment, the Canton, Mass.-based retail chain.

"We can demonstrate on the (sales) floor the difference between CableCARD and a true digital path through the TV, which is a compelling demonstration. The picture is dramatically different with the CableCARD."

> **"About the only people who don't seem to know about it [CableCARD] are the cable companies."**
>
> **—Gary Yacoubian, MyerEmco Audio-Video**

Roshinski pointed out that the CableCARD in the back of the TV is adequate for "day-in-day-out viewing" and that the second input into the cable box can be used for video-on-demand and pay-per-view shows.

"At first it was a tough sell, but when we showed the quality of picture difference," he said, consumers agreed.

Gary Yacoubian, president of MyerEmco Audio-Video in Gaithersburg, Md., an upscale retailer/installer, said that some customers ask about CableCARDs when they buy HDTV equipment.

"About the only people who don't seem to know about it [CableCARD] are the cable companies," Yacoubian added.

At Saga Electronics in Tenafly, N.J., David Belfield, the store's top HDTV salesperson, said a few consumers wonder, "Why should I care about using the CableCARD instead of the box?" He said he can only point out that the upside is "no more box" but that the "downside is that you don't have the capability of the card to do two-way." ■

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Nagravision Secures Digital Content

Company touts worldwide coverage

by Andrew Morris

CHEASEAUX, SWITZERLAND

In today's hacker-infested world, securing digital content is no trivial matter. Nagravision, with corporate headquarters in Cheseaux, Switzerland offers a broad portfolio of products that tackle the task of content protection in digital television and a variety of other markets.

A wholly owned subsidiary of the Kudelski Group, the majority of Nagravision's conditional access (CA) systems are mostly based on secure microprocessors that are inserted into a "Smart Card." SIM card (similar to those used in cell phones), or embedded into the decoder or consumer device.

Nagravision products include Aladin and MediaGuard conditional access solutions. Components of these conditional access systems include encryption, subscriber management, content management, and authentication key management.

Nagravision uses the IDEA (International Date Encryption Algorithm) algorithm with its 128 bit key for security. IDEA is available for licensing from MediaCrypt, a joint venture between Kudelski and Ascom the company that developed the IDEA algorithm.

SECURE HARDWARE, SOFTWARE

"We have a flexible and powerful key management scheme," said Philippe Stransky, CTO for Nagravision. "Managing the authentication keys is an important value of our technology. Our global experience has proven the superiority of a combined secure hardware and secure software CA system. Some of our sophisticated techniques include obfuscated software and tamper-resistant hardware and software.

"We have a very close relationship with chip manufacturers. We share our experiences with them. Because our competitors use the same chips we use and because any case of piracy is bad for the conditional access industry, it is in our shared interest to develop silicon that is secure as possible."

Stransky explained that set top box manufacturers that license their conditional access technology must follow well-defined procedures in how the set top boxes are configured and how "the secrets" are installed in the set top boxes.

Although secure key management is a critical underlying technology, Robin Wilson, Nagra's vice president of business development explained that for operators, this technology translates to important customer and marketing features that entice higher viewership of premium content and enable features such as "push VOD"

"Allowing flexible previews or time-limited free viewing windows is a great sales tool for premium content. We can also securely load content on the disk of a PVR [Personal Video Recorder] in the background and thus have premium movies available for a zero latency VOD experience. As an extension we have implemented Digital Rights Management or DRM, where expiration time windows or copy options are all controlled by the same secure key management technology," Wilson said.

Globecast uses Nagravision's conditional access technology for its WorldTV service.

Nagravision's largest markets include satellite and cable systems but they also have terrestrial broadcast clients and are moving aggressively into securing IP networks over DSL. For digital television they have customers on every continent.

PROTECTING GLOBECAST

GlobeCast, a global satellite services company with 30-plus distribution platforms for DTH, cable, and broadcast program delivery is a Nagravision customer for its WorldTV service in the U.S. GlobeCast's WorldTV service, the third largest direct-to-home satellite service and the largest source of international programming services in the US via satellite, uses Nagravision's conditional access technology for nearly half of its 113 TV and radio channels beamed over North America.

"Nagravision offered me scalability and superior service and support," said Thomas Reiss, GlobeCast senior vice president Technology Development. "They have also integrated a significant amount of set-top boxes and that allows me to source set-top boxes from a variety of manufacturers."

In addition to encryption, Nagravision offers a variety of features that are used by GlobeCast WorldTV. These include an Electronic Program Guide (EPG) and management systems for Pay-Per-View (PPV) services.

"All the modules are available on the core system so if, for example, I had ini-

NAGRAVISION, PAGE 34

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Jackson Trial Tests Media Coordination

Media pool producer maintains order

by Craig Johnston

SANTA MARIA, CALIF.

When last we met Peter Shaplen, he was just wrapping up as pool-producer for the media-crushed Scott Peterson trial last fall, ("Dealing with the Media Hordes," Jan. 19). Now he's media pool-producer for the Michael Jackson trial at the Santa Barbara Superior Court in Santa Maria, Calif.

Sheer numbers give some idea what Shaplen is up against: "When Peterson ended, there were about 860 credentialed media. When this trial began there were about 1,200, and as of today we're over 1,600. We've got press from 24 countries, and on the pad today, there were 53 camera positions."

ARRIVALS & DEPARTURES

But Shaplen was quick to point out another major difference between the two trials. "This defendant is not in custody. So what happens is every day, we have at least an arrival and a departure."

Not surprisingly, this has the county sheriffs, in charge of security, on high alert. "Every day he's exposed in the public, and they do not want anything to happen. It's an entertainer, it's a celebrity, and the witness list reads like a who's who."

Another difference is that outside the courthouse at the Peterson trial, once reporters were away from the front steps, the press could come and go. "When Jackson is leaving, it's like a White House lockdown. Nobody moves."

According to Shaplen, Jackson didn't help the press in its relations with the court and the sheriff at all when, at the beginning of his arraignment, he climbed atop his own SUV. "He had brought three video crews of his own, and invited one of his crews to come up on the roof with him while he moon-danced for the crowd."

The evening **TV Technology** talked with Shaplen, Jackson had diverted to the hospital on his way to court in the morning, claiming back pain. Then his motorcade raced to the courthouse to save his $3-million bail and avert being locked up.

Though it was dark outside and court had been recessed for hours, Shaplen was interrupted five times during the half-hour interview with questions from the likes of CNN and CourtTV. He even got a question from media at the Scott Peterson trial, where he is still assisting, albeit long distance.

NO SWIRLING ALLOWED

Acting as the media liaison in both the Peterson and Jackson trials has taught Shaplen a basic difference between the court and sheriff's department, on the one hand, and the media on the other.

"Courts like process. Courts like systems. Those of us in the media are just as comfortable, or we even prefer the nature of swirl," he said.

"Courts, when they see swirl, typically contract, because swirl to them has a connotation of mistakes, errors of judgment or justice. So this remains a blending of our needs for immediacy with their comfort level of deliberation."

He said the key to bridging that chasm is trust. "What ends up happening is that it's all about trust."

Technically the Jackson trial setup is also different from the Peterson case.

"Here we have the possibility of up to four live cameras; at Peterson we had two tape cameras. We can switch between the four. We probably have more than 10 miles of live cable for all of the positions. Here it's technically much, much more complicated. There are many more fiber paths out. It's a much more rigorous thing."

Photo: Reuters/Landov

Michael Jackson arrives at the Santa Barbara County Courthouse in Santa Maria, Calif.

CAMERA PLACEMENT

Shaplen counts the camera in the courtroom as high on the list of cooperative accomplishments the press has had with the court and the sheriff's department. It's not live to the pool, though it feeds the listening room for press overflow that is located three buildings from the courthouse. (The courtroom camera is also fed live to the sheriff's SWAT team housed in the courthouse.)

There are also cameras at the security checkpoint just inside the door, in the walkway entrance, on the second floor overlooking the plaza, and one in the interview area. That feed is switched from the pool area with Shaplen acting as producer and director.

Despite his previous work on the Peterson trial, Shaplen still finds enough surprises in the Jackson trial. "Even today, with Jackson coming back from the hospital, with the motorcade, the speeds were in excess of 90, 95 miles an hour," he said.

"There was one cameraman producer who was driving himself in a rented Cadillac, and was shooting a camera while he was driving. There were other crews driving right along with them. There were fans driving on the shoulder of the road, at 90 miles an hour.

"That's dangerous." ■

Nagravision

CONTINUED FROM PAGE 32

tially elected not to implement the EPG or impulse PPV I could add them later. These are all plug-in modules," said Reiss.

"Scalability allows us to easily expand hardware and licenses in an incremental manner. The same hardware goes to a very extended amount of end users. It's scalable in that their system allows me to start small and grow large without having to fork lift out the old system and put in a new system."

Nagravision offers a secure software downloader that allows a service provider to push firmware updates to the user set-top box. In addition to security updates and patches, the software downloader allows a service provider to add features including EPG updates and PPV offerings. Reiss described the software downloader as a very useful feature of the Nagravision system.

As for security Reiss said, "Security is an industry wide problem and Nagra does deal with security problems. They are very aggressive. We feed them information and they do deal with it, they come up with countermeasures to deal with specific threats."

Bell Canada's ExpressVu service, a service described as "a combination of Echostar and DirecTV," serves 1.5 million subscribers and uses Nagravision products. ExpressVu uses Nagravision's conditional access, encryption and Smart Card products and recently upgraded its Nagravision Smart Cards. Terry Snazel, ExpressVu vice president of technology said, "The new Smart Cards offer much more secure conditional access and a variety of new features such as VOD, EPG and a greater ability to package programs."

Jessica Casavant, ExpressVu director of digital technology said, "The enhanced features allow our marketing people to do different things with channel offerings. It enables us to offer Impulse Pay-Per-View and allows viewers to subscribe and buy on the fly."

Still security is Nagravision's bottom line product. According to Wilson, the company has, over the years, been responsible for securing $50 billion worth of content. It is a pure play in the conditional access business since Nagravision does not own any cable, satellite, broadcast operators, or programming, nor do they own a set top box business. Wilson said, "We have optimized our business to focus on content security." ■

Andrew Morris is a consulting engineer based in Denver, Colorado. He can be reached at amorris@msn.com.

videos themselves, they're keeping track of who's watching what—and what's effec-

option to "save" these selections.

There are also "progressive downloads,"

Video Services

CONTINUED FROM PAGE 12

ing it can launch a new IPTV service in "under 60 days versus the industry average of 12 to 18 months."

Shapiro declined to disclose the price menu for the various service packages "for competitive reasons." But he said the pricing would include a monthly aggregation fee, (based on the length of contract and its components) and a monthly per subscriber fee, based on the type of customer subscription package.

"We want to make it flexible enough to meet any need from any kind of broadband provider," said Shapiro. He noted that the partnership would accommodate technology biases—for example, a preferred encryption technology or set-top box. "They can use their own but then they won't get the benefit of this packaged, turnkey solution."

He declined to reveal which equipment the partners deemed optimal for the job.

Other features include video network design, integration and installation; video content aggregation and IP encapsulation; content encryption and 24/7 customer service, network monitoring and technical support.

"Something like this—if it delivers as promised—is going to be something very interesting to the smaller players who need to get into the market quickly," said Matt Davis, director, broadband access technologies at the Yankee Group, a Boston-based research firm. "All they have to do is supply first-mile access."

Although David said it's "where the market is going—putting together end-to-end networks," he doesn't know of any other arrangement quite like IPTVComplete.

According to Davis, "IPTVComplete offers several key components of the value chain, including content, transport and customer premises equipment [CPE]. Service providers seeking entry into the IPTV market will find this combination can substantially reduce the time and cost it takes to get up-and-running."

"Something like this—if it delivers as promised—is going to be something very interesting to the smaller players who need to get into the market quickly."

—Matt Davis, Yankee Group

Frost & Sullivan analyst James Brehm also had never heard of anything quite like IPTVComplete. He believes it would serve small telecoms similar to the way VeriSign provides MVNOs (Mobile Virtual Network Operators) with everything from signaling to database and billing. He also believes Eagle Broadband could be just as successful as "the telcos' MSO" as VeriSign is in being the "carriers' carrier."

For GlobeCast it was another opportunity to cash in on the services the company already provides.

"They came to GlobeCast for transmission distribution," said Jonathan Feldman, senior vice president of business development, regarding the genesis of the partnership. "We'll take the content, do encapsulation and retransmission to transponders for distribution to remote headends." ■

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DTV How-to Hearing Educates Few

Congress seeks ways to inform public about analog sunset

by Deborah D. McAdams

WASHINGTON

Nearly a year into a full-court press to end analog television as we know it, lawmakers finally got around to the subject of how to tell the public. During a recent House subcommittee hearing entitled "Preparing Customers for the End of the Digital Television Transition," a handful of congress members showed up to hear the testimony from individuals representing senior citizens, Hispanic Americans, the consumer electronic sector and retailers, namely, Radio Shack Corp.

Lavada DeSalles, who testified on behalf of the American Association of Retired Persons, informed legislators that people 50 and older watch more TV than any other age group at an average of 5.5 hours a day. She also said that of the 21 million U.S. household that receive only over-the-air TV, at least one person older than 50 lived in 8.6 million of them. She urged Congress to embark on an aggressive educational program for at least one full year before ending analog transmissions.

"AARP's major concern is with the millions of consumers, many of them older citizens, with over-the-air broadcast-only television sets," DeSalles said. "A significant number of these individuals and households will be hard put to afford costly conversion equipment."

The hearing marked the first time the AARP was asked how its 35 million members would be affected by the digital transition.

Representing the nation's 11 million Spanish-speaking television households, Manuel Mirabal, founder and co-chair of the Hispanic Technology and Telecommunications Partnership, told the assembled representatives that those households would be disproportionately disenfranchised by an analog shutdown. Mirabal estimated that 40 percent of Hispanic households nationwide rely exclusively on OTA television reception, and that few of them have DTV receivers. He said that unlike other demographic groups, OTA reliance is increasing among Hispanics.

"Any DTV transition plan that does not specifically address the needs of the growing Hispanic population risks the disenfranchisement of a large segment of that population," he said.

Mirabal urged lawmakers to "leave no TV behind" by labeling analog sets, sending out a mass notification mailing and providing citizens with digital-to-analog converters.

On that final point, Mirabal got no arguments from the two remaining witnesses–Dave Arland of Thomson and Leonard Roberts, CEO and chairman of Radio Shack. Roberts offered testimony reminding those present that 7,000 Radio Shacks stand ready to sell government-subsidized converter boxes. As for labeling analog sets, fuggedaboutit, he said.

It would "further confuse and even mislead our customers," Roberts said.

The TVs carried by Radio Shack are predominantly small and analog, including the $90 13-inch RCA E13320. (The E13320, described as "enormously popular," on www.radioshack.com, was out of stock online, but listed as being available at 10 Shacks within 5 miles of the TV Technology offices.)

Roberts said analog TVs would continue to sell until smaller, cheaper digital sets penetrated the market. Currently, analog sets currently outsell DTVs 5.6-to-one. This has not escaped the attention of Thomson, which introduced 27- and 32-inch standard-def DTV sets at CES in January.

Arland, vice president of communications and government affairs for Thomson, brought one of the smaller models to demonstrate OTA digital reception at the hearing. (See "Can You See It Now?") The digital set, from Chinese setmaker and Thomson partner TTE, cost less than $300, Arland said. At that price level, a comparable analog set would cost about $70 less, he said.

He also noted that half of all analog sets sold every year in the U.S. have screens 20-inches or smaller, and typically sell for less than $200.

Arland also brought a small D-to-A set-top converter and said Thomson could crank it out en masse by fall, at $125 a pop, if an analog deadline were soon established. ■

Can You See It Now?

At a recent Congressional hearing on educating the public about the digital transition, the Thomson contingent brought two 27-inch RCA CRT sets—one digital and one analog, and set them up side-by-side. Both sets were tuned to WETA signals, and an impromptu investigation revealed that both were wired to rabbit ears in a windowsill behind where the lawmakers were seated. (This arrangement was confirmed when the rabbit ears were repositioned and both signals were duly messed up.) The window faced an inner courtyard of the fortress-like Rayburn building—a perfect environment for multipath interference.

Dave Arland, Thomson vice president of communications and government affairs, said the digital set was connected to an off-the-shelf set-top receiver. The digital picture was sharp, while the analog picture was full of ghosts and snow. Consequently, the digital transmission appeared to be superior to the analog, although the digital dropped much easier.

One factor that made the comparison not quite apples-to-apples is that WETA transmits their analog and digital signals from different locations. According to FCC documents, WETA-TV Channel 26 is transmitted at 2,290 kW from Bethesda, Md., on a tower at a HAAT of 235 meters; WETA-DT Channel 27 is transmitted at 75 kW from Arlington with a HAAT of 177 meters.

Despite this difference, and based on the available date, the signals behaved in a fairly predictable fashion, according to TV Technology columnist and RF expert Doug Lung.

"A minimum of 64 dBuV/m is needed to receive a satisfactory analog signal compared to 41 dBuV/m for the threshold level of DTV, which is either perfect or not there, although it can transition between these two states, causing breakup," he said. "Thus, theoretically, a DTV signal can be 20 dB—a factor of 100 in power—weaker than the analog signal and still be received."

As for the analog ghosting, which would suggest the type of multipath interference that once overpowered digital reception, Lung said, "any interference, ghosting or noise is going to be visible in the analog signal, even if the amount of interference, ghosts, etc. is minimal. You won't see it at all in the digital signal until it goes away completely. Therefore, if the DTV signal can be received reliably, it will always look better than the analog signal, excluding digital compression artifacts.

"This ghosting was death to early DTV receivers, but the newer designs can actually use the energy in the ghosts to improve the signal-to-noise level above what it would be on the main signal alone. So the energy that was interference—ghosts—to analog becomes something that improves DTV reception!"

Back at the Rayburn Building, the lawmakers were on a vote break while the Thomson contingent scrambled to retrieve the digital signal and corral the reporter who moved the rabbit ears. The signal was thus restored long before the subcommittee members returned from their break.

Deborah D. McAdams

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Nextel to Address Broadcasters

2 GHz transition expected to be a main point of focus at NAB2005

by Robin Berger

LAS VEGAS

This year's hot topic for newsrooms is the Nextel Frequency Relocation Plan Rollout. Nextel will pay $512 million to move TV broadcasters' operations—including electronic newsgathering—from the BAS Channel 1 spectrum it wants to use, as required by an agreement brokered with the FCC.

News directors and other station personnel responsible for budgets are very keen to understand the repercussions of this largesse, said Mike Stutz, News Director at KGTV San Diego and a member of the Radio-Television News Directors Association's Convention Planning Committee.

NAB's exhibit floor will provide the forum for equipment to make this transition. Nextel's 2 GHz relocation teams will be present at vendor sites on the Las Vegas Convention Center exhibit floor throughout the NAB show, according to the company Web site. In addition, on Tuesday, April 18, Nextel leadership will speak to NAB attendees about the transition in Room N110 from 3:30-4:00 p.m.

MICROWAVE LINEUP

Because the agreement was hammered out several months prior to the broadcast industry's biggest annual event, microwave equipment will be a hot topic at the show, but not necessarily on shopping lists. "Nextel has really sped up the COFDM market—before it was announced, very few people were purchasing, because they didn't want to start with a new technology—it was very expensive equipment," said Jeff Daubert, Sales Manager for RF Central. With Nextel as a supplier, "they're getting it—though, not necessarily buying it."

Last year RF Central captured the imagination of those in the newsgathering business with a Mini Cooper loaded with ENG equipment to prove traditional vans weren't mandatory for the task at hand. This year, it's traded the Mini Cooper for a Chevy Aveos—and "a new, reliable COFDM to compete with MRC, Nucomm, and BMS, and be a big part of the market," said Daubert.

Nucomm's president and chief engineer, Dr. John Payne, agrees that stations with analog equipment certainly have more incentive this year to replace it. But he disagrees that COFDM is necessarily the only way to go digital.

"Stations now are looking towards how they're going to handle HDTV over ENG, and using COFDM is very marginal because the data rates are relatively low," Payne said. For this reason, he said, NuComm is incorporating an 8-VSB option into its ChannelMaster portable transmitter-receiver and Newscaster CR6D Central receiver, "so that they can switch

BMS will launch its Truck-Coder II at NAB2005.

to that and transmit high definition at a higher data rate from an ENG van than they can transmit using COFDM."

He believes the higher data rates afforded by the VSB option will also appeal to broadcasters favoring split channel operations. The new equipment will also be easily switchable between the old and new channel frequency plans.

"A lot of things have to happen in the radio when you go to the new channel plan—you have to reduce the deviation, you have to move your subcarriers," Payne said. "When the deviation is reduced, the video output level is reduced by that same ratio. Our receiver will automatically adjust for that."

DIGITAL EXPERTISE

Other suppliers of microwave gear concede that stations may seek out the VSB option, but have provided a different solution.

"External modulators and demodulators would be an option—ASI inputs and outputs are standard," said Tim Smith, product manager at Broadcast Microwave Services, regarding the truck solution his company will demonstrate at the NAB show. The BMS' Truck-Coder II operates at dual frequency (2GHz and 7GHz), as well as both digital and analog formats. The company's portable Carry-Viewer II, said Smith, is "purely digital," and though it also is equipped to interface with external modulators and demodulators, he didn't think its users would opt for VSB.

BMS found that stations were most concerned that their scaled-down crews would not have the expertise necessary to deal with the digital trucks required for the changeover. As BMS Business Development Manager Rob Bauer saw it, stations that use analog "turn it on, fire it up and off you go"—and would be looking at "an awful lot of complexities as to how a radio can be set up." So, a brand new product, the Truck-Coder II, and its companion piece, the Central-DeCoder II, were developed.

"The controls are more intuitive—you don't have to know all the different kinds of parameters you can set up with digital that you didn't have to deal with using analog," said Bauer. "There is an unlimited amount of presets that the engineers can set in the studio—then the photographer out there hits the preset button and is up and running."

Microwave Radio Communications is accommodating the switch with its new MRX4000 analog video/audio demodulator that incorporates a digital COFDM/MPEG-2 demodulator/decoder, according to Dan McIntyre, vice president of sales and marketing.

McIntyre believes that the most significant issue in going from analog to digital is taking into account the processing time required by a digital environment to acquire and peak up the ENG signal, which may create problems for an ENG crew lining up a shot. The MRX 4000, he stated, has "an extremely fast acquisition time (less than 200 msecs).

The product also includes four remotely controllable and frequency-selectable subcarriers, enhanced digital monitoring and signal confidence performance metrics, as well as ASI, SDI and other interfaces. The company also has upgraded its CodeRunner and Strata Families lines to meet the new operational challenges the 2 GHz BAS relocation brings, McIntyre noted. He stressed the importance of upgrades versus radically new product launches.

"I'm very concerned that some circles might be advocating the use of a lot of new products for the BAS effort," he stated. "The last thing broadcasters or Nextel need during this large scale conversion is to try out a bunch of new products."

MRC, he noted, spent "the last five years to ensure that we have had the necessary products to meet the requirements of the BAS relocation when it came."

Other manufacturers echoed this concern, as well, acknowledging years of product development to accommodate the transition.

"Nextel has 30 months (from Feb. 12) to convert 500 to 1500 stations," said BMS' Bauer. "Everyone's going to have to gear up and be ready to go." ■

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ENG Makes HD Connection

Microwave systems and encoders adapt to HD ENG

by Bob Kovacs

LOS ANGELES

New products and industry partnerships are showing the way to HD ENG and remote production.

Nucomm, JVC and Broadcast Microwave Services (BMS) announced last year that they were combining forces to provide end-to-end solutions for HD ENG microwave.

The heart of the system is JVC's DM-JV600U encoder, which accepts HD-SDI and encodes it into HD MPEG-2.

JVC's encoder works with the BMS Carry-Coder, a portable COFDM microwave transmitter, to achieve wireless HD video for ENG and EFP applications. Nucomm has also demonstrated its Analog Coder with the DM-JV600U to provide digital HD over existing analog microwave links.

"[This] combination of products lets us capitalize on the proliferation of conventional analog microwave radios that are in the field now," said John Payne, Ph.D., president of Nucomm.

Some recent events demonstrated the ability to get HD from a helicopter covering a major broadcast. One example is Los Angeles TV station KTLA, which used a new Moseley microwave system to capture a digital HD feed from an airborne camera to cover the Tournament of Roses Parade on New Year's Day.

LAST-MINUTE PROJECT

The helicopter, provided by Wolfe Aviation, was fitted with a Moseley DTV-65 6.5 GHz microwave radio that carried MPEG-2 video at 40 Mbps. Chris Neuman, director of broadcast operations and engineering for KTLA was initially planning to use a different helicopter service but switched at the last minute to Wolfe Aviation when the original equipment was no longer available.

Carston Bell piloted the Wolfe Aviation helicopter that was used for aerial shots of the Tournament of Roses Parade.

The switch worked well for the station.

"It was an incredible surprise," Neuman said. "It cut so well with the other cameras you would have thought we were flying SMPTE fiber."

For the parade, the chopper flew with a Gyron airborne pan/tilt stabilizing system that was fitted with a Sony F950 HD camera and Fujinon 42x lens. Carsten Bell of Wolfe Aviation piloted the aircraft.

The Moseley DVT-65 uses a 20 MHz channel to support 40 Mbps transmission, using a proprietary modulation scheme. The company ruled out COFDM modulation for the DTV-65, according to Sunil Naik, director of DTV products for Moseley Associates.

"COFDM is the most inefficient method to transmit data," Naik said.

POINT-TO-POINT

Moseley's proprietary modulation scheme was specifically targeted at point-to-point applications, such as television news and event production, instead of the point-to-multipoint foundation of COFDM.

Since the DTV-65 has a DVB-ASI input, the complete system also used JVC MPEG-2 encoders and decoders to complete the digital system. A Peak CO655-4.5 omnidirectional antenna was used to feed the signal out of the chopper.

Naik said that he was unable to line up a suitable microwave power amplifier

HD GEAR, PAGE 44

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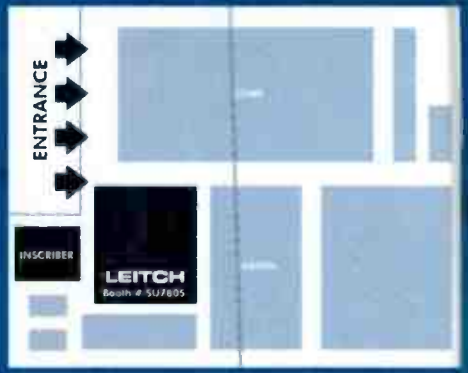

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NAB2005
THE WORLD'S LARGEST ELECTRONIC MEDIA SHOW

ENG Tapeless Workflow Evolves

Broadcasters discover hidden benefits of new technologies

By Craig Johnston

SEATTLE

Anyone who has worked as a photog in TV when news and production went from 16mm film to three-quarter-inch Umatic tape saw firsthand the workflow evolution that technology change brought.

For example, without having to wait a half hour or more for the film to be processed, stories could be covered closer to news time. The tape could be ejected from the field deck and edited immediately.

As stations begin to move to tapeless acquisition, new workflow changes are coming about. TV Technology spoke with four stations in the process of changing over from videotape to each of four tapeless formats, acquiring video on hard drives, optical discs and memory cards.

DON'T THROW IT OUT

San Diego's KFMB is deploying the Sony XDCAM format for newsgathering. XDCAM uses 23 GB re-writable optical discs, and each of the station's photographers is issued five optical discs.

Since the station shoots in the 25 Mbps mode, each disc can hold 85 minutes of video, more than is typically shot on a single story. "They can shoot many stories on that disc," said KFMB Director of Engineering Rich Lochmann.

"But then they just keep saving them and saving them, and then they have to decide which ones don't they want, which ones do I need to archive?"

This "but I might need that video later" issue was a concern with all four newsrooms we spoke with. (That's why newsrooms throughout the world are distinguished by the boxes of old field tapes sitting under reporters' and producers' desks).

The station hasn't established a formal system for saving old file footage, other than the video actually used in an evening's newscast, which is put on an optical drive and shelved.

Back at the station, KFMB has chosen to ingest story material into a central server rather than editing directly off the optical discs. That allows them to take advantage of the browse system that's part of their Grass Valley NewsEdit system.

"The reporter can go into the browse system and either do a quick EDL for the editor or the photographer to send it to the edit bays," said Lochmann. "Or, if it's simple enough, they can actually edit the piece and send it directly to the server."

A last minute story can be edited directly from the optical disc, saving time in the ingest process. The station also has four vans with editing systems in them, and five portable editing units to allow pieces to be edited in the field and transmitted back to the station for air.

"I think one of the biggest things our crews appreciate out in the field is how quickly they can start recording," said Lochmann of the XDCAM system. Where a tape had to thread up and give a five-second pre-roll, "now they pop the disc in and they virtually start recording."

The Ikegami DNS33W1 Editcam

LENDING LIBRARY

As of mid-March, New York City cable newschannel NY1 had 10 of Panasonic's P2 cameras deployed in the field and was phasing out the rest of its DVCPRO camcorders for P2. The P2 cameras acquire video directly on memory cards in the camera.

The cost of the memory cards has prompted NY1 to put them on a type of "lending library" program. The news channel's reporter/photographers are signed out five cards, identified by their serial numbers, for use in the field.

"When the camera comes back with the five cards, the cards come back to the ingest area, and those people take responsibility for those cards," said Joe Truncale, vice president operations and engineering for NY1. Then they are signed over to the field operations manager or ENG shop to be reissued for field use.

Ingesting from the memory cards presently is at two to three times real-time. In mid-March, NY1 went through a Pinnacle upgrade that will allow them to speed that process through file transfer protocol.

What to do with extra material a journalist wants to save? Truncale said NY1 has a pair of strategies. First, all press conferences are recorded for the full duration into the server, then clips that could be important later are retained.

He said NY1 is contemplating using 40 GB external hard drives for other file material. "We may give those out to reporters to keep their material on." In any case, the P2 memory cards will be returned as quickly as possible to the field for more newsgathering.

Truncale said that in the field, NY1's journalists are taking advantage of the tapeless camera's capabilities; for example, because they no longer have to back up a tape, they can review stand-ups they've just shot to be sure they remain in frame.

"Also with the card they have the ability to delete stuff that they don't want, and just record over it," he said. "So they have selective recording and simple selective editing in a sense, and they like the LCD screen."

GETTING ORGANIZED

Phoenix's KNXV purchased the Ikegami and Avid Editcam3 system, which uses removable hard drive media. Chief Engineer Ryan Steward said the new technology required a different mind-set.

"The biggest change we saw in the workflow wasn't the cameras, it was getting people inside a TV station to go from linear editing to nonlinear," he said. "That workflow process change was huge."

An editor at NY1 edits material shot on P2.

It was a matter of organization; rather than just shooting on a tape, take after take, photographers had to think in terms of different bins on the hard drive, with each shot a clip. The advantages of that organization pays off, Steward said, when material can easily be found on the three-hour capacity Editpak hard drive media.

As of mid-March, the station had deployed three cameras into the field and had converted one truck to the Editcam system. "It really has changed how we do everything," said James Bradley, engineer in charge of the Editcam changeover.

"If you can go from acquisition to playout on air and never have to deal with real-time payout on tape, it's a much cleaner system, much faster throughput."

Editing is done directly off the Editpaks, without ingesting the material. "What's happening right now is a photographer carries it to an edit bay, they load it, and then the reporter can log it right in the edit bay," said Bradley.

"They write and do what they need to do, and the photographer comes in and cuts it, and then goes directly to our AirSpace, which plays directly out to air, without going back to tape."

Editpaks are now assigned to the photographers, but Bradley said the station is considering assigning them to reporters instead, which would require them to offload or purge material off the media so they could do their next story.

Bradley also pointed out the need to purge the hard drives on the editors in the news vans. "When you first get in the truck in the morning if it's Tuesday, you go to the Tuesday bin and dump Tuesday. That way that person, whoever used it last Tuesday, has had a week to get the stuff off the drive."

MULTITASKING

KAZA, a Glendale, Calif.-based Spanish language station has five Panasonic camcorders fitted with the nNovia removable hard drive media system. The nNovia drives are cabled to the camcorders via IEEE 1394 FireWire, and the camcorders can simultaneously shoot to tape as well.

One immediate advantage KAZA staffers found is that the nNovia drives could be plugged into a regular PC via FireWire and viewed for logging. The material is then ingested at faster than real-time to the station's Avid Landshare server for editing.

Because two drives are assigned for each camera, ingesting tapes to the server frees the media to go back out to the field while editing goes on. But for late material where every second counts, the Avid editors can recognize the field hard drives and edit directly from them.

"We did have to establish some rules in how to handle the discs and where to put information, because there are some limitations as to the size of the file that can be recorded," said director of operations and engineering Joseph Berardi.

"But that same limitation is also in Avid, so it was basically learning how to use the device the way it was designed."

The station has also found it convenient to use the drives to record news service feeds off satellite because they can be ingested and accessed in the editing system much more quickly than tape from a VTR.

KAZA had the same issues as the other newsrooms with retaining file footage.

"The disk filled up, and you've got to do something with it," said Berardi. "You either have to roll it off to tape for archiving, or you have to get rid of the material. There were some conflicts with some of the newspeople who always have a tendency to want to keep everything to put in their library." ■

WUSA Plans Local News in HD

Station first in top 10 market to do HD local origination

by Bob Kovacs

WASHINGTON

Gannett-owned WUSA announced recently that it plans to convert its local newscasts to high definition before the summer.

The Washington, D.C.-based CBS affiliate broadcasts 35 hours of local news each week, in addition to carrying the primetime lineup of HD programming from the network. After the switch, all the station's local origination will be in HD.

"We're excited to be the leaders in this new technology," said Darryll J. Green, president and general manager of WUSA. "It will be like giving [viewers] a front-row seat in our studio."

The upgrade will include new HD studio cameras, switchers, monitors and servers. The station has upgraded its Omneon server to provide HD feeds. For the moment, upconverted graphics will come from an SD system.

In the field, WUSA will continue using SD equipment for news stories and remotes, although it will switch to 16:9 to integrate better with the studio's visuals.

"Right now, our plan is to focus on the studio portion of the HD upgrade, as that's a major undertaking," Green said. "In the future, we'll look at how we do [field HD]."

KUSA, WUSA's sister station in Denver, made a similar move to HD last year, which helped guide all Gannett stations on the necessary technology upgrades.

"We definitely learned a lot from KUSA and they have been great to work with," Green said. "We've learned that as you build the system, you must be flexible and also get equipment that you can upgrade to HD."

SOURCE OF INFORMATION

In this nascent era for HD news origination, WUSA found that equipment vendors are a useful source of information and advice regarding the switch.

The station will install two Sony MVS-8000 production switchers and several Sony studio cameras equipped with HD lenses.

The WUSA news set will get a complete makeover to prepare for HD news.

"Sony has been an ongoing partner with us and has played a lead role in helping us move [to HD]," said Terry Smith, director of technology and operations for WUSA.

On the other hand, Smith said that HD graphics are not quite ready for the demands of a major-market news town like Washington.

"Graphics will stay SD and will be upconverted until the industry seems to be able to produce systems with all the functionality in the same box that you can get out of standard definition," he said.

The station will use a Grass Valley router to handle simultaneous SD and HD signals, and distribute embedded and unembedded audio to different parts of the facility. Miranda Technologies' up- and downconversion devices will handle the interchange between SD and HD. Other significant products from Miranda include the Kaleido multi-image processor and a Presmaster master control and branding switcher.

Ensemble Designs gear will be used to embed audio and frame synchronization. Staff from the station will be at NAB2005 to research other equipment.

The days when television equipment were completely separate from computer systems are long gone and Smith made sure that the HD upgrade will be "IT-friendly."

"One thing we evaluate with our equipment is its IT [capability]," Smith said. "A lot of these components are IT-driven and that was one of our decision factors."

RECONSIDERING THE BASICS

As part of its upgrade to HD, the station is building a new news set that takes advantage of DTV's 16:9 aspect ratio. Of course, the higher resolution of HD means that a lot of entrenched television principles must be reconsidered.

"You've got to understand that you're shooting at 16:9 and have to be aware of what's on camera," Smith said. "Plus, with the sharper picture, you can't get away with something that was a traditional set design. You've really got to pay attention to the details because they are going to show."

The set is being built in New York and will be inspected, knocked down and shipped to WUSA within weeks. Although the station's management closely holds the design elements, Green was enthusiastic about the new set.

"I love it," he said. ■

HD Gear

CONTINUED FROM PAGE 42

for the project in time for the broadcast, so the team went with the 1W signal directly from the DTV-65. By the time 3dB of cable loss was accounted for, the output power was 500 mW—from an omnidirectional antenna. The chopper roved as far as five miles from the receive location without any loss of signal.

"We never had any breakup during the event," Naik said.

Neuman of KTLA agreed: "Very sweet pictures," he said.

The whole thing was put together a few days before the parade, after the original helicopter service was found to be unavailable.

"Wolfe Aviation came to me and asked if we could do it in a week," Naik said.

The system was first tested the day before the parade and pressed into service when the test went well. ■

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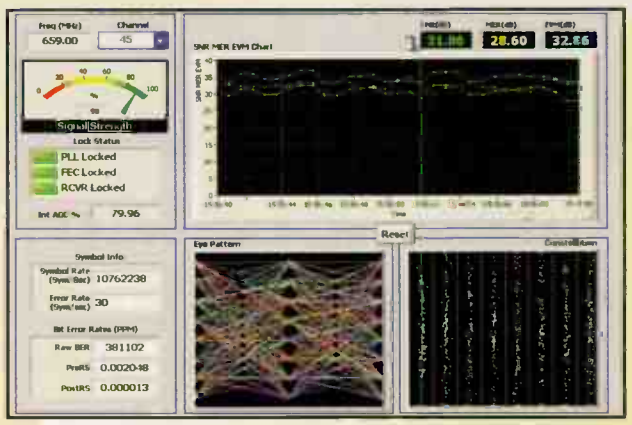

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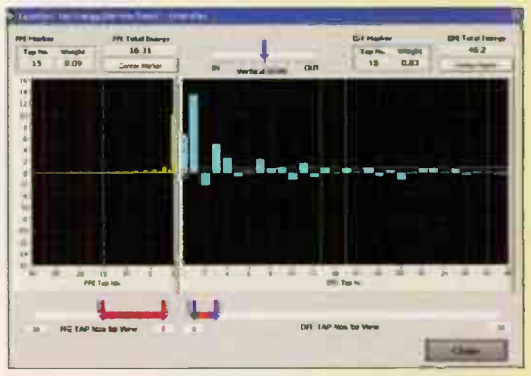

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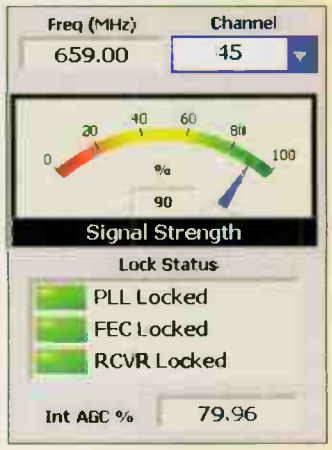

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Doing More with Less

Automating workflows will be key for decision-makers attending NAB

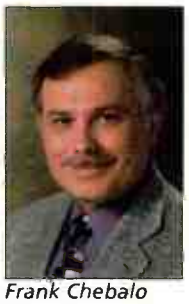
by Claudia Kienzle

LAS VEGAS

At NAB2005, top broadcasters and systems integrators will be looking for solutions that increase the value of their on-air product while enhancing the bottom line. Executives from The New York Times Broadcast Group, PAX TV, Meredith Broadcast Group, DST and CEI tell us they will be on a mission to find products that automate and streamline the workflow to meet the demands of this new multichannel DTV era.

MORE EFFICIENT WORKFLOW

"Broadcasters are looking for better, more efficient ways to do what we do—delivering the network signal and serving our local communities. As we move from analog into a truly digital broadcast world, stations will have to get more aggressive about their ability to run multiple channels efficiently," says Frank Chebalo, senior vice president of operations and engineering for The New York Times Broadcast Group, and president and general manager of WTKR, in Norfolk, Va.


Frank Chebalo

"At the show, I think you will see heightened interest in such products as servers, automation, asset management, nonlinear editing systems, and newsroom computer systems, which can increase operational efficiency, because the business demands it. If the business strategy dictates doing more with fewer people, then the challenge is to come up with the tools and technology that will satisfy that need," said Chebalo.

The New York Times Broadcast Group consists of eight stations, including WTKR-TV, the CBS affiliate in Norfolk, Va; WREG-TV, the CBS affiliate in Memphis, Tenn.; KFOR-TV, the NBC affiliate in Oklahoma City, Okla.; and WNEP-TV, the ABC affiliate in Scranton, Pa. Unique to this station group is a proprietary centralized automation system (currently based on Harris' Encoda MCAS) that allows centralized operations of all eight stations from the Digital Operating Center at WTKR.

Installed six years ago, Chebalo said, "We've taken the master control function out of those stations, and perform that task remotely from Norfolk, but local programming is still produced at the stations. Our stations produce a minimum of five hours of live news daily, which is a rather major task that utilizes approximately 50 percent of our workforce. In the not-too-distant future, the model will be to have a completely digital, tapeless workflow from acquisition to play-out. If we need fewer people to handle the mechanics of the operation through streamlined automation solutions, we can then dedicate those people to generating the content, where the real value is."

SAVING TIME AND MONEY

"Broadcasters are willing to invest in anything that makes it easier for them to get their job done efficiently. This increased efficiency leads to a solid return on investment, which leads to greater profitability," says J.T. Duggin, senior vice president/COO of Digital System Technology (DST), a leading systems integrator based in Atlanta, Ga.


J.T. Duggin

Among the products likely to draw interest at this year's show are low-cost servers in the $7,000 to $10,000 range, such as those from 360 Systems, which will appeal to small- to medium-market stations that cannot justify more expensive, robust architectures. "They won't offer as many inputs and outputs, but at that price-point, you could stack them for additional I/O capacity," said Duggin.

HDV camcorders are expected to appeal to small- to medium-market stations, especially for ENG, because of their price performance. "But, I don't know how quickly HDV will become a dominant format for ENG. Because broadcasters today have a greater interest in streamlined workflow, they're likely to choose that benefit over enhanced image quality. If a station's future operations remain tape-based, HDV is a good recording option. But if they're transitioning to file-based formats, HDV still requires ingest from tape into a file format."

DST spends several million dollars on behalf of its customers at NAB each year. Duggin said, "NAB is not always the start of the sales cycle; for some customers, it's the end of the buying cycle. Many customers have already researched product information at vendor Web sites or attended product demos, so many selections have already been made prior to the show. For those making a group purchase decision, NAB is the place for all parties to come together for a final conclusion on what they're buying."

BETTER TRANSMISSION

"At PAX TV, we've divided our stations into regions, and we will have regional engineers who represent stations within their regions. We'll have a delegation of 15 engineers who will work as a team to ensure that we cover everything of interest to us at the show," said David Glenn, vice president of engineering for PAX TV, in St. Petersburg, Fla., the network operations center for this prominent station group. With 60 stations nationwide, PAX TV is the second largest station group in the country.

Among the trends and technologies of interest to PAX TV are MPEG splicing, multichannel logo insertion and new file servers for on-air operation. "Hopefully, all of these will be with centralized store and forward and control systems," said Glenn. "And, we're mostly interested in improved compression technology and techniques, and expanded uses for Windows Media 9 and MPEG-4 for contribution and distribution."

NAB UPDATE, PAGE 50

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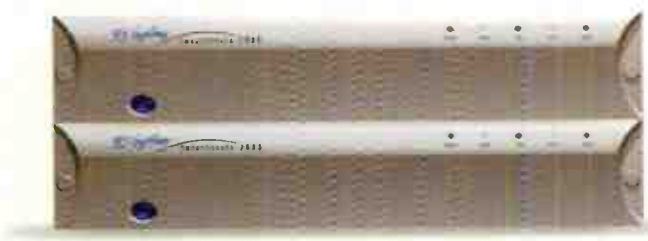

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Verizon CEO to Keynote NAB2005

Telco makes serious inroads into TV business

by Deborah D. McAdams

LAS VEGAS

If convention keynotes are any indication, the NAB cannot be accused of shrinking from its rivals.

Verizon Communications Chairman and CEO Ivan Seidenberg will be the keynote speaker during the All-Industry Opening at NAB on April 18.

Verizon is currently smack-dab in the midst of a major effort to compete in the television programming delivery business. Nearly a year ago, the phone behemoth announced it would be sinking $40 billion into fiber to the premises (FTTP). The immediate intention was to beef up broadband speeds in order to make DSL more competitive with cable-modem service. At a top speed of 1.5 Mbps, DSL download rates are only half as fast as cable broadband. Cable currently dominates the U.S. broadband market, with nearly 20 million customers compared to 13.3 million for DSL.

Now, while the largest cable companies are tweaking download speeds up to 5 Mbps, Verizon is offering tiered price packages for speeds of 5, 15 and 30 Mbps.

The ultimate goal of FTTP deployment is to be able to deliver voice, video and data, otherwise known as the "triple play"—the new catchphrase heir to "killer app." Earlier this year, Verizon secured deals to use the Microsoft electronic programming guide with Motorola set-tops for launching digital TV; and TVN Entertainment for video-on-demand content.

The wireless division of Verizon is already heavily into television with its V CAST offering. In January, the company teamed with Fox for the creation of "mobisodes," short episodes of regular Fox programs, designed specifically for tiny cell phone screens (See "From the Small Screen to Smaller Screen," p. 27).

FTTP IN 14 STATES

As for its wired network, dubbed "FiOS," Verizon's goal was to have 1 million homes on fiber by the end of last year. While the final tally wasn't announced, the company is building a press release file reminiscent of a certain DBS company (EchoStar) that fires off missives for every launch of local TV service, no matter how small the community. Thus, Verizon's archive is rife with such gems as, "New High-Fiber 'Diet' for 19 Eastern Massachusetts Communities," and "Verizon Brings Blazing-Fast Computer Connections to Rye, Armonk Customers."

Verizon Communications Chairman and CEO Ivan Seidenberg

> "Nobody sends a local e-mail or a long-distance e-mail. You send an e-mail."
>
> —Ivan Seidenberg, Verizon

Verizon's recent rollout in New Jersey makes that state the 14th on the fiber deployment map.

Phone TV is certainly nothing new. Telephone companies have tried to jump into television before, with bleak results. One of these more spectacular forays involved a consortium of telcos that included Verizon progenitors Bell Atlantic and Nynex, which was run by Seidenberg at the time.

The venture, Tele-TV, launched in 1994 with a Who's Who of Hollywood in charge. Superstar agent Michael Ovitz was content king; Sir Howard Stringer, now the CEO of Sony, was chief executive, and Fox exec Sandy Grushow was head of programming. Grushow returned to Fox within two years; Stringer left for Sony and Ovitz went to Disney to become Michel Eisner's fall guy. Tele-TV shuttered the following year, taking $500 million with it.

That same year, Nynex merged with Bell Atlantic, where Seigenberg co-chiefed with Bell Atlantic CEO Ray Smith. Then in 2000, Bell Atlantic acquired GTE and became Verizon. Siedenberg was again a co-CEO, this time with GTE chief Chuck Lee, until 2002, when he finally took the reins on his own.

Verizon technicians lay fiber to the premises.

BEYOND THE TELECOM ACT

Perhaps nostalgic for another heady merger experience, Siedenberg was leading Verizon in a bidding race with Qwest to acquire MCI at press time. He was also testifying on Capitol Hill, where lawmakers are wondering if the nation's telephone monopoly is reassembling itself, what with Sprint Corp. also going after Nextel and SBC trying to buy AT&T.

Siedenberg told members of the House Energy and Commerce Committee that wireless and broadband networks have changed the landscape of communications beyond the scope of the 1984 breakup of AT&T and the 1996 Telecom Act, which required the resulting Bells to open up their lines to competitive local exchange carriers.

"Nobody sends a local e-mail or a long-distance e-mail. You send an e-mail," Siedenberg testified.

Several members supported the pending mergers, including Rep. Rick Boucher, (D-Va.)

"The broad public interest is well served by the mergers," Boucher said. The strengthening of these companies will "reduce the number of dropped calls ... and speed the introduction of new services."

In his keynote at NAB2005, Seidenberg is expected to talk about the future of telecom technology and the electronic media industry as a whole.

Last year, NAB brought in Gary Shapiro, head of the Consumer Electronics Association, who scolded broadcasters for adopting hi-def TV too slowly.

"Digital is your destiny," he told the audience, "but HD could make your swan song."

Siedenberg will appear at the 9 a.m. opening event at the Las Vegas Hilton Barron Room along with NAB president and CEO Eddie Fritts, who will deliver his final state-of-the-industry address as head of the organization. ■

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Wes Skiles would know.
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Wes and his team have filmed volcanoes, caves, underground rivers, jungles, deserts and the ocean floors to film the largest iceberg in recorded history was as challenging in its production as its images were stunning.

Karst's latest project was an exploration of the underground rivers of Florida for PBS. Diving great distances through narrow passages while being tracked from above, the team charted the detailed path water takes to reach local springs. Their Sony HDW-900/3 cameras were equipped with HyTRON 120 and Dionic 90 batteries both above and below the water in special waterproof housings.

"Our specialty is utilizing cutting edge technology to capture the experience of exploration while expanding the understanding of our planet," says Wes. "I made my reputation filming some of earth's most extreme environments. That's why I use Anton/Bauer batteries for my shoots - they're tough, reliable and versatile. Confidence in your team *and* your equipment is a must."

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NAB Update

CONTINUED FROM PAGE 46

"We also want to see what other manufacturers have jumped onto the bandwagon for distributed transmission using single-frequency networks to distribute the broadcast signal more efficiently within the coverage contour where you have terrain limitations," said Glenn. (Axcera has been the leading provider of distributed transmission solutions.) "We are also interested in any automated VSB test and measurement equipment and I'm hoping to see manufacturers working on E-VSB (Enhanced VSB) solutions for more robust data transmission."

David Glenn

MOVING UP TO HD

"As a systems integrator, we always send a big delegation to NAB to see the newest technology and get a feel for where things are going. We would be remiss in not sending all our engineers to the show because we recommend and purchase equipment on behalf of our broadcast customers," said Tara Kelly, director of sales and marketing for Communications Engineering, Inc. (CEI) in Newington, Va.

"Among the big trends we'll see at this year's NAB are control systems for asset management and automation and archive solutions," said Kelly. "We'll also see developments in monitoring, digital preservation and migration of news to HDTV. Broadcasters will be looking for the latest in remote and studio monitoring of incoming network signals—from companies such as Leitch, Miranda and Snell & Wilcox—because stations have fewer staff people to monitor a growing number of signals."

Regarding digital preservation, Kelly said that as small- and medium-market stations adopt video servers, they will have most of their current material in tapeless form. But their archives will still be largely tape-based, and the time-consuming task of preserving those archives will stimulate demand for asset management solutions that can locate and ingest tape-based assets.

"Another major area will be HDTV, again," said Kelly. "Increasingly, pool feeds for high-profile events are being offered in HDTV. And I believe that as major networks fully transition to HDTV, they may put pressure on events producers to provide pool feeds in HDTV exclusively. Because of this, many stations will feel compelled to support HD acquisition, production, downconversion and transmission sooner than they had planned to. Especially in the news area, many of our customers are asking us to provide an upgrade path to HDTV so they will be prepared to add it when the time comes."

MAXIMIZING EQUIPMENT

"Our main interest is to look into enhancements to the gear we've already bought and installed—such as an Avid newsroom solution, SeaChange servers, and Grass Valley Profile servers—to see how we can gain more efficiency and a better workflow. We want to get more value out of the systems we already have in place," says Joe Snelson, vice president and director of engineering for Meredith Broadcast Group, in Henderson, Nev. Snelson handles engineering planning and purchasing for the Iowa-based station group.

Joe Snelson

Among the systems already in place is an automation system from Harris. Snelson wonders what impact Harris' recent acquisition of Encoda will have. "It will be interesting to see how they integrate that capability and how they might put together an end-to-end solution tying traffic, automation, asset management and transmission."

Also, Snelson said, "In our master control areas, we want to find ways to reduce the work it takes to get things done, like automatically moving files to edge servers and then to playout servers to deliver them to air. We're not planning any purchases at this time. These are just some of the things we want to look into." ■

DIGITAL JOURNAL

Bill Hayes

The Annual Rite of Spring

Despite all the changes, NAB is still the place to be

AMES, IOWA

It cannot possibly be time to plan for NAB and yet here it is. In the year that has passed since NAB2004, the IPTV engineering team has signed on three full-powered DTV stations and completed the majority of work for signing on two more full-power stations later this summer. We have also signed on one low-power DTV station and will have three more LP DTV stations on the air before the end of the summer.

We have replaced the full duplex fiber-optic hardware between our studios and transmitter sites with a new Harris NetVX system. We are in the process of installing the new PBS ACE master control system, and we will be the first to take that system operational next month. We have installed new servers from Omneon and Sencore, added a four-camera HD remote system to our repertoire and performed field trials of mobile datacasting for the State of Iowa Department of Homeland Security. In addition, we have signed a contract with Axcera to supply us with eight new translators varying in power from 1 kW to 6 kW, all capable of field conversion to DTV translators, the first to be installed in Ottumwa, Iowa, this summer. We have out for bid a five SD/one HD encoder package, and we are finishing bid specifications for a new 2,000-foot tower in Mason City, a new 1,250-foot tower in Fort Dodge, a new 450-foot tower in Ottumwa and major modification to our 1,000-foot tower in Iowa City. Did I mention we were busy?

THOSE WERE THE DAYS

Yet we now have to plan for our trip to the NAB. I remember my early days working in radio and television when

Photo: NAB

Who can resist the lure of NAB on a Monday morning?

planning for the NAB was a one-hour exercise of going through the vendor list and determining which vendors had products that I wanted to see. My wife would actually go with me and we would stroll up and down the aisles, stopping to discuss equipment with various vendors and picking up little toys for our daughter. In fact, there was a four-year run in which each year Audio Technica would have an inflatable microphone or headphones and our daughter had the full collection hanging in her bedroom.

But those were the good old days. Now, my daughter and son-in-law are expecting their first child so I'm looking for little toys again for another generation. My wife may come out for a few days over the weekend but probably won't set foot in the convention center, and I'll be coming off three days of a PBS engineering conference that precedes the NAB. This will be in time to do a presentation at the Ennes Workshop on the aforementioned ACE implementations that, due to delays, will not have taken place at IPTV yet in time for a four-day jogging tour of the NAB floor. Sometimes when I'm there I look at the people riding around in the scooters and wonder if I could get one. Not that I can't walk, but I'd soup up the motor to get some real speed out of it and maybe be able to make all the appointments I need to make.

PLAN YOUR WORK

With so much going on at IPTV and such a huge amount of space to cover at NAB, what's my plan? Well, I have some very strategic things that I need to accomplish and the NAB convention floor is an excellent place to work. First, there are the projects for the next year. At IPTV that means the conversion of our studio production facilities from analog SD to full digital HD capabilities. We have an online studio control room, a studio and a 300-seat auditorium to convert. The IPTV team will be looking at HD switchers, graphics, effects and surround sound audio systems. We'll also be looking at HD studio cameras and lighting. In my last article I mentioned our linear editing suite that will be transitioning to HD-capable.

Routing is also a huge and challenging system to evaluate. I've been to a number of presentations by manufacturers and end-users on their routing projects and plans, and I've left many of them less sure of what we should do than when I started. When I worked at WSAZ in Huntington, W.V., we did a router change that I had to justify to both the local station management team and the corporate ownership management team.

NAB is a great place to get problems solved because most companies have people there who can make those decisions.

Routing systems are not particularly glamorous or glitzy. In explaining to both these groups why we needed to spend the lion's share of our capital budget

SPRING, PAGE 52

Spring

CONTINUED FROM PAGE 51

for the year on this rather bland and innocuous piece of technology, I jumped through many hoops. I made numerous comparisons and analogies, including using the central switch of the phone system and the traffic light management of busy city streets and railroad track management in a busy rail yard.

However, from my point of view, the best and most accurate analogy that I came up with was the sewer. It is a critical system that is truly buried and forgotten that everyone relies on; however, as soon as it stops working, everyone affected wants it fixed because of what's backing up in their home. Laugh if you want, but there were a number of people at the corporate office for whom this analogy was the one that they best understood. Fortunately this time, I don't have to justify the purchase of the new router because in the sewer plumbing analogy I'm afraid the differentiation between SD, HD and analog could get... well messy. Needless to say, what is a very fundamental portion of the infrastructure that must be done correctly has become much more complex, based on the variety and types of services to be handled in the plant.

THE VALUE OF BEING THERE

Another key reason for going to NAB is to meet with vendors and service providers to discuss projects that are currently or soon will be under way. Depending on the status of the project, these meetings can be very interesting and intriguing. A number of years ago, prior to my coming to IPTV, I was at NAB with our station's production manager meeting with a well-known supplier of graphic systems and the now defunct reseller of the system. Our topic of discussion was our dissatisfaction with the system (it didn't work), and it did not include all the extras that the manufacturer's sales rep promised us to make up for all our problems and the lack of corrective action. The manufacturer, in its defense, was unaware of the problems because the sales rep had not reported them and had moved quickly to correct them. The sales rep, on the other hand, denied ever making any promises and in essence called us liars. At that point the production manager, a 6-foot 8-inch giant, turned bright red and leapt to his feet, at which point the sales rep ran from the room. I still see this sales rep from time to time working at different companies and marvel that he is still around. NAB is a great place to get problems solved because most companies have people there who can make those decisions. I'm sure I'll spend a bit of time meeting with tower companies to discuss our numerous projects that are going to go out for bid right after we return from Las Vegas.

The final key reason for me going to NAB is networking—I don't think it is appreciated as much as it should be. Meeting other engineers and talking to them and going through equipment with them has amazing value because we all have unique ways of looking at things and focusing on different parts of the same puzzle. Early in my television career I was at NAB and ran into Tom Mikkelsen, who at that time was working for WGN in Chicago. Tom and I had met through a mutual friend a few years earlier. I was working at the NBC affiliate in Honolulu, where we were dreaming about getting a Betacart to replace our single TCR-100. Sony was just showing the new Beta LMS to Tom and I tagged along. I was wrapped up in the hardware, as well as the capacity and the ability of the machine to handle thousands of spots. Tom asked the operator to hand him one of the tapes from the machine. Tom then proceeded to use his thumb to smear the label barcode, handed it back to the operator and asked him to reinsert it in the machine. Of course the barcode couldn't be read, although it wasn't completely obscured. What followed was a high-level discussion between a number of very senior Sony people about this problem. I don't know if I would have ever thought to do that on my own, but in the real world, it was an important issue. In the digital world, there are going to be a lot of important issues, some of which I'll consider and others I'll miss. Without this opportunity to network, interact and share knowledge, I wonder how many more issues I'd miss. I hope to see you at NAB. I'll be the guy riding the Lark scooter with the Hemi. Sweeeeeeet! ■

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

When It's Time to Relax

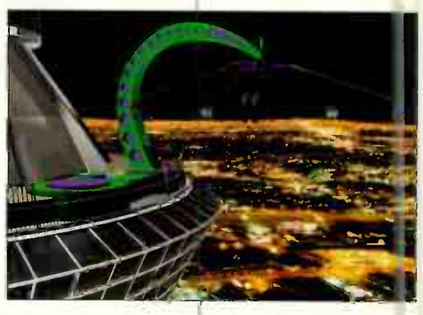
Ever on the lookout for things to keep you busy at the upcoming NAB convention, **TV Technology** wants to point out a new attraction at the top of the Stratosphere Casino Tower. It's called "Insanity-The Ride."

Promoted as an "aggressive, new genre of extreme thrill ride," it spins you out over the edge of the tower that dominates the Vegas skyline. The inverted centrifuge is the last of four rides planned for the top of the Stratosphere. This one holds 10 passengers and spins at 40 m.p.h.

"The key to the ride is that thrill seekers experience a centrifugal force of three Gs while being spun out 64 feet past the edge of the Stratosphere Tower overlooking the City of Las Vegas more than 900 feet below," the promoters said.

The casino's general manager was quoted in press material as saying, "Well, you'll have to be nuts to even think about getting on it."

It consists of an arm that extends 64 feet over the edge and will spin passengers at up to three G's.



"As the ride spins faster and faster, the riders are propelled up to an angle of 70 degrees. Riders will experience the thrill of being flung over the edge of the tower and literally facing downward at the City of Las Vegas below."

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Miranda Focuses on Control, Branding

Company to launch gear to monitor, brand and interface to HD

by Tom Butts

MONTREAL

Broadcasters face a future of multicasting, 5.1 audio, HD and who knows what else lurking around the corner. How then, do they make the different components work together and, just as importantly, how do they manage and monitor their gear and brand their content to make it stand out in the crowd?

Those are just some of the issues the folks at Miranda Technologies have been working on for years and at NAB2005, they'll be rolling out the latest versions and enhancements to their interface, monitoring and branding product lineup.

Miranda's focus is about providing broadcasters "with higher level tools to make operators even more efficient and the system more robust and keep stations on air more of the time," said Neil Sharpe, vice president of marketing for the Montreal-based company.

"There's a lot going on in a television station," Sharpe said. "Because of this, you have to create something intuitive and to us, that means highly graphical, rich visuals that operators are very comfortable with."

CONTROL & MONITORING

Among those higher level tools is Miranda's iControl monitoring and control over IP system, which helps operators track facility failures in television systems of all sizes.

iControl has been expanded to manage complex multichannel and multiformat television operations handling hundreds of signals. SNMP protocols are used to monitor and control video, as well as all the surrounding transmission, networking and building infrastructure, making it well-suited for a variety of environments such as incoming feed management, multichannel HD/SD master control and video network operations centers for cable, satellite and IPTV operators.

Customers visiting Miranda's Montreal headquarters can put iControl through its paces.

"[iControl] has moved away from being a simple interface for status report and control to become a facility monitoring system in a wider sense," Sharpe said. "It's not just looking at Miranda's interfaces, it's looking at the complete station infrastructure... including elements such as air conditioning, for example—all those critical elements in a television facility."

A new Third Party Zone feature allows third party applications to be hosted directly within iControl, allowing one keyboard and mouse to control all Miranda and third party applications. To illustrate these features, the Miranda booth at NAB2005 will feature Miranda control gear integrated with third party equipment, according to Sharpe

Other new features for iControl include an embedded Web browser which allows direct access to HTML-enabled devices, and a group of scripted macros that allow automatic reaction to element failures and can also guide operators through complex diagnostic and repair procedures. Also on hand is iControl Solo monitoring and control software to allow broadcast operators and maintenance engineers to configure and control Miranda's Densité and Imaging Series interfaces directly from a PC.

CHANNEL BRANDING

Channel branding is playing an increasingly important role in the multichannel universe.

"One of the things driving HD is the fact that there is this tremendous competition among broadcasters, satellite and cable operators and they're all trying to differentiate their product offerings. HD is one of those differentiators—along with 5.1 audio—and one of the things we're offering as a company is the toolsets for that differentiation," Sharpe said.

New enhancements to Miranda's Imagestore HDTV master control switching and channel branding processor

MIRANDA, PAGE 60

Omneon Offers New Options

New family of interface devices launching at NAB2005

by Susan Ashworth

SUNNYVALE, CALIF.

With its eye on a broadcast market that is searching for a way to successfully integrate SD and HD, Omneon comes to NAB2005 with a host of new solutions.

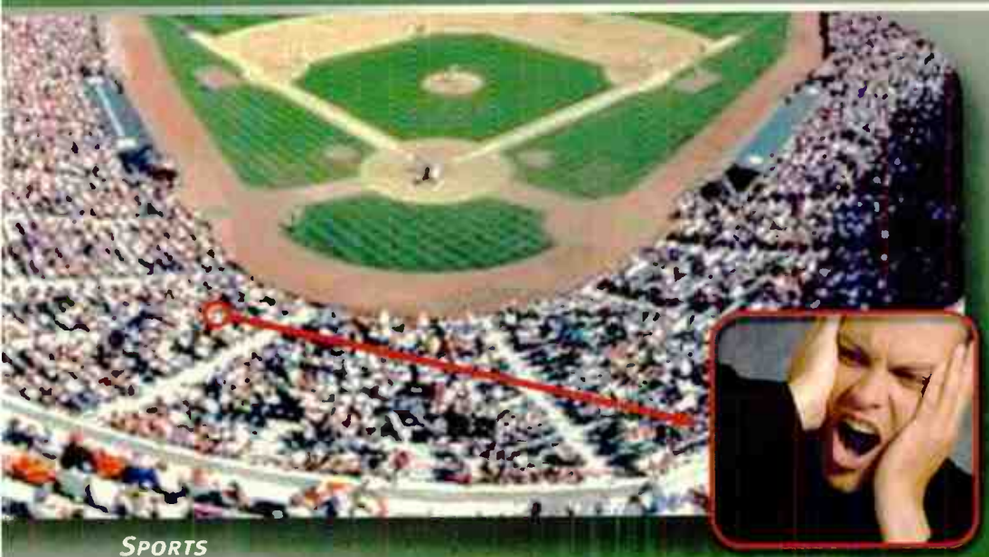
Chief among those is the Omneon Spectrum media server, which offers integrated HD and SD functionality for the simultaneous playback of high- and standard-def content—a feature that can be achieved on either the same channel or independent channels.

Designed with flexibility in mind, the Omneon Spectrum can support real-time broadcast connectivity and nonreal-time network connectivity, allowing broadcasters to use multiple formats and applications simultaneously. The Omneon Spectrum media server consists of three basic components, including MediaDirector server components, MediaStore storage arrays,

OMNEON, PAGE 68

Canon's 3-Chip PTZ Camera System Adds A New Dimension To Quality Production.

NEW 3 CCD PTZ



SPORTS

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NU-700N FEATURES AT A GLANCE

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Ikegami Touts Tapeless Technologies

Company addresses production market with new SD/HD switcher

by Susan Ashworth

MAYWOOD, NJ

Ikegami comes to NAB2005 with a host of technological advances, including new HD offerings, a new full-size HD/SD production switcher, and solutions designed to tap into the broadcast market's growing interest in tapeless technologies.

This year Ikegami will introduce a line of tapeless digital newsgathering solutions that are expected to be one this year's most-talked about technological advances.

"We expect tapeless technology to be the hottest topic at NAB this year and our booth will reflect our many years of experience with this technology," said Teri Zastrow, director of sales and marketing for Ikegami. "In addition to a complete line of SD tapeless products, we will also be showcasing our new HD tapeless technology."

"NAB 2005 attendees will see historic Ikegami product introductions that will shape the future of broadcasting for years to come," said Alan Keil, vice president and director of engineering for Ikegami.

An HD version of the Ikegami Editcam will be launched at NAB2005.

EDITCAM HD

Key among these solutions will be the company's new Editcam HD camcorder, which employs a data rate of 140 Mbps to offer broadcasters multiple recording and playback solutions—including 1080/60i, 1080/24p and 720/60p. The company will offer demos of the FieldPak2 recording media, including the new 120 GB FieldPak2, which provides more than an hour of HD recording time.

The recording portion of the new Editcam HD camcorder is based around an Avid DNxHD mastering codec that will allow recorded HD-resolution images to be edited on laptop and desktop systems in real time. The DNxHD codec will support 220 Mbps for increased performance in the future, the company said.

The company will also showcase its standard-definition Editcam3, the DNS-33W, Ikegami's next-generation 520,000-pixel AIT (Advanced Interline Transfer) CCD camcorder. The system features Retroloop recording, a timelapse feature, and new triax and multicore adapters to allow the camera to be used in studio or field configurations.

Other new camera technologies from Ikegami include the new HDL-40HS, a high-speed HD box camera that can produce images at 1080/60p and 720/120p for slow-motion applications. The camera employs CMOS (Complementary Metal Oxide Semiconductor) image sensor technology, which offers features such as decreased power consumption, multiformat options and high-speed capabilities.

Other camera offerings on tap for Ikegami include the company's line of HD and SD portable and studio cameras, including the HDK-75EX in studio configuration; the HDK-79EX with SE-7000 System Expander for field production; and the HDK-790E studio camera operating on Ikegami's HD triax system. Studio and portable SD models will include the studio HK-399W and its portable companion, the HK-399PW; the triax HL-60W; the new HC-D57W; and the one-piece DVCAM camcorder, the HL-DV7AW.

MAKING A SWTICH

Ikegami is also jumping headfirst into the switcher space, introducing the HSS-3000, a full-size HD/SD production switcher that can input HD, SD or SDI signals. The switcher offers up to 96 inputs and 64 outputs. The switcher's four M/Es are fully assignable to either HD or SD, and each M/E includes a two-channel DVE. Features include external machine control, optional frame store and a dual LCD touch

IKEGAMI, PAGE 60

PESA Gears Up for Big Routers

Company sports new owner, president

by Bob Kovacs

HUNTSVILLE, ALA.

PESA, a manufacturer of routing and master control switchers, has long been a favorite for remote production truck designers.

At NAB2005, the company will keep an eye on this established customer base and look to increase its market share in fixed facilities, which is already an important part of the company's business. With a 2,700-square-foot booth in the South Hall of the Las Vegas Convention Center, PESA will have plenty of room to demonstrate its routing and master control switchers.

However, the big news for the company at NAB2005 is that QuStream, a private equity company with experience in the television industry, acquired PESA in Dec. 2004.

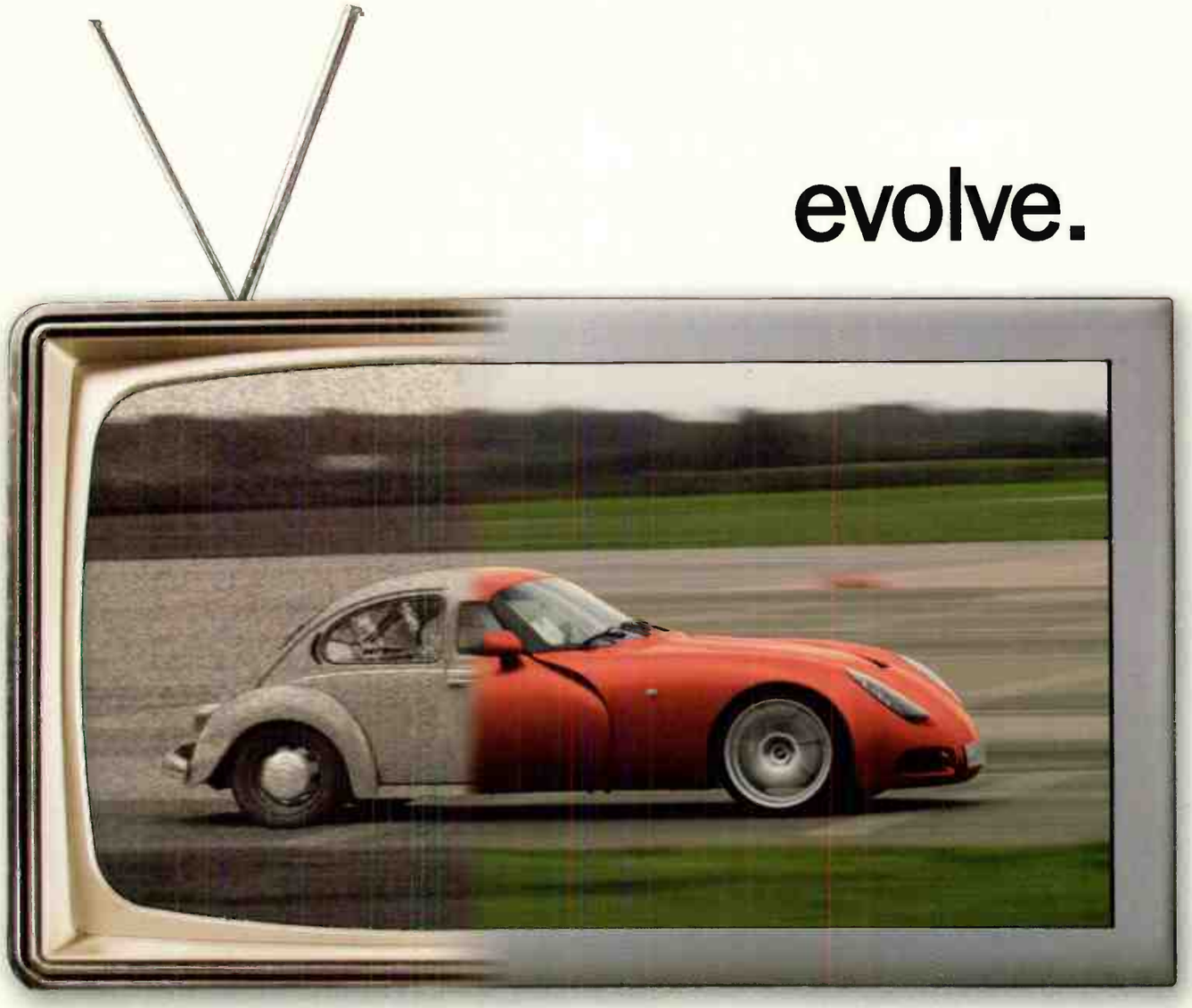
"We're a company that's been rediscovered and now has an opportunity to excel," said Bob McAlpine, senior vice president of sales and marketing for PESA. "We are the first acquisition [by QuStream], with a mandate for growth."

At the same time QuStream made the acquisition public, the company announced that Steve Miller was to be PESA's new president and COO. In addition to his role with PESA, McAlpine was also named vice president of business development for QuStream. After all the financial dust settles, the PESA name and brand will continue.

"The name is well known, the customer base is strong and we're going to

PESA will launch the Cheetah V5 routing switcher at NAB2005

PESA, PAGE 67



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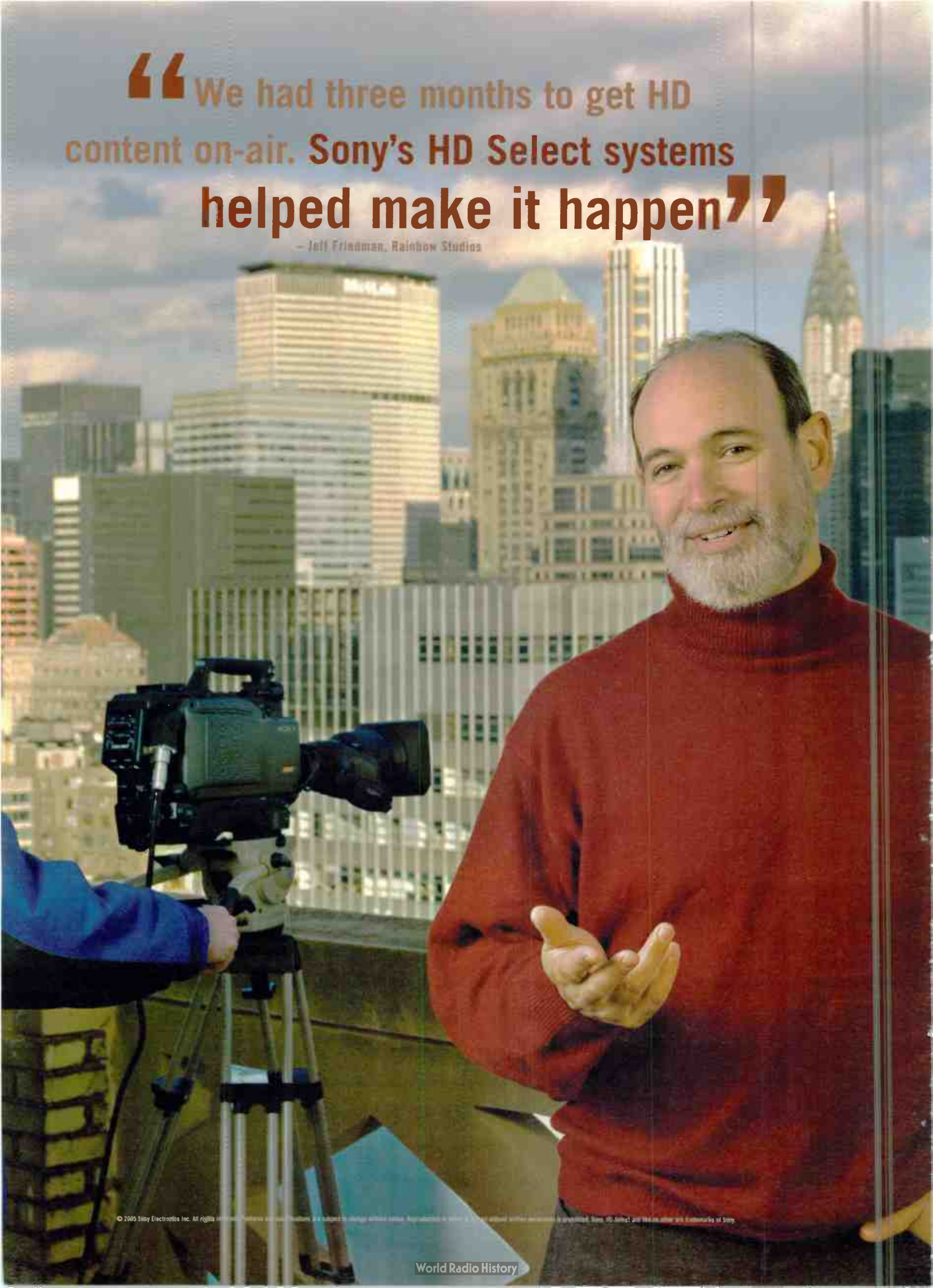

SONY

HDelivered.

When Rainbow Studios, a part of Cablevision, needed high definition in a hurry, they turned to Sony HD Select™ systems. Jeff Friedman, VP of Technical Operations explains, "Not only did Sony work with us to meet our delivery schedule; but they insisted on sending their people in here to commission the studio cameras and the switcher. One of the great things was that our engineers worked hands-on with their guys, and our questions were answered right from the source."

"We send our ENG cameras all over the planet — for everything from fashion in Paris to extreme sports in Tibet and Madagascar," Friedman declares. "When you have cameras falling down mountains, you depend on service after the sale. Our maintenance contracts with Sony have been fabulous. We drop a camera off and two days later it's delivered back to my door. That really helps keep our customers satisfied."

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Miranda

CONTINUED FROM PAGE 54

include a new dual DVE option that allows high-quality dual picture-in picture effects for compelling program junctions and promotional graphics.

"We also have a co-processor called 'Intuition HD' which is a very powerful channel branding graphics coprocessor that allows you to do virtually unlimited animations and CGs," Sharpe said. "That capability just hasn't been there but now the highest level of graphics capabilities is there in HD as well as SD."

A new audio mixer for Imagestore HDTV provides 16 channel audio mixing using embedded or AES audio, allowing for 5.1 audio playout and multilingual broadcasting. The processor can provide eight channel audio storage for 5.1 clips or stereo voice-overs in four different languages.

INTERFACING

On the interface side, Miranda is introducing the new DV-Bridge Cam, a DV-to-SDI converter targeting DVCAM newsgathering operations. The compact interface can be mounted securely under a handheld DV camera or sandwiched between a tripod or camera, and it enables operators to use DV cameras as if they were SDI cameras.

In the higher-end camera market, the company will launch the DVC-802/322 HD downconverter and DV encoders for Sony and Panasonic HD cameras, as well as the MDC-902/922 HD downconverters, all featuring 24p to 50i support.

Miranda's Imaging Series XVP HD interface modules lineup has been expanded to include a new HD cross and down converter, an upconverter and cross converter and an HD frame synchronizer and downconverter. The new interfaces all feature firmware that can be readily upgraded to provide additional signal processing. Also new to the Imaging Series module range is the QXC-801i HD cross converter which provides interfacing between 720p and 1080i HD standards.

Miranda's Densité Series interfaces has also been enhanced with the addition of the DEC-1021 NTSC to SDI 3D/2D decoder, frame synchronizer and proc-amp, which offers probing and streaming of video over IP for remote control and monitoring.

With more and more broadcasters and production facilities turning their attention to HD, Sharpe thinks that NAB2005 will mark a turning point in high-def production worldwide.

"Miranda was one of the first companies to invest in HD equipment, but it's only been in the last year that HD sales have become a very significant portion of our business," Sharpe said. "Across the board, HD has really taken off, especially within the past six months." ■

Ikegami

CONTINUED FROM PAGE 56

screen. The company will also roll out a smaller version, available in one and two M/E versions.

The goal, according to Ikegami, is to offer the market a high-end production switcher designed for broadcast applications requiring a dual HD/SD solution.

Ikegami decided to enter the high-end production space in the United States with a full-size HD/SD switcher after successfully selling high-end production switchers in Japan for the past 20 years, according to Zastrow. "We felt it was time to bring the product to the U.S. market in order to be able to offer a more complete system package including switchers, cameras and monitors," she said

Zastrow points to several of the switcher's unique features, including simultaneous HD/SD capability, a compact mainframe and a two-channel simple DVE per ME.

Other solutions that will be on display include Ikegami's line of LCD and CRT monitors, including a new nine-inch HLM-900 multiformat color monitor, as well as digital microwave solutions. ■

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Sundance Targets New Workflow Strategies

Company looks at automation beyond master control

by Claudia Kienzle

DALLAS

Sundance Digital says it will change the way broadcasters look at broadcast automation at NAB2005. The company will show how its portfolio of automation products work together to promote a comprehensive digital workflow management solution that goes beyond master control to encompass managing all of the tasks throughout the production pipeline.

Robert C. Johnson

"Our automation products are designed to increase a television station's operational efficiency, while reducing costs and eliminating errors," said Robert C. Johnson, president of Sundance Digital. "We want people to act, not react. In this mission-critical business, knowledge truly is power. With the management and communications tools in our products—such as Seeker, Titan, and FastBreak, people get a heads-up about potential delays and problems so they can take appropriate action to ensure a high-quality on-air product."

AUTOMATED WORKFLOW

The latest addition to the product portfolio is Seeker, which was introduced at last year's NAB and will ship in mid-summer. Built on a Microsoft SQL database platform, Seeker is a unique digital workflow management system that can tie different departments—traffic, production, editorial, and master control—together so that each knows what the other is doing, as well as the whereabouts of media assets.

"If a promo is needed by 5 p.m., this system allows users to assign that task to specific individuals, and track the physical asset as it progresses from production to editorial to the playout server," said Johnson. "We're also developing tighter integration between our automation products and industry-leading traffic solutions, which will enable traffic to check the length of any element in our database, and master control to see changes that impacted the on-air log as soon as they're available, among other benefits.

"The key factor for broadcasters is to have a powerful tool that not only provides asset management, but the means of managing station operations—something that is especially critical in a multichannel environment," Johnson said.

MULTICHANNEL SOLUTION

Seeker is an ideal complement to both Titan and FastBreak, Sundance's flagship transmission automation systems. Titan was designed for large-scale operations involving hundreds of channels and multiple remote sites. Titan was recently installed at WISC-TV, a Madison, Wis.-based CBS affiliate and part of the Morgan Murphy Stations group, to automate its multiple channel operation, in conjunction with an Omneon Spectrum media server system.

"We evaluated a lot of systems, but Titan's adaptability and attractive pricing won us over," said Leonard Charles, director of engineering at WISC-TV. "We want to remain flexible in our equipment choices and Sundance was able to customize the system to interface with our legacy gear, making it a terrific, cost-effective solution."

Sundance Digital's FastBreak automation system was designed for independent, stand-alone stations with up to five channels. WNIT-TV, in Elkhart, Ind., recently installed FastBreak to automate a SeaChange Broadcast MediaCluster server, among other master control equipment, for multicasting.

"We turned to other PBS stations for recommendations and received an overwhelming endorsement for Sundance Digital and its products," said Brian Hoover, chief engineer of WNIT-TV. "This is our first experience with automation so we were determined to select a user-friendly system with an easy learning curve; one that would cause the least dis-

SUNDANCE, PAGE 64

Pro-Bel Ready For Primetime

Products go from preview to on-air

by Robin Berger

READING, U.K.

NAB's annual show is a godsend to Britain's Pro-Bel.

"NAB is key to re-establishing ourselves in North America—it's very much the way to attack the North American market," said the company's chief technology officer, Neil Maycock.

Pro-Bel had previously marketed its lines to North America through Chyron, but split from the company in November 2003 in a buyout by its management team. Last year was the first time Pro-Bel exhibited at the show as an independent entity, which it proclaimed on a 100 foot banner hung outside the main entrance to the Las Vegas Convention Center. This year its banner will be placed above the entrance to the South Hall, a venue better fit to Pro-Bel's 2005 lineup of automation and media management software and router lines.

"Both camps of our competition have migrated to the South Hall," said Maycock.

MORPHEUS

Pro-Bel's Morpheus automation and media management software has morphed from last year's pre-release state to a bona fide new product that is on-air with several customers, according to Maycock.

"We started again from scratch—it's not a re-spin—that properly deals with secondary content, which is becoming a really big deal in digital TV," he said.

Data needed for today's broadcasts is no longer confined to getting the pictures and sound to air with a bit of closed-caption information. There are also demands for sophisticated graphics, audio description, aspect ratios, and details for high definition formats and repurposing output to cell phones or the Internet. Systems are grinding under the strain of information overload, Maycock said, which prompted Pro-Bel to design MediaBall.

"MediaBall is a way of taking secondary content stuff, wrapping it up as an object, and presenting it to the operator," he said. "[At NAB 2005], we'll have several channels of information playing out schedules showing how you can do advanced graphics inside the automation schedule—the sort of stuff you had to pre-author—and put that to air."

PRO-BEL, PAGE 64

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Pro-Bel

CONTINUED FROM PAGE 62

Sirius Gold, the large scale version of the company's router product line, will also be demo-ed. It's 512 by 512 in 39 rack units.

"This is the first we've had the real product—you can open the doors and touch it," said Maycock.

The broadband Crosspoint cards switch AES, SDI, ASI and HDTV signals. The product offers a choice of controllers: full-featured internal control at no additional space or cost, or its Aurora control system for maximum power.

PROCION

Procion will also be real and demonstrable at NAB.

"It started life as a PC-based control platform for router control, but we've had a major initiative to expand that," said Maycock. "We're using it now as a user interface to enable workflow management (including custom workflows) across all the different function elements of Pro-Bel's product range."

Maycock said that customers want to enable operators sitting at workstations to draw bits of various applications to do their jobs. To that end, he said, Procion lets them "draw a custom user interface that has the exact functionality they need." What's more, this is all done in a Windows environment, with a "graphically rich interface," or run as Web pages for Mac users, for example.

"We're breaking up the function elements from automation, asset management, router control, modular products alarms and monitoring—and putting them together in a unified, user interface," said Maycock. "It allows customers to design the workflow screens that they need."

INDUSTRY TRENDS

"The market's really bouncing back—we've [Pro-Bel] experienced a 20 percent growth in profits over the previous year," said Maycock. "And the outlook from our perspective is very buoyant."

HDTV is one of the drivers making this so.

"Twelve months ago no one was thinking of HD in Europe—suddenly it's a big issue," he said. "People are taking the first steps—buying router switchers. They might not want it equipped with HD cards, but they want to know that the frame they've got can be HD in the future. A product like that will have a five to ten year lifetime—they'll know they'll being doing HD within the life span of that product." ■

Sundance

CONTINUED FROM PAGE 62

ruption of staff productivity. Fast-Break fit the bill." This year, NAB attendees will get to see a functioning digital television station right on the show floor. The NAB-HD Pavilion (in the North Hall of the Las Vegas Convention Center) will provide a hands-on look at everything that goes into running an HDTV facility, including a Sundance Digital Titan automation station managing two on-air channels using a pair of Grass Valley Profile XP media servers. Output of the NAB-HD studio will then be fed to air via KVVU-TV (Fox 5) in Las Vegas, and will be seen through the convention center, on hotel channels, on convention shuttle buses, and as streaming media on the Internet.

In just 10 years, Sundance Digital has grown from a three-person start-up to a growing company about to move into a new 10,000 square-foot facility in the suburbs of Dallas with a state of the art testing lab. "We had always thought of ourselves as the little guy nipping at the big guys' heels. But, a few years ago, we were surprised to find that the bulls-eye was now painted on our backs and everyone was chasing us," said Johnson. "Today, we have a proven history of helping stations become more profitable by cutting costs and increasing efficiency and productivity using our automation products." ■

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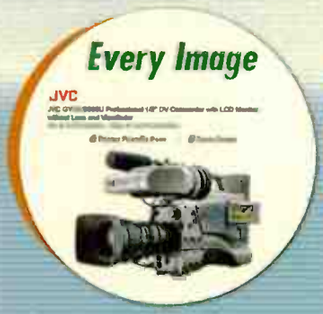

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Snell & Wilcox to Show the Big Kahuna

Booth to feature large switcher for live production

by Bob Kovacs

NEW YORK

Snell & Wilcox wants to remind you that it is a major manufacturer of production switchers.

The company, well known for its digital video effects, signal conversion and processing products, has quietly forged a reputation as a player in the switcher business, which accounts for as much as 30 percent its revenue. At NAB2005, Snell & Wilcox will spotlight the shipping version of its Kahuna, a large, multiformat and multiresolution production switcher for live and live-to-tape productions.

"The switchers that we sold traditionally have been smaller, 1- to 2.5-M/E," said Joe Zaller, vice president of marketing and product management for Snell & Wilcox. "The fact that the Kahuna is a 4-M/E switcher puts [us] into a different league."

Kahuna takes that to a different level, working with SD and HD signals of any format side-by-side, mixing and switching them as needed.

"If you only want an SD switcher now, the Kahuna is the same price as a competitive [SD] product," Zaller said. "But you have peace of mind knowing that you can upgrade to HD/SD-multiformat operation whenever you want."

The base Kahuna starts with two mix/effect busses and can be upgraded to a full 4-M/E system. Systems have already been shipped to several broadcasters in the United States and more sales will be announced at NAB2005, Zaller said.

Snell & Wilcox will also introduce a 3D DVE option for the Kahuna at NAB2005.

Although the company has a significant presence in the switcher market in the United States, Zaller realizes that potential Kahuna customers need to know that their mission-critical switcher gets solid, around-the-clock support.

"We're launching an initiative that we call 'Kahuna Care' to offer 24/7 technical support for this product," he said. "We are focusing on the live-production environment."

To service its North American customers, Snell & Wilcox has offices in New York and Los Angeles, and the company has been adding staff as its business has grown.

CONVERSION AND DISTRIBUTION

Also on display in the company's 4,200-square-foot NAB2005 booth will be 25 new modular products for conversion, distribution and processing video and audio signals. Most new Snell & Wilcox products feature Ethernet ports to permit control, monitoring and distribution of various signals, including metadata and program files.

"What we're saying to broadcasters is not 'We'll get you to HD'; we're saying 'We'll help you transition to digital and HD, but don't forget there will be another transition when you go to a file-based, IT-based [operation]'," Zaller said.

For some time, Snell & Wilcox has been delivering products that are format- and resolution-agnostic, working with both standard-definition and high-definition signals in their many flavors. This makes a lot of sense for components that comprise the infrastructure of a digital television system.

"If you think about modular products, it means that you don't have to have two of everything," Zaller said.

For the past few NAB conventions, Snell & Wilcox offered up a relaxed end-of-show party open to all attendees, the highlight of which is a witty presentation that pokes gentle fun at the industry and its products. For those who hold out until the bitter end, this has been a smile-inducing conclusion to a wearying and occasionally overwhelming show.

Zaller promised that this party is on the schedule this year, although he wouldn't go on record regarding its humor content. The question of its entertainment value will be decided by those still on their feet at the end of NAB2005 and manage to get to Snell & Wilcox's booth.

Designing products that do not become obsolete as needs and standards change is a challenge that Snell and Wilcox has accepted.

"This transition that broadcasters are faced with is not just a series of steps, it's almost like a never-ending journey," Zaller said. "What S&W offers is the ability to plan your transition to digital, HD and IT-based operations at a measured and cost-effective pace." ■

PESA

CONTINUED FROM PAGE 56

capitalize on an asset of 32 years of products and customer service," McAlpine said.

STALKING THE BOOTH

In its NAB2005 booth, PESA will debut its Cheetah V5 routing switcher, which distributes wideband RGBHV and stereo audio down a single coax cable by multiplexing analog component signals onto an HD-SDI data stream of 1.5 Gbps. This has the interesting benefit of future-proofing the V5 for HD digital operations, since it is already configured for HD-SDI.

"We have a strong position in the mobile truck market."

—Bob McAlpine, PESA

The Cheetah V5 is compact, typically taking up one-fifth the space as previous component switchers. The system works with current PESA control systems and has industry-standard control ports for use with AMX and Crestron controllers.

Also new from the company at NAB2005 will be expanded control options for its 3500PRO switcher control system. McAlpine said there will be other new product announcements at the company's NAB2005 booth.

PESA is perhaps best known for its broad range of "cat" routing switchers, where the size of the switcher can be inferred by the size of the cat. For example, the company's smallest switcher line is the Bobcat and its biggest is the Tiger. In between are the Ocelot, Cougar, Jaguar and Cheetah, which makes for a lot of cats.

All these products, in various configurations, will be featured in the PESA booth at NAB2005. In particular, the company will have an operating master control system anchored by its MCLite master control switcher, all under the control of station automation software.

Also in the PESA booth will be its breakthrough Glimmerglass photonic switcher.

RELIABLE AND COMPACT

The company's routing switcher line first started decades ago under the 3M brand name and it came to be seen as a reliable product that put a lot of crosspoints in a compact chassis. This reputation for delivering small products with big capabilities has served PESA well in the remote production truck market.

McAlpine said this is an important market for PESA and products targeted for remote production will be highlighted in the company's NAB2005 booth. However, with new management and investment at PESA, the company also sees an opportunity to expand its presence in facilities that don't have wheels.

"We have a strong position in the mobile truck market and we're going to focus a little bit more closely on broadcasters," McAlpine said.

The Cheetah line looks to be of special interest to broadcasters and PESA will have a version at the show to demonstrate the model's ability to route a range of signals in a single chassis. The Cheetah line starts at a 64 x 64 matrix and goes up to 512 x 512; the models at the show will be in the 64-to-128 input/output range.

Now that broadcasters have purchased their DTV transmitters and RF devices, many are starting to invest in their infrastructures—of which routers are a major component. McAlpine expects there will be a lot of interest in large routers this year.

"Someone once asked me, 'How many 512 x 512 frames do you think you can sell?,'" he said. "The first one went to a broadcaster and there is incredible interest in large switchers."

If PESA has its way, you may end up with a Tiger in your control room. ■

Leitch Rebounds

Company builds on acquisitions in T&M, graphics

by Mary C. Gruszka

TORONTO

After a few years of seeing red, Leitch Technology is in the black.

"The company had a couple of years of losses, but has returned to profitability in the last few quarters," said Tim Thorsteinson, president and CEO of Leitch Technology, who joined the company in November 2003. "We've turned the corner and have gotten the company back into a profitable position again."

Revenue for the third quarter of FY2005 (ending April 30, 2005) is expected to be [Cdn] $49.7 million, a 28 percent increase from the same period last year.

"In the first quarter of this year we reported our first operating profit in two years, and last quarter we reported our first net earnings in four years," Thorsteinson said. "This quarter we have achieved our target of 50 percent gross margins and are showing positive year-to-date net earnings for the first time since 2001."

ADDING & SUBTRACTING

Broadcasting accounts for 90 percent of the revenues at Leitch. "Business is strong in all geographic regions and all product lines," Thorsteinson said. "We have taken a number of steps to get the company in a strong financial position."

Those steps have included introducing a variety of new products, strategic acquisitions, and manufacturing cost-cutting.

"Sixty percent of our revenue was based on things that we introduced in the last two years," Thorsteinson said.

Two hot products for NAB2005 are the X75HD frame synchronizer and the Nexio HD server.

"The X75 is the highest impact product that we've introduced since I've been here," Thorsteinson said. "This [product] will re-establish people's view of Leitch as a technology leader. It really hits the mixed technology marketplace at a time when people need it. We've sold [Cdn] $1 million of this product in the recent quarter, and it has only been shipping in the last two weeks of the quarter."

Nexio HD is Leitch's first HD server.

The Nexio HD is the company's first HD server. "We have made a real commitment to HD," Thorsteinson said. "Leitch came into HD late, but we are making up for it."

Leitch's financial outlook has been improved by the acquisition of test and measurement company Videotek, during the first quarter, and of graphics company Inscriber Technology Corp., during the third quarter of FY2005.

Thorsteinson described these products as horizontally complementary, since Leitch did not have graphics or test and measurement products before the acquisitions.

"We have acquired successful products, and they have become more successful since becoming part of Leitch," Thorsteinson said. "They are sold by the same kind of people to pretty much the same kind of customers, although Inscriber offers digital signage that is a

LEITCH, PAGE 70

Omneon

CONTINUED FROM PAGE 54

as well as MediaPort and MultiPort interface adapters.

The system was designed to be unique, the company said, because the Omneon Spectrum offers users the ability to either combine components in myraid different ways or add components at different stages, with the goal of giving flexibility over channel count, bandwidth options, storage capabilities or system redundancy.

Paul Turner

IS IT HD YET?

At NAB, one of the biggest announcements from Omneon will be the introduction of a new family of interface devices for MPEG-2 decoding. These devices, known as the MultiPort 4100 series that can be added to an existing Omneon Spectrum media server to include HD playout capabilities, allows users to play back both SD and HD MPEG-2 material on a single channel. The interfaces also offer built-in up- and down-conversion capabilities.

"People are saying that 'HD is here, HD is here.' Well, it's not, at least not entirely," said Paul Turner, vice president of product marketing for Omneon. "Stations still need a method to help make that move from SD to HD," he said, adding that this solution allows users to create HD channels while simultaneously creating an SD stream.

Features via the MultiPort 4100 include outputs for SDI video, HD-SDI video, audio, timecode and control. Each MultiPort 4100 also includes connectors to use external up- and down-conversion equipment as needed. When using an external conversion device, the MultiPort 4100 offers users built-in adjustable frame delay compensation in an effort to maintain audio/video synchronization.

"Some stations want to be able to choose their own up- and down-conversion system, and this gives them the ability to do that," Turner said.

Other HD interfaces on display by Omneon will include the MultiPort 4000 Series of HD MPEG decoders, designed to provide integrated playback of HD material; the MediaPort 4010, which provides an input interface for HD material; a new as-yet-unnamed HD delay server; and MigrateTool, a software system that allows customers to convert already-ingested material from legacy servers to a format that can be utilized by the Omneon Spectrum.

Omneon has also expanded its third-party support options, and at NAB this year the company will showcase how its server supports compressed formats such as Sony HDCAM and Panasonic DVCPRO-HD. ■

ENG Delay Correction

Perfect for the BAS Relocation

DELAY WILL RENDER NEWS GATHERING IFB USELESS

If delay isn't already making your IFB useless for ENG, it will soon. The advent of Digital ENG microwave (COFDM) will introduce 250 to 1,000 milliseconds of delay between the remote site and the studio. Modulation Sciences has an array of tools for dealing with delay.

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Leitch

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new space for Leitch."

COMMON BRANDING

In integrating these new acquisitions into the Leitch fold, Videotek became part of the VP&D (video processing and distribution) product line, and Inscriber was combined with post production to form the new Digital Media business unit. A third unit handles servers.

"The Leitch product lines are fairly independent," Thorsteinson said. "They have quite a bit of autonomy related to their products. They know their marketplace better than anyone and they've been successful."

At the same time, Thorsteinson said, there will be common branding, advertising, positioning and coordination across all product lines.

And even some engineering, Videotek's first MPEG analysis offering, the SQM-355 advanced MPEG data analysis module, was accelerated by access to other Leitch-developed technologies.

Dan Mance, former CEO of Inscriber, has taken the newly created position of Chief Technology Officer of Leitch Technology. "He will make sure that the product lines are seamlessly integrated," Thorsteinson said. "Dan has a vision for where broadcast technology is heading and will help Leitch identify growth markets and develop new technologies."

Leitch's bottom line has benefited from improvements in manufacturing efficiency. Aiding in that effort was the appointment of Bob Schonbeck as vice president, worldwide supply chain management.

Thorsteinson said that Leitch's diverse product offerings, especially with the new acquisitions, will enable the company to pursue larger projects, like NBC Universal's recently launched NBC Weather Plus, which streams weather and other related community information on DTV channels of NBC's stations and affiliates.

"We have acquired successful products, and they have become more successful since becoming part of Leitch."
—Tim Thorsteinson, Leitch

For that project Leitch Systems Engineering (LSE) group consulted on designing into the project a variety of Leitch products, along with products from other companies.

"This was a unique situation," Thorsteinson said, due to the complexity of the project and NBC requirements. "The LSE group worked on system design, integration, setup, testing and certification of Leitch products and third-party solutions [for this project]."

Thorsteinson anticipates that Leitch's system design services will be used more frequently through its systems integrators channel. "Leitch will work with systems integrators to provide design plans for integrating workflow incorporating Leitch and third-party products as necessary," he said.

The company's diversity of product offerings will be demonstrated at Leitch's booth at NAB2005 with the "ICE Wall" displaying "an Integrated Content Environment highlighting interoperability and a range of solutions for applications from production to news, processing, transmission and signal management," Thorsteinson said.

With all this increased activity, Thorsteinson is upbeat about the company. "Business is good. We're very happy with the progress we've made, and the new products we're introducing. We have multiple pieces of technology that work together to provide solutions." ■

RF TECHNOLOGY

Doug Lung

Channel Election Choices Revealed

In early February, most broadcasters had to pick the DTV channel they will use once the DTV transition is complete, and analog broadcasting ends. Within a week, the FCC made available on CDBS the dtv_transition and dtv_agreement_group databases that show those elections. I analyzed station channel choices using the databases dated Feb. 23, 2005. You may be surprised at some of the results.

Fig. 1 shows the number of stations electing each VHF and UHF channel. From this, you will notice the high-VHF channels, 7 through 13, have approximately twice as many stations per channel than the UHF channels. Of course, a major reason for this is there are only seven high-VHF channels available compared to 37 UHF channels. As you can see from Fig. 2, based on the channel elections filed in February, there will be three times as many stations on UHF as on VHF.

Sixty-six percent of stations picking channel election option "A" (selecting their analog or digital channel) elected to keep their existing DTV channel. Other filers selecting option "A" either picked their NTSC channel, or had only one channel to begin with.

Let's take a more detailed look at the channel elections on a band-by-band basis.

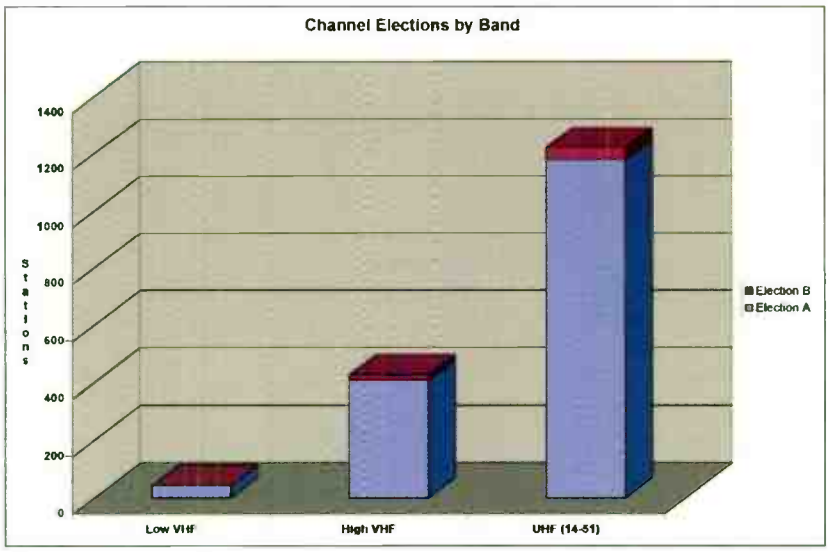

Fig.1

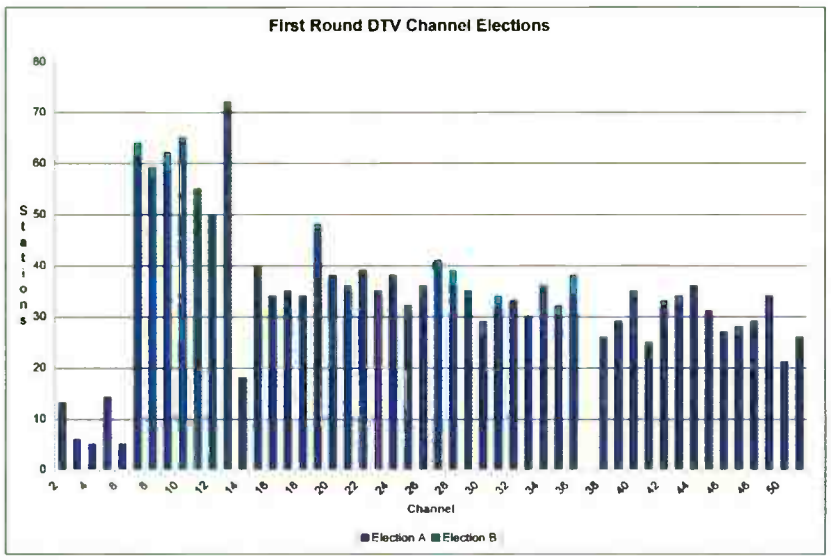

Fig. 2

LOW VHF

My columns on low-VHF TV channels for DTV generated a large e-mail response. The vast majority of comments, including some from engineers at stations transmitting on low-VHF DTV channels, were against the use of the low-VHF channels—2 through 6—for DTV.

Guess what? While only 15 stations (43 percent) that were already allocated a low-VHF DTV channel kept it, 28 stations picked their low-VHF analog channel as their final DTV channel, increasing the total number of low-VHF stations from an existing 35 (based on Form 381 filings) to 43! Channel 5 was the most popular channel, followed, surprisingly, by Channel 2.

Stations with a tentative DTV channel designation on a low-VHF channel will have a chance to change it in the third round of selections. For the sake of argument, if all stations electing low-VHF DTV channels keep them, will consumers buy the large antennas needed to receive them? To answer the question, it's worth looking at where these stations are located.

HOW STATES SELECTED

Twenty-three states had no stations electing low-VHF channels. No state had more than three stations electing low-VHF DTV channels, and only four states had that many—Alaska, Michigan, Montana, and South Dakota. Eight states had two stations electing low-VHF DTV channels—Colorado, Georgia, Nebraska, Nevada, Tennessee, Virginia, West Virginia and Wyoming.

For the sake of argument, if all stations electing low-VHF DTV channels keep them, will consumers buy the large antennas needed to receive them?

You may have noticed many of these states have markets that include large rural areas. These would be difficult to cover with a single UHF DTV station. People in these areas are used to erecting large antennas for over-the-air TV, but interference from motors, broadband-over-power line and other stations

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MEDIA SERVER TECHNOLOGY

Karl Paulsen

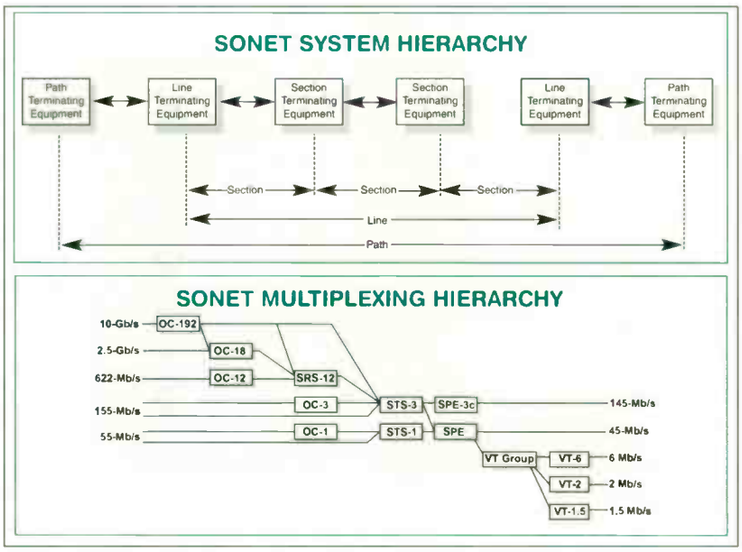
Flexible Networks for Media Services Delivery

The deployment of networking technologies is reaching deep into the content space, making it possible for the user to enjoy new experiences using a flexible set of alternatives. To help understand what is evolving in the transport of these services, we will explore some of the networks, transports and switching mechanisms employed today—with an eye on the future of media distribution.

Ultra-high band digital transport for media has been under development for many years. One of the transport mediums is the use of the hybrid-fiber/coax (HFC) cable system, a combination of high-speed fiber and last-mile copper.

The introduction of this technology has enabled networks originally designed for video services to provide reliable bandwidth for interactive video, data and voice services.

Those large telecom companies that have overlaid video on fiber-in-the-loop (FITL) architectures efficiently carry analog video on synchronous optical network (SONET) backbones. This structure solves the power challenge imposed by dense wave division multiplexing (DWDM) on optical amplifiers in long-haul networks.



In the United States, with its 300 million analog television sets—most of which are cable-ready—the analog structure must remain intact for years. This reality has driven fiber and hybrid technologies. Today, much of the current bandwidth is still used for analog video, which highlights a fundamental difference between HFC and copper-based networks.

Copper's bandwidth limitations, coupled with significant advances in digital subscriber line (DSL) technology, have forced a switched approach, resulting in untenable interface costs. For mass deployment, and to address the growing volume of interactive traffic, it was necessary to expand the service set offered over HFC. Changes were necessary in both in access and transport.

TRANSPORT EVOLUTION

Modern media services are deployed from servers that may be located throughout the network, necessitating that transport be flexible and connections efficient. Since services rendered from these servers typically start out at the headend, significant strain is placed on the network at this point. The goal in providing a suitable video and interactive service is to maximize the reusable bandwidth per user, while providing the flexibility to connect servers anywhere on the network.

A critical element in building the high-speed multimedia backbone for digital transmission is the deployment of video-optimized SONET multiplexers. Technologies integrated into this network are enabled through wave division multiplexing (WDM), which not only increases bandwidth but permits optical routing, and results in lower access costs. Fur-

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Channel

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could still cause reception problems. However, I've heard newer ATSC receivers do a better job handling impulse noise, which could help low-VHF DTV reception.

HIGH VHF

Seventy-four percent of the 178 stations with DTV channels in the high-VHF band (Channels 7-13) decided to keep them. A total of 427 stations elected high-VHF channels—18 of them through negotiated channel agreements, representing 25 percent of the channel elections made in the first round. Looking at Fig. 1, you will notice more stations elected Channel 13 than any other TV channel.

While there will still be more DTV stations on UHF, with the number of high-VHF DTV stations more than doubling, consumers will want their antennas to include elements for high-VHF. As I noted in my review of Kerry Cozad's paper on receive antenna measurements, many UHF antennas will do an acceptable job receiving high-VHF signals. However, if these antennas do not meet the gain and directivity parameters used in FCC OET-69 studies, interference-free coverage may not be as good as expected. The increasing number of high-VHF DTV stations should give manufacturers an incentive not to compromise high-VHF performance in new designs. One downside is that the popularity of high-VHF DTV channels could pose a problem for stations wanting to increase coverage beyond what they specified on Form 381.

UHF

The database showed 954 stations (62 percent) elected to keep their UHF DTV channels. More than 10 percent of the stations with UHF DTV channels couldn't keep their existing channel because it was out of core (above Channel 51). The most popular UHF DTV channel was 19, with 48 stations electing it. The least popular UHF DTV channel was 14, with only 18 stations choosing it. At the other end of the band, 26 stations elected channel 51, the same number that elected channel 38. Three channels—14, 41 and 50—were less popular.

ACCURACY?

You may be wondering how much we can tell about the final DTV channel landscape when there will be two more rounds of channel elections. All stations had to file their DTV coverage choices in the pre-election filing last November.

According to the dtv_transition database, 1,761 stations filed FCC Form 381 last November. The Feb. 23, 2005 dtv_transition database showed 1,743 stations filed FCC Form 382 for first-round DTV channel elections in February. Of these 1,743 stations, 50 picked option "C" and elected to give up their in-core DTV channels and participate in the second round. Based on these numbers, only 68 stations have yet to make their final DTV channel election. Another 62 stations picked option "B" for negotiated channel agreements. While some of these agreements may fall through, many stations entered into agreements allowing other stations to use their in-core analog channel and will stay on their existing DTV channel, even if the agreement collapses.

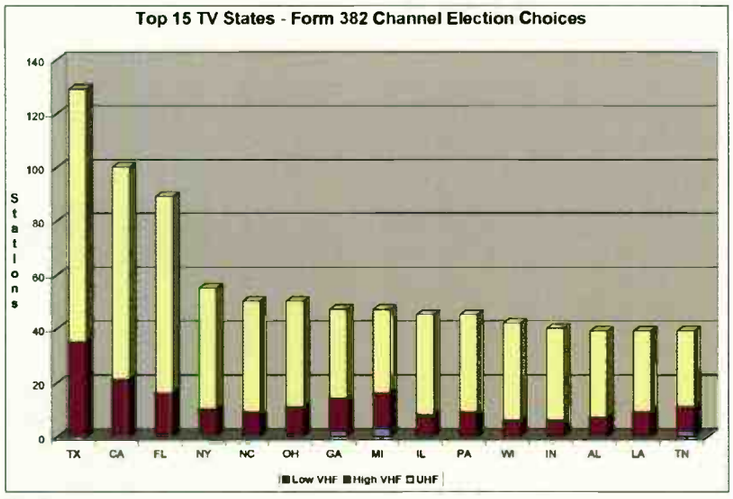

Fig. 3

Channel Choices	Election A	Election B
Kept DTV channel	1080	16
Picked NTSC channel	546	13
Only one channel	5	0
	Election A or B	**Percent**
Kept Low VHF DTV (2-6)	15	43%
Kept High VHF DTV (7-13)	131	74%
Kept UHF	954	62%

Table. 1

If we assume half the stations entering into a DTV channel agreement don't get their choice, it leaves only 99 stations, or about 6 percent, to make channel elections in the next two rounds. As noted before, stations on low-VHF channels will get a chance to pick another channel in the third round. This could result in as many as 43 stations picking new channels. If all decided to move off the low-VHF channels, first-round election results would still reflect the choice of 92 percent of TV broadcasters.

These counts are based on the data from the CDBS tables. While working on this article, I found the dtv_transition.dat table showed multiple and conflicting DTV channel election filings for several stations. Using the application_id field, I manually deleted the older applications. While I checked the 1,700-plus channel election applications three times, it is possible I missed a duplicate. I've posted spreadsheets showing channel election and negotiated channel data at *www.xmtr. com/fcc/dtvch.zip*.

NAB2005

In the past, before the National Association of Broadcasters show, I listed some of the items I'd be looking for. When I started to do that this year, I realized I'd be looking for many of the same items I'd written about last year. If you don't remember last year's column, you can find it at *www.tvtechnology.com*.

I expect the Nextel-led transition to 2 GHz digital ENG to be a big topic this year. Consumer interest in DTV is growing rapidly and advertiser interest will soon follow. This will put more pressure on TV broadcast engineers to make sure their DTV signals are ATSC-compliant and easily receivable, leading to increased interest in test equipment, higher-power transmitters and new techniques like distributed transmission. Don't forget to check *www.nabshow.com/bec.asp* for the latest information on NAB Broadcast Engineering Conference sessions.

Look for my observations on NAB2005 in my June 2005 RF Technology column.

See you at NAB! ■

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

DIGITAL TV | Charles W. Rhodes

Farewell to the Great CRT

Fifty years ago, we slowly entered the world of color TV, having gone down the yellow brick road of NTSC. I was there. I built my first color TV receiver even before I joined the engineering department of Tektronix.

Aside from transmission problems, which incidentally led me to develop the Vectorscope, there was also a display problem.

The first NTSC receivers had a 15-inch round, white-faced picture tube, and inside it was a piece of plate glass, which was the actual screen. It provided a 4:3 aspect ratio picture—about the same size as a 12-inch TV receiver. The picture was simply marvelous after the sun went down, and after you adjusted the purity and convergence controls. I thought then that a different display technology would be needed to make color TV (CTV) successful. How wrong I was! It took the next 15 or more years for an army of U.S. engineers to re-invent the shadow mask tricolor CRT, but they did it.

Then along came Sony with their Trinitron and its aperture grille instead of a shadow mask—almost. In the early 1980s, it appeared that the display problem was returning again as all CRTs involve a trade-off between brightness and resolution because of the beam diameter.

So, again, it looked like another technology would have to come along for HDTV, because the public was not going to accept low-contrast pictures to get high-definition in those pictures. Again, the CRT technology was refined to meet the challenges of HDTV.

We used a 55-inch projection unit by Hitachi for testing the Grand Alliance DTV System in 1995 because of its multiscan capabilities and its high resolution. But the sheer physical bulk of a rear-screen projection display dismayed nearly everyone.

Everyone wanted a two-dimensional flat-screen display that might be hung on a wall, with the new aspect ratio, lots of contrast as well as brightness and high resolution.

I replaced my 27-inch CRT receiver with a 42-inch plasma panel HDTV display more than a year ago, and I've never regretted doing so. It looked rather large at first, but in only a few weeks, it seemed just about right. Maybe my next set will be larger still.

COLOR WHEEL RETURNS

Gone from the market are direct-view CRT TV receivers. Last summer, I saw fantastic deals on CRT PC monitors, which suggested that flat-panel displays had arrived. Now they have taken over. They are all widescreen, (16:9); the biggest being 102 inches. This made me realize that plasma-panel technology is already fast approaching the fundamental limit in screens that can pass through a doorway.

Samsung, perhaps the manufacturer with the largest floor space at CES, had their 102-inch plasma display on exhibit, and they had a wide range of large, widescreen displays. Samsung is covering all bets on display technology. By that, I mean that they have LCD displays, plasmas, and DLP projectors. Some of these non-CRT displays included something that cannot be done with direct-view CRTs. There are now a number of models that produce a 1,080 (active line) 16:9 picture progressivly scanned and refreshed 60 times per second (1,080p/60).

Can you believe it—the color wheel is back! Yes, single-valve DLP projectors have a tiny color wheel. This takes me back to the CBS Field Sequential Color receivers, a few of which appeared in 1951 after the FCC adopted the CBS Field Sequential Color System.

Those sets were direct-view, with a 12-inch monochrome CRT. The color wheel was larger than the receiver, and it limited picture size to 12 inches or so. Those 1951 color sets are extremely rare collectors' items today. Of course, the NTSC compatible color system displaced the CBS system. But as with color wheels, what goes around comes around. They have returned in some of the DLP displays I saw at CES. I don't know how tiny their color wheel is, but after all, how big need it be when coupled to the light valve (actually an IC developed by Texas Instruments. I'm sure there is no audible sound coming from their micro-color wheel.)

The first NTSC receivers had a 15-inch round, white-faced picture tube, and inside it was a piece of plate glass, which was the actual screen.

With three DLP light valves—you guessed it—there is no need for a color wheel. Instead, there are three high-intensity lamps and the resulting displays are really, really bright!

Pioneers in television; Charles Jenkins on this side of the ocean and J.L. Baird in England, must be gloating as they look down upon us now to see mechanical television receivers in full color, and with marvelous definition and brightness, silently amazing viewers.

Until Philo Farnsworth and Vladimir Zworykin of RCA demonstrated all-electronic TV systems early in the 1930s, television scanning was mechanical. Some very ingenious, and some quite rudimentary mechanical scanners were developed. However, due to the limitations of such rotating machinery, HDTV was 100 lines, not 1,000. Why bring up ancient history? As with the color wheel, mechanical scanning has returned in the DLP. The TI light valve has more than 1 million micromirrors mounted in an IC. These mechanically tilt to modulate the light from a high-intensity lamp. These million or so

micromirrors on an IC chip change the intensity of individual pixels. By separating the source of light from the light modulator, each can be optimized, and the result is something a CRT can't do—provide both high brightness and high pixel resolution. Brightness and resolution are no longer traded off, one for the other, as in a CRT.

What most impresses me is the number of major manufacturers offering DLP models. This is impressive when you consider that one firm is the sole source for the light valves. If TI is licensing other manufacturers, I don't know it, but clearly this technology has achieved a significant follow

and he is also still a prophet.

Those soft-looking NTSC pictures, up-converted for DTV, really turn me off now, and I find that we are watching DVD or true HDTV.

At CES, Sanyo displayed a DTV receiver built into a cell phone, and this is now in use in Japan. The Japanese Terrestrial Integrated Services Digital Broadcasting (ISDB-T) broadcasts in their own unique kind of DTV signals in

grill CRT;
lor wheel

ese-developed COFDM but it the European ulticarrier sys- are thousands of carriers, each digitally modulated, filling the 6-MHz UHF channels. These thousands of carriers are subdivided into 13 groups. The one in the middle can carry 180 kBps, enough to deliver a usable picture to these handheld receivers.

This group is modulated in QPSK (2 bits per symbol), so a very rugged signal results, one that can be received under very poor conditions making this suitable for mobile and pedestrian reception. When used to receive TV, the lithium ion rechargable battery lasts two hours. This receiver is not just run-of-the mill, otherwise, it couldn't work in the concrete jungles of Tokyo. It employs diversity reception technology. They have integrated this diversity TV reception capability with the same antenna that receives cellular telephony. They use MPEG-4 coding. The receiver is a direct-conversion type, which means the local oscillator is phase/frequency locked to the received UHF signal, not offset from it by the IF. So the output of the synchronous detector is at baseband and can be digitized.

This topology is ideally suited to a system on a chip (SOC)—not a new idea. The United States had zero-IF radar receivers in World War II. Since then, this receive topology has been used in many digitally tuned receivers. It is only a matter of time before direct-conversion topology takes over in DTV receivers as manufacturers seek ever-smaller and lower-cost topologies.

This would probably reduce battery drain as well. Just how well this topology would work in our crowded broadcast spectrum is not quite clear. But for handheld receivers, there is scant space for tuned circuits. There must be filtering before the A/D converter, which must handle the desired signal and the much stronger multiple undesired signals.

Well, it is coming, not because the public demanded it, but because when they see it, they will demand it. Perhaps the cutest feature is that the screen of this receiver can be scanned in portrait or landscape aspect.

Incidentally, South Korea is getting into mobile, portable and pedestrian TV too. But they are doing it differently. They will use nonbroadcast spectrum below the UHF band, so don't look for these receivers on American streets. Here, we may soon see some sort of personal, portable and pedestrian TV on former broadcast channels. There is a lot of hype about this, but there also seems to be a lot of automobile DVD players already.

IN THE BEGINNING

The shadow mask three-gun color CRT was invented in Germany in 1938. That patent was discovered by researchers at the Sarnoff Research Lab and reduced to practice within about six weeks as a result of the competition between the CBS Field Sequential TV System and NTSC. Now, after 50 years of service, the color CRT has retired. HDTV, with its life-size screens, will carry on from here. If you don't believe it, just visit any large store selling TV sets to see what they are stocking and selling. ■

Charlie Rhodes is a consultant in the field of television broadcast technologies and planning. He can be reached via e-mail at charleswrhodes@worldnet.att.net.

Networks

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thermore, as the network grows, so does the amount of carriage on fiber. Accordingly, passive optical technologies become essential from both the cost and performance perspective.

SONET is a physical network designed to provide a universal transmission and multiplexing scheme through the standards of the other OSI layers. SONET offers cost-effective transport, both in the access and core areas of the network. SONET transport is widely relied upon in telephone and data switches for interconnection. Because the services (i.e., video, voice and data) require a resilient network, SONET was adapted to address resiliency—the ability of the network to cope with the loss of a link or node and still provide alternative routes for the transport of traffic.

SONET, for cable operators, would be more costly than current HFC architectures. However, once operators want to add high-speed data and telephony, they must add switching. An Asynchronous Transfer Mode (ATM) or IP network is better suited to this kind of traffic.

ATM, a connection-oriented high-speed general-purpose transport mechanism, can be implemented on several physical networks, including SONET. ATM, being a cell-based technology designed for switching and multiplexing, is excellent for carrying multimedia formats such as video, audio, text and graphic imaging. The extremely high speed of ATM is accomplished by fixed-length cells switched through hardware-based processing and routing systems.

Transporting ATM traffic over SONET is accomplished by continuous mapping of the ATM cells into the SONET frame. Additionally, IP packets can also be formatted into ATM cells, enabling content generated within an IP network to be transported over the ATM data transport.

However, IP transported over ATM is not terribly efficient because of the overhead requirements of the ATM cell structure, and the inherent overlap of IP datagrams that map well outside the ATM cell size. Internet service providers are considering running IP content directly over a SONET to improve efficiency.

From an advantage/disadvantage perspective, IP over ATM does offer bandwidth management, which IP over SONET does not. ATM further provides for end-to-end quality of service, whereby SONET is strictly point-to-point.

Addressing and routing for IP over SONET is possible, but requires extensive provisioning. ATM already has simple, fast provisioning built in. ATM by design offers flow control, whereas SONET has none. Both architectures for IP provide fault tolerance, albeit through desperate means (SONET uses dual-ring; ATM, dynamic routing protocol).

All of these transport issues seem to be relatively in the background from an end-user perspective, but as the deployment of high-speed multimedia services steps to its next level, so will next-generation networks. The impact will affect content delivery providers, including broadcasters, networks and cable services. Those new players in the marketplace will certainly have something to crow about once a successful deployment is in place. Until then, service providers continue to deploy new services over existing transport systems. ■

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

In the United States, with its 300 million analog television sets—most of which are cable-ready—the analog structure must remain intact for years.

INSIDE PRODUCTION Walter Schoenknecht

Written In Stone

Scene: The ancient Sumerian philosopher lays down his stylus one final time, reflecting upon the newly completed set of clay tablets—his life's work. That night, a rampaging dromedary in the temple precincts will crush the tablets, grinding them back into the desert clay from which they were formed.

Scene: Renowned for his lifelike depictions of jousting tournaments, the painter adds his signature to the room-sized fresco in the royal dining hall. The artist is unaware, however, that the impurities in his pigments will cause his masterwork to disintegrate, flake by flake, over the next six months.

Scene: The editor nudges the cut one frame this way, two frames that way—perfecting the timing of the program's pivotal scene. She has rendered the composites and matched them back into the timeline; the scored and sweetened soundtrack is laid back in perfect sync.

Then, without a moment's warning, the RAID array unmounts itself, the monitor goes dark, the speakers silent, and all that remains is the rhythmic tick-tick-tick of a hard drive's head actuator, methodically scraping the pictures off the platter.

SWEARING FOUL OATHS

It's impossible to estimate the number of times each year this sad tale plays itself out in edit suites across the world. I've witnessed two big-time failures this past year in our own shop, and each has been a horrible experience, beyond simple repair costs. Weeks worth of work was lost in each case, along with the good will of clients whose jobs were trashed.

Particularly ironic is the notion that this most crucial part of the digital content chain—storage—is left to the one remaining mechanical device in a modern computer, the hard drive. Even within the relatively recent time span of desktop video, futurists and prognosticators have foretold a time when motors and magnets no longer have a role in moving pictures. And that time was supposed to have been now.

I recall one such ingenious scheme, described about 10 years ago, called "wafer scale integration" (WSI).

Particularly ironic is the notion that this most crucial part of the digital content chain—storage—is left to the one remaining mechanical device in a modern computer, the hard drive.

When RAM chips are manufactured, it seems, a large number of junctions are deposited onto a single silicon wafer, and later cut into individual RAM circuits. In WSI, a single silicon wafer full of RAM, perhaps the size of a CD, would be left intact, with a common path leading to and from the circuits, and with a small communications circuit placed ahead of each chip. A storage controller asks permission to store a byte; the first RAM location is queried, and if the location is reported as empty and viable, a byte is written—no moving parts.

SEARCHING FOR STORAGE

I'm not sure why WSI never succeeded, although it's not uncommon for brilliant ideas to eventually reveal fatal flaws. Of course, innovators don't stop inventing after one area of investigation goes sour, and the storage we all use for video and audio seems to constantly evolve. I spoke recently to Michael Anderson, chief engineer for array manufacturer Huge Systems (now part of Ciprico).

Mike was a founder of Huge Systems, and before that, of Medea, both of which specialize in creating massive high-speed arrays from inexpensive ATA drives. Older arrays exclusively used pricey, and often smaller, SCSI drives. Mike shared the story of a talk he gave at a major post-production conference during which he asked the audience of several hundred editors to raise their hands if they used SCSI storage.

According to Mike, about 5 percent of the audience responded. The balance, when asked, indicated they were using ATA arrays. The response remains a surprising indication of the rapid time-to-adoption for ATA-based devices.

It's normal for the cost of technology to drop as a product life-cycle progresses, but ATA arrays leapfrogged the price curve as drive capacities increased and parts decreased. All I know is that we bought less than 50 GB of dual-channel SCSI RAID storage back when we got our first nonlinear editor, and it cost more than $10,000. Our new 1.2 TB ATA-based RAID array, with dual-channel ultra 320 SCSI interface, cost less than $5,000.

Lower cost and higher speed are attractive features, to be sure, but the fundamental flaw remains—electrical and mechanical breakdowns can spell catastrophe. And it may be that this moment in history offers fewer clear choices for prevention and remediation.

Larger RAID array capacities have made it more practical than ever to use "mirroring"—using half the array to make a simultaneous backup of the data you write.

In practice, though, it's not foolproof. Hardware damage can just as easily affect the backup, and retrieval of the mirrored data is no mean feat.

And as for backups onto other media... well, the practice hasn't advanced much in all these years. Tape backup drives are profoundly expensive. The tape itself isn't cheap, and most data formats still run abysmally slow, far slower than real-time dubs of the actual footage onto less expensive digital video media. What's an editor to do?

One candidate technology may be Tapestry, a system of holographic archival data storage media developed by InPhase Technologies. The technology grew out of Bell Labs research, and with a team of former Lucent and StorageTek execs at the helm, it has garnered support from Maxell and other industry leaders. The physically compact Tapestry media is planned to hold up to 200 GB with a shelf life of more than 50 years. Now, that's what I call archival. We'll all get a good look at Tapestry when it debuts in 2006.

Until then, save early, save often, and keep your fingers crossed.

WRITTEN, PAGE 84

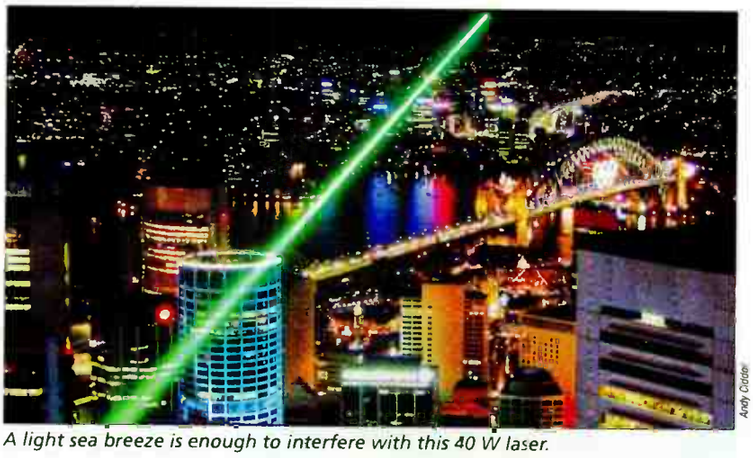
LET THERE BE LIGHTING — Andy Ciddor

Having One of Those Hazy Days

Light is strange stuff. Paradoxically, light is invisible unless it hits something. While we are primarily concerned with what happens at the end of our light beams, there are occasions when we're at least as interested in seeing the beam itself.

To make a light beam visible requires something in the atmosphere that will scatter some light without compromising the beam's characteristics, or blocking it entirely. In the natural world, that something may be dust, smog, mist, smoke, drizzle or fog. When the extent of the scattering needs to be of controlled intensity or duration, then it's up to us.

During the 2000 Summer Olympic Games, I was on the roof of the tallest building in Sydney, Australia, trying with limited success to get some usable images of the beams from some 40 W YAG lasers. These powerful devices were part of the laser and searchlight show that ran several times each night during the Olympic Games. The lighting designer was fervently hoping that as the night got cooler, there would be enough condensation in the spring air to help reveal the beams.



Andy Ciddor

A light sea breeze is enough to interfere with this 40 W laser.

Unfortunately, the Pacific Ocean breeze had all but blown away the light smog over downtown Sydney. There are no such problems with the "Symphony of Light," a laser and searchlight show that runs every night in Hong Kong. The smog from the nearby industrial cities of southern China provides ample light scattering.

Although widely employed in drama and music production, the complexity of using atmospheric effects in television is not something to be sneezed (or coughed) at. It's vital to consult with the facility air handling and fire alarm specialists when planning to use atmospheric effects. Many types of smoke detectors are triggered by theatrical smokes, hazes and even the so-called water-based (actually glycol-based) fogs that are the mainstay of modern atmospherics. Knowing which detectors need to be isolated to avoid false alarms while still maintaining maximum fire safety can save a lot of confusion and angst.

CONTROLLING EFFECTS

Having knowledge and control of the air-exchange system can also make it easier to prevent your carefully constructed atmospheric effect from inadvertently being vented into the open air or distributed throughout the studio complex.

It is very easy to underestimate the density of effect required to produce a particular look on-screen. Camera tests are vital for assessing the type and number of effects machines required, not just to create the desired pictures, but also to maintain them for the duration of the scene. I once sat in a control room watching my monitors and asking the effects operator for more and more fog, while trying to get just the right look. On commenting about how slowly things were going on the studio floor, I was encour-

aged to look down through the window. Despite looking like a light haze on camera, the entire set had been swallowed into the mists like Brigadoon.

Needless to say, your vision controllers also need a thorough briefing on the look that you're aiming to achieve. The ability to override the camera's automatic exposure and levels programs is absolutely critical to any attempt to use atmospheric effects. Even a minor adjustment to camera black levels can produce quite drastic changes in the appearance of atmospherics.

Continuity is a significant consideration when using atmospheric effects. Getting the right density is important, but keeping that density and distribution from shot to shot and from scene to scene, can be a major source of delays and distress.

Most effects machines have an output controller that theoretically ought to allow the effect to be replenished at precisely the rate that it's dissipating.

In practice, the effect tends to be constantly changing in distribution, requiring assistance from fans and crew members waving sheets of cardboard or lightweight reflectors to cajole it into place.

Camera, scenic and talent movements can disturb both the density and distribution of the effect. Where possible, during shooting, the set should be locked down; doors kept closed, crew movement kept to a minimum and air-exchange systems either wound back or shut off. Hours of painstaking work can be ruined by something as innocent as a production assistant delivering a revised schedule to the set. It is also worth considering shooting atmospheric effects scenes in script sequence. Then, variations in the effect tend to be clustered together in editing, rather than becoming more obvious problem cuts jumping from a few gentle wisps to a full-density London fog.

Although it's difficult to get enough atmospheric effect onto the set in the first instance, getting rid of it again can also present difficulties. If you're going live or working under a tight shooting schedule, clearing the effects from the air may require some planning and coordination with your air-handling adviser.

Unassisted, your air-exchange system may take hours to eliminate all visible traces of the effect, particularly if it was smoke or haze. As the camera is generally quite insensitive to such effects, these will disappear from pictures long before the air is actually clear. One technique for quickly clearing the air is to open the dock doors and vent the studio to the outside world, providing of course, that you're not passing the effect on to an unsuspecting neighboring studio. News presenters have a hard enough job to do without having their studio filled with fog, although it might improve that closing wide shot.

Unlike their predecessors, contemporary atmospheric effects are achievable, affordable and generally quite safe. Substantial research into nontoxic, low-irritation effects generators has taken us to the point where there are workable recommended exposures for most effects. (A future column will look at how these generators work.) Even opera singers, a group notoriously finicky about their lungs, voices and working conditions, are willing to perform in the current generation of fog effects. If only they were easier to use. ■

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****.*

Even a minor adjustment to camera black levels can produce quite drastic changes in the appearance of atmospherics.

Hong Kong Tourism Commission

Great atmospheric effects for the nightly light show

Photo: Steve Jordan

NET SOUP | Frank Beacham

Mobile TV: Do Wireless Carriers Have it Backwards?

Suddenly, as if it's the hottest new idea on the planet, mobile phone companies all over the world are announcing plans to enter the TV distribution business. Trials are underway, and mud fights are already starting over who has the best technology.

Even though most of these services will not launch in North America and Europe until the end of this year, mobile TV is already a hot media topic. The idea is simple: the pay TV model will be extended to allow users to watch video programming on their cell phones.

Am I dreaming, or is this another case of "been there, done that?" Broadcasters have been putting out mobile-friendly RF television signals for half a century. Electronics manufacturers like Casio and Sony have been selling micro-sized pocket TV receivers for at least two decades.

Sometimes—especially during emergencies or at sporting events—these little portable TVs actually come in handy, but most people never develop significant viewing habits on minuscule 1- or 2-inch diagonal screens. Common sense tells us why there has been no iPod mania here.

DESPARATELY SEEKING DOLLARS

This has not slowed the frenzy at the mobile phone companies, which are desperately seeking ways to generate new income from those expensive high-speed 3G networks they're building. All common sense aside, the mobile carriers—who seem to want to do anything except improve the basic reliability of their voice phone calls—are touting mobile TV like it's the hottest new technology to come along in years.

The program fare they are pushing includes custom-made micro-dramas, news clips, movie previews, music videos and whatever else they can find that's short and cheap. And, best of all: *they want us to pay for it!*

Having survived the dot.com era, I've developed a pretty good BS detector when it comes to the latest, greatest, newest technology that's supposedly going to change the world. And, yes, I do believe IP television will have an important future—but as a means to sell entertainment television over cell phones? Sorry, I don't think so.

Finally, after a long silence from those who should know better, I've found others who share my opinion. Last month, a new report from the research firm, Strategy Analytics, threw the first official cold water I've seen on the idea.

In a report titled "Mobile TV: Hype not Justified by Demand!," the researchers argued that the vendor-led rush to bring broadcast services to market misses the critical issue that there may be little demand for mobile TV.

Additionally, they found that poorly defined costs associated with infrastructure deployment will extend the return on investment for mobile broadcast networks beyond the currently envisaged two to four years.

Strategy Analytics, based in Newton, Mass., believes that the momentum behind mobile broadcasting is unfounded.

"Consumer demand for paid-for mobile TV remains highly uncertain, and we remain unconvinced that consumer appetite for mobile TV services exists outside of niche segments," said Phil Taylor, director of global wireless practice for Strategy Analytics. "Operators have the perfect opportunity in 3G to see if mobile video services will fly, without further extending themselves into the provision of broadcast services."

Mobile carriers—who seem to want to do anything except improve the basic reliability of their voice phone calls—are touting mobile TV like it's the hottest new technology to come along in years.

Just as with the blind enthusiasm that many dot.coms crashed and burned, the mobile operators seem to be deluding themselves on this one.

"Beyond the basic business case and potential cannibalization factors, mobile TV faces four key challenges," said David Kerr, vice president of Strategy Analytics.

Those four challenges are—the technology roadmap for mobile television is far from stable; regulation and low spectrum availability may slow the spread of services; adoption of media-enabled devices beyond the technophile segment is slow; and uncertain revenue models and value chain reconciliation will deter content industry participation.

In short, mobile TV, as a mass-market pay entertainment distribution medium, isn't ready for primetime. However, that doesn't mean there aren't some exciting possibilities for the reverse—sending TV images from cell phones for distribution to a mass audience.

As we've reported before, the BBC has led experiments using cell phone video from breaking-news events. Though the image quality is still quite low from most cell phones, the technology is improving dramatically. In the near future, a cell phone equipped with the latest generation CCD camera and a 3G broadband connection could send high-quality images to a broadcaster for use on the air.

In the meantime, video from cell phones is beginning to have an impact on blogging, the Web-based phenomenon that's caused a renaissance in personal publishing. The terms "vlog" (video log) and "moblog" (mobile log) are gaining popularity as creative publishers begin to add motion video and electronic still images to their text-based "blogs."

Moblogs are especially interesting, since these video-capable Web sites can be updated directly from the field by camera-equipped cell phone users. The implications this technology could have for newsgathering may be immense, allowing a reporter equipped with a mobile phone and small computer to create a Web-based information outlet from virtually anywhere.

Of course, not everyone is a reporter (or blogger), and the mobile operators don't see the same business opportunities for users who pay to send, rather than receive, video over their 3G networks.

But I'd bet the real killer app for mobile TV will come from the information creators, not the passive consumers of entertainment programming.

For additional information on the study cited in this column, go to *www.strategyanalytics.com*. ■

Frank Beacham is a New York City-based independent writer and producer.

TECHNOLOGY CORNER — Randy Hoffner

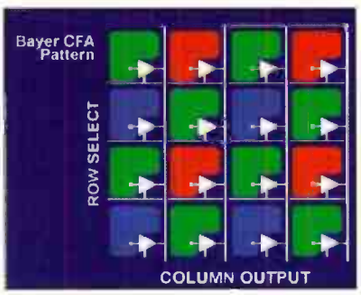
One-Chip Sensors—The Bayer Pattern

Traditionally, most professional color television cameras have been three-sensor devices that produce red, green and blue signals that are electrical analogs of the light that enters the lens and falls on the sensors. Today, these signals are typically sampled and digitized before being output. In the tube camera days, this took the form of three pickup tubes—one each for red, green and blue light. In the current solid-state camera sensor era, three solid-state sensors—one each for R, G and B—are used Over the years, there have been some notable exceptions, but this has been the rule. Film also uses an RGB approach, with separate red-, green- and blue-sensitive emulsion layers.

In an RGB camera, light enters the lens, is focused, then passed through an array of filters and prisms that separate the red, green and blue components and steer each to its respective sensor. It bears noting here that the R, G and B filters used are spectrally wide. For example, the color-passing characteristics of the red filter overlap those of the green filter on its upper end and the blue filter on its lower end. The filters overlap to prevent spectral gaps, which would result in some colors not being registered at all.

The majority of single-chip video cameras, and almost all digital still cameras, use so-called Bayer pattern sensors

The sensor itself, typically a charge-coupled device or CCD in today's video camera is colorblind, sensing only the intensity of the light falling on it, not the color. The raw light intensity information generated by the sensors becomes the red, green and blue electrical signals respectively. The signals that come off the sensors occupy a linear color space—they are linear representations of the instantaneous amplitude of the lights that generated them. This space is often called "linear light" in the video business. Before being transmitted or recorded, the linear signals are gamma-corrected, or converted into a logarithmic color space, by being subjected to a particular set of calculations that compensate for the way the human visual system perceives light.



There are some potential drawbacks to the three-sensor approach to video or still photographic capture. Some of these include the fringing effects that can be caused by prisms, and the engineering problem of where within the camera to locate the bulky prism and filter apparatus.

Some video cameras and all digital still cameras use a single-sensor array rather than three sensors. Single-chip video cameras have traditionally been largely lower-cost consumer devices, but some professional video cameras, notably some video cameras designed to replace motion-film cameras, now use single-chip sensors. And all digital still cameras, including high-end ones, use single sensors. None of these single-chip cameras, save for a few using sensors made by one company, uses a straightforward RGB approach.

HOW IT WORKS

As always, there are some exceptions, but the majority of single-chip video cameras, and almost all digital still cameras, use so-called Bayer pattern sensors. These sensors, particularly in some still cameras, may be CMOS rather than CCD devices, but the principles are the same. The Bayer pattern approach, patented in 1976, was invented at Eastman Kodak by Bryce E. Bayer.

When a single sensor is used, light falls on a sensor array in which each element or pixel is covered by a colored fil-

SENSORS, PAGE 84

INSIDE AUDIO — Dave Moulton

What is HD Home Theater Like for Consumers?

Several things just happened to inspire this column. First, in the February issue, I wrote about the state of the art in 2005. Second, I ventured into a consumer audio store over the holidays (something I hardly ever do). Third, I went to a Super Bowl party featuring a consumer-grade home theater HD setup.

So, while I've recently been thinking about the audio-for-video biz, at the same time, I got an interesting and informative taste of consumer audio.

First off, the Super Bowl in HD was certainly a paradigm shift. I have a pretty good TV myself (as I'm sure I've mentioned before), and while I expected HD to be better, I didn't expect it to be quite so freakin' much better, if you know what I mean.

The quality of the picture was spectacular, and the assistance it gave to perceived sound quality was considerable. I'd heard the sound system before—an economy system with five small matched speakers and an OK, but not really convincing sub. Somehow, with the HD picture glowing benevolently at you, the sub becomes more convincing, the stereo strings and brass fills become really pretty sweet, the envelopment begins to feel pretty exciting and the whole thing works. Danged if it didn't work pretty well.

Suitably inspired, I decided to do some in-store investigation of what's really available. (The Super Bowl system was owned by an audio pro who doesn't qualify as a typical consumer in spite of his vigorous claims to the contrary.)

So, I headed down to my local consumer audio store, a Cambridge SoundWorks store in Nashua, N.H.

For those of you who don't know, Cambridge SoundWorks is an audio company specializing in low-cost, decent-quality loudspeakers and bundled systems. This particular store is a pleasant one, and one of the sales guys, Neal Demazure, served as a listening panelist for me some years back. So I took the liberty of asking him if I could interview him and take a listen to the range of stuff the store offers for home theater. I happily auditioned audio systems priced from approximately $500 to $5,000. We also talked about what customers seemed to want, their expectations, how happy they seemed with their purchases, and what problems they had.

WHAT I SAW AND HEARD

We watched, over and over, an action sequence from "Behind Enemy Lines," which rang out the various systems pretty well. The $500 system didn't give us a whole lot back. The sub basically sang one low note through its port; integration of the system was limited, and sonic detail even more limited. However, for $500 (including speakers and a receiver), it really did a lot.

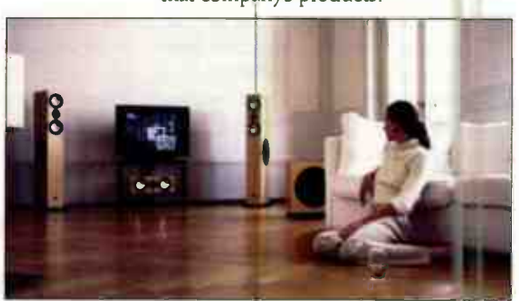
As we went up through the price-points, several things happened. First, the subwoofer experience got a whole lot better pretty fast. Second, the center channel began to really come in and deliver voice and on-screen effects clearly. Third—and this surprised me—the surrounds began to be much more integrated and effective. By the time we got to the $5,000 system, the experience was really pretty reasonable and enjoyable, even by my lofty and elitist standards.

When you add HD video, these complete systems would cost between $2,000 and $10,000, which certainly has to cover the fat part of the bell curve. There's no reason you can't get a lot of enjoyment from any of these systems, particularly the pricier ones.

BUYING A SYSTEM

When the consumers plunk down their credit cards, they gets a pile of boxes neatly loaded in the back of their SUVs. They also get, according to Neal, a pep talk and fairly lengthy discussion of how to hook it together. This includes advice about getting HD service—many consumers, quite reasonably, don't know that they have to do this. It also includes how to place the TV and speakers, how to configure the receiver, how to troubleshoot the system, and a phone number to call when it all swerves south temporarily. This often includes an informally sketched layout plan.

The store offers in-home installation, but it is oriented more toward home sound/media systems—two guys for a one-hour minimum at $125 an hour. If you're buying a cheapish home theater, it seems a little rich and off-target. There is no prepared manual or DVD that Neal knows of or that the store uses other than a one-page guide from Onkyo for one of that company's products.



Audio for home theater covers a wide price range.

Neal noted that when the pep talk is not provided, it is almost a slam-dunk that the system is returned because the purchaser was not able to install it.

Neal also figures that a significant part of the store's home theater revenue comes from people who are turned off by the "low-touch" experience of the big discount chains, where the best you can hope for is a pile of boxes at checkout.

Unfortunately, there is no way to determine whether the final installation is correct, or how satisfied the customers are, except when they're really angry! Unfortunately, there's no money built into the system to ensure that the customer has installed a system correctly.

I'm surprised at how well the consumer audio business seems to be working. I'm a little surprised it's working at all. I know from personal experience—unrelated to Cambridge SoundWorks—that it is extremely difficult to get these consumer systems working correctly, due to a) the complexity of options, b) the extremely poor ergonomic design of the systems I've had to struggle with, and c) the poor quality of written instructions. I wouldn't be surprised if something like 50 percent of the home theaters out there were not set up correctly.

Nevertheless, when it works, it is really pretty spectacular. And here's where we can segue back to my Super Bowl experience. (Please note that I'm from Boston, and I was unduly pleased by how the game came out!) Primary topics of party conversation included the good sensory quality of the game coverage, the wide variables between the game, various commercials and teasers, and how truly awful the worst stuff was. A standard refrain around the salsa bowl was, "I never realized how poor standard TV was until I saw this."

Enough said.

Thanks for listening. ■

Dave Moulton is saving up for his very own HD home theater. You can complain to him about anything at his Web site, www.moultonlabs.com.

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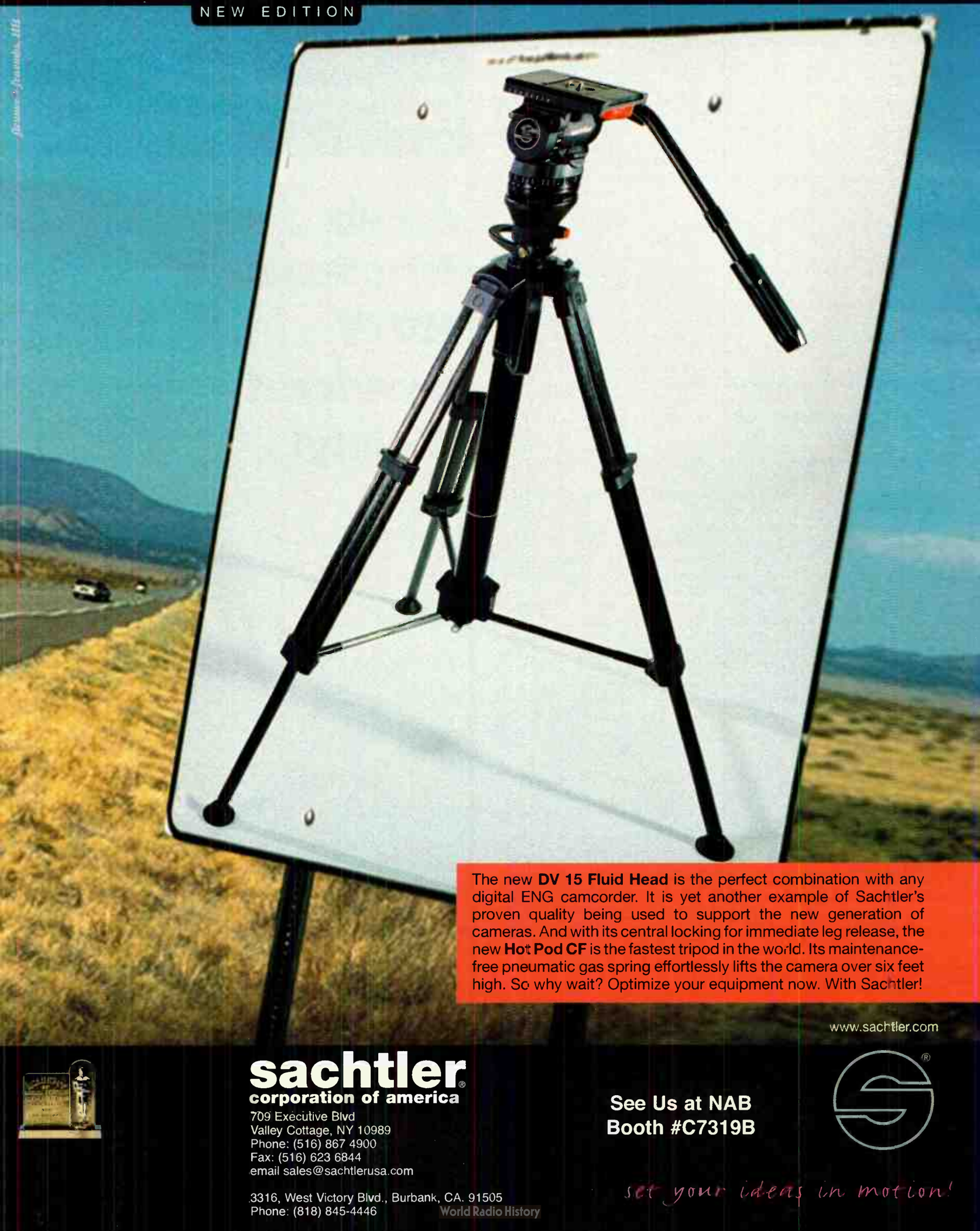

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Sensors

CONTINUED FROM PAGE 81

ter. One obvious way to arrange the filters would be in the pattern: R, G, B, R, G, B, etc., progressing across each horizontal row of pixels. Other approaches include arranging colors in diagonal rather than horizontal and vertical patterns. These and other approaches have been tried, but the most popular arrangement for video cameras, and virtually the only arrangement used in still cameras, is the Bayer Pattern. Bayer used some characteristics of the human visual system as the basis for his arrangement.

In the Bayer Pattern sensor array, colored filters are arranged in repetitions of a two-row pattern. Across the top row of pixels, for example, the colors might be red, green, red, green, etc.; in the row below, the arrangement is green, blue, green, blue, etc. These two rows are consecutively repeated for the remainder of the array. Various manufacturers use various filter sequences. The top row is typically red and green, but Kodak sensors, for example, begin with green, while those from Sony begin with red.

The first thing that might be noticed is that there are twice as many green pixels as there are either red or blue pixels. The human eye is most sensitive to light in the green portion of the spectrum, and the eye obtains most of its "sharpness" information from green light. Thus, the green channel may be thought of as a luminance channel.

The next thing that is apparent is that none of the color channels is completely sampled. Only half the image is sampled by the green channel, and the red and blue channels each sample only one-quarter of the image. In order to form a complete image, the missing portions must be derived by interpolation.

DEMOSAICIZING

Because the individual red, green and blue images somewhat resemble mosaics, the process is often referred to by such tortured non-words as demosaicizing, demosaicing or demosaicking.

The demosaicizing, or Bayer pattern decoding process, can be done either by hardware or software. Hardware is faster and more portable when video images are involved. Since speed is of the essence, hardware is used. There is, naturally, a tradeoff between processing speed and image quality. Digital still cameras also have built-in hardware demosaicizers, but here, decoding speed is less of a priority.

There is another approach to demosaicizing and processing digital still images. In addition to processing each image by applying Bayer-pattern decoding, white balance, etc., and outputting the image, digital SLRs and some of the higher-end digicams can output raw, linear pixel data and associated metadata. The raw data is simply the sets of grayscale values for the red, green and blue components of the image, along with metadata, in a proprietary format specific to the camera manufacturer.

To view an image, a raw file must be processed with a software program that knows the file's syntax and format. In addition to demosaicizing, the raw converter converts the data from a linear space to a gamma-color space and applies all the parameters, such as color temperature, color balance, exposure and aperture values, etc.

In addition to having a highly sophisticated demosaicizer, this approach makes it possible to adjust the image's parameters in the linear space. Doing so causes less damage than would result from applying the same corrections in gamma space, where calculation errors would be greater.

So when we see high-quality still pictures or video images, it is possible that we are not in fact seeing the whole image, but rather a partial image with the missing portions interpolated. But thanks to Mr. Bayer, we would never know it by looking at it. ■

Randy Hoffner is manager of technology and strategic planning for a network in New York. Write to him c/o ***TV Technology****.*

Written

CONTINUED FROM PAGE 77

TELEVISION TAPE UPDATE

In January, I told you the story of a television pioneer, John Vrba, who helped make a case for the use of a then-new invention, videotape, for commercial production. I invited readers to download and view John's 10-minute kinescope pitch, produced by KTTV in 1962, from a Web site I'd thrown up for that purpose, http://www.televisiontape.tv.

I thought you might be interested to know that the "Television Tape" site has been seen by more than 2,500 unique visitors from 25 countries. Who knew that the good people of Togo, Nigeria and Lithuania would be interested? Among the IP addresses have been lots of broadcast stations and post-production houses. Military installations have been curious, as have the media departments at colleges and universities. A link at a film archivists' bulletin board drew lots of viewers. I also noticed a visit from the Museum of Television and Radio—interested, folks? In all, the 5 MB movie racked up about 30 GB in downloads, far more than I'd expected, and that's great. Thanks to all who posted on the guest book or e-mailed kind words. ■

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

IT REALLY DOES ALL WORK TOGETHER!

NAB-HD will provide a hands-on look at everything that goes into putting together a digital television operation... by building a functional station right on the exhibit floor! From capture to editing to delivery, this is a unique opportunity to see how it all comes together.

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USER REPORT

TNDV.com Takes Hitachi on the Road

by Nic Dugger
Owner/Operator
Tennessee Digital Video

FRANKLIN, TENN.

I have worked in mobile television for more than 10 years and spent time on trucks from small three-camera vans, all the way up to some of the largest production vehicles on the road today.

With Tennessee Digital Video (TNDV.com), I wanted to fill the gap between large mobile units and flight packs. With four cameras, TNDV.com's truck is appropriate for small shows or events that require the capabilities of our Chyron Duet, Jimmy Jib, five channels of DNF VTR control, two-M/E switcher, 16:9 support and SDI video throughout.

When choosing cameras for the truck, we considered price, available configuration options and overall image quality. We ultimately looked hard at three camera models, including the Hitachi Z4000, and all offered similar options.

Triax was a must, along with SDI video, large-format operator control panels and 16:9 capability. The Hitachi Z4000 offered additional features such as SDI return video, digital audio and a price that was much more reasonable than the other cameras.

BIG FEAR, NO PROBLEM

Our biggest fear was the lack of name-brand recognition with our cameras, but I am happy to report this has caused no problems. Mobile clients simply want great-looking video, and I need a camera that is stable and easy to configure. The Z4000 studio camera fulfills both these needs.

The Hitachi cameras have worked great on the road for months now. From Inaugural events in Washington to live-to-tape shows for national networks, the Z4000s have performed flawlessly.

These cameras have been a testament to the fact that the days of relying on nothing but a brand name are done. Hitachi has been a great choice; the image quality has been just as good if not better than its competitors and the price that was much more reasonable.

The training, warranty and general customer service support I get from Hitachi has far exceeded that from other camera vendors. These facts alone have justified the choice to go with Hitachi. ■

Nic Dugger has used TNDV.com's Hitachi Z4000 cameras on shoots from the presidential inauguration to MTV.

Nic Dugger is the owner/operator of Tennessee Digital Video (TNDV.com) and can be reached at nic@tndv.com.

For more information, contact Hitachi at 516-682-4429 or visit www.hdal.com.

BUYERS BRIEF

The CC-95 is the professional single-ear headset by **Clear-Com**. The headset is equipped with a moveable-boom, noise-canceling mic and a four-pin XLR-type connector to mate with the Clear-Com or other beltpacks and intercom stations.

Camera operators can use the push-to-talk handheld mic to talk through speaker stations. The headset can be used in television/broadcast production, for stage performances and other applications.

Also, Clear-Com recently launched its RS-600 line of beltpacks. The RS-601 is a single-channel beltpack that features three-pin female and male XLR I/O, four-pin male XLR headset connector, 2.5 mm aux headset connector and an RS-232 data connector.

The beltpack stores four set-up modes, built-in noise shaping and mic noise gate, and is compatible with all Clear-Com party-line systems.

For more information, contact Clear-Com at 510-496-6666 or visit www.clearcom.com.

Intercom Systems

Telex Communications

12000 Portland Avenue South
Burnsville, MN 55337

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

- Matrix intercom sytems (ADAM)
- Compatible with a range of intercom devices
- RVON-8 fits into ADAM matrix chassis
- RVON-8 connects multiple ADAMs on the Internet

USER	Mike Mundt New Century Productions 207-658-9859	Bob Streeter NBC 212-664-7568	Frank Glowacki NBC News 704-329-8700	Paul Bonar Game Creek Video 603-882-5222
WHAT MODEL(S) DO YOU HAVE?	ADAM (five systems)	RVON-8	RVON-8	ADAM (eight systems)
HOW IS IT USED?	Intercom systems in trucks	Interconnect with global intercoms	Interconnect with network	Intercom systems in trucks
HAS IT PERFORMED AS EXPECTED?	Yes	Yes	A couple of problems	Yes
WHAT FEATURES DO YOU LIKE THE MOST?	Programmability	Flexibility; can redefine virtual trunk paths	Ease of use	Familiarity among clients and engineers; ease of use
WHAT FEATURES DO YOU LIKE THE LEAST?	None	Lack of user-definable options	None	Older technology
HOW LONG HAS IT BEEN IN SERVICE?	Seven years	13 months	13 months	Eight years
HAVE YOU HAD ANY EXCESSIVE MAINTENANCE PROBLEMS?	No	No	Occasional audio breakup	No
HOW WOULD YOU RATE THE MANUFACTURER'S SERVICE/SUPPORT?	Fair to good	Exemplary	Good	Good and getting better
WHERE WAS THE EQUIPMENT OBTAINED?	Manufacturer	Manufacturer	Manufacturer	Manufacturer
WHAT WAS THE DECIDING FACTOR FOR YOUR PURCHASE?	Features	Cost savings	Required by network	Backwards and cross-compatibility; price

For more information, contact Telex at 800-392-3497 or visit www.telex.com.

USER REPORT

Ikegami Meets HD Requirements

by Bill McKechney
Vice President of Engineering
F&F Productions

CLEARWATER, FLA.

F&F Productions is a full-service remote-production company that provides facilities and equipment to make our clients' broadcasts successful. We support both high-definition and standard-definition mobile units and our two HD trucks will run at either 1080i or 720p.

One year ago, we looked carefully at new HD cameras. We ultimately chose Ikegami's HDK-725P cameras but we arrived at that decision only after a long process in which we considered numerous criteria. These cameras have a switchable 1080i/720p CMOS imaging chips, which was our first experience with this technology.

First on our list was the camera's ability to use triax, SMPTE fiber or single-mode fiber. Second, it was important that that camera be switchable between 720p or 1080i native. A third consideration was viewfinder performance, which includes options to assist camera operators in focusing shots during live HD telecasts.

F&F Productions outfitted its HD trucks with Ikegami HDK-725P cameras.

USER CONTROL

User controls were also an important factor. A previous camera had user controls that were too small, thus making them impossible for camera operators to tweak without close examination. We needed to ensure that this would not be the case with our new cameras.

We looked at Ikegami and one other manufacturer and decided all our needs would be satisfied by the HDK-725P, which performed well in our tests. The first purchase consisted of 24 cameras, which we installed in our first HD mobile units, the GTX 11 and GTX 12.

F&F has a long history with Ikegami, going back to the early 1980s and the days of the HK-357. We previously used a number of Ikegami cameras, including the HK-323, HK-355, HK-366 and HK-388.

Throughout our history with Ikegami, the company's cameras have had few failures and, when there has been a problem, Ikegami's service and support ensured that the camera was repaired and turned around promptly.

Our transition to HDTV has had its ups and downs from a hardware standpoint. As new products become available, our clients need to learn about them.

Much of today's HD technology is so fresh that—when compared to SD equipment—you find the operating procedures are quite different. Often it takes time for clients to be accustomed to new products.

Remote production cameras are subjected to environmental extremes such as cold and hot temperatures and variable humidity, while the majority of broadcast cameras are used in air-conditioned studios. Ikegami cameras have proved to us that they can take the abuse in the field and respond with excellent images. ■

Bill McKechney is the vice president of engineering for F&F Productions and can be reached at billm@fnfproductions.com. The opinions expressed above are the author's alone.

For more information, contact Ikegami at 201-368-9171 or visit www.ikegami.com.

USER REPORT

Sinclair Takes Grass Valley Nationwide

by Del Parks
Vice President, Engineering and Operations
Sinclair Broadcast Group

HUNT VALLEY, MD.

Sinclair Broadcast Group owns and operates, programs, or provides sales services to 62 TV stations in 39 markets nationwide. Its television group includes 20 Fox, 19 WB, six UPN, nine ABC, three CBS, three NBC affiliates and two independent stations, and reaches approximately 24 percent of U.S. television households.

Choosing a camera for our digital production studios was a decision we entered into very carefully because we were buying for a number of stations at once. If we got the decision wrong, it would be the wrong choice multiplied by a number of stations.

As most readers know, Sinclair pioneered a centralized news production model, called "NewsCentral," that helps our stations produce a more cost-effective newscast by allowing them to focus on what they do best: local news. Sinclair's Hunt Valley, Md., headquarters serves as the central production facility that creates and feeds national and international news segments and prepackaged, customized graphics to many of its local stations.

Sinclair uses LDK 1707 cameras with triax in its Maryland studios.

Therefore, when designing the systems, it was important for us to pick equipment that is common to all of our station locations because we wanted to reduce incompatibility and maintenance issues while ensuring seamless operation. We also wanted to maintain a consistent look across the station group.

GRASS VALLEY, PAGE 90

USER REPORT

Riedel Connects the Super Bowl

by John Arenas
General Manager
Versacom

BURBANK, CALIF.

Versacom, a specialist in intercom systems, is no stranger to Riedel Communications.

We provide gear and services for large-scale events and have used Riedel's Artist M intercom platform for approximately 12 annual events including the Summer and Winter X Games, the NBA All-Star Game and multiple Super Bowls. The NFL first hired us to configure an intercom system for Super Bowl XXXII because of our experience and zero-failure rate.

The Super Bowl is annually the nation's highest-rated TV program and the most-watched single-day sporting event. In addition to thousands of spectators in the stadium, the game is broadcast in more than 200 countries worldwide and a failure in communications would be catastrophic.

After a thorough investigation into intercom systems, we found Riedel was the only company to offer the technology and capability that we needed for an event the size of the Super Bowl. It's the system we have used ever since Super Bowl XXXVII.

The Riedel system is ideal for large-scale events such as the Super Bowl because of its decentralized matrix architecture. Its masterless, fiber-based backbone gives us excellent flexibility, which allowed us to position multiple Artist M frames throughout Jacksonville's Alltel stadium, connected with fiber to create numerous access points for stations and interfaces.

At this year's Super Bowl, Fox used Riedel RCP-1028E intercom stations (center-right) at four points in the stadium. This is the front-of-house mixer location.

FOUR NODES

The configuration for the last Super Bowl consisted of four nodes installed throughout the site: at the stadium public-address control position, the on-field monitor-mix location, the television truck compound and the distribution room. Once we had a node installed at the truck location, we connected to Fox/NEP by simply running a 100-foot cable to the NEP host truck.

From the on-field site, we covered the monitor-mix and RF operations control, and interfaced with seven wireless intercom systems. The rack room node served as a general operations interface and all wiring and cable distribution passed through that location.

The entire system was easy to incorporate—once the cable was laid out and put into place, we could program all four nodes from one on-site computer or from a remote location. For this event, we set up operations in the rack room trailer and implemented the entire show from that location.

The Riedel system is also an uncomplicated system to operate. When we first started using Riedel, there were some minor initial problems and we were up and running with a basic system within an hour or two.

ALPHANUMERIC DISPLAYS

Artist M's unique features extend to its key panels, which feature eight alphanumeric displays that are a great help when describing a circuit on a particular key. In addition, its integrated volume controls per key let us fine-tune levels.

A valuable bi-product of Artist is its ability to function as an Internet distribution system. This let us plug a DSL circuit into any of our four nodes to communicate with any or all other locations, and gave staff members access to high-speed DSL for Internet access and local e-mail.

With this feature, we ordered for one DSL circuit and distributed it to all our other frames. Therefore, the telco provider charged us for only one DSL circuit despite the number of users we had on the system.

As always, the system performed flawlessly. Unlike the systems we used prior to Riedel's Artist M, it is reliable and we've never had an issue with it—there were no failures.

Riedel has been very supportive, providing us with on-site software updates when necessary and shipping replacement products whenever we need.

The Riedel system has become a cornerstone of the Versacom operation. In addition to the Super Bowl, we used it for the Academy Awards and Golden Globes this year.

We were the first rental house in the United States to purchase a Riedel system and it has helped us maintain our expertise level and edge in the market. It makes us, without a doubt, the first call when doing an event that requires a matrix-based intercom. ■

John Arenas is general manager of Versacom and can be reached at johna@versacom.com. *The opinions expressed above are the author's alone.*

For more information, contact Riedel at 818-563-4100 or visit www.riedel.net.

Grass Valley

CONTINUED FROM PAGE 88

Working with Azcar, we designed an "ideal" equipment complement and production control room for its NewsCentral initiative. This system was first installed at WSMH-TV, Flint, Mich., in 2001 and we've never looked back. With the system now up and running smoothly, it has been successfully duplicated at numerous Sinclair stations.

This package includes the Grass Valley Trinix 128 x 128 video router and a Concerto 64 x 64 audio router, two-M/E Zodiak digital video production switcher, and at least two LDK 1707 digital cameras for the studio. (Grass Valley Gecko signal processing modules, for signal conversion, distribution, and timing functions, tie it all together.)

ACQUISITION PROCESS

For the all-important acquisition process, we chose Thomson Grass Valley TTV 1707 standard-definition digital cameras for our studio production. These cameras are more affordable than models with similar features and they provide consistently clean images that can be shared among our stations with ease.

Although some parts of a station's newscast is produced in Hunt Valley, most of NewsCentral is created locally. We wanted the shows to look like they were shot in the same studio with the same camera.

Judging by the look of the stations already on the air, we think we've achieved that. In addition, the camera's 12-bit processing has improved the stations' on-air look.

The LDK 1707 digital camera can be used in either 16:9 or 4:3 production mode and can transmit an uncompressed 4:2:2 signal from camera to its CCU base station with a Grass Valley digital triax adapter. Other features that played into our purchasing decision include the camera's dual skin-detail and dynamic pixel correction features that help maintain the look we're after.

Markets participating in Sinclair's NewsCentral newscasts include: WSMH, Flint, Mich.; WLFL, Raleigh, N.C.; WUHF, Rochester, N.Y.; KOKH, Oklahoma City; WPGH, Pittsburgh; WUPN, Greensboro, S.C., WVTV in Milwaukee; WTTA, Tampa, Fla.; WTTO, Birmingham, Ala.; KFBT-TV and KVWB-TV, Las Vegas; and WSTR-TV, Cincinnati.

Sinclair's NewsCentral service is also responsible for an expanded edition that airs weeknights from 11-11:30 p.m. Stations receiving this package include: WXLV, Greensboro, N.C.; WBFF, Baltimore; and WVTV-TV, Nashville, Tenn. Baltimore and Nashville also do a 10 p.m. local version that does not use NewsCentral pieces from Hunt Valley.

We've been a Grass Valley customer since 1985, so it might seem obvious that we would choose the company's cameras but that's not the case here. We tested all the available cameras in this price range and found the TTV 1707s to be the best for our applications.

We have always been careful about the technology we choose because equipment has to last and provide a fast return on investment. With the TTV 1707 cameras, we feel we got our money's worth. ■

Del Parks is the vice president for engineering and operations for the Sinclair Broadcast Group and can be reached at delparks@sbgnet.com. *The opinions expressed above are the author's alone.*

For more information, please contact Grass Valley at 818-729-7711 or visit www.thomsongrassvalley.com.

BUYERS BRIEF

The *DigiPrime* family of lenses from **Carl Zeiss** offers eight focal lengths from 5mm (T1.9) to 70mm (T1.6). The family also includes the Sharp Max precision back-focus alignment device as well as a Chrosziel sunshade/filterholder.

For more information, contact Band Pro at 888-226-3776 or visit *www.digiprimes.com*.

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Interface Modules

The Nvision Synapse interface modules are designed for interfacing legacy analog gear to an all-digital facility.

The Synapse ASM10 analog-to-digital bridge performs A/D conversion and embedding and the SAM10 digital-to-analog bridge does just the opposite.

The ASM10 module accepts analog audio, component and composite video inputs and also outputs SDI with embedded audio. After a facility completes its digital conversion, making analog video inputs obsolete, the ASM10 has an SDI input that can still be used.

The SAM10 module has an SDI input with embedded audio and also separate AES inputs.

For more information, contact Nvision at 800-719-1900, *www.nvision1.com* or visit the company's NAB booth, SU9301.

Visualization System

The SGI Prism is a Linux-based visualization system for media, scientific and medical communities to view complex graphical representations.

Featuring 6.4 GBps interconnect technology, cross-platform connectivity and 64-bit Intel Itanium 2 processor, this tool is a complete visualization network.

This open system also handles the demands of the digital cinema mastering and digital intermediates.

For more information, contact SGI at 650-960-1980, *www.sgi.com* or visit the company's NAB booth, SL1943.

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

Neutral Density Dual Grad Filter

The Schneider neutral density (ND) dual grad filter is used for motion picture and digital cinematography.

The filter controls exposure in two areas of the frame and provides two graduation ND attenuator sections. One section covers two-thirds of the glass and graduates from four stops to the central clear. The second section covers one-third of the glass.

ND attenuators diminish distracting background by permitting wider lens apertures, which reduced the depth of field. They are available in 6.6 x 6.6-inches only.

For more information, contact Schneider at 818-766-3715, *www.centuryoptics.com* or visit the company's NAB booth, SU10329.

USER REPORT

Canon Goes Deep for NEP

by George Hoover
Senior VP of Engineering
NEP Supershooters

PITTSBURGH

Roone Arledge, the late ABC Sports executive, often said that nothing captures the passion and emotion of sports than a look into the athlete's eyes.

Visualize the ball on the 20-yard line. It's third-and-long with less than two minutes to go in the quarter. The score is tied and as the quarterback calls for the snap, the crowd is going wild.

The camera zooms to inside the quarterback's helmet, his eyes fill the screen and you can see the concentration and feel the pressure to make the first down. Although it's a cold day, the rock-steady image lets you see the quarterback sweat.

Whether it's football, basketball, baseball or the Kentucky Derby, the emotional moments that help make the televised sport experience exciting are brought to you courtesy of the big glass—camera lenses with zoom ratios in the 80x to 100x range. These numbers reflect the ratio from widest angle to most telephoto or tightest shot.

The Canon 86x and 100x lenses both have a wide-angle view of 9.3mm. The 100x lens goes to an amazing 1,860mm telephoto lens when its 2x extender is used.

For this year's Super Bowl, director Artie Kempner from Fox used Canon lenses, with 12 86x lenses and six 100x lenses for game coverage on Fox. You might be surprised to learn where the 100x lenses were deployed: in the end zones and a high corner. Those cameras bring the close-up of the quarterback's eyes into our living rooms with such emotion.

Using the 100x lenses in those locations is important. These cameras typically shoot the tightest close-ups of the game and it's shadowy inside those helmets. When a lens is zoomed fully tight, less light enters the lens; the Canon 100x lets us see the eyes at partial zoom and prevents the light loss that you get with a full zoom on a shorter telephoto lens.

Furthermore, if the video operator does not have to operate the iris at full open, the camera operator has the advantage of increased depth of field. This eases the camera operator's task of maintaining crisp focus, particularly in HD.

IMAGE STABILIZATION

Both the Canon 86 and 100 have built-in image stabilization. This helps ensure rock-steady shots, even when the operator is at full zoom and the stands are shaking from the crowd's excitement.

Big lenses are not just limited to sports, though. At most awards shows that NEP covers, we use Canon 86x or 100x lenses on cameras providing podium coverage, typically less than 50 feet from the stage.

The stabilizers hold the image rock-solid even though the cameras are on temporary platforms erected in the seating areas. The operator works the sweet spot in mid-zoom range, affording maximum sensitivity and greatest depth of field. Typically for these shows there may be only 20 to 25 footcandles of light, which is necessary to balance the scenic elements, projection screens, talent, air conditioning and budget.

The big glass lenses from Canon give us the ability to capture the excitement and emotion "up close and personal," with non-invasive lighting, while maintaining focus and optimum depth of field. Roone would be proud. ■

George Hoover is the senior VP of engineering for NEP Supershooters and can be reached at george.hoover@nepinc.com. The opinions expressed above are the author's alone.

For more information, contact Canon at 800-321-4388 or visit www.usa.canon.com.

Fujinon

CONTINUED FROM PAGE 96

The problem is maintaining focus and stability. In order to successfully track a player in motion without losing focus, it's essential that the lens has great depth of field. We've found that to be the case with the XA87 lenses.

COMPLICATED

Building an HD truck is a complicated challenge, as HD is such an unforgiving format in terms of picture quality. Visual anomalies are greatly enhanced in HD, so we wanted to make sure we were working with a lens that made it as easy as possible for our camera operators to maintain focus and required minimal adjustments by our video operator.

The Fujinon XA87 fit those requirements. Because of its great depth of field, light passes well through the lens, with minimal distortion and no color changes.

This spring, we begin our coverage of Major League Baseball games with M-5. Because we will frequently do two shows out of this truck, we've added cameras in more positions.

For the centerfield camera shot of the batter, we've found the XA87's focal length to be excellent. An operator can capture that shot with little concern for focus and stability.

How well a particular lens handles lighting changes during football and baseball games as daytime turns to nighttime is a concern.

With the XA87 lens' excellent focusing capabilities, our operators have had few problems maintaining focus as light changes from day to night. The lens' EBC coating also does a fine job at eliminating flaring during subtle lighting changes.

Mira has used Fujinon lenses since 1995 and our operators love the lenses because of their ease of operation and consistent reliability. We also need lenses that can withstand the rigors of frequent travel and outdoor use and the XA87s are rugged.

Since December, we've used them on college basketball games for ESPN and Fox Sports Net Northwest, all Sacramento Kings/Comcast SportsNet home games, arena football for NEP/NBC, several home games for Fox Sports Net Northwest/Seattle Supersonics and many other events, without experiencing one mechanical problem. The fact that our lenses have had minimal failures has greatly improved our productivity. We just do not run into the bottlenecks that we've experienced with other manufacturers' lenses in the past.

Long focal-length lenses must have critical mechanisms that create an increased chance of failure, but we haven't seen this with our Fujinon XA87 lens. It's one sturdy lens for the remote business. ■

Rick Hayes is the chief engineer for Mira Mobile Television and can be reached at rhayes@miramobile.com. *The opinions expressed above are the author's alone.*

For more information, contact Fujinon at 973-633-5600 or visit www.fujinon.com.

PRODUCTS & SERVICES SHOWCASE

Sony

CONTINUED FROM PAGE 96

way for the digital transition. With the cost of HD cameras approaching that of their SD counterparts, one may wonder whether Sony will continue to produce SD cameras.

"It's all about supply and demand," Willox said. However, "the market size is shrinking for SD quite rapidly and with that overall shrinkage, we're not going to put a lot of R&D money into development of SD cameras for studios," he said.

Willox cited Seattle, where four of the top television stations are using HD cameras for broadcast news segments, so this might fuel the fire of competing stations to go digital to keep up with the others.

HD AT NAB2005

Gearing up for NAB, Sony has been working with some of its top customers on a camera that's based on 1080/60p technology.

The camera allows Sony to output the mainstream signals out of that camera easily, by dynamically switching signals, so shooters can get 1080/60i, 1080/24p or 720p and the signals that can be sampled from a 1080/60p image.

"I can optimize all of my lensing, filtering and DSP for the highest bandwidth, and from that root, grow any tree that I desire at the highest quality level," Willox said.

The two-camera family includes a portable HD-1500, an OB/studio camera called an HDC-1000.

Sony optimized a large lens adapter for the portable called HDLA 1500, which helps shooters maintain a center of gravity and has other benefits.

Instead of having facilities buy big cameras and small cameras and some large lens adapters, basically the business model for mobile production is that Sony is offering a more cost-effective portable camera that users can use in every instance, along with a low-cost build-up kit.

"It just adds a lot of versatility to the system," he said.

With every inch and ounce at a premium on OB trucks, Sony has tried to preserve the valuable real estate on the truck by providing a build-up kits that are lightweight and compact.

"We did that with a lot of feedback from the leading mobile companies and studio companies and they're loving it," he said.

"We're doing the most watched programming on TV with this new camera," he said. ■

BUYERS BRIEF

The AK-HC931 from **Panasonic** features three, high-performance 2/3-inch, one mega- pixel (1,280 x 720 progressive scan) IT CCDs clocked at 74 MHz, ensuring a flat frequency response through the 30 MHz-pass band of the HD system. The camera's horizontal single-read CCDs and spatial-offset processing reduces moire and assures high resolution.

The HC931 is equipped with 12-bit analog-to-digital conversion circuits and 38-bit internal signal processing that improves dark and highlight image quality. It also offers sensitivity of f10 at 2,000 lux. The camera weighs less than 10 pounds and features a standard 480i standard definition output and with optional output signal processing boards is upgradeable to 720p or 1080i.

For more information, contact Panasonic Broadcast at 201-348-7994 or visit *www.panasonic.com/broadcast*.

REFERENCE GUIDE

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

PROMPTERS

MANUFACTURER	DISPLAY MODEL	MULTI-FORMATS	MODES	OPERATING SYSTEM/ STANDARD	FEATURES	WEIGHT	PRICE
Audio Video Design 321-255-1616 *www.avd-prompt.com*	AV15CA Cam-mount, stand-alone & speech	XGA TFT flatscreen Win/Mac	Computer analog XGA 1024 x 768	Windows 2000/XP, Mac	Milled aluminum bracketry, premium glass beamsplitter mirror, includes Win or Mac SW	13 lbs.	$1,495 includes Mac or Win Software
Autoscript 203-338-8356 *www.autoscript.tv*	On camera unit from 8" TFT to 20" TFT	PCI card, USB X-Box and VGA	VGA, composite video, NTSC/PAL, autosensing SECAM	All Windows OS, interfaces with iNEWS, ENPS, MOS, etc.	Autoscript prompting systems deliver flexibility, smart design and full support	2.9 - 14.2 kg	$2,995-$6,695 for on camera units
Comprompter 608-785-7766 *www.comprompter.com*	NewsKing TotaPrompter	Analog or digital monitors	NTSC/PAL/XGA B/W or color, direct or reverse mirrored	Windows OS, network	Writing/editing scripts, organizing a presentation, printing and prompting, supports all Microsoft languages	TotaPrompter SW supports all size monitors	$1,500-$5,000 for multiusers
Computer Prompt. & Capt. 800-977-6678 *www.cpcweb.com*	CPC-1000	Windows-compatible	VGA and composite	All Windows; NTSC/PAL	Scrolls text with any TrueType font in any language; variable text sizes	N/A	$1,495
Listec Video 561-683-3002 *www.listec.com*	Multi-input and composite flat panels	9", 12", 13", 15" standard and high-bright 19" and 20"	LCD mirror reversal commands	Panels - universal, software - Windows	Fold down or studio hood, specially priced HW/SW systems	8-35 lbs.	Starting at $2,895
Magic Teleprompting 415-626-5283 *www.magicscroll.com*	MagicScroll	Mac/Windows	Multisize, multifont output	Magic Scroll for Max OSX, Windows	Smooth scrolling, bookmarks, script queuing, ordering-linking, timer, loops and color text	N/A	$1,500
Mirror Image 920-232-0220 *www.teleprompters.com*	LC-110; LC-160-HB; SF-220-LCD	10" LCD; 15" LCD; 20" LCD	NTSC/PAL/SVGA; NTSC/PAL/SECAM	SVGA/NTSC/PAL for all	LC-110 (400 nits) & LC-160-HB (400-1600 nits) are portable; SF-220 is the largest on market	13 lbs.; 20 lbs.; 30 lbs.	LC-110 $3,295; LC-160 $5,095; SF-220 $5,095
QTV 203-406-1400 *www.qtv.com*	FDP-12; EFP-15 HB; FDP-17	12" + 1,600 nits 15" + 1,500 nits 17" + 1,200 nits	NTSC/VGA and PAL composite video	NTSC/PAL; AC/DC; Windows 95, 98, NT 2000, XP; Cuemac V10	Full color, high-resolution, non-glare	12.5 lbs.; 22 lbs.; 37-51 lbs.	Call for pricing
Stewart Instruments 800-722-8937 *LowCostTeleprompters.com*	Model 950/ 1250/1450/ 1550	Studio/Portable	Composite/VGA	DOS, Windows & Mac software	Low-cost hardware and software	9", 13 lbs.; 12", 20 lbs.; 14", 32 lbs.	$875/$975/ $1,075/$1,575
Telescript 888-767-6713 *www.telescript.com*	Fold and Go, Value and Studio	8-18" flat panel LCD, Win 2000/XP	Wide-angle field, studio, newsroom, public speaking	NTSC, PAL, XVGA Win 2000, XP	Professional and value monitors, DirectView, lightweight cam configs, custom cases, control options	5-27 lbs.	Up from $2,795; software starts at $895
Tekskil Industries 604-589-1100 *www.tekskil.com*	LCD13; LCD15; LCD17; LCD20	Full color	XGA, picture invert/reverse	NTSC/PAL	High light output (15", 1,800 nits; 17", 750 nits); fold-down design	13", 12 lbs.; 15", 13 lbs.; 17", 16 lbs.; 20", 28 lbs.	Contact for pricing

USER REPORT

Token Creek Shoots With Angenieux

by John R. Salzwedel
Owner
Token Creek Mobile Television

MADISON, WIS.

Over the years, Thales Angenieux lenses have established a fine reputation in the film industry.

The same precision and quality that has made Thales Angenieux's film lenses so popular is also applied to manufacturing high-definition video lenses for broadcast and professional video applications. All around, these lenses provide the best combined performance and value on the market.

Our company, Token Creek Mobile Television, first purchased Angenieux lenses in 2000 when we began our migration to HD. Although price was an important factor in our lens selection, quality was the deciding factor and we felt the performance of the Angenieux lenses was equal to or greater than comparably priced glass.

More importantly, our customers were pleased with the results. Five years later, we own one 70x HD OB/sport, two 60x HD OB/sport, three 62x HR OB/sport, one 22x HR studio and two 26x HD ENG/EFP lenses.

Token Creek Mobile Television provides mobile production services from our two trucks, both equipped with top-level production gear. We specialize in regional and national sports, large corporate events and entertainment venues, have been coast-to-coast for the Golf Channel, celebrated Harley-Davidson's 100th birthday and provided coverage for ESPN's broadcasts of college sports throughout the Midwest. Our Angenieux lenses were also used for CNN's coverage of the vice presidential debates in Cleveland last fall, but sporting events comprise a large segment of our growing business.

There are six lenses in the Angenieux OB/sport lens lineup and we use three of them. All are designed with dust and condensation-free enclosures to protect against humidity, as well as a retractable visor to protect against rain and a front protective glass for minimizing light interference. Their low power requirement allows a direct connection of the lens to the camera, eliminating the need for a power box—one less piece of gear to worry about.

FAST ZOOM AND LOW RAMPING

The 2/3-inch format lenses feature a fast zoom with low ramping and incredible focal lengths, varying from 9.5-570 mm on the 60xHD to 11-665 mm on the 70xHD. All the OB/sport lenses incorporate Thales Angenieux's Assisted Internal Focus (AIF) to deliver fast zoom, precise focus and return frame operation.

John Salzwedel of Token Creek Mobile Television said that freelancers like the intuitive operation of Angenieux's box-style lenses, and the handles on top are a convenient touch.

When shooting sports events, a wide horizontal field of view is critical—even more so with football. The Thales Angenieux lenses deliver accordingly with 50-degree horizontal fields on the 70xHD and 62xHR.

Like most other mobile production companies, Token Creek uses freelance crews around the country. The lens setup and operations of the Angenieux lenses are intuitive and when fitted to a camera, the balance and comfort so exacting that even first-time or occasional users can familiarize themselves with lens operation in a very short time.

In addition to positive feedback from all operators on the performance of the lenses, the most common remark is about the design and in particular, how handles are on top of the lens. It may seem like a little thing but shooters really like this feature.

Outstanding after-sales service and support by a manufacturer can make a customer for life and Angenieux understands this philosophy very well. Sales and technical support are only a phone call away and on the rare occasion when we've needed to contact the company's technical support, technicians understand the problem and resolve it in a way that suits our needs.

An example of this is Angenieux's standard practice of expediting parts. Even providing loaner lenses is the norm for this company.

Adding it up, Thales Angenieux HD/HR lenses are a superior piece of optical technology and craftsmanship. I have and will continue to recommend them to people in this industry. ■

John R. Salzwedel is the owner of Token Creek Mobile Television and can be reached at tcp@tokencreek.com.

For more information, contact Thales Angenieux at 973-812-3858 or visit www.angenieux.com.

BUYERS BRIEFS

Schneider Optics offers three kinds of polarizing filters; true-pol polarizing filters, "circular" true-pol for video assist and top-pol and Kaesemann polarizers for professional video.

Tru-pol polarizing filters reduce glare and reflections, saturate colors and improve contrast. These filters are designed with film that is laminated between two pieces of water-white optical glass.

The "circular" true-pol filter uses polarizing elements in the beam-splitters that split light in two directions.

The top-pol and Kaesemann polarizers for professional video are screw-on elements that feature Schneider's brass mounting rings, designed to prevent jamming on the lens barrel.

For more information, contact Schneider Optics at 631-761-5000 or visit *www.schneideroptics.com*.

Hollywood, hyper, north and vector are all types of star filters that **Tiffen** offers. These are the effects that make glass shinier and candlelight more dramatic.

The effects are created by thin lines etched into the flat optical surface of a clear filter. These lines diffract light points into long thin lines of light running at right angles to the etched line.

Tiffen offers star four-point 2mm, star six-point 2mm and star eight-point 2mm filters.

For more information, contact Tiffen at 631-273-2500 or visit *www.tiffen.com*.

InnoVision's HD Probe tubular lens is designed for HD video, with a periscope attachment lets operators shoot from an ultra-low perspective. The HD Probe has interchangeable, straight and 90-degree periscope attachments, and is waterproof for use in water tanks and aquariums.

The HD Probe features high-resolution glass elements and relay optics that provide edge-to-edge sharpness, a flat field, and extreme depth of field. State-of-the-art multiple coatings provide sharp, low dispersion images.

For more information, contact Innovision Optics at 310-453-4866 or visit *www.innovisionoptics.com*.

The HDC-900 studio camera from **Sony** is a multiformat, multiframe-rate camera capable of capturing 1080 24/25/30-frame progressive or 50/60 interlace images, as well as 480/60p. The HDC-900 employs a 2.2-million "square" pixel CCD imager, 12-bit A/D and a two-million gate VLSI for up to 34-bit processing. The camera has a sensitivity of f10 at 2,000 lux and three-channel skin-tone detail correction.

For more information, contact Sony at 800-686-7669 or visit *www.sony.com/professional*.

The PSM-10 progressive-scan camera from **Wolfvision** is an XGA resolution camera/lens system that can be used for high-definition imaging in studio, research and presentation situations. The PSM-10 features 12x optical motorized zoom, manual and auto focus, manual and auto iris, a 52mm lens mount for additional lenses and filters and 180-degree image rotation.

For more information, contact Wolfvision at 800-356-9653 or visit *www.wolfvision.com*.

MARKETPLACE

Highlighting the latest products available to professionals in the video industry

Patchbays for HDTV

The new audio and video patchbays by Switchcraft can be used for HDTV and digital applications.

Digital-ready products by the electronics manufacturer include high-density video patchbays rated to 3 GHz, audio patchbays fitted with 48, 52 and 96 jacks per panel, audio patchbays, audio and also video patch cords made with 110 ohm cable.

The MBK series has 16 midsize video jacks and 48 TT bantam jacks and optional 75 ohm terminated or non-terminated video jacks.

Audio jacks feature nickel-plated steel frames and gold-plated crossbar switching contacts.

Swtichcraft offers a lifetime warranty on its products.

For more information contact Switchcraft at 773-792-2700 or visit *www.switchcraft.com*, SU7865.

Wheelcair-Enabled Video Production System

The Laird Telemedia VGO broadcast system mounts a video camera onto a wheelchair.

Laird developed the video production system to help broadcasters and educators meet the Sec. 508 standards for making new technology accessible for people with disabilities.

The video wheelchair system has a steel arm that swings out and a camera tripod head mounted on it for steady camera movement. Two knobs lock and unlock the system.

Users have the option to use two tripod heads, one that is hand-operated and the other with automatic start, stop, record and lens controls that are remote-controlled.

Options include a 5.6-inch color LCS monitor system and clamp.

For more information, contact Laird Telemedia at 800-898-0758, *www.lairdtelemedia. com* or visit the company's NAB booth, SL1243.

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

Transmitter

The 7222, 7224 and 7226 Pure Digital Fiberlink transmitters from Communications Specialties (CSI) work with display devices that support VGA, SVGA, XGA, WXGA and HDTV resolutions.

The transmitters can be used in places that use digital signage, although broadcast studios, stadiums and theatres and can also make use of the Pure Digital Fiberlink optical distribution amplifiers, 8000 or 8100 series.

Units are 1 RU tall and do not require adjustments, equalization or de-skewing.

For more information, contact Communications Specialties at 631-273-0404, *www.commspecial.com* or visit the company's NAB booth, SL2268.

INTRODUCING

the TRX900 Wireless Microphone Transceiver with Built-in IFB

TRX900 body pack wireless includes:

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- Digital modulation wireless transmitter
- RF remote control
- 1.5 hour internal recording with time code

Zaxcom's revolutionary new wireless microphone transceiver redefines the art of professional wireless. The extremely small TRX900 body pack transceiver offers the highest quality audio of any wireless microphone, a full function IFB receiver, RF remote control of all transmitter functions and a 1.5 hour internal recording capability with time code reference.

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Please visit us at
NAB2005
Booth N4215

MARKETPLACE

Highlighting the latest products available to professionals in the video industry

System Control and Monitoring

The Dayang MagicBox series of interface cards use Serial Network Management Protocol (SNMP) for system control and monitoring.

The MagicBox series offers video and audio noise reduction, SD/HD and HD/SD conversion, aspect ratio conversion, frame synchronization and more.

Twelve cards fit easily in a 3 RU chassis.

The series integrates with Dayang D3 equipment and other third-party tools.

Other cards feature a still or animated logo inserter, A/V and data router and also processing and distribution amplifier.

For more information, contact Dayang at 852-2730-2117, *www.dayang.com*, or visit the company's NAB booth, SU9352.

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

Audio Console

The Smart Console from Smart AV uses ARC technology to present and unify channel access and feature control.

ARC Technology uses a physical ARC to present and unify the functions of interrogation and channel selection into a spatially fixed array providing instant access to any channel or combination of channels. A scribble strip allows users to write channel names on the ARC; this writing then appears on the channels and can be saved with a project. Optical touch sensors on the ARC present all available channels; they can be used to assign or call up channels, tracks and other features. Designed as a universal controller, the Smart Console can interact with multiple control engines, including the Klotz Digital VADIS, Yamaha DME 64N and Emagic Logic.

For information contact Smart AV in New South Wales, Australia, at +61-2-9648-6744, *www.smartav.net/* or visit the company's NAB booth, N3135.

Cable Connectors

The NC**XX XLR by Neutrik is the company's next generation of cable connectors.

Available in three to seven pole configurations these connectors offer female cage type contact designed to increase conductivity and reduce wear of male contacts. A new ground contact maintains the integrity between the chassis and cable connectors. The new series of connectors comes in nickel housing with silver contacts or in black metal housing with silver or gold contacts.

The die cast shell has internal threads that mate with the external threads on the boot to eliminate potential damage from exposed threads.

For more information, contact Neutrik at 732-901-9488, *www.neutrik.com*, or visit the company's NAB booth, C5137.

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

ANTENNAS/TOWERS /CABLES

Want to Sell

Bogner B16UO antenna on TV chnls 28 & 29, vgc, return loss tested good, $6500; Scala SL-8 on TV chnl 66, vgc, return loss tested good, $300; 8' grid dish w/mount, $200; 10' solid dish w/mount, $300. A Martin, 218-765-4321.

CAMERAS

Want to Sell

Canon XL1-S camera, $2100. Glen, 208-735-1970.

Panasonic AJ-D900WAP DVCPRO P camera, $8995; Panasonic AJ-D90 DVCPRO 50 dockable rcdr, $3995; Sony DXC-637 w/PVV-3 back, $6500. 818-788-4700 or www.tvprogear.com.

AUDIO PRODUCTION

Want to Sell

Mackie 1604 VLZ Pro, new, $849; Mackie 1604 VLZ, $625; Sony MXP-744, BO; Bittree & ADC audio & video patch panels from $400; Stantron 45RU racks from $450; Emcor Series 10 40RU racks from $450; DigIdesign 888, $650; PSC Universal microphone pwr sply, $150. 818-788-4700 or www.tvprogear.com.

TV TECHNOLOGY

CAMERA ACCESSORIES

Want to Sell

Cartoni Beta head & single stage sticks, $1850; Sachtler Video 20 II w/ENG 2 DA legs, $4500. 818-788-4700 or www.tvprogear.com.

DIGITAL EFFECTS

Want to Sell

Channelmatic Little Money-maker insert RS spots for cable system or LPTV, one owner, $295; Channelmatic Ad Cart system, high end TV station automation remote operation, satellite record, the works, one owner, $2500. D Viles, 845-876-1212.

EDITING EQUIPMENT

Want to Sell

Avid Adrenaline w/Avid Assurance, new, $25000; Avid Symphony version 3.5 on IBM Intellistation, $24900. 818-788-4700 or www.tvprogear.com.

LENS REPAIRS

Focus Optics. Service and repair of broadcast video lens. Fujinon, Canon, Nikon, Angenieux, etc. **We have the fastest turnaround in the country.** We also repair lens that have bad inpact damage. **Call Stuart at 800-234-lens or www.focusoptics.com. See Us at NAB Booth # SU8977.**

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Want to Sell

M/A-COM 2 GHz, 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.

MISCELLANEOUS

Want to Sell

Stantron equipment racks w/wheels, $250/ea. Glen, 208-735-1970.

MONITORS

Want to Sell

Sony BVM20F1U w/SDI, only $3650 w/SDI; Sony PVM-20M4U, $1750; Sony BVM14F1U w/SDI, $2395; Sony PVM20L5, B-Stock, $2695; Sony PVM14L5, B-Stock, $1650. 818-788-4700 or www.tvprogear.com.

SIGNAL PROCESSING

Want to Sell

Miranda Symphonie w/full compliment of audio & SDI cards, $6000; Leitch Mix-7001 multi-function digital frame, $500; Grass Valley Series 8900 Frames w/redundant power supply, $600; GVG 8501 video DA's, $175; GVG 8551 audio DA's, $150; GVG 8936 cards, $250; Sony BVX-10 component color corrector w/remote, $700; Sony BVX-D-10/BVR-11, $4500. 818-788-4700 or www.tvprogear.com.

STATIONS

Want to Sell

(2) Low Power TV Stations on air and cable in Delaware, plus six licenses in DE and MD. Call for info, 302-732-1400.

SWITCHERS

Want to Sell

Grass Valley 200-2, fully loaded, $6500; Miranda Digipath 16x16 SDI router w/remote panel, $4500; Sony DVS-V1201 12x1 SDI switcher, $1950; Leitch 4x4 MB routers, $175; GVG Ten X, S800; Kramer 5x4 A/V switchers, new, $475. 818-788-4700 or www.tvprogear.com.

Panasonic WJ-MX30 digital AV mixer w/PRO-THIRTY upgrade from RealTime Video Eng, 3-inputs, 470 lines of resolution, 2-pro amp, in original box & manual, $1500 + shpg; Shure M267 mic mixer, $120 + shpg; AMR 42 mixer 4-inputs w/4-trk & stereo outputs, w/manual, $100 + shpg; Sennheiser SK300 wireless body pack, UHF, no xmtr, $100 + shpg. Freddie, 562-924-4289.

TAX DEDUCTIBLE EQUIPMENT

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

TELEPROMPTERS

www.LowCostTeleprompters.com

TELEPROMPTERS WTS (Cont.)

TEST EQUIPMENT

Want to Sell

Tektronix 1725 PAL waveform monitor, $1000; Tektronix 1735 PAL waveform monitor, $1000; Tektronix 1720 & 1730 combo w/case, $1750; Tektronix 764 digital audio monitor, $2500; Tektronix 760A audio monitor, $1250. 818-788-4700 or www.tvprogear.com.

Tektronix 528 waveform monitor, $250; Fujinon focus block FMM6A or FMM7, $100/ea; Sony AC-500 adapter, 12V-7 amps, $150; Panasonic DVC pro tapes, single pass, 15 & 33 minutes, $1/ea, hundreds avail. Freddie, 562-924-4289.

Tektronix rack mount for (2) 1720, 1730 or any other 1700 Series waveform or vector monitors, like new, $90; Tektronix 149A NTSC test signal gen, $350. A Martin, 218-765-4321.

Tektronix THS 730A handheld oscilloscope/DMM, used, gd cond, $1800. B Cho, 718-358-9300 x.197.

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.

TUBES

Want to Sell

4CX250BC used tube in gd cond, made 100% pwr when last used, was kept as standby spare, $75; 4CX250BC, new tube, $100; Thomson TH331, used, 100% pwr when taken out of service, $800; 9017 good used tube w/new fingerstock kit, tube in gd cond & made 100% pwr when last used, wa kept as standby spare, $1100. A Martin, 218-765-4321.

VTRs/VCRs /RECORDING MEDIA

Want to Sell

Sony 1" VTR BVH-2000 w/TBC, new 96 min tape V1-K & empty reel, manuals, calibrated & working fine, $400. 847-441-5999.

Sony 7020 3/4" deck, going to digital, runs OK & gd cond, $200. D Viles, 845-876-1212.

Sony BVH-1100 1" machine w/TBC, $500. Glen, 208-735-1970.

Sony UVW-1800, lw hrs $5500; Sony PVW-2800, $6000; Sony PVW-2800P, $7000; Sony BVW-70 from $6500; Sony BVW-65, $2000; Sony BVW-60 from $2000; Sony DSR-2000, new, $11500; Sony DSR-1800 DVCAM rcdr, new, $7500; Sony DSR-1500A, new, $5250; Sony DSR-80, $3500; Sony DSR-45, new, $3995; Panasonic AJ-D950 DVCPRO 50 rcdr, lw hrs, $8500; Sony VO 9850 w/timecode, $1200; Sony VO 9800 w/timecode, $1200; Accom WSD Xtreme, $3500. 818-788-4700 or www.tvprogear.com.

EMPLOYMENT

HELP WANTED

Fox Networks Engineering & Operations in Los Angeles, CA is searching for experienced professionals for the following positions:

Graphics Maintenance Technician

Macintosh/PC Tech Support Engineer to work in television graphics production environment. Will need expertise in setups, moves & configuring for both news/existing Macintoshes, XServers, PCs, & peripherals. In this role, you will also provide network administration & maintenance, network connections, file transfers & backups, as well as software/hardware installs, upgrades, troubleshooting & occasional user training.

Requires:
- 2-3 years experience in computer support or administration role, as well as in television graphics environment
- Hardware installation, configuration, backup & maintenance of Xserve G5 Servers & RAIDs
- Provide end-user support for Macintosh OS X, Windows 2000 & XP clients
- Install, support & maintain computer hardware, software & peripherals
- Willing to work extended hours during peak periods
- Support for Final Cut Pro, Maya, After Effects, Photoshop & Illustrator applications
- BS/BA degree in technical field

Preferred:
- Writing scripts for UNIX and After Effects
- Maintenance of television graphics & post production equipment
- Troubleshoot & maintain Avid Editing systems

Maintenance Engineer

This successful candidate will have excellent people skills & a strong electronic maintenance background with the ability to troubleshoot to the component level.

Individual should be experienced in digital television system maintenance, including intercom systems, monitors, cameras, still stores, character generators, production & routing switchers, videotape & audio equipment. The candidate should also be familiar with LAN systems, TCP/IP, computer configuration & software installation.

The professional we seek will be a self-starter, well organized & willing to work flexible hours, including evenings, weekends & holidays. Must have an Associate's degree in electronics or a minimum of 4 years experience as a maintenance engineer in a broadcast or production facility.

To apply, interested candidates should visit:

www.FoxCareers.com

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starz entertainment group

DIRECTOR, POST PRODUCTION

Starz Entertainment Group LLC, the nation's largest provider of cable and satellite-delivered premium movie channels, has an immediate opening for a Director of Post Production. The individual in this position will be responsible for numerous areas of functional responsibility, to include but not limited to, post production and broadcast operations. The individual must ensure the department's conformance to the company's quality system is in accordance with customer and company requirements. In addition, the incumbent in this position will not only supervise all managers within the post production environment, but also supervisor the operation of the scheduling office.

The Director of Post Production will be responsible for maximizing the use of facilities and post production edit personnel; develop and deliver technical and performance policy for all staff; and direct and design the growth of an evolving technical facility to meet the needs of post production clients and the changing business needs of Starz.

Minimum of 10 years' experience in a post production facility, television station, or network required. Experience in television systems design, engineering, and general management, preferred. Minimum of 8 years' supervisory experience. Bachelor's degree in Film or Television, or equivalent experience required. Master's degree in Business Administration, preferred. Strong business acumen and analysis. Demonstrated success in fostering senior management consensus for projects. Superb teamwork and people management skills. Excellent oral, written, and presentation skills and a demonstrated ability to communicate effectively at all levels and across all functional areas. Ability to operate effectively in a rapidly changing environment.

Please send your cover letter and resume to Job Number: 412-10367, Starz Entertainment Group LLC, P.O. Box 6542, Englewood, Colorado 80155; fax to (720) 852-5891; or e-mail information to jobs@starz.com. Drug test required of successful candidate. Visit us at www.starzencore.com. EOE

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Business News

Vizrt to Acquire Curious Software

BERGEN, NORWAY & LONDON

Broadcast graphics provider Vizrt has signed a letter of intent to purchase all assets of Curious Software.

U.K.-based Curious Software produces Curious World Maps, the core product of its digital mapmaking software for the broadcast news, video and film production and has 500 customers worldwide, including 185 in the United States.

Vizrt will combine its Viz|Artist animation software with the maps product from Curious to produce a template-based mapping tool that uses 3D animation and design tools for mapping, using Viz|Engine for rendering.

Curious World Maps will also be integrated with other Vizrt graphics products.

The deal should be complete by June 1, 2005. ■

Harmonic Acquires Broadcast Technology

SUNNYVALE, CALIF. & ANDOVER, U.K.

Harmonic—a digital video, broadband and IP delivery systems provider—has completed its acquisition of Broadcast Technology.

Harmonic will integrate the technology from U.K.-based Broadcast Technology with its Convergent Systems Division, expanding its reach into the cable, satellite, terrestrial broadcast and telecom markets.

The $754,000 deal was paid mostly in cash and also with 169,112 shares of Harmonic common stock.

"We look forward to working as a part of Harmonic to capitalize on the coming market opportunities," said Nick Jennings, managing director of Broadcast Technology. Products by Broadcast Technology will be supported by Harmonic NMX Digital Service Manager, a system deployment, monitoring and control tool. ■

SeaChange Reports Lower Q4 Revenues

MAYNARD, MASS

Despite earning record revenues for FY2004, digital video systems provider SeaChange International ended its fiscal year on a down note, reporting $30 million in revenue during the fourth quarter (ending Jan. 31), a 23 percent decrease from the $38.9 million in revenues generated during the same period last year. The company attributed the loss to a decrease in fewer-than-expected VOD shipments in the fourth quarter.

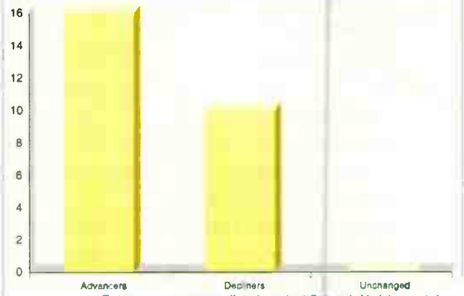
The company expects revenues to bounce back to approximately $40 million in the first fiscal quarter of 2005, ending April 30. SeaChange also reported a net loss of $2.2 million, compared to $2.6 million net income during the same period in FY2004.

Revenues for FY2004 were up a record $157.3 million, up from $148.2 million during the same period last year. Net income for the fiscal year was also up, ending at $9.9 million, from $5.6 million from Jan. 31, 2004.

During Q4, VOD systems revenues represented $12.7 million of the $18.8 million in total revenues for the quarter.

By the end of Q4, the company had a total of 40 cable operators that were using its on-demand offerings, 26 more than it had at the end of the same quarter last year. ■

WIN-LOSE RATIO



TOP ADVANCERS BROADCAST STOCKS
(Feb. 18 - March 4)

Young + 7.18%
Paxson + 6.61%

TOP DECLINERS BROADCAST STOCKS
(Feb. 18 - March 4)

Gray - 2.31%
Hearst Argyle - 2.02%

TOP ADVANCERS TV STOCKS
(Feb. 18 - March 4)

Leitch - 8.45%
Harris - 6.01 %

TOP DECLINERS TV STOCKS
(Feb. 18 - March 4)

Ciprico - 3.70%
Scientific Atlanta - 3.11%

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

TV Tech STOCKS as of Mar. 4

Company Name	52-Week Range	Feb. 18	Mar. 4	% Change
Avid	39.59 - 67.55	65.43	65.75	0.49%
Ciprico	3.15 - 7.21	4.05	3.9	-3.70%
Harmonic	4.86 - 12.40	11.28	11.09	-1.68%
Harris	42.37 - 69.15	64.92	68.82	6.01%
Leitch	6.53 - 11.2	7.1	7.7	8.45%
LSI Logic	4.01 - 10.79	6.26	6.38	1.92%
Pinnacle	3.25 - 9.91	4.28	4.3	0.47%
Sci. Atlanta	24.61 - 36.50	31.23	30.26	-3.11%
SeaChange	11.22 - 20.10	13.9	13.6	-2.16%
Tektronix	26.26 - 35.00	28.52	28.55	0.11%

Broadcast STOCKS as of Mar. 4

Company Name	52-Week Range	Feb. 18	Mar. 4	% Change
Acme	5.43 - 9.22	5.95	6.05	1.68%
Belo	18.00 - 29.90	24.27	24.17	-0.41%
Emmis	17.08 - 25.95	19.05	19.1	0.26%
Entravision	6.85 - 9.79	8.41	8.96	6.54%
Fisher	45.02 - 52.00	50.52	51.46	1.86%
Gray	11.20 - 16.19	15.14	14.79	-2.31%
Hearst Argyle	22.57 - 27.93	25.79	25.27	-2.02%
Nexstar	6.54 - 13.17	8.01	7.97	-0.50%
Lin TV	17.41 - 24.30	17.92	17.75	-0.95%
Paxson	0.90 - 4.08	1.21	1.29	6.61%
Sinclair	6.12 - 14.20	7.8	8.08	3.59%
Liberty	38.50 - 51.79	43.47	45	3.52%
Univision	25.80 - 36.79	27.54	28.99	5.27%
Young	8.14 - 20.45	8.5	9.11	7.18%
Tribune	38.74 - 51.90	41.54	41.06	-1.16%
Meredith	45.68 - 55.94	47.4	47.78	0.80%
EW Scripps	44.73 - 54.65	46.69	46.69	0.00%

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Sony Cracks 4K Barrier PAGE 8

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WHAT'S INSIDE

Tuner Time

FCC phase-in begins

by Deborah D. McAdams

WASHINGTON

This is the first article in a two-part series about over-the-air digital television reception technology, which is being added to TV sets in accordance with the FCC's tuner mandate, and plug-and-play order.

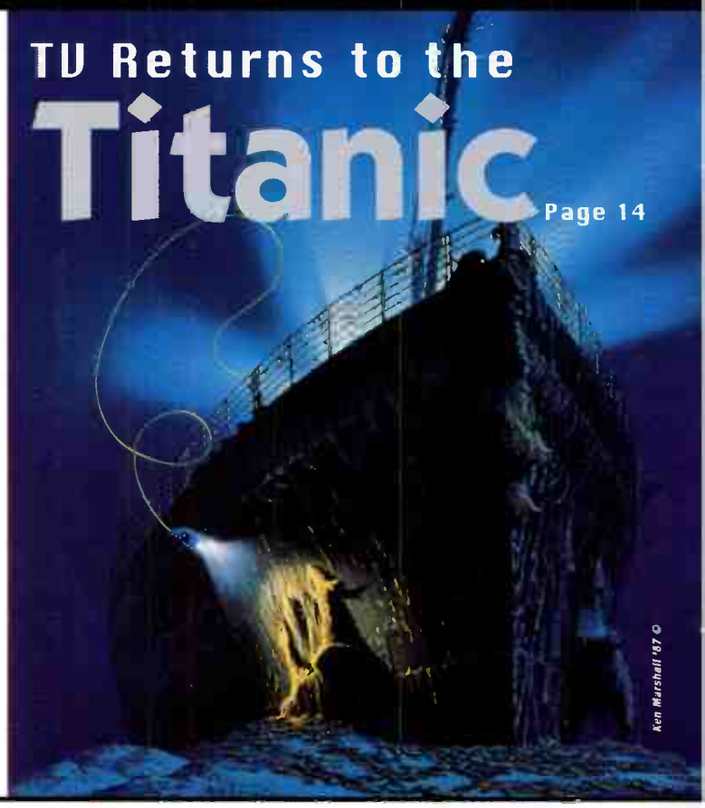
Ever since the government rubber-stamped 8-VSB as the digital television transmission standard in 1997, questions about its receivability plagued broadcasters.

Now, the true test is nigh. The first phase of the FCC's order requiring new TVs to include off-air DTV tuners kicked in July 1, and cable-ready sets, which must also include the tuners, are already appearing in electronics showrooms. The intention is that new, digital-reception capable sets eventually will supplant old analog sets in the market.

"We've always said, if you can't receive this indoors with a simple antenna, it ain't gonna work," said Nat Ostroff, vice president of New Technology at Sinclair Broadcast Group.

So tenacious was Sinclair's criticism of 8-VSB receivability that it became the stuff of industry folklore. In the meantime, a handful of engineers quietly applied their intellects to 8-VSB reception—commonly referred to as ATSC, named for the Advanced Television Systems Committee, from whence the standard came.

TUNER, PAGE 13



Planning for Disaster

Broadcasters grapple with security

by John Merli

WASHINGTON

Round 2 of the Media Security and Reliability Council (MSRC II) began last month when the group held its first meeting since the FCC rechartered the consortium of broadcasters, manufacturers and government officials for an additional two years.

The meeting began and ended with a number of vague but ominous observations.

"I don't want to fuel the rumor mill, but it is important that we have a high sense of urgency to all this," Hearst-Argyle Television CEO David Barrett said in opening remarks in a meeting that lasted only about 45 minutes.

Barrett, who gave no further details regarding the rumors to which he alluded, was appointed to chair the council in March by FCC Chairman Michael Powell.

The 41-member council met at FCC headquarters, preceding a public forum co-sponsored by the Department of Homeland Security (DHS), where some panel members expressed continuing frustration with federal officials who appeared to make contradictory statements regarding homeland security that often lack specificity but not urgency. Panel moderator Sam Donaldson of ABC News underscored a situation that occurred in late May, when Attorney General John Ashcroft and Homeland Security Secretary Tom Ridge appeared to have been competing for attention over jurisdiction of security-warning protocol, as well as the severity of the warnings.

"Clearly," Donaldson said to panelist Susan Neely, DHS public affairs assistant secretary, "the government did not speak with one voice ...which can present a real problem for us, the media, who have to report on all this."

While not responding directly to the question of overlapping jurisdictions, Neely said effective homeland security also includes what the media does *not* report—such as erroneous

DISASTER, PAGE 8

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CONTRIBUTING WRITERS

NAME: Karl Paulsen

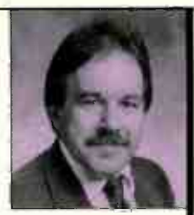
COLUMN: Media Server Technology

In the process of planning for a system that will manage media assets, it becomes extremely important to quantify, qualify and clarify what the MAM, DAM or DRM system is to accomplish. When quantifying how well a system is expected to perform, ... Page 25

NAME: Jerry Whitaker

COLUMN: ATSC Outlook

The ATSC has published two new Candidate Standards documenting enhancements to the AC-3 digital audio compression standard and specifying its use in digital television. This is a major step toward using advanced audio coding for a wide variety of applications. Enhanced AC-3 will provide ... Page 28



NAME: Randy Hoffner

COLUMN: Technology Corner

We have recently taken a look at some of the older and the newer ways television pictures are shown, considering both direct-view displays and projection displays. It is fair to say that one of the strong trends in the television display business is the increasing ...Page 30

FROM THE EDITOR

Progress on the Tuner Front

Four years ago, at the height of the debate (some would say "war") over the 8-VSB transmission standard, Sinclair's Nat Ostroff told Zenith, among others, that broadcasters didn't "trust" manufacturers and accused the consumer electronics industry of manufacturing gear with "unacceptable flaws."

What a difference four years makes.

After the battle over the VSB vs. COFDM effectively ended when the FCC reiterated its approval in 2001 of the VSB standard, manufacturers set about working on improving receivers, (and ATSC, as well initiated work on enhancing the VSB standard). Now we're seeing the fruits of those labors. The initial results are encouraging, with some caveats.

I knew things had really changed when I sat down with Mr. Ostroff at NAB and he told me that Zenith's fifth generation DTV receivers may have finally "solved the indoor antenna reception problem." This was before the company put out a press release last month detailing tests it had conducted in Baltimore at sites that had previously failed to pick up signals.

Ostroff made it clear to me that his battle was never with Zenith, which owns the patent to VSB technology, but rather with the consumer electronics industry as a whole, and in particular with the CEA, which he has not let off the hook. In fact, he thinks Sinclair should be given some credit for improving the technology. "I think our efforts helped accelerate the development of bringing a viable over the air receiver to the market," Ostroff said. "It forced people to act."

It will be later this year before the new Zenith chips reach the consumer marketplace, but the development of the improved technology comes at a crucial time in the DTV transition. By the time you read this, the first phase of the mandatory DTV tuner act will be in effect and, although the impact of the mandate will take some time to realize (how many owners of 36-inch-plus DTV sets do you know who use antennas to watch broadcast DTV?), the mandate marks one of the first true tests of consumer acceptance of over-the-air DTV. Unfortunately consumers' experience with over-the-air DTV up until now have been well documented in the trade press and are now being picked up by the general press.

In a hard-hitting article on broadcast DTV in The New York Times last month, viewers vented their frustration over trying to receive reliable DTV signals. One consultant even warned DTV customers to "steer clear" of broadcast DTV after grudgingly acknowledging that the technology was improving. The article cited the usual culprits that we're all familiar with: complex, software-based set-tops and low power digital signals, among other things. The accusations have been repeated many times in these pages: No one entity in this industry is completely blameless for the problems in the transition.

Nevertheless, the improvements in the receiving chips are an important and encouraging development in this transition. In addition, the ATSC's recent approval of voluntary guidelines for DTV receivers gives the industry much-needed guidance in which to develop next generation technology. The next big hurdle will come when broadcasters increase their signal power. It's the classic Catch-22 for the industry; the expense of running dual transmission systems is taxing broadcasters' budgets and many claim that it's not financially prudent to broadcast at maximum power with so few digital broadcast viewers. But that could change with the increasing presence of DTV tuners on the market.

Tom Butts
Editor
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LETTERS

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

Those Pesky Consumers

Dear Editor:

I recently read your May 5th editorial "The TV Set in the Bedroom." While I'm not really clear on what point you were trying to make, you sounded like you wanted to say, "...the main problem in the broadcasting industry is those pesky consumers and end-users."

Granted those (analog) TV sets in the bedroom just may be holding up reallocation of that chunk of spectrum, but here's the problem that you, the DTV manufacturers and the Washington lobbyists have: those consumers have a legitimate claim to owning that spectrum. Put another way, does the phrase, "...licensed in the public interest" ring a bell? I'd love to see a show of hands from DTV vendors that have had the thought, "If these stupid consumers would just realize that HDTV is better for them and throw away their SDTV sets, everything would be just fine; we could sell our boxes and everyone's stock portfolio would go back to where it should be."

I'll once again state the dirty, ugly little secret of the HDTV situation that is the bane of the vendors: most consumers can't afford HDTV right now. So the only hope for the vendors is to do an end-run and get the government to force HDTV upon the consumers. After all, the government always knows what's best for the consumer anyway, right ? In a twist of the old classic movie, Fahrenheit 451, perhaps the government could have teams come to consumers' houses and search for what would be illegal analog TV sets. Bet the vendors would like that.

Best regards and keep up the great work,

Charles Farr
Virginia Beach, Va

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HD in 35mm Introduced

WOODLAND HILLS, CALIF.

Panavision recently announced a new camera for electronic cinematography called Genesis, which uses a Super 35mm imaging sensor for compatibility with film lenses and production techniques. Panavision and Sony jointly developed this high-definition camera.

Panavision Genesis

Designed to be about the same size and weight as a Panavision 35mm film camera, Genesis can be docked to a Sony SRW-1 HDCAM-SR recorder for portability. The CCD imaging sensor works in true RGB at a resolution of 12.4 megapixels, and the camera has two 4:4:4 HD-SDI outputs and a 4:2:2 HD-SDI monitor output.

"Digital moviemaking is a reality," said Bob Beitcher, president and CEO of Panavision. "We felt that we should design a digital camera that makes sense to filmmakers."

Development of Genesis was kept secret by Sony and Panavision, where the project was known as NGC for "next-generation camera." The Super 35mm CCD is based on the Dalsa Origin sensor, which was originally developed for medical imaging devices, and the camera permits variable speed recording up to 50 fps.

One of the requirements for the Genesis was that it have the same depth-of-field as a traditional film camera. In addition, Panavision designed it to use all of the company's popular 35mm film lenses, including its Primo line of prime and zoom lenses.

Technology

Remote AquaCam Propels HD

LOS ANGELES

Underwater cinematographer Pete Romano recently dipped his toes in HD. The underwater cinematographer and president of Hydroflex Inc., has shot with film for the past 30 years. Now he's developed the company's new HD Remote AquaCam to help move film shooters into submerged HD video production.

Romano cited issues such as vignetting—when part of the image is cut off from the frame—as a reason for moving to the HD AquaCam.

Pete Romano uses the Aquacam for a hi-def underwater fashion shoot.

"My roots are so deep in film, but I also know there is a changing climate," said Romano, whose DP credits include "The Life Aquatic," "Waterworld," "Pearl Harbor" and "The Italian Job."

The 74-pound HD AquaCam has a watertight housing designed to accommodate several professional cameras, including Sony's HDW-950, F950 and F900 and Panasonic's 24p Varicam. It incorporates a Fujinon HA13x4.5 wide-angle HDTV cine style lens with Preston iris, focus and zoom hand unit controls for the camera.

"The HA13x4.5 is the widest lens out there, and with this special housing, we're able to take full advantage of that," Romano said.

The HD Remote AquaCam was designed to mount on HydroFlex's underwater pan-and-tilt remote head, but because of its elliptical shape, the AquaCam can also be handled and moved through the water easily.

The AquaCam has remote camera and lens controls, allowing shooters to get closer to the subject, and resulting in a clearer shot of the subject. All iris, focus and zoom functions are controlled with the Preston hand unit, which is operated at the surface.

High Definition

FCC GRANTS DTV EXTENSIONS

Although more than 1,000 commercial TV stations have begun DTV broadcasting, some stations still can't meet the construction deadlines. Last month, the FCC considered 35 requests for a third extension of construction deadlines, which require the attention of the full commission.

Four requests were from satellite TV stations, which are full-power operations authorized to retransmit all or part of the programming of a parent station. Since the FCC has deferred the DTV construction deadlines for satellite TV stations pending the outcome of the DTV periodic review proceeding, the commission gave these stations relief from the deadline. The FCC is considering allowing satellite TV stations to "flash-cut" to DTV at the end of the transition.

For 29 other stations granted extensions, a variety of explanations were given to justify the extension. One station's construction was delayed due to problems obtaining a lease for antenna space on New York's Empire State Building after the Sept. 11 terrorist attack. WFUT-DT, Newark N. J., has obtained an STA to operate from an alternate site and is working to install equipment there.

Four stations—KOLN-DT, WAWD-DT, WJHG-DT and KXLA-DT—were granted extensions due to documented problems with tower construction or technical problems with their antennas.

Eleven stations are either awaiting FCC action on construction permit modifications or channel changes, or received authorizations recently and have had insufficient time to complete construction. The commission found that the stations had taken the necessary steps to complete the commission proceeding, but were unable to do so prior to their DTV construction deadline and were entitled to extensions. Fourteen stations were granted extensions due to construction being delayed because of financial difficulty.

According to the FCC, two stations—WBHQ-DT in Sumter, S.C., and WCOV-DT, Montgomery, Ala.—provided little support for their third extension requests. Although the stations asserted that there was a delay in construction, the commission was unimpressed with the support the stations offered to back up their claims.

WBHQ and WCOV were denied requests for unqualified extensions and required to report within 30 days upon release of the FCC Order on the steps they intend to take to complete construction, and the approximate date expected to reach each construction milestone. The stations also have to submit reports detailing construction progress after 60 days and justify any delay in meeting the milestones.

The commission went on record stating that TV stations giving the appearance of dragging their feet with respect to beginning DTV transmission will be placed in a remedial program, with a greater burden to demonstrate the reason for failing to complete their DTV construction. If the affected stations have not completed construction within six months, the FCC said it would issue a "Notice of Apparent Liability" unless the stations can demonstrate that the reasons for non-compliance are "extraordinary and compelling."

Although the FCC did not state that licenses would be revoked, it clearly is interested in turning up the heat on broadcasters deemed to be tardy with their digital transmissions.

Approximately 185 commercial television stations in the U.S.—out of a total of nearly 1,200—are not yet broadcasting a digital signal.

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Sony Cracks the 4K Barrier

New digital projector is the first to meet DCI specification

by Jay Ankeney

HOLLYWOOD

A major milestone in the progress of digital cinema was reached last month when Sony Electronics Inc. gave its first public demonstration of a true 4K digital cinema projector, the SRX-R110, at the Digital Cinema Laboratory in Hollywood.

"We want to help the motion picture industry make the move to digital cinema by following the guidelines and specifications set forth by the Digital Cinema Initiative," said Tom Mykietyn, director of content creation for Sony Electronics.

"One threshold the studios have specified is 4K, or 4,096- by 2,160-pixel digital projection resolution, which will be vastly superior to what a consumer would be able to achieve in their own home theater. This demonstration at the Digital Cinema Lab proves we have finally accomplished that goal," he said.

When the Digital Cinema Initiative released DCI Technical Specifications Version 3.0 last November, the bar for digital projection was raised to a hierarchical architecture approach, with the goal of making a practical 4K resolution delivery system that would also be compatible with existing 2K projectors.

THE HOLY GRAIL

A 4K delivery system is the image resolution level that the DCI members, including Disney, Fox, MGM, Paramount, Sony Pictures Entertainment, Universal and Warner Bros. Studios believe will provide a picture quality that will at least equal—if not exceed—the resolution of 35mm film prints. Several companies, including JVC with its own D-ILA technology, have been giving 4K projection demonstrations at trade shows during the past year, but Sony is the first to do a public exhibition of a working model to the Hollywood production community.

"A 4K projector has long been considered the holy grail of digital cinema," said John Scarcella, president of Sony Electronics' Broadcast and Production Systems Division. "This

SONY, PAGE 21

Disaster

CONTINUED FROM PAGE 1

information in a rush to be first on the air—and is vastly helped by broadcasters who do their homework.

"Last November, some white powder shows up in an envelope in the Washington suburbs and the initial tests are positive for anthrax," Neely said. "But having gone through this before, a lot of us already knew that this often shows up as a 'false positive,' which thankfully and wisely was included in how this [incident] was widely reported by the media. We all do a reasonably good job of alerting the public that there could be a threat out there, but reporting the field tests alone may not be conclusive. And it turns out that [in this instance] it is a false positive. So the public is told there could be a threat out there, but not to worry about it needlessly."

EDITORIAL CONTEXT

Powell, for his part, said he believed the tangible act of providing information, alone, is a useful service.

"Giving out information itself is part of the solution. The mere [relaying] of facts... to people serves a worthy purpose."

Playing devil's advocate, Donaldson asked Powell if the media should simply consider passing on homeland security information to the public verbatim, as it is disseminated by government sources? Powell quickly said no.

"I think editorial context here matters significantly," he said.

The MSRC issued a series of "best practices" in December 2003 for electronic media to adopt in dealing with an array of emergency scenarios, ranging from dirty bombs and other terrorist acts to the upheaval wreaked on local communities from weather disasters. The situations would require fundamentally different reactions from media and government. For example, a bio-terror attack typically would unfold gradually, rather than come as a single cataclysmic event; a chemical or radiological attack could require the public to seek adequate shelter in place rather than attempt to evacuate the danger zone. The Best Practices, among other things, cautions media outlets to be fully prepared for anything that may affect their respective markets in the foreseeable future.

"The key objective now is to have a disaster plan in place, and to rehearse it," Barrett told those attending the June gathering.

Rehearsal is a key to any successful plan, the MSRC has said repeatedly since it was first chartered by the FCC following the events of Sept. 11, 2001. But so far, the warning is falling on deaf ears within the broadcast industry. Barrett said only 17 percent of TV stations and a miniscule 7 percent of radio outlets have actually conducted rehearsals of their own plans. Cable appears to be doing much better, according to MSRC findings, with a 58-percent plan rehearsal rate. Powell has said in past meetings that a plan that is not rehearsed is not yet a plan at all.

RTNDF WORKSHOPS

But some help may be on the way to nearly a dozen major markets in the months ahead, according to MSRC II member Barbara Cochran, head of the Radio-Television News Directors Association (RTNDA). She told the council her group's educational foundation (RTNDF) will conduct 10 workshops starting this month—featuring simulated incidents tailored to each market that will call upon local media, government officials and experts to work in tandem. The fictional scenarios could include chemical, biological, nuclear or radiological events. The workshops will use the resources of the DHS and the National Academies, with some input from MSRC II.

"Too often, emergency planners leave media out of their planning, when, in fact, the public turns to the media for information in an emergency," Cochran said later. "A good and timely flow of information from public health and safety officials to the media can prevent the spread of panic and keep a crisis from turning into a catastrophe."

At press time, the workshops were scheduled for this month in Chicago, in Portland, Ore., in August; Kansas City in September; Philadelphia in October; Miami in December; Austin in January; Atlanta in March; San Francisco in April; Denver in June; and Boston in July 2005. (Check *www.rtnda.org* for specific dates.)

The RTNDA did not mention at the MSRC meeting that it is calling on the DHS to revise some rules mandated by the Homeland Security Act, which encourage people to submit sensitive information directly to DHS about what it calls "critical infrastructure." The direct submission is to ensure that it will not be disclosed to the general public.

"RTNDA's concern is that government is sweeping vast amounts of public safety and security information behind a curtain of secrecy and it will be much more difficult for the public to hold government and businesses accountable," Cochran said.

Photo by Charles Harrington, FCC

At the FCC public forum on homeland security: (l-r) moderator Sam Donaldson, ABC News; meteorologist Topper Shutt, WUSA-TV, Washington, D.C.; Steve Souder, director of Montgomery County, Md., 9/11 Emergency Communications Center; Susan Neely, DHS assistant secretary for public affairs; David Barrett, CEO, Hearst-Argyle Television; anchor Leon Harris, WJLA-TV, Washington, D.C.; FCC Chairman Michael Powell; and FCC Commissioner Jonathan Adelstein.

Similar to Barrett's opening, Powell chose to end the MRSC II meeting with a vague hint of urgency as he noted the second half of 2004—a time frame that includes two political national conventions, Fourth of July celebrations on the Washington Mall and elsewhere, the Summer Olympics in Athens, and the pending presidential campaign and general election in November, among other high-profile events.

"Things are progressing, but they are always too slow. When I look out over this year, I am certainly hopeful, but I plan for the worst," Powell said. "I see some major events that could be trouble." ■

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Field Editing Heats Up

More options mean greater benefits for journalists

by Linda Romanello

NEW YORK

The market for laptop editing has accelerated considerably over the past few years, and companies such as Apple, Sony, Pinnacle, Avid, Thomson and Panasonic have all helped fuel the engine.

Ranging from HD to compatibility with Sony's XDCAM and Panasonic's P2, manufacturers are now delivering more efficient laptop editing systems with greater benefits.

"One of our customers is a journalist who works for CNN," says Avid's David Schleifer, director of broadcast and workgroups. "He was out in a truck in Syria, editing his report on Xpress DV [as the truck was in motion, driving over the rough terrain]. While he was feeding his story back to the studio via satellite, his van was rocking."

Avid actually offers several laptop editing systems. According to Schleifer, "one size does not fit all. Each segment of the market needs that custom fit to get the job done. Xpress DV can be used in a broadcast environment, but it is geared more toward the DV professional. NewsCutter XP is the tool that most journalists rely on. For instance, we focused on the importance of a laptop system that would be able to connect easily into the asset management system being used back in the newsroom."

NewsCutter XP includes effects, audio editing, titling, DV25/DV50 and 30, 40 and 50 Mbps IMX editing, a FireWire interface, and an option for Avid Mojo or Adrenaline for acceleration and HD capabilities.

To extend the HD capabilities of its DNA product line further, Avid introduced DNxHD at NAB2004. Avid products, including NewsCutter XP and Xpress Pro, now include the 10-bit HD encoding technology that enables collaborative HD post production with the same storage bandwidth and capacity requirements as SD files.

MORE POWER

Eric Dufosse, director of product management and marketing for servers and digital news production for Thomson Grass Valley, recognizes the increasing need to have HD ability on a laptop, but also points out that one of the reasons why that's an option today is because the laptops themselves have become more powerful. He also stresses other factors ultimately led to the laptop's growing role in broadcasting, including FireWire interfaces, the migration of hardware-assisted workstations to software-only applications, more features, lower cost, higher storage capacity, easier format conversion, and simplified connectivity and compatibility to newsroom systems.

Thomson's NewsEdit LT features 2D effects, titling and speed. While Dufosse said, "the LT is the fastest laptop editing solution on the market," he also described how partnerships with companies such as Apple and Telestream have helped increase the laptop's flexibility.

Thomson announced at NAB2004 its integration with Apple's Final Cut Pro software and joint technology agreement with Telestream's MAP*one* newsgathering application for WiFi transmission. MAP*one* supports low-data-rate wireless or wired transmissions. It compresses the files so that journalists and producers can edit stories in the field and file them cost-effectively via phone line or Internet access point.

Courtesy Kanaal 3, Belgium

Journalists at Kanaal 3 in Belgium shoot their own stories using DV cameras, then edit them using Avid Xpress DV software.

MOBILE HD EDITING

Apple has positioned itself well as a provider of professional mobile-editing systems. The company offers powerful laptops, such as the high-end Titanium in the PowerBook series, as well as a professional editing system with Final Cut Pro.

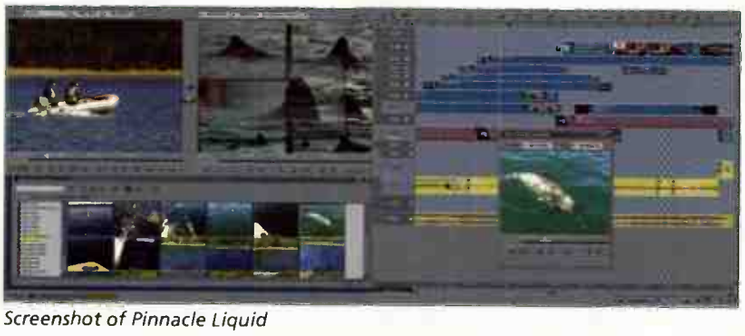
"One of the great advantages of Final Cut," said Richard Kerris, senior director of professional applications marketing for Apple, "is that it can work across platforms—laptop or desktop—and resolutions, making it a flexible option. At NAB this year, we announced Final Cut Pro HD, a bold statement that not only says we're going to talk about HD, but to actually deliver a codec at the very core of Final Cut Pro that enables HD to be used as any other resolution is used."

Final Cut Pro HD delivers the ability to capture, edit and output broadcast-quality HD video over a FireWire cable, without any additional hardware.

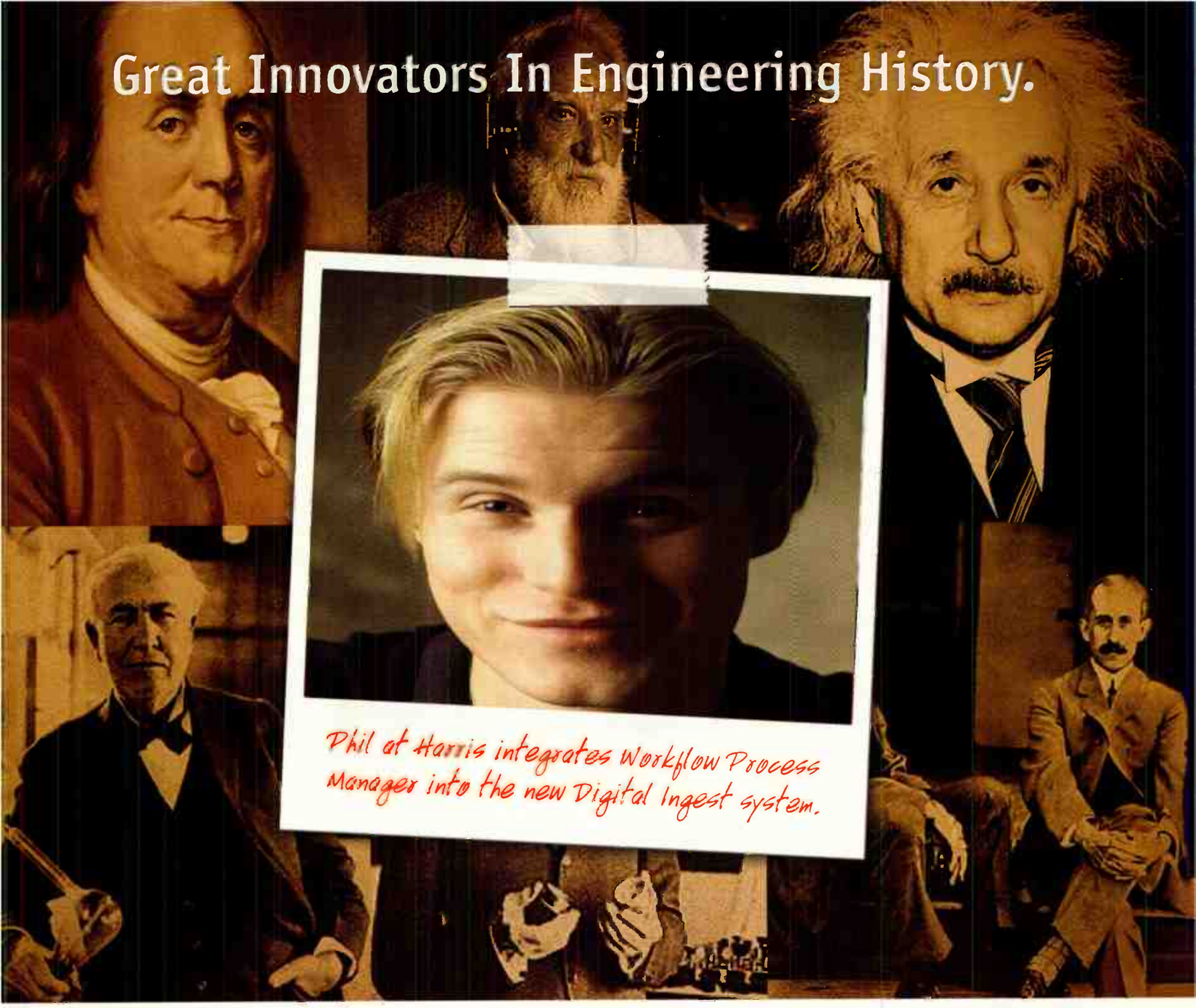
Panasonic has also joined Apple in delivering HD to mobile editing. Along with the announcement of Final Cut Pro HD, Apple and Panasonic jointly announced that they would offer HD over FireWire capabilities to mobile editing with Panasonic's AJ-HD1200A HD production VTR. Offering a FireWire interface and Apple's FCP HD professional video editing software, the system enables mass adoption of HD resolution images on PowerBooks.

Sony has a cost-effective solution for the laptop with Vegas 5 software, from its Sony Pictures Digital Networks division. The latest version offers increased functionality, more specialized features and an extensive audio upgrade. With advanced, real-time scalable production for SD, HD,

EDITING, PAGE 16



Screenshot of Pinnacle Liquid



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HARRIS

Industry Sees HD Graphics Taking Over

Vendors prepare for a shift away from upconversion

by Claudia Kienzle

PARK RIDGE, N.J.

Until now, broadcasters have upconverted standard-definition graphics to high definition because the relatively small HDTV audience did not justify the expense of native HD graphics systems. But, at NAB2004, vendors like Chyron and Pinnacle introduced next-generation HD graphics systems that will enable broadcasters to maintain their high production values, cost effectively.

MOVIN' ON UP

"The issue today is one of 'no compromises,' said Caren Anhder, director of product marketing for Pinnacle's Graphics and Content Delivery division in Rochelle Park, N.J. "Major networks are quickly adopting HDTV for their primetime shows and live sports events. While there were only four HD trucks on the road in previous years, today there are nearly two dozen, largely in response to growing demand for native HD production by major networks. I believe that this time next year, most graphics for HDTV sports will be produced in native HD."

Pinnacle's Deko graphics systems are widely used by CBS Sports, ESPN, Turner Sports, NBC Sports, and USA Sports.

The Deko3000 HD offers real-time performance; internal clip playback with key matte, a "FastAction" keyboard with macro keys for push-button to air; and full effects capabilities, such as shimmers and glows.

"In talking to our customers, we recognized that many were concerned with the workflow inefficiencies of having to create graphics for both 16:9 and 4:3 aspect ratios," Anhder said. "But Deko3000 HD provides tools to address this challenge. It maximizes HD's widescreen without any aesthetic compromises."

RE-INVENTING THE CG

Chyron, which is widely credited with inventing character generators, introduced next-generation products at NAB, including the HyperX multiformat CG platform. The latest Duet model, HyperX uses a high-speed bus architecture with an advanced 3D rendering engine to create stunning, real-time HD graphics. HyperX may be coupled with Clyps-HD, Chyron's new HD graphics clip server.

"ESPN and Fox have mandated that trucks move to Duet. It will be a slow migration, but the trend is underway," said Rich Hajdu, vice president, sales and marketing for Chyron Corp. in Melville, N.Y. HyperX serves as a replacement for the Chyron iNFiNiT, which dominated the CG landscape for more than a decade.

"Unlike the iNFiNiT, where software and hardware were embedded together, Duet products are 'de-coupled' from Lyric, our real-time content creation software," Hajdu said. "This gives everyone flexibility to create their content offline with Lyric, then run them with any Duet."

Lyric converts between SD and HD; and 4:3 and 16:9; and supports more than 25 image file formats.

Chyron also introduced the low-cost C-Mix HD graphics mixer, which enables four video and key pairs plus a video background layer, such as SD animations, clips, stills, and other effects not easily reproduced in native HD, to be simultaneously upconverted to HD.

National Mobile Television (NMT) purchased 10 Chyron Duet LEX Systems configured with the C-Mix option.

According to Jerry Gepner, president of Torrance, Calif.-based NMT, "The combination graphics device and clip player with Internet access could bring more compelling graphics to live productions by providing real-time stats updating, and better 3D animation.

MOVING HD GRAPHICS

Jeff Jonas, senior vice president of Business Development and Production for Sportvision in Chicago, Ill., said that the greatest challenge in doing HD sports graphics is getting rid of clutter on the top of the screen.

"While broadcasters have traditionally placed graphics over the SD picture, the trend in HD sports graphics is to get graphics out of the way of the incredible HD picture. We want to display meaningful information to the fans in an organic manner, [within the video, enabling] the HD picture to stay on the field and on game action," he said.

For ABC's "Monday Night Football" and ESPN's "Sunday Night Football," Sportvision's 1st and 10 and Virtual Rush and Pass Charts produce HD graphics right on the field of play. Also, Sportvision's virtual starting line-ups, half-time stats, and virtual shot charts were produced in HD for the NBA's Western Conference Finals for TNT.

Screen shot of the Pinnacle Deko 3000 HD motion editor

Up until recently, according to Kobi Shina, director of sales for Orad Hi-Tec Systems, Inc., an Israeli-based developer of virtual sets and graphic systems, "the primary focus of the networks has been on building their end-to-end infrastructure for HD. Now that most of the pieces of the puzzle are in place, the interest in graphics is increasing."

Orad's 3Designer authoring and creation software allows users of Orad's Cyber-Graphics live 3D graphics system to create their own 2D or 3D templates without having to employ popular 3D animation packages like Softimage and Maya. 3Designer provides real-time graphics for SD and HD, has an intuitive user interface and works with systems such as iNews and ENPS via MOS and TCP/IP protocols.

"3Designer is ideal for dynamic environments like news and sports, where last-minute changes and quick graphic updates are essential," Shina said. "And rather than being limited to just 2D graphics, 3Designer accomplishes complex 3D graphics, transitions, and animations, as well as changes on the fly, by harnessing the processing power of its Orad's DVG-10 Graphics Computer.

"Many broadcasters are quite satisfied with simply upconverting SD graphics to HD, Shina said. "However, there is already a noticeable growing demand and interest in native HD graphics, including sophisticated 3D, for real-time applications."

CLARITY IN SPORTS

"Broadcasters want SD and HD capability in a single box rather than on separate, dedicated systems, and they want their HD graphics systems to have the same features and flexibility—CG clips, stills and audio—as their SD systems," said Rick Balabuck, director of sales for Los Angeles-based Pixel Power Inc.

Pixel Power's Clarity2 SD/HD system is capable of real-time display of any combination of stillstore images, CG pages with animated text and graphics, externally generated flipbook animations, plus live video inserts, tickers, rolls and crawls.

A dual-channel Clarity2 system is used by Madison Square Garden in New York for displays on its HD JumboTron. HDNet, a 24-hour HDTV cable network, uses a Clarity2 for HD sports graphics but primarily in post production for openings and promotional pieces.

Chyron HyperX combined with C-Mix

While many broadcasters are still upconverting their graphics to HD for live sports, Balabuck said the trend is moving toward generating native HD graphics in the near future. ■

FCC Broadcast DTV Tuner Phase-in Timetable

Based on the FCC's DTV Tuner Phase-In Act adopted last summer, televisions and other electronic devices equipped with over-the-air analog reception technology must also be equipped with ATSC receivers, according to the timetable below.

Televisions equipped with cable plug-and-play cards, arriving in stores now, must also have ATSC reception.

- **July 1, 2004:**
50 percent of TVs 36 inches and above.

- **July 1, 2005:**
100 percent of TVs 36 inches and above; 50 percent of TVs 25-to-35 inches.

- **July 1, 2006:**
100 percent of TVs 25 inches and above.

- **July 1, 2007:**
100 percent of TVs 13 inches and above; All other devices that receive broadcast television signals.

SOURCE: FCC 02-230

Tuner

CONTINUED FROM PAGE 1

Sinclair called for the FCC to define DTV receiver performance standards, but the commission declined. At press time, the ATSC membership was voting on voluntary performance guidelines, which were expected to pass. (See "ATSC Recommended Receiver Performance Guidelines" at right.)

Then last month, Sinclair blessed the latest ATSC reception technology from Zenith, an 8-VSB patent holder and subsidiary of LG Electronics.

To understand Sinclair's trajectory, it helps to know the basics of ATSC reception, a three-stage operation involving not just a tuner, but a demodulator and signal decoders as well. Only the third stage of the process has been nailed down with any consistency.

Ideally, the tuner grabs the desired channel and rejects the rest, but there is concern about how well current devices do the job. The problem lies not in the technology, but with economics and spectrum policy.

Digital tuners are similar to analog tuners, except in price, which is simply a function of volume. Having been fabricated for some 50 years, analog tuners run about $3 to $4 apiece, where a digital tuner may cost $15 to $20, according to Richard Lewis, chief technology officer at Zenith. Additionally, there are two types of digital tuners—single and double conversion.

"What we've seen industry-wide, is people moving away from double-conversion tuners," Lewis said. "They're better at rejecting unwanted signals, but they cost more than single-conversion tuners."

Tuner reliability may be further complicated if the FCC farms out unused TV frequencies, said Bob Rast, president of Linx Pro Electronics, a Palatine, Ill. firm recently purchased by Zurich-based Micronas.

"The more people putting out signals, the greater the risk for interference," said Rast, who's worked on ATSC demodulation for years.

Another problem for tuners involves the simulcasting.

"It's partly a transition issue," Rast said. "in which there's a digital low-power channel next to an analog channel. The analog channels are wiping out the digital channels. If you overpower the tuner, the IC can't fix it."

The IC is engineer shorthand for integrated circuit; in DTV reception, it refers to the demodulator.

The evolution of digital television demodulation will be examined in Part 2 of "Tuner Time" in the July 21 issue of TV Technology. ■

ATSC Recommended Receiver Performance Guidelines

The ATSC's receiver performance guidelines include numerous measurements:

- **Sensitivity:** A transport stream bit-error rate of no worse than 3x10-6.

- **Multi-Signal Overload:** Accommodation of more than one undesired high-level received NTSC and ATSC signal.

- **Phase Noise:** Tolerance of phase noise levels at a threshold of visibility (TOV) of -80dBc/Hz at a 20kHz offset from signal source.

- **Selectivity:** Multiple thresholds for taboo, first-adjacent and co-channel rejection.

- **Burst Noise:** Tolerance of a noise burst of at least 165ms duration and a 10 Hz repetition rate without visible errors.

- **Multipath:** Multiple parameters

- **Smart Antenna Interface**

SOURCE: ATSC Working Draft, Recommended Practice: Receiver Performance Guidelines

CNN Moves Uptown

Atlanta-based news icon goes digital

by Art Daudelin

NEW YORK

In a business defined by deadlines, successfully moving CNN's New York operation from Penn Plaza to the 250,000-square-foot headquarters in Manhattan's Time Warner Center may prove among its most significant achievements. The facility, which went live with CNNfn April 19, had a long planning phase but a comparatively short time-to-air, said Gordon Castle, senior vice president of technology for CNN.

"We've been planning this since 1997, but we didn't hit the installation of the facility until last fall. In just a matter of months, we had to pull together a large and high-tech facility," he said.

CNN's studio in the new Time Warner Center, on New York's Columbus Circle.

TIME-OBSESSED

The challenging time frame meant that integrating the facility was very much a time-obsessed mission, said Keith Jackson, executive project director for the lead integrator, A.F. Associates of Northvale, N.J.

"It was still a construction site last October, and we were always just hours behind the Turner Construction guys," he said. "When they told us we had an area, we were in it, starting to install equipment and pulling cables."

Installing 2.8 million feet of copper cable and 1.5 million feet of fiber in the facility, designed by New York-based Kostow Greenwood Architects, required considerable human resources.

"No matter how many bodies you throw at the project, it's enormous," said Jackson, who had a staff of nearly 100 people.

From the outset, the goal was the deployment of a tapeless facility that would be ready for an HD future.

"We came pretty close to that totally tapeless environment," said Castle, allowing that tape is still used in the field.

To that end, the site boasts such HD-friendly equipment as the Thomson Grass Valley Trinix 512 routers, Sony MVS-8000 series switchers, and Sony HDC 930 multiformat, multiframe rate cameras.

SHARED STORAGE

The Pinnacle Palladium Store 5000 shared storage system for Vortex became the heart of CNN's tapeless initiative. As configured at CNN, the system features 13 TB of mirrored storage in DV25 format. Currently, 49 Vortex I/O devices are in place, segregated as 29 ingest stations/encoders and 20 playouts.

"But that's a flexible number," said David Potter, project manager for the Pinnacle installation.

The mirrored approach is a vital feature, Potter said.

"Ingested SDI video is simultaneously written to both cores," he said. "In the event that we lost a core through a cable or even a core failure, there is no background copying necessary. We continue in real-time streaming to the opposite core."

A Palladium status tool, a real-time status monitoring feature, ensures a constant, high-level view of the system.

Simultaneously, with the high-resolution ingesting, the Vortex I/O encoder also writes low-resolution audio and video proxy with the same mirrored approach.

"This enables users at the desktop level to view material just five seconds after we begin ingesting it," he said.

Integrated into the Vortex news environment is Pinnacle's Liquid Blue multiformat editing system, which was previously used at Penn Plaza.

"We were still in the development stage with servers there, so we had Liquid Blues that went out to tape," said Jeff Polikoff, vice president of Broadcasting Information and Technology for CNN.

As a result, editors gained valuable training ahead of time before the

migration to the Time Warner Center.

"It was basically just a matter of learning the Pinnacle server piece of the work," he said.

LOOK TO HAMLET

For media asset management, CNN turned to Stockholm-based Ardendo and its Digital Automated Recording Tool (DART) application, on the heels of a similar integration project Ardendo had done with Swedish Television (SVT).

"As a Web-based application, it allows anyone with log-in permissions inside our LAN from anywhere in the world to initiate a record on the system," Castle said.

The scalable system can ingest up to 29 simultaneous feeds and enable real-time status updates on all connected workstations, real-time mirroring to tape, and input selection with video routers that include the Nvision NV9000, Philips Jupiter, Quartz Q16XX and others. CNN uses Ardendo's Digital Content Acquisition and Playout (ARDCAP) for digitizing content from videotape.

"In just a matter of months, we had to pull together a large and high-tech facility."
—Gordon Castle, senior vice president, technology for CNN

CNN also looked to Scandinavia some years ago when choosing Vizrt for graphics.

"That was motivated by our desire to do real-time, 3-D graphics as opposed to pre-rendered graphics," Castle said.

The control rooms feature Sony and Samsung monitors, Barco projection screens, Marshall LCD displays, Euphonix Max Air 96-channel audio boards and control room consoles from Deer Park, N.Y.-based Forecast Consoles for control room consoles.

INTEGRATED ENVIRONS

The new facility represents the largest implementation of CNN's Integrated Production Environment concept that also dates back to 1997. At that point, CNN launched new networks built on video servers.

"Issues such as compression formats, media management, and metadata were becoming more commonplace terms within the broadcasting community," Castle said. "It also signified a move to a more complex set of systems."

As a result, the Technology Planning Group was developed with a charter to create and develop a long-range plan.

"We identified that this wasn't going to be a single vendor world," said Castle, who leads the group. "The resulting vision proved a foundation with a common infrastructure of middleware that allows for the integration of multiple pieces of technology, and allows for that technology to evolve over time without having to change everything it touches."

Much of the success of the CNN move uptown, Jackson said, can be attributed to stellar efforts across the spectrum of participants.

"I don't know if it's luck or good planning—most probably a combination of both," he said, "but everything we did fired up perfectly. CNN, Pinnacle, and Forest Electric have all been extremely good. My experience is that it's been a very strong team effort that has made this successful." ■

Reagan Funeral Mobilizes Coverage

Video teams converge on Washington

by Bob Kovacs

WASHINGTON

President Ronald Reagan's recent state funeral drew news organizations large and small to cover an event the likes of which had not been seen here in more than 30 years.

Generating the television coverage meant the convergence of dozens of satellite and ENG trucks into the high-security of the nation's capital. Tailoring it for local stations helped personalize it for viewers around the country. Ali Gorman, a reporter for the Washington-based Medill News Service, prepared videotaped coverage of the funeral procession for TV station WDVT in Clarksburg, W. Va. Her report mixed video of the procession shot by chief photographer Ben Harper with clips of interest to WDVT's viewers.

"I have some sound bites on Reagan from [West Virginia] congressmen that I'll use in the report," Gorman said. "Using WUSA's Newspath feed, I'll send it to WDTV."

News vehicles were in town from stations within a day's drive of Washington, and side streets near the Capitol were a showroom for mobile-broadcast technology.

Network and international news services had to pull things together quickly, although Washington is well-wired for major broadcast events. The BBC had a reporter in front of the Capitol providing live coverage of the funeral procession, with connection services supplied by Al Levin in a microwave truck leased from Diversified Communications in Washington.

Levin used the truck for several international clients and provided bidirectional links using a complicated series of active relays to move the signals between the truck and an uplink center located on M Street in Washington. The international interest was such that Levin, the president of Diversified Communications, was kept hopping.

"We're doing feeds day and night, 24/7," he said.

Across a patch of grass from Levin's truck, BBC reporter Tom Carver ended a report in the ruddy late-day sun as freelance videographer Kevin Beyer broke down the gear and prepared for the next shot.

"We've got a lot of teams out here, but I think it's going pretty well," Carver said. ■

Clockwise from right: Al Levin, president of Diversified Communications, provided satellite feeds for several international clients, including the BBC; a few of the bevy of satellite trucks used to cover President Ronald Reagan's funeral procession; Ben Harper, chief photographer for Medill News Service, stands ready to cover the funeral procession; a camera operator records the procession from the back of a van.

Remembering Ed DiGiulio

by Craig Johnston

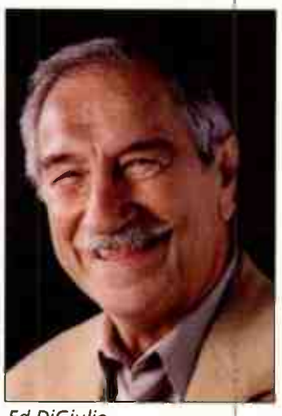
MALIBU, CALIF.

When I began shooting 16mm newsfilm in 1968, the gear was heavy and cumbersome. Ed DiGiulio, who died June 4, changed that.

Ed was one of the motion picture industry's most important and influential technological innovators and a multiple Academy Award winner. His camera-engineering prowess was well known in Hollywood, but he also became a hero to us local news shooters.

In '68, the Bach Auricon 16mm film-magnetic equipment we used was based on a design that must have gone back to World War II and before. We carried around 40 lbs. of equipment (60 with a battery light) on a jury-rigged shoulder mount that you might be able to run with.

But finally the Auricon patent ran out. Ed jumped in. His cameras were "CP-16s," named for his Cinema Products company.



Ed DiGiulio

In a quick succession of versions, he reduced the battery from a 20-lb. lunch-pail size to an insignificant weight cellphone size. He replaced the cigar-box-sized amplifier/mixer in the camera body itself and built the camera itself out of lightweight materials. Then he introduced the reflex viewfinder CP-16R.

Now you had a camera you could use. You could run with it, quickly get it on and off a tripod, put it on the ground, carry it up a ladder. It was revolutionary!

Ed was like that, always listening to the shooters, identifying their problems, building equipment to solve those problems. Under his wing, the Steadicam was designed and built.

My friend Susan Lewis, a 10-year employee, tells me Ed was wonderful to work for as well.

"Even when he had nearly 100 people working for him, not a day went by that he didn't go around and chat with each person working at Cinema Products. He knew what everyone on the assembly line was doing. His door was always open—literally."

A lot of us will miss Ed DiGiulio. ■

Sony

CONTINUED FROM PAGE 8

is what the industry has been waiting for."

The SRX-R110 is a 10,000 ANSI lumen projector built around an SXRD (Silicon X-tal [crystal] Reflective Display) imaging device that is Sony's adaptation of LCOS (Liquid Crystal on Silicon) technology. The 4K projector puts out nearly four times the pixel count of conventional HD displays at a current contrast ratio of 1,300:1, ultimately to become 2,000:1 when the SRX-R110 ships to theaters by early next year.

SXRD TECHNOLOGY

With SXRD technology, pixels are set at a pitch of 8.5 micrometers from the center of one SXRD pixel to the center of the next with an inter-pixel gap of 0.35 micrometer. This removes the crosshatch pattern sometimes seen from digital projectors of lower resolution, even when the picture is projected onto a large screen.

A narrower pitch and thinner gap translate into a quicker refresh rate, which smoothes out the appearance of moving images. During the demonstration at the Digital Cinema Laboratory, a project of the Entertainment Technology Center at USC (ETC), the images from the SRX-R110 were seen on a 39- by 20-foot screen with no visible pixelization at a normal viewing distance.

The 4K projection demonstration included images from the DCI/American Society of Cinematographers Standard Test Emulation (StEM) footage developed as a standard for testing digital cinema projection. Test footage can be downloaded in various resolutions from the DCI Web site, *www.dcimovies.com*.

"A 4K projector has long been considered the holy grail of digital cinema."
—John Scarcella of Sony Broadcast

OTHER USES

The Sony engineers also presented production footage shot on a 65mm Panavision film camera with Kodak 5218 stock, which was processed in Technicolor. Those images were scanned at 6K resolution on a Northlight scanner at 70mm Inc., an IMAX company, and resized to 4K resolution at EFILM in Hollywood. Sony also projected a sample set of 4K still images acquired from a 4K digital still camera.

SRX-R110

"Some of the total system design that will enable practical digital cinema presentations to rival theatrical film delivery and projection depends on finalization of the DCI specifications, including the method of delivering the digital files to individual theaters," Mykietyn said. "Until then, we are supplying the projector from JPEG2000 compressed files generic off-the-shelf, high-definition servers, and are focusing on the projection side."

In addition to digital cinema, the SRX-R110 projector is also suitable for a variety of large venue installations, including live events, simulations, auditorium staging or command-and-control applications, since they are capable of simultaneously displaying multiple high-definition images. In normal operation, the full 4,096 x 2,160 pixel image is typically projected onto a single theatrical screen. In dual-screen mode, two 1,920 x 1,080 images are projected and that resolution is maintained when four 1,920 x 1,080 images are projected in quad-screen mode, making the SRX-R110 suitable for simultaneous high-definition presentations.

The SRX-R110 4K projector is slated to sell for $80,000 (plus $15,000 for the lens) when released in January. Sony will also be releasing a 5,000-lumen SXRD projector, the SRX-R105, selling for $60,000 and recommended for screen widths of up to 25 feet. ■

DIGITAL JOURNAL

Bill Hayes

IPTV Among First to Install ACE

Understanding the driving forces behind PBS's new automation system

JOHNSTON, IOWA

This month's journal is the beginning of a series on a very important project that will be taking place at IPTV—the implementation of the PBS ACE system for master control.

I have been asked several times to explain to our board of directors the concept of the ACE system and how it fits in at IPTV. To understand the concept of ACE, it is helpful to know some of the underlying drivers that led to its creation.

Probably the primary driver for the creation of ACE is the planned migration of the PBS content-delivery system from video and audio to a file delivery system. Since the leases for the nine transponders used in the current satellite delivery expire in October 2006, and given the inherent inefficiencies in the system and the advances made in digital compression, rethinking the delivery model from a real-time audio/video delivery service to a nonreal-time file transfer service just made sense.

Unlike our commercial brethren, PBS is not a network that we join, but a service we purchase with dues. As such, the PBS member stations are a very independent group with a great deal of flexibility in determining when to air PBS-supplied content. Very little content from PBS is aired live from the feed; the majority is shuffled and aired when the local station determines it has the best potential audience. Much of the content will be aired multiple times during the course of a week. This can add a lot of complexity at both PBS and stations.

HYBRID DELIVERY

Thus, out of these factors and a few others, the next-generation interconnect system (NGIS) was born. NGIS takes advantage of the improved digital compression and IT-based technologies to create a hybrid delivery system that includes satellite- and terrestrial-based connections as well as local station edge servers with automation to request and store content. Since most PBS content is delivered weeks in advance of airing, this allows the network operations center to deliver content to the stations using whatever delivery method is appropriate, and to store the content on the local station edge server. If the station plans on airing the content multiple times, the material is merely kept on the edge server and is available when needed. Content for the most part is fed once to all stations and managed locally on the edge server.

STREAMLINING

The next logical layer at the station level is ACE. Originally called the enhanced interconnect optimization project, or EIOP, the idea is essentially to transform the edge server from a PBS store-and-forward server to an all-station content playback server. Integrate this with automation and traffic systems for both local and network content and add a master control system and exception monitoring—now the local operation can be streamlined.

PBS headquarters in Alexandria, Va., the base of ACE.

I first heard about this concept on a conference call. I had been on the PBS engineering committee for about two months. I was at our transmitter site in Fort Dodge, sitting in an SUV in a cornfield, so my mind was pretty open to conceptualizing.

Because of budget constraints, IPTV had been unable to proceed with any of our planned DTV conversion at the studios. What I heard being described was exactly what we needed, and since we had been handcuffed financially, we did not have to deal with any thoughts of how we make this fit in our DTV structure. I offered to implement the system at IPTV as soon as it was available.

PERSONNEL REDUCTION

There has been unrest within the PBS station community over the ACE concept. Not that the concept itself is flawed, but how it will benefit stations has been called into question. One of the potential benefits, which has been overstated in my view, is the potential for personnel reduction. In the initial concept and subsequent refinements, PBS presented the ACE as a potential walk-away master control operation. Using Miranda Probes and a backhaul from the station to PBS headquarters in Alexandria, Va., the PBS folks propose to take over monitoring master control from their NOC and dealing with problems by trouble ticketing from the NOC. The idea appears to be that the operator sitting in master control for an eight-hour shift would go away.

I haven't worked in a station since 1990 where the MC operator sat at the console and watched TV. In the real world, he or she is dubbing spots, pulling tapes, ingesting content, setting up satellite feeds and doing any number of tasks that are still going to happen for some time to come.

So I don't see ACE reducing personnel. I do see it making the job of MC more manageable, especially in an environment like IPTV, where we will be multicasting to nine transmitter sites throughout Iowa.

I briefly mentioned exception monitoring—I don't want to minimize that this is a very different concept than most broadcasters are used to, especially at the general manager level. From an engineering point of view, I'd say most stations have been forced to morph into exception monitoring.

We have all had our staffs reduced and are doing more with fewer people. As that change has happened, the people who are doing more have begun to operate on the assumption that if the alarm isn't ringing, then there's no problem. Therefore, on-air blackness typically won't set off any alarms unless it happens to be in the middle of a program and the GM happens to be watching and wants to know where in the ^%$#^% the MC operator is.

Many stations are doing exception monitoring, but they are doing it without a net, and in some cases without the monitoring.

For exception monitoring to work, all the details have to be right on the front-end; automated systems typically do not deal well with ambiguity. Metadata has to be correct from beginning to end. There have to be failover systems, backup paths and myriad intelligent forethought to deal with the truly unexpected failures. Sales that get put off until the last minute cannot be considered normal operation and therefore accommodated.

So for exception monitoring to work, it has to be embraced at all levels of the operation.

COCKPIT CONCEPT

In the Digital Journal in the July 26, 2000 issue of **TV Technology**, I described my concept of the digital master control using the cockpit concept of a modern jet aircraft. In the fly-by-wire world of high-performance jets, there are too many systems for a pilot or two pilots to effectively monitor and control. The control of the aircraft is therefore under the command of computers.

In jets, there are a couple of multifunction displays (MFDs) that automatically show critical operating parameters and switch to display alarm conditions and correction commands. In the majority of cases, the display is informational because the automation should have already made the appropriate corrective actions.

The idea is to ensure that the operation continues as smoothly as possible, while making sure that the operator knows about the problem.

This is one of the fundamental elements of the ACE system.

I had hoped to be able to offer more detail about the nuts and bolts of the implementation of ACE at IPTV. Unfortunately, since our preliminary meeting with PBS engineering, we have not seen a lot of information on progress. PBS of course was busy with preparation for the PBS engineering conference that took place just before NAB, and then NAB as well. We have put together a preliminary project schedule that will have us operational on the ACE system by Dec. 7, 2004.

Another element that has been added to the mix is that PBS is now evaluating incorporating an archive system into the ACE project. Although this is certainly an important component, we don't see this as anything that will slow down our implementation plans. ■

RF TECHNOLOGY

Doug Lung

RF@NAB: DTV Reception And Interference

At NAB2004, broadcast engineers were focusing on getting ready for the shutdown of analog TV. At past NAB conventions, the date was uncertain. Some engineers believed analog TV would never be shut down, and I don't think anyone thought the Dec. 31, 2006, date set by Congress and the FCC was realistic. The concensus at this year's NAB seemed to be analog TV broadcasting will end sometime in 2009 or 2010. This realization had broadcasters concerned about DTV reception and coverage issues, both before and after the transition. I'll look at some of the papers that focused on these issues this month. Most of them were not in the NAB2004 Broadcast Engineering Conference Proceedings and are based on notes I took during the sessions.

HANDLING CONGESTION

One major concern among broadcasters is how well current ATSC receivers perform in today's congested TV bands. Andy Bater reported on ATSC T3-S10's recommended practice for ATSC DTV tuners, which was sent to the full ATSC group in April. The recommended practice had not been posted on the ATSC Web site (*www.atsc.org*) when this column was written, but here are some highlights from Andy's paper.

Receivers should be able to handle signal inputs ranging from –83 dBm up to –8 dBm. The –83 dBm input is based on the minimum signal level needed for DTV reception. The –8 dBm maximum level was determined by looking at the expected signal level from a UHF DTV station operating at the maximum power the FCC allows—1,000 kW—using an antenna with an elevation gain of 30. The elevation gain is inversely proportional to the elevation beamwidth of the antenna and thus affects the amount of signal hitting the ground close to the tower.

Photo: NAB

Wayne Bretl of Zenith discussed the company's fifth-generation receiver performance.

Andy Bater noted that transmitter performance can have an impact on DTV reception. Many NTSC transmitters put out excessive spurious signals on adjacent channels, making receiver adjacent-channel rejection moot. Also, although there is a phase noise recommended practice for receivers, some DTV transmitters transmit signals with excessive phase noise, eating up much of the margin provided by the receiver. He emphasized the need for broadcasters to emit a clean signal.

When the original DTV planning factors were developed, it was assumed DTV tuners would utilize double conversion receivers. In practice, most are single conversion. Based on this, some of the UHF channel taboos eliminated for interference into DTV tuners may have to be reinstated.

William Meintel addressed this situation in his paper, *Computing Interference under Moderate and Strong Signal Conditions—Proposed Changes to the FCC TV Analysis Model*, which detailed problems with the initial planning factors and inappropriate use of the FCC Bulletin OET-69 and Longley-Rice for analyzing such things as analog transmitter site moves. OET-69 never considered aggregate interference from multiple stations. The desired-to-undesired ratio used in OET-69 assumed weak signal conditions. The antenna elevation patterns that stations actually use, especially LPTV stations, do not match those in the planning model. As Meintel pointed out in a previous NAB paper, the Longley-Rice model overpredicts signal strength under many conditions.

He recommended developing an improved methodology for predicting coverage and interference for use in repacking DTV channels when analog ends. Some of the improvements needed include moderate and strong signal desired-to-undesired (D/U) ratios, taboo channel D/U ratios for DTV and consideration of the aggregate of interfering signals. When looking at interference D/U ratio, the placement of the transmitters should be considered, as the weak signal D/U ratios can be relaxed by 10 to 15 dB for collocated transmitters.

Meintel's paper was not published in the proceedings and he rushed through the recommended D/U ratio slides too fast for me to catch them all. For taboo channel interference offset from the desired channel by 2 to 15 channels, he recommended D/U ratios of –20 dB in strong signal environments and –40 dB in moderate signal environments. In a weak signal environment, the ratios vary depending on the offset.

DTV RECEPTION, PAGE 24

DTV Reception

CONTINUED FROM PAGE 23

Of course, the overprediction of signal level by Longley-Rice poses problems in determining what constitutes a strong, moderate or weak signal level. This problem could be addressed to some extent by including land-use clutter factors in the Longley-Rice calculations or development of a new propagation model.

MSTV PROPOSAL

Victor Tawil described the DTV repacking dilemma in his presentation at NAB. It now appears likely analog broadcasting will be shut down in 2009 or 2010. While this seems like a long time, a lot of work is required to move stations with out-of-core DTV channels back into the core, determine what channel stations with two in-core DTV channels want to keep after the transition and accommodate other channel changes stations may need to make to avoid interference and maintain coverage.

This is not a trivial problem. Tawil used the New York and Philadelphia markets as an example. These markets are close enough that channels cannot be shared between them without creating areas of interference that reduce coverage. There are 43 DTV licensees in the market and five UHF channels assigned for land-mobile use. After the transition, 49 channels will be available if low VHF is included. Tawil asked rhetorically, is there enough spectrum? He said "yes," but warned stations may not have the same service area. Can VHF be abandoned? Yes again, but this will also result in some service reduction.

Other issues have to be considered in repacking the channels, including the accuracy of the FCC database, coordinating DTV channels with Mexico and Canada, and the adequacy of the current interference model.

On May 13, MSTV sent the FCC a five-step process for repacking TV channels after analog broadcasting ends. For details on the plan, check my article in the May 18 issue of my weekly RF Report e-mail newsletter (*http://www.tvtechnology.com/dlrf/issue.php?w=2004-05-18*).

NEXT-GENERATION RECEIVERS

Wayne Bretl from Zenith and Victor Tawil presented an update on the performance of fifth-generation 8-VSB receiver chips in the paper, "Fifth Generation VSB Receiver Field Test Report." Some of these newer chips are able to take advantage of multiple echoes and provide reception, even when the uncorrected signal-to-noise ratio is less than 15.5 dB. Equalizer response has been extended and is now symmetrical, which should greatly improve reception from distributed transmission networks or on-channel boosters, where multiple transmitters may be received at one location, leading to "pre-echoes" that older 8-VSB receivers had trouble handling. Fifth-generation receivers now initialize the equalizer based on channel impulse noise response, reducing acquisition time. The newer chips also have improved capability for handling reflections with higher Doppler rates, making them more suitable for portable and mobile use.

The new chips have improved capability for handling reflections with higher Doppler rates, for better portable and mobile use.

Tawil also presented the field-testing results of the fifth-generation receivers in Washington D.C. The D.C. sites were the same as those used in the testing of the Linx receiver technology reported at NAB2003. The test procedure was similar to the Linx testing—a dipole antenna mounted on a tripod five feet above street level. The tests found that the fifth-generation receiver provided successful reception for 66 percent of the tests, intermittent reception for 21 percent of the tests and no reception in 14 percent of the tests. An error in transcribing the fractional percentages from the presentation or rounding to the nearest full percentage point resulted in the total of 101 percent.

See my July 9, 2003 RF Column (*http://www.tvtechnology.com/features/On-RF/f_dl_rf_technology-07.09.03.shtml*) for details on the Linx tests and procedures. In Washington D.C., the Linx prototype failed in 17.7 percent of the tests, provided intermittent reception in 22.3 percent of the tests and provided successful reception in 60 percent of the tests, compared with failure rates of 62.6 and 63.6 percent for each of two reference receivers. The link for the Linx test report in my June 2003 column is no longer working. It is now available at *http://www.linxelectronics.com/pdf/04-08%20LINX%20NAB%20MSTV%20-%20MSTV.pdf*. Note that these tests were based on an older Linx prototype receiver and newer versions should be expected to provide better reception.

Tawil warned that the sites used for the testing were selected as worst case sites and cannot be used to determine service availability. Based on pictures of the sites in the Linx report you can see he isn't exaggerating!

E-VSB UPDATE

Bretl also reported that based on simulations, adding enhanced VSB (E-VSB) packets to a DTV signal does not offer much improvement in the Brazil A echo ensemble with fourth- and fifth-generation VSB receivers. Adding E-VSB packets to the Brazil C ensemble provided improvement ranging from 20 to 25 percent on fourth-generation receivers, but minimal improvement on fifth-generation receivers. He concluded that recent receiver designs do not need much help from E-VSB—the main benefit is the 6 dB gain in SNR performance on the E-VSB signal itself. Unfortunately, I didn't see any over-the-air demonstrations of E-VSB at NAB this year.

Adding E-VSB packets does improve equalizer convergence, however. In the Brazil C echo ensemble, fifth-generation receiver equalizer convergence time with 5 percent enhanced packets improved from 230 to 83 milliseconds. For the Brazil E ensemble under the same conditions, convergence time improved from 500 to 220 milliseconds. Adding 7.5 to 15 percent enhanced packets improved Doppler performance in early fourth-generation hardware but was not needed with the new demodulators.

That's it for this month. Next month I'll look at some of the new transmission technology at NAB2004 and also give you an update on the performance of low-band VHF DTV. Many viewers and broadcasters responded to my last article with useful comments. One correction: Several CBS engineers alerted me that the CDBS information on WBBM-DT is out of date. The station is currently operating at 3.7 kW with a license application pending. Also, Jack Davis from KTXL-TV in Sacramento pointed out that KCRA replaced its circularly polarized antenna on Channel 3 with a conventional three-bay batwing antenna last summer. He noted the signal at his house increased by 8 dB when they went back to horizontal polarization.

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

MEDIA SERVER TECHNOLOGY **Karl Paulsen**

The Business Case for Asset Management

In the process of planning for a system that will manage media assets, it becomes extremely important to quantify, qualify and clarify what the MAM, DAM or DRM system is to accomplish. When quantifying how well a system is expected to perform, one must determine how the goals will attribute to its *success*. For the remainder of this discussion, focus will be placed on the nontechnical issues of selecting a MAM and DAM system—opening the eyes of potential purchasers and exploring what you should strive for, what to watch out for, and how to be successful in selecting systems. As a set of guidelines for specifying and selecting a MAM or DAM system, the prospective purchaser should consider the following steps.

Carefully define the scope of this digital integration project. Understand that to be successful, a DAM integration project must be of high value and well-bounded. Do not make the system too broad in scope so as to make it impractical to implement.

Establish a project leader that can effectively engage not only senior management (who sign the checks and provide the capital), but also the users. Both management and user must find true value or the system will be doomed to fail. Identifying the intended results is important or the plan may be considered wasteful.

Appreciate that a DAM system is not worth implementing unless the stakeholders understand the benefits to be achieved; senior management will want to see financial rewards and strategic value. Middle management will want to see operational improvements; satisfied users (or customers) and staff and other users will want greater productivity without serious additional effort.

Knowing that the front-end deployment of any new system is painfully time-consuming, the reward comes when the users let it be known "it was all well worth it." The end users, whether internal or external, will expect to see better service as a result of implementation. They get what they want, when they want it and without undue stress and strain on the balance of their needs or requirements.

Recognize that false expectations from promises that cannot be achieved will inhibit the end user's ideas and creativity. Evaluate and test the product before you buy it; thoroughly assess your requirements to determine what and how much you need. Avoid excessive customization; resist the temptation to add special features unless you are replacing a system from which you are unsatisfied (and you knew where the shortfalls were). Customization always costs more, and until you know precisely what you can achieve from the new system, holding off on customized feature sets pending full testing and implementation of the base systems may save costs in the long run. If the selection process has been thorough, application-specific customization may not be a requirement.

KNOW THY USER

Strike an early internal balance between those who will use the system, and those who must maintain it. Get an unbiased view of the entire project; your IT department may lead the project, but they should not direct it. IT people should not force the creative users into a techno stronghold. Additionally, a business-led project may indeed ignore corporate IT needs, such as platform changes for performance, security issues, support and vendor qualifications. Engineering should support the needs of all the parties. Harmonize your internal project team into a working group that is respectful of each others' needs and you will be far more successful.

Define the *system* architecture for the departmental needs of the facility. Understand the scalability of the system and if it will meet both immediate needs and future extensions as well. For example, building a DAM system around only program-length material and ignoring other media objects, such as graphics or interstitials, will eventually paralyze the usefulness of the system. Not being able to index and link subcomponents to master project files will deter fluidity.

Whenever possible, avoid architectures that employ proprietary standards because they may be fraught with long-term problems, unless you are certain the hardware and software vendors will remain stable for the useful life of the DAM asset. Upgrades and improvements for the hardware and software are expected, and routine, but be sure there is a clear migration path to future developments, and that the vaporization of one contributor will not lead to complete system implosion.

Match the facility workflow to the metadata collection processes. Simply ingesting media into the system and ignoring the crucial entry of as many metadata elements as are practical will signal an "end of life" flag from the onset. Metadata is a fact of life, so select a product that is extensible and practical. Understand just how much effort is required for the complete and thorough ingest of all types of digital media.

IT people should not force the creative users into a techno stronghold.

Whether metadata is automatically tagged through scene detection and voice recognition, or manually entered by operators; if the time required to ingest material is limited from a workflow perspective to simple tagging of the house number and EOM/SOM, then why bother with a DAM system in the first place?

GET UP TO SPEED

Provide essential training and documentation for a successful rollout and long-term implementation. As with any software product, if the users fail to embrace it because they weren't trained or allowed sufficient "get up to speed" time—the products will turn into shelfware. Development and enforcement of internal policies, the creation of a users' forum for tips and practices, and keeping the lines of communication open between the user and middle managers will lead to success.

In conclusion, coming full circle once again, management should have already defined what "success" means before the selection process is finalized. If the goals are not set and displayed, if the users and staff do not understand what is supposed to be achieved, and if the criteria for operations cannot be met, it will be impossible to reach success. A DAM or MAM system is not just about technology, it is about workflow—successful and improved workflow.

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

Photo: Steve Jordan

NET SOUP

Frank Beacham

Mobile Videophones Meet TV News

This year we've experienced the power of one of the most significant new developments in TV technology since the arrival of electronic newsgathering a quarter century ago. It arrived—not on the floor of NAB—but from a grim prison in Iraq called Abu Ghraib.

We all know what we saw, but it was the *how we saw it* part that has huge implications for the future of broadcast news. A new generation of digital imaging—both still photographs and motion video—coupled with wireless access to the Internet, is already making its mark on history.

Anyone with a digital camera, a Web site and the ability to stream images can now command global attention. The graphic video of the beheading of Nicholas Berg, an American in Iraq, was dramatically "broadcast" to the world via an al Qaeda-linked Web site. It became an instant global "TV channel" with view ratings through the roof!

INSTANT JOURNALISM

In the 1970s, the portable video camera usurped the 16mm film camera as the key tool of television journalists. In the past decade, cheap DV cameras transformed ENG once again.

Now we are entering the era of the mobile videophone, a technology so potentially powerful that anyone can become an instant journalist. Images can be revealed throughout the world in a matter of minutes.

The good news is that cheap digital cameras, combined with easy Internet access, has the potential to democratize the newsgathering process. What many of us had prematurely predicted would happen with the invention of the Sony "Portapack" video system in the 1970s has finally come about.

Those whose job it is to keep secrets are rushing back to the drawing board. Donald Rumsfeld is one who comes to mind. In his testimony before congressional committees, the defense secretary said that the flood of pictures was now beyond the control of U.S. authorities.

"We're functioning with peacetime constraints, with legal requirements, in a wartime situation in the Information Age, where people [carry] digital cameras and taking these unbelievable photographs and then passing them off, against the law, to the media, to our surprise," Rumsfeld lamented.

Video shot on Nokia cellphones is now being broadcast.

On the other hand, Rumsfeld admitted that he had not realized the seriousness of the abuse allegations in the prison until the pictures were released. Whether one believes that statement or not, isn't the revelation of such conduct by operatives of the U.S. government the essence of good journalism?

A broadcaster who has not missed this coming sea change in newsgathering technology is the BBC. Earlier this year, the "beeb" outfitted about 40 of its reporters with Nokia mobile videophones that enable them to e-mail still and motion video with audio back to news headquarters via GPRS.

The reporters are using the same Nokia 3650 phones found at many U.S. mobile phone stores. However, these phones have been outfitted with special software from Philips that allows the handsets to record up to 15 minutes of video. When finished, the reporter simply transmits the pictures to the BBC in London.

Both Philips and the BBC acknowledge the enormous potential of newsgathering using standard mobile phones. Journalists in the field covering breaking stories can now send video reports back from difficult or remote locations. Though the image resolution is low, the technology works well enough for breaking stories where time-to-air is paramount.

The enabling software developed by Philips for the BBC is part of the company's multimedia platform for next-generation mobile phones. In fact, a main objective of Philips Software, an autonomous business group within Royal Philips Electronics, is to develop and market multimedia capability in a range of consumer products.

On its instant newsgathering technology, Cees Geel, director of marketing and sales director of Philips, said: "The BBC is well known for continually striving for the highest possible picture and sound quality...we are confident that experience gained from this application will rapidly lead to further innovative developments."

The BBC is betting the value of the news it breaks first using videophones will give it an edge over competitors. The news service has already scored scoops of breaking stories—one involving a Welsh bus accident—simply because a producer equipped with a Nokia phone got to the scene earlier than camera crews. During a recent trip to the U.K., President Bush even got a taste of the technology when his motorcade was followed though rural areas on mobile phones.

NEWS BY NOKIA

Nokia, the cellphone maker, certainly hasn't missed the compelling idea of placing its wireless cameras in the hands of millions of would-be journalists. It has just upped the ante by introducing the Nokia 7610.

Shipping now in Europe, Africa and Asia-Pacific (but not the U.S.), this phone includes the ability to capture, print, edit, store and send still pictures and videos wirelessly via the Internet.

Using its integrated megapixel camera, the 7610 not only records video, but allows users to edit scenes and add special effects such as music, text, new colors or moving objects to the "movie." It can also be used to e-mail images or transmit them via Bluetooth to computers, printers and—using the phone's Kodak Pictures application—to a virtual photo album on the Web.

So far, the BBC is the only major news organization to publicly announce its use of mobile videophones for on-air reporting. Though they have been quiet, we can't imagine that U.S. news operations are asleep at the wheel on this one.

No doubt that caution will change as the technology improves (and you can bet it will) and a few aggressive and enterprising young journalists start beating big news organizations at their own game.

Frank Beacham is a New York City-based writer. You can contact him through TV Technology.

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ATSC OUTLOOK

Jerry Whitaker

Advanced Audio Coding Moves Forward

The ATSC has published two new Candidate Standards documenting enhancements to the AC-3 digital audio compression standard and specifying its use in digital television. This is a major step toward using advanced audio coding for a wide variety of applications.

Enhanced AC-3 will provide the industry with expanded audio capabilities that can be used for broadcast, cable, satellite and DVD applications. It is another example of the continuing efforts to evolve ATSC standards to respond to marketplace requirements.

ATSC first standardized the AC-3 digital audio system in November 1994. AC-3 (known in the marketplace as "Dolby Digital") is now widely used in digital television systems around the world. The enhancements to AC-3 (E-AC-3), which will be marketed as "Dolby Digital Plus," are in two new documents:

CS/T3-613, which adds technical specifications to the ATSC Digital Audio Compression Standard (A/52) that can be used with a variety of media. The document details features that could be relevant to ATSC television systems, and also specifies features likely to be used in other (non-ATSC broadcast) applications. These features are being documented in A/52 because that standard is the fundamental source document for AC-3 and is relied upon by other (nonbroadcast) industries. Including additional features in the Enhanced AC-3 specification will enable its use in other applications, indirectly benefiting the ATSC digital television system.

CS/T3-614, which describes additions to the ATSC DTV Standard (A/53) that specify use of E-AC-3 in the Enhanced VSB (E-VSB) robust transmission mode currently under development in ATSC. The E-VSB mode would allow broadcasters to trade off throughput for robustness. With an E-VSB transmission, some of the approximately 19.4 Mbps data is allocated to the robust mode and the rest is allocated to the normal 8-VSB mode. The robust mode symbol stream includes additional *forward error correction* bits to improve reception under weaker signal and stronger multipath (ghost) conditions.

Enhanced AC-3 was submitted to the ATSC for consideration by Dolby Laboratories in response to a Request for Information published in December 2002. E-AC-3 offers new coding tools that fundamentally improve performance, as well as new features that allow operation over a wider range of bit-rates and numbers of channels. Of great importance to the industry, E-AC-3 can be converted into AC-3 for playback compatibility on consumer's existing A/V decoders.

ABOUT E-AC-3

Enhanced AC-3 builds upon the current version of AC-3 specified in ATSC Standard A/52A. All decoders for the enhanced version will also decode all legacy A/52 AC-3 bitstreams. In addition, although the new enhanced audio format is not directly compatible with current A/52 decoders, it is feasible to perform a modest-complexity conversion into a compliant A/52 bitstream syntax, thus enabling backwards compatibility to legacy decoders that have S/PDIF bitstream inputs. This capability is critical to support the 20 million 5.1-channel Dolby Digital decoders now in the U.S. market. (There is already a large installed base of home theater systems incorporating multichannel sound, more than 30 percent of U.S. households according to a CEA survey in January 2003). This compatibility, in fact, was one of the key deciding factors on the part of ATSC contributors in selecting this system. Important technical capabilities of Enhanced AC-3 that relate directly to ATSC broadcast applications include:

Expanded data rate flexibility: E-AC-3 allows the number of blocks per sync frame and the number of compressed data bits per frame to be adjusted to achieve significantly more data rate flexibility than standard AC-3, including a greater maximum theoretical data rate and finer data rate granularity.

Spectral extension: Enhanced AC-3 decoders support a new coding technique called *spectral extension*. Like channel coupling, spectral extension codes the highest frequency content of the signal more efficiently. Spectral extension recreates a signal's high-frequency spectrum from *side data* transmitted in the bitstream that characterizes the original signal, as well as from actual signal content from the lower-frequency portion of the signal. Because it may be desirable in some circumstances to use channel coupling for a midrange portion of the frequency spectrum and spectral extension for the higher-range portion of the frequency spectrum, spectral extension is fully compatible with channel coupling. Both tools can be enabled at the same time, for different portions of the frequency spectrum.

Transient pre-noise processing is an optional decoder tool that improves audible performance through the substitution of audio segments just before transients to reduce the duration of pre-noise distortions. This technique is called *time-scaling synthesis*, where synthesized PCM audio segments are used to eliminate the transient pre-noise, thereby improving the perceived quality of low bit-rate audio-coded transient material. To enable the decoder to efficiently perform transient pre-noise processing with no impact on decoding latency, transient location detection and time-scaling synthesis analysis is performed by the encoder and the information transmitted to the decoder. The encoder performs transient pre-noise processing for each full bandwidth audio channel and transmits "helper" information once per frame, only when necessary (for example, when transients are present that will benefit from the technique).

Adaptive hybrid transform processing: In 1995, the transform employed in A/52 AC-3—based on a modified discrete cosine transform (MDCT) length of 256 frequency samples—provided a reasonable tradeoff between audio coding gain and decoder implementation cost. With continuing advances in silicon manufacturing processes over the years, the integrated circuit complexity that constitutes a reasonable level has now increased. This increase in chip performance provides an opportunity to improve the coding gain of AC-3, and hence perceptual audio quality at a given bitrate, by increasing the length of the transform. This is accomplished through use of the Adaptive Hybrid Transform (AHT), which adds a second transform in cascade in order to generate a single transform with 1,536

frequency samples.

Enhanced coupling. This is a new tool that improves the imaging properties of coupled signals by adding phase compensation to the amplitude-based processing of conventional coupling. Prior to downmixing the coupled channels to a single composite signal, the encoder derives both amplitude and additionally interchannel phase information on a sub-band basis for each channel. The phase information includes a decorrelation scale factor as a measure of the variation of the phase within a frame. This sidechain information is transmitted to the decoder once per frame. The decoder uses the information to recover the multiple output channels from the composite signal using a combination of both amplitude scaling and phase rotation. The result is an improvement in soundstage imaging over conventional coupling. This improvement allows the technique to be used at lower frequencies than conventional coupling, thus improving coding efficiency.

Additional features of E-AC-3 of particular interest to applications outside of DTV include:

Channel and program extensions: The enhanced AC-3 bitstream syntax allows for time-multiplexed *substreams* to be present in a single bitstream. With this capability, the enhanced AC-3 bitstream syntax enables a single program with greater than 5.1 channels, multiple programs of up to 5.1 channels or a mixture of programs with up to 5.1 channels and programs with greater than 5.1 channels to be carried in a single bitstream. These extra channels do not affect a two- or 5.1-channel decoder in ATSC broadcast applications.

Sample-rate processing: Additional metadata is reserved for applications that involve source material sampled at two times the nominal rate, such as 96 kHz and 88.2 kHz.

Mixing control processing: Additional metadata is reserved for applications that involve the mixing of two program streams. These applications require control of the mixing process and resultant dynamic range control metadata; this feature reserves data capacity to accomplish this task.

THE SPECS

The Enhanced-AC-3 Candidate Standard specifications can be found on the ATSC Web site, specifically:

CS/T3-613, which documents revisions to the ATSC Digital Audio Compression Standard (A/52) and can be used with a variety of media.

CS/T3-614, which describes additions to the ATSC DTV Standard (A/53) that specify use of E-AC-3 in the E-VSB robust mode currently under development in ATSC.

These new Candidate Standards complement three previously published Candidate Standards relating to E-VSB:

CS/T3-608 and **CS/T3-609** document transport stream specifications for the use of advanced video codecs in the proposed E-VSB mode.

CS/T3-606 specifies changes in the ATSC PSIP Standard (A/65) for use with E-VSB.

The candidate standard stage recognizes that a specification has reached a level of technical maturity that would benefit from implementation experience and technical feedback. After the candidate standard period ends, the document typically moves on to the next approval stage on its way to becoming an ATSC standard.

Candidate standards, along with all other ATSC standards, recommended practices, Implementation Subcommittee findings and related informational documents, are available at no charge from the ATSC Web site, *www.atsc.org*.

Jerry Whitaker is VP of Standards Development for the ATSC. You can reach him at tvtech@imaspub.com. *Background technical information for this article was contributed by Dolby Laboratories.*

TECHNOLOGY CORNER — Randy Hoffner

Lamps for Microdisplay Projection

We have recently taken a look at some of the older and the newer ways television pictures are shown, considering both direct-view displays and projection displays. It is fair to say that one of the strong trends in the television display business is the increasing proportion of projection displays being purchased.

Traditionally, television projector engines for home use, which until recent years constituted a relatively small niche market, were cathode-ray tube projectors. This circumstance itself served to limit the market for home projection displays because the inherent light output of the CRT projector tubes caused the projected images to be rather dim. Moreover, the light losses caused by a translucent display screen almost compelled them to be used in front-projection systems, which put the projection engine into the viewing room.

The emergence of backlit, liquid crystal microdisplay-based projection engines has served to make these projection systems more practical for a home living room environment,

A UHP lamp emits broad-spectrum light suitable for projection.

enabling them to produce satisfyingly bright pictures. The LCD projection engine's high performance is in no small part due to the use of the ultra-high-pressure (UHP) mercury lamp as a light source.

Large projectors, including both film projectors and DLP micromirror projectors used in cinema theaters, utilize xenon lamps. Xenon is one of the inert gases, known to early chemists as the "noble gases," whose electron orbital shells are filled with electrons, making them chemically inactive. They can, however, be excited into luminescence by passing an electrical current through them.

Xenon lamps, like mercury lamps, are arc lamps, in which an electrical current is used to strike an arc across a gap between electrodes in a gaseous medium. A form of xenon lamp is used for automobile headlights: we have all seen those cold, blue-looking, beaming headlights on expensive luxury cars. Xenon lamps have the advantage of emitting a broad spectrum of light with a color temperature near 6500K, the precise color temperature specified for the white point of professional video monitors. They have the disadvantage that their operation requires considerable control circuitry.

UHP lamps are also arc lamps, the arc being struck through an atmosphere of mercury vapor. They are, in fact, highly sophisticated fluorescent lights.

THE VAPORS

We recall from our discussion of plasma display panels that the plasma cells, which are tiny fluorescent lamps, operate by striking an arc that generates a plasma of mercury vapor. When mercury vapor is sufficiently excited that some of the outer electrons that normally orbit the mercury atoms are stripped of their associated atoms, an electrically and magnetically active cloud of mercury ions and free electrons is created. The energy exchange that occurs during this process of mercury atoms losing and regaining their orbital electrons in the plasma state—the absorption of electrical energy that causes the electrons to break free, and the re-emission of energy when the electrons rejoin their atoms— causes the plasma to emit ultraviolet light. Ultraviolet light is not visible to humans and, in fact, short wavelength or "hard" ultraviolet light is harmful, causing sunburn and eye damage. However, in a fluorescent lamp, the outer shell of the lamp is coated with phosphors that absorb ultraviolet light and re-emit this energy as visible light. One of the physical principles at work here is that phosphors typically emit radiation at longer wavelengths than they absorb. This is a quantum mechanical phenomenon: an electron in orbit around a phosphor atom absorbs a quantum of energy in the form of a photon of ultraviolet light, raising its energy level to a discrete higher state. When the electron falls back to its initial energy level, it releases a quantum of energy in the form of a photon of visible light.

Ordinary fluorescent lamps operate with mercury at low-pressure levels, which causes the mercury plasma to emit a large percentage of its radiation in the short ultraviolet wavelengths, around 254 nanometers. This, in combination with the phosphors used, cause the low-pressure fluorescent lamp to emit much of its energy in the blue and green regions of the spectrum, and very little energy in the red region. Although this is highly efficient as a generator of illumination because the human visual system is highly sensitive to green light, it does not generate a desirable spectral content for image reproduction. Phosphors in low-pressure mercury lamps do not emit a wide spectrum of light. Rather, a given phosphor emits photons of a specific frequency, causing light output to be a rather thin spectral line. Light of the desired spectral content must be generated by mixing phosphors that will emit the required spectral lines.

Under higher pressure, mercury plasma emits a relatively higher percentage of its light in the longer wavelength ultraviolet region, at about 365 nanometers. This, combined with the proper phosphors, causes the lamp to emit more light in the red spectral region, which forms the basis for "color-corrected" fluorescent lamps.

UNDER PRESSURE

Fluorescent lamps typically operate at rather low pressures of a few atmospheres; UHP lamps operate at pressures above 200 atmospheres. The scuba divers reading this know well that an atmosphere, corresponding to standard atmospheric pressure at sea level, is about 14.7 pounds per square inch. 200 atmospheres is then about 3,000 pounds per square inch.

The extremely high lamp pressure is important to achieve the desired light output, because not only is more red light emitted at the higher pressure level (above 200 atmospheres, about 20 percent more red light is emitted than at 150 atmospheres), but also at such high pressures the nature of the emission spectrum is more continuous and less a combination of a few atomic spectral lines.

Fluorescent lamps operate on alternating current. While the operating voltage requirement for a small-arc UHP lamp is low, a much higher strik-

PROJECTION, PAGE 32

INSIDE AUDIO — Dave Moulton

Revenge of the Couch Potato

Our Story To Date. Alert readers may recall my recent concern with the variance in audio levels as experienced by us home viewers. In my last piece on this issue ("Metadata in the Home: A Case History," March 10), I discussed my own personal "couch potato" history.

If you recall, I told you I couldn't make the system work perfectly (the set-top box from Scientific Atlanta and my Bang & Olufsen Avant TV did not successfully communicate regarding the presence or absence of digital audio, requiring me to restart the TV any time I wished to enjoy digital, as opposed to analog, sound). I also noted that there was essentially no information about the Dolby metadata system available from either the set-top box manufacturer or the cable service provider, in this case Charter Communications.

These things, in and of themselves, are not an overwhelmingly big deal. They are annoying, and they make it fundamentally impossible for me, as the end-user, to optimize my system.

In all fairness, the net effect is not all that bad—the analog sound isn't significantly worse than the digital sound, particularly in the face of the overall broadcast audio quality (which is okay but not great), and the lack of information about metadata reduces the potential for the system to some degree, but does not render it totally useless. I have confidence that the technology will settle out eventually and the long-promised capabilities will be there.

DOLBY'S LM100 METER

Through the good offices of Jeffrey Riedmiller of Dolby Labs, I was able to borrow a Dolby LM100 level meter to measure the actual *dialnorm* metadata values and LeqA levels of my particular installation, and have now collected a fair amount of additional information about the whole system. I spent several days channel surfing and getting a real feel for how the TV audio system works in terms of levels, using the same measurement instrument recommended for all content producers and service providers.

I haven't yet begun to measure the differences in level between commercials and program material, so I won't go there today. However, I took a lot of measurements of all the channels, analog and digital, using both RF mode and line mode, and also observing the direct RF cable feed.

I took a lot of measurements of all the channels, analog and digital, using both RF mode and line mode.

EARLIER MEASUREMENTS

This all follows some informal measurements I made about a year ago, where I simply took quick relative average level readings from all channels, and was appalled to discover that the range of observed levels was about 18 dB; the standard deviation was about 5 dB (this suggests that approximately one-third of the levels varied more than 5 dB from the average). These measurements correlate well with studies by Jeffrey Riedmiller and others at Dolby, as well as work by Michael Guthrie at Harmonic Inc.

Clearly, there was a problem a year ago. Sadly, there still is.

You all recall dialnorm, right? It's a metadata calibration value and is supposed to be set at the A-weighted

DIALNORM, PAGE 33

LET THERE BE LIGHTING

Andy Ciddor

Color Temperature: The Battle Rages On

There are a formidable variety of correction filters available to aid us in the battle of the color temperature. In their simplest applications, correction filters are intended to adjust the color temperature of full spectrum (black body) light sources to match shooting conditions and available light sources. Color Temperature Orange (CTO) filters shift the color temperature downwards and Color Temperature Blue (CTB) filters shift the color temperature upwards.

In theory, full CTB is intended to shift a standard 3200K incandescent studio lamp up to 5700K (the color of summer sunlight), while a full CTO is intended to shift 5700K daylight down to match 3200K incandescent lamps. In practice, no two brands of CTO and CTB filters are the same and are not always safely interchangeable.

Here is a test that you can perform in the privacy of your office. Take a piece of full CTO filter and a piece of full CTB filter, place one in front of the other (the order is unimportant) and look at a white surface through the combination. What you should see is the white surface, but at reduced brightness (the same effect as a neutral density filter).

What you probably also see is a color shift in the white surface due to the upwards and downwards color temperature corrections not being equal. The results of an in-depth survey (picking up the two swatch books laying within arm's reach on my desk) revealed that the filter book with the yellow cover produces a noticeably warm gray, while the one with the blue cover produces a slightly green gray. Doing this test between different brands of correction filter produces even more interesting evidence of color inconsistency.

THE VALUE OF MIRED

On closer examination, the specifications for the different brands of filter quote different correction factors, despite giving very similar descriptions of the filter's functions. Color correction factors are usually quoted in Mireds, a measurement system with long history in color photography. Mired is an acronym for Micro Reciprocal Degree, a measurement derived by dividing one million by the color temperature in Kelvin. For example 3200K is 313 mired (1,000,000 ÷ 3200) and 5700K is 175 mired (1,000,000 ÷ 5700). Therefore the filter needed to correct from studio incandescent to summer daylight is 137 mired and the reverse, from 5700K to 3200K, requires a -137 mired filter.

Mireds have proved really valuable for selecting correction filters. Although the color temperature shift produced by a filter is dependent on the color temperature of the light source it is correcting, the mired shift for that filter is always the same. The CTB correction from 3200K to 5700K produces a 2500K (–137 mired) shift, however the correction from 3600K (278 mired) to 6100K (164 mired) is also a 2500K shift, but its mired shift is –113, which equates to a Lee 3/4 CTB filter. One of the major benefits of using mireds is that you can add and subtract mired values to get the mired shift needed for a particular job. Surprisingly enough, a Cinegel 1/2 CTO correction (81 mireds) has the same effect as combining two Cinegel 1/4 CTO corrections (42 mired), and a Lee 3/4 CTB (–112 mired) is equal to combining a Lee 1/4 CTB (–35 mired) with a Lee 1/2 CTB (–78 mired).

If the notion of mireds is new or unclear, you can go to TV Technology's Web site (*www.tvtechnology.com*) and download an MS Excel spreadsheet that I prepared to go with this article. The spreadsheet will give you the chance to play with mired and color temperature values, and experiment with different filter and light source combinations.

In practice, there is rarely a circumstance where a single off-the-shelf filter will solve the mismatches between lightsources. Our 5700K daylight reference point of northern hemisphere summer sunlight is almost never the actual color temperature that we need in our pictures. If our shot is not in direct sunlight, or not in the middle of the day, or not in the summer time, then using a Readhead or a tungsten camera light for fill on a daytime shot, we usually require more correction than that offered by a single full CTB. A Double CTB (–260 mired or –274 mired, depending on where you shop) kicks your color temperature up into the 10,000K range.

NO STANDARD DAYLIGHT

On the other hand, if there is effectively no such thing as "standard daylight" outside a standards laboratory, how can we rely on an HMI or other Metal Halide "daylight" source to provide the appropriate fill in for our daylight shots? The answer of course is that we can't use "Metal Halide daylight" straight from the can: we have to spice it up a little to make it work.

Other than direct sunlight, which can range from 1500K at dawn/sunset to around 5000K in the middle of a summer's day, the majority of daytime light comes to us via reflections off clouds, the sky and everything else around us. The huge blue sky component of this reflected light can easily shift the color temperature up into the 10,000K to 16,000K region. This is what we are unconsciously adapted to seeing in a picture—a warmer key source of sunlight, filled in by much cooler sky light.

If we don't follow this pattern in our own lighting setups, we can produce a look that our audience will identify as artificial, even if they can't pinpoint the reason. The daylight fill that we add to a typical talking head shot should probably be at least a thousand or two cooler than the prevailing key source. It may seem a little odd at first to be correcting daylight sources with daylight filters, but this is the mark of an enhanced, naturalistic picture.

When dealing with conversions (in either direction) between tungsten light and daylight, be very wary of relying on the labels on the lamps or filters. Just because it's labeled "Daylight" doesn't mean that it will do the job for you in all circumstances. Your eye, or better still a color monitor, will give you a good indication of whether or not you are within the right color-temperature ballpark.

Applying a layer of CTO over a window so that you can use tungsten light for an interior shot often results in the window looking way too blue. The chances are that the light coming through the window is well above the 5700K for which CTO is intended to correct. Try out a full CTO combined with a 1/4 CTO for a healthy 220+ mired conversion that will deal with 12,000K skylight. If the shot shows that you are looking through a window, be careful to leave the exterior looking just a little bluer than the interior, because that's what the audience expects to see.

Despite the numbers and the formulae, color temperature correction is much more of an art than a science. The numbers are a big help in looking for the right solutions. However they rarely provide you with answers that will look great, rather than merely adequate, in your pictures. Becoming an artist with color temperature correction firstly involves very careful observation of the way light behaves in the world. Next, grab a camera, a few lights and a selection of conversion filters and try some looks out for yourself. It's only then that you discover tricks like using uncorrected tungsten for fill in the last fleeting moments of a sunset.

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.

Projection

CONTINUED FROM PAGE 30

ing voltage must be used to shock the mercury atoms into the luminescent plasma state when the lamp is first ignited.

To generate the very high luminance in the small beam of light required by a liquid crystal microdisplay, the lamp's arc must be quite short. Current UHP lamps have arc lengths of about one millimeter.

The largest factor contributing to the demise of such a lamp is the danger that the tungsten that has evaporated from the lamp's electrodes condenses on the cooler wall of the lamp's shell, reducing emission efficiency (or efficacy, as lamp engineers would say) by blackening the walls of the arc tube. To prevent this from happening, an amount of oxygen and bromine is added to the lamp atmosphere. This causes the atoms of the tungsten vapor to react chemically with the oxygen and halogen to form oxybromides in the colder regions inside the lamp.

To give an idea of the parameters for a UHP projector lamp, we will look at an example of a 120 W Philips lamp for LCD projection:

Lamp current	2.0 A.
Lamp voltage	65 V.
Ignition voltage	5 kV.
Shell type	Borosilicate glass
Arc gap	1.0 mm
Luminous flux	7000 lumens
Color temp.	7600K
Rated life	6000 hours

Specifications in the Philips data sheet were obtained from Lamptech Co., U.K.

This is the current state of the art in projection lamps for liquid crystal displays. It is interesting to note that in addition to electronics, our examination of displays has involved the sciences of chemistry, physics and quantum mechanics.

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

Dialnorm

CONTINUED FROM PAGE 31

power-based average of dialog level (aka "dialogue LeqA"). The default setting that Dolby ships it with is –27 dBFS, and the level at which *no* attenuation occurs is –31 dBFS, the lowest level it can be set. The content producer is *supposed* to set it at the same level as the measured dialog level.

On the digital channels with dialogue where dialnorm is present, I measured dialog levels ranging from –40 dBFS LeqA to –17 dBFS LeqA. Unfortunately, I measured only two dialnorm settings: –27 dBFS (the default, encountered on 75 percent of the channels measured) and –31 dBFS, the setting that defeats *any* static attenuation via metadata.

This is bad news indeed. Only three out of 28 measured channels were correctly set within a dB, and only 10 made it within ±3 dB! Further, I suspect these were mostly due to dumb luck. Meanwhile, seven channels were more than 10 dB off! Seventy-five percent of the content producers aren't bothering to even set metadata values, and those that are setting it are setting it to a level where it is supposed to do nothing, which is to say they are in essence attempting to defeat the system! In fact, the system is defeating them, by miscalibrating their levels by the amount of the error.

As our visually-oriented friends might say—it ain't a pretty picture!

THE GOOD NEWS

It's not all bad, though. On the analog side of things, levels from my provider, Charter Communications, have gotten significantly more consistent. A year ago the range of levels of the measured analog channels was 14 dB, and the standard deviation was about 3 dB. Today those level ranges have been reduced significantly, for a range of only 7 dB and a standard deviation of only 2 dB—much, much better! Not only that, but it is also good enough to be really acceptable! There's not much need for further improvement in this realm.

So, there's hope. A little attention to levels can actually make a significant improvement.

Dolby LM100

MAKING IT WORK

The system still isn't working, though. For it to work, *everybody* has to play *and* play by the rules. Right now, the content providers are not yet using dialnorm, which is to say that they are mis-using it.

Based on my experience and the letters I've received, the service providers and their vendors are not telling their end-users what they are doing or what the end-users should do to optimize their systems. Further, all end-user systems don't work together as the seamless transparent media delivery package that Dolby rightly desires and envisions.

Efforts to contact my service provider were unsuccessful (Charter Communications simply never picked up their phone when I called, leaving me to listen to "exciting" announcements for 25 minutes). At Scientific-Atlanta, I was able to speak to Jim Kiker and S-A's audio expert Dave Sedacca. They had enough to say about the problem that I am going to have to take up Scientific-Atlanta's side of the story in another column.

All end-user systems don't work together as the seamless transparent media delivery package that Dolby rightly envisions.

They also tactfully suggested that I continue to pursue Charter through its national headquarters, so stay tuned on that front. In any case, they were very clear on the issues and have been working hard to (a) help their customers (cable operators) deliver better service, and (b) improve the quality and performance features of their set top boxes.

Finally, Bang & Olufsen noted that the company has encountered my digital-vs.-analog signal problem with some other set-top boxes and service providers and is working on a fix, taking the position that it is B&O's responsibility to make the TV talk to the set-top box because the company knows full well that the set-top box manufacturers are *not* going to adapt to Bang & Olufsen!

What we can take from this is that the people who supply the media to us may not necessarily be good at nor devoted to good end-user relations or communications, but they really *do* seem to know what they are doing, with considerable depth, thoughtful and technical expertise.

INFORMATION SHARING

Dolby needs to exert some influence here (in all fairness, the company already is working hard at it behind the scenes). Dolby needs to insist (a) that the content providers use the system correctly and (b) that the media vendors accurately and fully share with their end-user customers and each other what is going on. The company need to emphasize that the various players really need to *actually* do their parts in this quite elaborate production process.

The sooner the better, I hope.

Thanks for listening!

Dave Moulton is still trying to find his TV Guide. He suspects it may be gone for good. You can complain to him about anything at his Web site, www.moultonlabs.com.

CAPTURE/OUTPUT CARD

Aurora PipePro

by Michael Hanish

The latest additions to Aurora Video Systems' line of digital input/output cards, only for Macintosh OS X, continue the company's tradition of low-cost and high-quality: Pipe, PipeSDI, PipePRO and PipeHD.

This review focuses on the feature-rich, standard-definition PipePro PCI card, which has SDI video (with embedded audio) in and out, AES/SPDIF digital audio in (four channels) and out (six channels), composite, S-Video and component video out, genlock and RS-422 device control. The SDI BNC connectors are on the exterior backplate of the card; all other connectors are on a short breakout cable.

FEATURES

System requirements are seriously modern: OS X 10.3 "Panther" or later (the Pipe will not run with the classic operating system), G4 dual-processor at 800 MHz (or better) or a G5 at 1.6 GHz or better, 512 MB RAM (absolute minimum). Since the Pipe family serves as I/O for editing and compositing applications, such as Final Cut Pro or After Effects (or any other QuickTime-based application), you must take into account the system requirements for those applications as well.

Storage requirements for video/audio capture range from 2 MBps, 8 GB per hour for offline 10:1 compression to 28 MBps, 100 GB per hour for full 1:1 10-bit uncompressed video.

Several interesting features of the Pipe hardware are controlled in a System Preference Pane, which is installed with the system software, including codecs. Desktop Output controls the extended desktop feature of the Pipe family, which gives you an additional configurable monitor that shows up in the Displays Preference Pane. The display signal is present at all the video outputs.

Aside from price-point, one of the strongest things going for the Aurora line is the quality of its codecs. The company provides two outstanding codecs: 8-bit Extreme Uncompressed and 10-bit Extreme Uncompressed. Both produce excellent images and are fully compatible with the Apple uncompressed codecs. They process internally in YUV color space, which is one of the clues to the excellent image, before rendering out to 4:2:2 RGB.

FAST FACTS

Application
Post production

Key Features
10-bit codec; analog and digital I/O

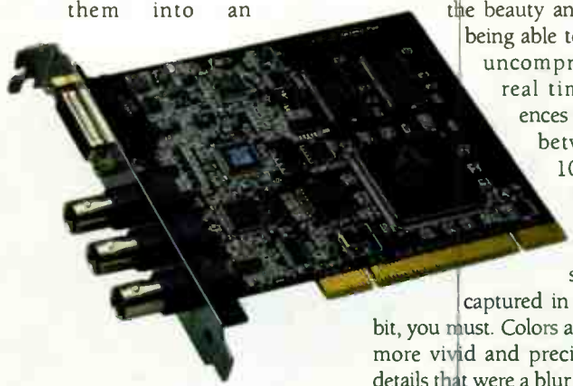
Price
$799

Contact
Aurora
586-726-5320
www.auroravideosys.com

IN USE

I used the PipePro extensively to prepare a number of effects sections for a documentary. These sections required multiple layers of composites, speed changes and a lot of color correction, all tasks that are less than satisfactory when done with compressed video.

Not having an SDI-equipped deck, I brought one into my studio to capture the video elements for the compositing sections at the highest quality possible: 10-bit uncompressed. I then dropped them into an uncompressed 10-bit Final Cut Pro (FCP) timeline. The PipePro's machine control (RS-422) capability worked like a charm for this.



The PipePro has SDI and analog audio and video inputs and outputs.

One of the really outstanding features of the PipePro is that all the analog video outputs are active all the time. This allows full-confidence monitoring while digitizing, through composite, S-Video or component outputs (as well as analog audio), depending on the level of quality desired.

To see how a given frame or sequence looks on video, you drag the workspace (in FCP, the Canvas; in After Effects, the Comp window) to the video monitor, and all changes appear in real time, with accurate video colors. The only interruption to workflow when using the extended desktop is that you must restart the system to activate or de-activate it.

It is important to remember, when figuring out the most efficient workflow for a given project with any member of the Pipe family, that these cards provide input and output only, and that all the rest of the editing functions and transcoding are dependent on the power of the host CPU. These cards don't perform hardware compression, instead being optimized for highest quality input and output.

The PipePro could not have been easier to integrate into my project studio and workflow. Aurora provides very clear documentation on use and a comprehensive set of presets for Final Cut Pro to ensure that setup and operation are correct while working.

I can't say enough about the excellent quality of the PipePro's output and the beauty and satisfaction of being able to work in 10-bit uncompressed video in real time. The differences in image quality between 8-bit and 10-bit are breathtaking.

If you haven't compared the same footage captured in 8-bit versus 10-bit, you must. Colors and gradations are more vivid and precise, and shadow details that were a blur pop into focus.

SUMMARY

The PipePro is not the only card with its capabilities in the marketplace, but it is surely one of the most cost-effective. For a relatively modest investment, you may be able to greatly improve the quality of your output. ■

Michael Hanish runs Free Lunch, a video/audio/multimedia production house a few miles outside scenic Guilford, Vt. Contact him at mhanish@sover.net.

EYE ON BATTERIES

Li-Ion Batteries Survive Regulations

by Bob Kovacs

Guns, explosives, knives and some chemicals are clearly hazardous material... but camcorder batteries?

In the wake of Sept. 11, the federal government passed laws and created regulations that tighten the definition of hazardous materials that can be shipped by air and even carried onboard an airplane. However, tightened regulation of lithium-ion batteries—a battery chemistry that is becoming popular in the television industry—was in the works prior to Sept. 11.

In the spring of 2001, a pallet of batteries that used one type of lithium chemistry was mishandled on the ground at Los Angeles International Airport. The pallet caught fire, which proved quite stubborn and resisted attempts to douse it. Although no one was hurt and the damage was minimal, the U.S. Department of Transportation decided to tighten regulations on batteries containing lithium, which are now covered under the United Nations Recommendations on the Transport of Dangerous Goods Model Regulations.

The new regulations took effect on Jan. 1, 2003, and qualifies any lithium-ion cell as a "Class 9 Hazardous Material" if it contains more than 2 grams of lithium. A lithium-ion battery (made from multiple cells) can have no more than 8 grams of aggregate lithium content. The regulation also requires new packaging and labeling for lithium batteries, and states that batteries can be packed in carry-on baggage only if their terminals are protected against shorting.

It's worth taking a moment to note that no one has been hurt or injured by batteries containing lithium, and there are no reports of any aircraft damage due to lithium batteries, either before or after the new regulations. Also, this regulation is for air transport only—it has no effect on products shipped by surface transport.

MEETING THE CHALLENGE

Manufacturers of batteries for professional television products took note of these regulations and either confirmed that their products met the new regulations or reformulated the product to ensure compliance. Barry Rubin, general manager for IDX Technology said that his company has been making Li-Ion batteries for eight years and had been watching this development carefully.

The Anton/Bauer Dionic 90 is a 90 W-h Li-Ion battery.

"We were aware of this from day one," Rubin said, "and we had a proactive approach to meeting the new regulations."

The lithium content in a cell has a direct effect on the current capacity of the cell. In other words, the more lithium a cell contains, the more current it can deliver.

With this direct relationship in mind, the ultimate regulation states that the maximum lithium content for a cell can be calculated by multiplying the amp-hour capacity of the cell by 0.3. In batteries that are made from multiple cells, the total lithium content for the battery is the amp-hour capacity of the cell sets times 0.3, multiplied by the number of cell sets. In the example of an IDX E-50 Endura battery, this is 3.3 A-h x 0.3g x 4 sets = 3.96g of lithium.

Using these calculations, batteries with a capacity of more than 14.4V/6.7 A-h (approximately 96 W-h) will usually exceed the 8g lithium limit. It turns out that IDX Li-Ion batteries already had lithium content low enough to meet the new specification and can be legally shipped on airplanes.

"I even have a declaration document that a customer can use when traveling with our batteries," Rubin said.

IDX has a solution for videographers who appreciate the lighter weight of Li-Ion batteries but need more power for on-camera lights and other accessories. The company's Endura battery line has an ingenious system that allows two batter-

BATTERIES, PAGE 39

CAMCORDER

Sony DSR-PD170 Camcorder

by Bob Kovacs

I have previously reviewed Sony's smallest, 3-CCD professional camcorders, including the current DSR-PDX10. I found these to be perfectly competent models that could easily be mistaken for consumer camcorders, even as they shoot with three-chip quality and record in the professional DVCAM (25 Mbps) format.

So I wondered what the DSR-PD150 and its successor, the DSR-PD170, bring to the party. Sony kindly loaned me a DSR-PD170 to answer this question and I found it pretty quickly—but you'll have to read more to find out.

FAST FACTS

Application
ENG and EFP

Key Features
DV and DVCAM camcorder; wide-angle adapter

Price
$3,940

Contact
Sony
800-686-7669
www.sony.com/professional

The Sony DSR-PD170 comes with a 0.7x wide-angle lens adapter and a dual-input audio module with mic/line capability and XLR connectors.

FEATURES

The Sony DSR-PD170 has a form factor that is somewhere between a consumer camcorder and a traditional shoulder-mounted camera. It has a handle on top like larger cameras and a 2.5-inch color flip-out viewfinder such as you would find on a consumer camcorder. In addition to this color monitor, there is an eyepiece monochrome viewfinder.

The three 1/3-inch CCDs in the unit are 380,000-pixel imagers that use Sony's Advanced HAD technology for better low-light performance. The permanently mounted lens has a 12:1 zoom ratio, and the DSR-PD170 comes with a 0.7x wide-angle adapter that screws onto the end of the main lens.

On the right side of the lens is a two-position neutral-density filter, a switch for manual or auto focus and a selector for manual iris control. In manual mode, the iris has 24 settings. The back of the camcorder has switches for gain, white-balance and shutter speed, as well as a nifty rotary control for the many menu selections that the PD170 supports. Also on the back of the camcorder is the battery slot; the PD170 ships with a lithium-ion battery that supports about 60 minutes of shooting.

The DSR-PD170 can be set to record in either DV or DVCAM mode, both of which record at 25 Mbps. The DVCAM tape speed is faster, giving the unit a record time of 40 minutes in DVCAM mode and 60 minutes in DV mode.

The unit has a progressive scan recording feature that saves 15 images per second at a higher resolution. This is interesting for doing some motion analysis work or for loading a fast series of pictures into a computer, but it is not the same as progressive scan recording of 24p or 30p images. The camera is switchable between 16:9 and 4:3 aspect ratios.

There is the usual fingertip rocker to control the zoom lens, and the PD170 also has a small zoom switch and start/stop button on top of the camcorder's handle that let you easily shoot while holding the camera at low angles. At the front of the handle is a convenient audio connection point with two XLR connectors, either of which can be switched to mic or line level. These connectors also support phantom power at the flick of a switch.

The unit records digital stereo audio at three quality levels: 16-bit/48 kHz, 16-bit/44.1 kHz or 12-bit/32 kHz. Next to the audio connectors is a shock-mount for the supplied shotgun microphone.

Near the front of the camera are several I/O connectors, including S-Video, analog video, stereo audio and i.Link (IEEE-1394).

In addition to the wide-angle adapter, lithium-ion battery and shotgun mic, the DSR-PD170 comes with a power supply/charger, two lens hoods (one of which has a cute built-in lens cap), a remote control and an analog audio/video cable. The camera can shoot still images and record them onto an optional Memory Stick, which does not come with the PD170, so I did not test this feature.

IN USE

Anyone familiar with a professional or consumer camcorder can use the DSR-PD170 in seconds. It takes only about three seconds to fire up the PD170 (assuming a tape is loaded)—the camera does a creditable job of finding the correct exposure and white-balance if left in the auto mode.

SONY, PAGE 42

PRODUCTS & SERVICES SHOWCASE

LENS ADAPTER

Collinscraft Red-Eye

by Carl Mrozek

If you're among thousands of videographers whose daily bread-and-butter work is still framed conventionally in 4:3 but shot with a native 16:9 CCD camera, then you have a perspective problem: a wide-angle perspective problem.

That's due to the 20-percent loss in angle-of-view when converting a native 16:9 image to a 4:3 perspective. Unless you use a pricey broadcast lens with a built-in crossover converter that compensates for the loss in angle-of-view, you either have to live with a more limited perspective or use an external optical adapter to undo the damage.

It's well worth examining nonzoom-through adapters that are compact and inexpensive. Moreover, when one is added to a pro lens used with a native 4:3 camera, it transforms a standard lens into a bona fide wide-angle lens.

FEATURES

The Red-Eye, made by Collinscraft Canada and distributed by VFGadgets, is one such alternative. It resembles a large screw-on filter, such as a polarizer, and weighs less than 100 grams. Like screw-on filters, it threads directly onto the outer end of most professional video lenses with outer barrel dimensions of 58mm, 72mm, 77mm and 82mm. Once mounted, the diameter of the lens barrel is unchanged; hence, the Red-Eye can be used with the same sunshade or matte box that the normal lens uses.

The immediate payoff is impressive: a 30-percent increase in angle-of-view. For those using 16:9 cameras to shoot 4:3 imagery, this is a gain of 10 percent in angle-of-view. If, however, you're shooting 16:9 with a 16:9 camera, or 4:3 with a 4:3 camera, the net increased angle-of-view is 30 percent. This transforms a 16x8mm standard lens into a 16x5.6mm wide-angle lens... with the twist of a wrist!

The Red-Eye features an antireflective coating designed to increase light transmission, which optimizes image clarity, contrast and sharpness. The lens has a scratch resistant coating thatimproves water repellency. For added protection, each unit includes a padded leather pouch designed to be worn on a belt, for safety and quick access.

The Red-Eye is made with high-index, high-clarity durable glass and the lens housing is sturdy, lightweight anodized aluminum, painted red—thus the name "Red-Eye." The threaded housing fits most standard pro lenses for cameras with 2/3-inch and 1/2-inch CCDs, and also fits some smaller camcorders such as the Sony DSR-PD150.

Although the Red-Eye may be screwed onto another screw-on filter, this increases the possibility of vignetting.

FAST FACTS

Application
EFP and ENG

Key Features
Wide-angle lens adapter

Price
Starts at $285

Contact
VFGadgets
416-686-1452
www.vfgadgets.com

IN USE

The Red-Eye is one of those exceptional products that does exactly what it is designed to do, nothing more and nothing less. It can be mounted on a lens as quickly as a screw-on filter.

I tested the 82mm Red-Eye with Fujinon 19x8.7 and Canon 19x9mm "pro" series lenses. In both cases, I had to remove the lens' sunshade before mounting the Red Eye, and then reattach it afterwards.

Once the Red Eye is mounted, the lens feels and looks as before except for the red ring around the outer element. However, the lens must be operated quite differently: no zooming and the focal range is extremely limited.

On the 19x9mm lens, I was only able to use the 9mm to 18mm portion of the focal range. Practically speaking, you probably want to set the lens at the widest end of its focal range. This simplifies focusing and is the primary purpose of using the Red-Eye—to widen your lens' field-of-view.

Another thing that changes is that once your focal length is set (ideally at maximum width), the lens' focus ring should be set to infinity. Focusing is then done with the lens' back-focus or macro-focus button.

It is worth noting that in sunlight or other bright light at *f*16, everything is in focus, including dust on the Red-Eye. It is therefore recommended that you use the neutral density filters on your lens to reduce incoming light and open the aperture to *f*11 or more. This makes it possible to reach a point where virtually everything from a foot to infinity is in focus.

This also simplifies shooting in most situations and virtually eliminates the need to refocus when the situation makes it difficult, if not impossible, to do so while shooting. Prime examples would be shooting with a Steadicam or with a jib.

I used it to tackle Steadicam-style shooting. I zoomed out to 8.7mm and focused the Red-Eye at infinity to track a wildlife researcher following wildlife in dense forest. This enabled me to stay close on his heels as he stomped through thick underbrush in search of an elusive forest feline.

The underbrush in the forest was too dense and hostile to permit using an external viewfinder/monitor without risking its ruin by spiny, spring-loaded low limbs and saplings encroaching on the sinuous forest trail.

Photo: Kathy Beck

Various versions of the Red-Eye will screw onto the end of a variety of professional camera lenses.

For added focus insurance, I tried to maintain a little buffer between the lens and the biologist while staying close through the dense underbrush. With the help of a sunshade, I was able to incorporate the backlash of boughs into the tracking shot as the biologist charged through the dense thickets in his obsessive quest for of one of North America's most elusive animals, the Canadian Lynx.

To my surprise and satisfaction, this strategy worked better than expected, yielding mostly sharp and well-framed footage, from an "over-the biologist's-shoulder" perspective. Framing was simplified by shooting in 16:9 with an Ikegami HL-45W.

This effectively transformed the Fujinon 19x8.7 lens into a 6mm lens, as I didn't use the rest of its focal range. Using a sunshade afforded some protection from hostile branches and I didn't detect any significant scratches on the Red-Eye's outer element. When finished, I quickly removed the Red-Eye and carried it safely in its padded-leather pouch looped on my belt.

Another situation where the Red-Eye's "bug-eyed" perspective came in handy was when I shot a jazz performance from the side of the stage. Initially, I had to move away from the stage and include speaker stands and other rigging in the foreground.

With Red-Eye, I was able to shoot from the edge of the stage and get an intimate, yet wide shot of the band and some audience, sans rigging. The audio was noticeably cleaner too, and I got the scene I framed with my eyes rather than the cluttered compromise I initially framed without the benefit of Red-Eye.

An obvious benefit of Red-Eye is to be able to shoot more comfortably in cramped interiors, as I did in an apartment with the Canon 19x9 lens and Sony DSR-570W camera. With Red-Eye, I was able to execute a 360 degree pan from the center of a small room, keeping everything in focus—as you would expect to accomplish with a pricy wide-angle lens fully zoomed out.

SUMMARY

Although its job description is quite finite, Red-Eye did deliver as advertised in a variety of situations. Some shooters might feel constrained using a nonzoom-through lens adapter but I found it refreshing—in part because it forced me to frame the best shot possible and concentrate on camera moves instead of optical movement.

It also got me out of tight spots in more ways than one and broadened my perspective about shooting in ways that wouldn't be otherwise feasible without switching to a pricy wide-angle zoom lens. It effectively enabled me to go into the field with two lenses: a standard pro zoom lens with 2 X extender and a wide-angle lens carried in a tiny pouch on my belt.

In short, Red-Eye reinforced my favorite maxim of camera accessories: small is beautiful and inexpensive is better yet! For the money, Red-Eye is well worth adding to the kit bag of every pro who wants to be ready for anything, anytime—especially if you're shooting a 4:3 world with a 16:9 camera. ■

Carl Mrozek operates Eagle Eye Media based in Buffalo, N.Y., specializing in wildlife and other outdoor subjects. His work appears regularly on the Discovery Channel, CBS, PBS and other networks. Contact him at eagleye@localnet.com.

Batteries

CONTINUED FROM PAGE 35

ies to be "siamesed" together, doubling the power capacity at a weight that is still lower than batteries made using other chemistries.

Sony BP-L40/L40A, BP-L50/L50A and BP-1L75 batteries have less than 8g of lithium and are therefore meet the new regulations for airplane transport. A spokesman from Sony confirmed that the company's current Li-Ion product line meets the new regulations.

EYING THE REGULATIONS

Anton/Bauer has a line of Li-Ion batteries and also had its eye on the new regulations. "We introduced our Dionic 80 at NAB2002 as an 80 W-h battery," said Alex DeSorbo, president of Anton/Bauer. "It has since been upgraded to a 90 W-h battery, the Dionic 90."

DeSorbo said that both these batteries have less than the 8g limit and can therefore be packed in baggage without any special considerations. He also pointed out that Anton/Bauer has a larger Li-Ion battery for users who need the extra capacity.

"At NAB2003, we showed a Dionic 160 [160 W-h battery] for customers who understand the travel restrictions but who need the power," he said.

The batteries developed by Aspen Electronics are now part of the Anton/Bauer line under the name "Aspekt." This represents a different approach to handling battery capacity with its Nexus 50 (50 W-h) Li-Ion battery. Although the battery can be mounted to any type of camera mount with the Nexus battery adapter, it should only be used with an on-camera light when mounted with the Nexus Phantom Package. This package has a slot for a Nexus 50, as well as an on-board 8 W-h NiCad battery for automatic backup when the main battery runs out of power.

The IDX Endura Li-Ion product line has a V-mount that allows two batteries to be stacked together for greater power delivery and longer run time.

The Nexus 50 contains less than 8g of lithium, so it meets the requirements of the recent regulations.

The new PAG L95 Li-Ion battery from PAG USA has a power capacity of 95 W-h and contains less than 8g of lithium. The L95 is available with either an Anton/Bauer- or PAGlok-mount and, like many other state-of-the-art batteries, has an on-board readout of its power and charge status. The company has adapters for Sony V-mount applications.

"The L95 easily meets the new regulation and should be no problem with air travel," said David Butler, national sales coordinator for PAG USA.

Although Frezzi does not have Li-Ion batteries in its published catalog, the company does supply customized Li-Ion batteries upon request. Jim Crawford, Frezzi's CEO, said that making sure Li-Ion batteries are correctly matched to a charger is critical to maintain good battery life and ensure safety.

"Charging and discharging a lithium battery at a rate that's too fast will cause the chemicals to breakdown and it could leak flammable organic material," Crawford said. He recommends NiMH or NiCad batteries for applications causing a heavy drain on the battery and where fast charging is required.

One final thought: Nobody is saying that Li-Ion batteries are dangerous in any way. A well-designed and properly manufactured Li-Ion battery has many advantages for ENG and EFP use, and is a perfectly safe and reliable product.

The recent regulations limit the amount of lithium in batteries that are packed as baggage, based on the possibility that very rough handling might cause a fire with certain battery chemistries, including Li-Ion. There has been no evidence that any Li-Ion battery used by television professionals caused a fire, either before or after the new regulations. ■

DVD AUTHORING SOFTWARE

Ulead DVD Workshop 2

by Geoff Poister

Ulead's DVD Workshop 2 provides a full range of tools for DVD creation, from capture to menu creation and compression. Ulead positioned this product to provide an assortment of professional features at a prosumer price-point.

To this end, some barriers have been broken. The software is designed to be easy to use, yet includes high-end features such as multiple audio tracks, subtitles, advanced compositing of images, real-time DV-to-MPEG-2 conversion on capture, and output-to-DVD, DLT (Digital Linear Tape) and DVD-9 for dual-layer disks.

FEATURES

Ulead has made a great effort to create a workflow design that is intuitive and efficient, abandoning the ubiquitous timeline used by most competitors in favor of a more visually efficient storyboard layout. An end-to-end application, the design provides video capture and encoding tools in addition to powerful menu creation. It runs on Windows 2000 or XP.

The interface has tabs—labeled Start, Capture, Edit, Menu and Finish—that guide you through the process. Clicking on each tab brings up a screen devoted to a discreet part of the production process, and looking at each of these is the best way to review the features.

The Start module is where you choose your destination format: DVD, VCD or SVCD.

The Capture mode allows you to capture video from a variety of sources that include DV tape, analog video and even a TV tuner. Still images can be captured from these sources as well. Video is input through IEEE-1394 (FireWire) or through a video capture card if using an analog source.

When using IEEE-1394, the Capture window immediately detects the source deck and provides device control. The video can be saved as an AVI file or an interesting variety of other formats, including MPEG-1, MPEG-2 and Windows Media. A unique feature is its ability to transcode DV or analog video to MPEG-2 or Windows Media in real time, a shortcut that can save many hours.

Switching to the Edit panel allows you to place assets into the project, and it is remarkably versatile in what it will accept. Unlike many DVD applications that accept only MPEG files, Ulead Workshop 2 imports AVI, QuickTime, WMV and MICROMV, lets you mix them all into the project, and automatically converts them at the end. Any imported MPEG files are not touched, so they maintain their original quality.

Audio can be imported directly from CDs, and material can be imported from noncopyrighted DVDs as well.

In Edit mode, the most useful features include the ability to trim, cut or join video clips and add up to eight audio tracks and 32 subtitle tracks. Audio levels can be adjusted, as well as faded in and out. The subtitle tools allow extensive use of fonts, colors, backgrounds and shadows.

Ulead Workshop 2 comes with a library of video and still images and music selections for quick menu assembly. For those who create slide-shows, 100 transitions help smooth the process.

The Menu mode is really the heart of Workshop 2 and it elevates the process to an art form. Ulead definitely raised the bar here by providing the power to add and manipulate just about any image, text object or audio source.

The resulting menus, which are full of motion video, composited images, music and sound, are not only visually enticing but highly efficient navigating tools. Each button has a playlist that can be changed to control the button's function. This allows you to create multiple sequences of movies, menus and chapter points without duplicating the original media on the DVD—a feature that saves valuable disk space.

Real-time preview is available throughout the process, guaranteeing that you will end up with what you planned before you burn a DVD. The menus display all motion and you can preview the action of all buttons to make sure they are correct.

In Finish mode, simply press play to test your menus and preview the entire project in real time. To preview faster,

ULEAD, PAGE 44

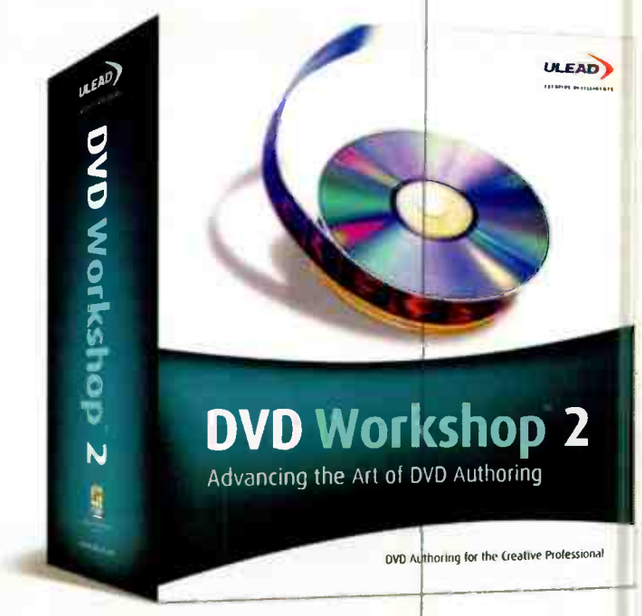
FAST FACTS

Application
DVD design and burning

Key Features
Compression routines; editing capabilities; menu generation

Price
$495

Contact
Ulead
877-226-6766
www.ulead.com



Ulead DVD Workshop 2 has features that automate the creation of menus for DVDs, including animated icons.

PRODUCTS & SERVICES SHOWCASE

Sony

CONTINUED FROM PAGE 36

Two things about the lens on the PD170 impressed me, particularly when compared with other small camcorders I've used from Sony and other manufacturers. The lens on the PD170 is the first to let me do a manual focus move with repeatable precision. In fact, I did quite a nice rack-focus between two different objects that worked well in a little sequence I shot.

The other nice thing about the lens on this camcorder is the beautiful chunk of glass that Sony supplies for the 0.7x wide-angle adapter. The big lens was distortion-free and made a noticeably wider shot when it was installed. It does add some weight, however.

I was less impressed by the new controls that Sony put on top of the handle for zoom and tape start/stop. The zoom control has two preset speeds that worked fine and presented no problem. But I always had to fumble to use the start/stop switch, causing shaking in the image during handheld shots. Since these top-of-the-handle controls are intended to be used for low-angle handheld shots, I felt that fumbling to find the switch defeated the purpose of what should be a convenient operation.

The 2.5-inch viewfinder that the PD170 shares with its predecessor, the DSR-PD150, also disappointed me. It's a nice enough 2.5-inch viewfinder but this camcorder's little brother, the DSR-PDX10, has a 3.5-inch viewfinder that's a real beauty—it deserves to be on the PD170.

In addition to flipping out from the body of the camcorder, the 2.5-inch viewfinder can rotate to face an operator either behind or in front of the camera. Rotating it to face forward flips the image, so that someone standing in front of the camera will appear to be standing normally instead of upside down. This is really handy when shooting in "one-man-band" mode.

The DSR-PD170 does have Steady Shot, an effective shake reducer. Although Sony implies that there is a performance penalty with Steady Shot turned on, I did not see any difference in the quality of the images. The ability of this feature to reduce the shakiness of handheld shots is impressive; I recommend leaving it on all the time.

The most impressive thing about the DSR-PD170's image quality was its excellent low-light capability. I shot a very wide range of images in all kinds of lighting and was continually surprised at the natural, noise-free pictures that I got from available light that would sink a lesser product. Sony claims that improved low-light capability is one of the big improvements with the PD170, and I can vouch that it is a big improvement, indeed.

The contrast range of the images was very good, too, enabling me to pull detail out of shadows where some other cameras in this same class just fade into dark noise. Performance in daylight was good as well, but you expect a camera to make good images in daylight. It's the low-light performance of this camcorder that really impressed me.

Real-world shooters will want a battery with longer run time than the one that ships with the PD170. Although the supplied battery is pleasantly lightweight, batteries with run times of several hours can pop into the slot with minimal extra load. A small LCD readout on the side of camcorder lists the status of the battery's charge and its remaining run time. Using an accessory such as a light or even a wireless mic receiver will pretty much require that you get a battery with greater capacity.

I used the PD170's wireless remote control very little but it does have certain advantages. For one thing, it is perfect for a stringer to control the camcorder while shooting a one-man standup report. The remote is small enough to fit in a jacket or pants pocket.

The supplied shotgun microphone and shock mount worked well and I heard very little mechanical noise when shooting with this mic. A more expensive shotgun mic will probably outperform the one that Sony supplies with the PD170 but it had good reach and sound quality for someone located four to six feet in front of the lens.

I did all my shooting in the 4:3 aspect ratio and did not use the 16:9 feature except to confirm that it worked.

Loading footage from the PD170 into an editing system was a snap. Using an IEEE-1394 cable, I plugged the camcorder into my computer and immediately had control of the transport from within Adobe Premier Pro. Transferring/logging images and sound was glitch-free.

SUMMARY

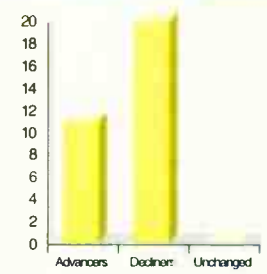
The Sony DSR-PD170 has a number of things going for it, including an excellent wide-angle adapter, a manual focus control that actually lets you do focus effects, a wide range of manual iris control and switchable 16:9 and 4:3 operation. The biggest thing that the camera offers is its terrific capability in low light, which is exceptional in my experience with this class of camera.

This is a very good camera for TV news stringers, as well as government, educational and corporate video operations, particularly if you need to shoot in less-than-optimum lighting situations. Small, lightweight and easy to use, the DSR-PD170 has a boatload of useful features, makes professional-quality pictures and sound—and is at its best in marginal conditions. ■

Bob Kovacs is the technology editor of ***TV Technology****.*

TV TECH STOCK INDEX

WIN-LOSE RATIO



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

TOP ADVANCERS BROADCAST STOCKS
(MAY 28—JUNE 11)

Paxson	+8.54%
Meredith	+5.62%

TOP DECLINERS BROADCAST STOCKS
(MAY 28—JUNE 11)

Granite	-13.04%
ACME	-10.34%

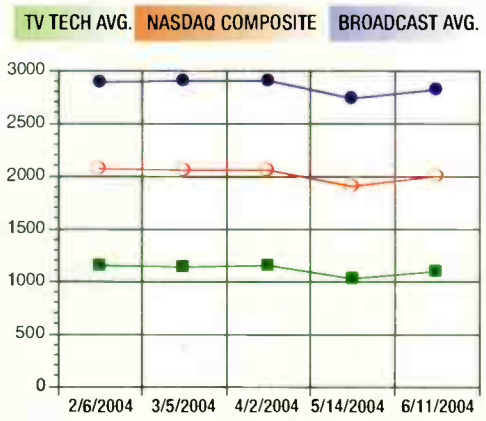
TOP ADVANCERS TV TECH STOCKS
(MAY 28—JUNE 11)

SeaChange	+3.56%
Belden	+3.08%

TOP DECLINERS TV TECH STOCKS
(MAY 28—JUNE 11)

LSI Logic	-4.15%
Parkervision	-2.35%

TV TECH TREND



1152	1131	1151	1026	1094
2064	2048	2057	1904	2000
2883	2898	2903	2736	2821

TV Tech STOCKS as of June 11

Company Name	52-Week Range	May 28	June 11	% Change
Avid	32.55 - 59.77	52.02	51.74	-0.54%
Belden	13.40 - 22.87	16.9	17.42	3.08%
Ciprico	4.42 - 7.21	4.61	4.59	-0.43%
Harmonic	3.18 - 13.75	6.39	6.58	2.97%
Harris	28.70 - 51.19	46.2	46.32	0.26%
Leitch	N/A	5.51	5.4	-2.00%
LSI Logic	6.20 - 12.90	8.2	7.86	-4.15%
Parkervision	4.00 - 12.30	5.53	5.4	-2.35%
Pinnacle	6.60 - 13.80	7.26	7.13	-1.79%
S-A	19.46 - 38.59	34.42	34.29	-0.38%
SeaChange	9.08 - 21.88	14.9	15.43	3.56%
Storage Tech	21.96 - 31.12	28.25	28.09	-0.57%
Tektronix	20.04 - 34.89	31.56	30.92	-2.03%

Broadcast STOCKS as of June 11

Company Name	52-Week Range	May 28	June 11	% Change
Acme	6.50 - 10.21	7.74	6.94	-10.34%
Belo	21.62 - 29.90	29.42	28.83	-2.01%
Emmis	18.00 - 28.65	21.9	21.34	-2.56%
Entravision	7.68 - 11.88	8.1	8.39	3.58%
Fisher	44.40 - 52.50	50.59	49.47	-2.21%
Granite	1.06 - 3.70	1.15	1	-13.04%
Gray	10.55 - 16.22	14.09	14.1	0.07%
Hearst Argyle	22.08 - 29.25	26.15	25.78	-1.41%
Nexstar	9.99 - 14.50	11.69	10.75	-8.04%
Lin TV	19.78 - 27.49	22.7	22.04	-2.91%
Paxson	2.15 - 6.99	2.81	3.05	8.54%
Sinclair	9.63 - 15.43	11.08	10.96	-1.08%
Liberty	40.46 - 51.79	46.55	47.37	1.76%
Univision	28.26 - 40.05	32.55	33.17	1.90%
Young	14.00 - 25.54	14.32	14.17	-1.05%
Tribune	44.28 - 53.00	48.29	46.9	-2.88%
Meredith	41.59 - 53.47	52.46	55.41	5.62%
EW Scripps	80.75 - 109.30	106.36	108.13	1.66%

COMPANY FOCUS

Leitch Ends FY On a High Note

TORONTO

After a restructuring and an acquisition, Toronto-based Leitch finished up for the final quarter of fiscal 2003, but down overall for the year, both ending April 30, 2004.

Revenue for Q4 was up 10 percent over the previous period, ending at $41.9 million. For fiscal 2003, however, revenues dropped 14 percent to $154.6 million, from $180 million in fiscal 2002.

Net loss for Q4 was $21.7 million or 63 cents per share, compared to $91.8 million or $3.08 per share for last year.

Tim Thorsteinson, president and CEO of Leitch said that the company continues to gain momentum toward its goal of returning to profitability, having booked $45 million in orders, finishing the fourth quarter with a strong backlog.

Video processing and distribution (VP&D) experienced a 14 percent revenue gain in Q4, and servers generated a 36 percent increase. On a geographical basis, Q4 revenue from sales fell 16 percent in the United States but increased 71 percent in Europe. End-of-year revenues for the United States decreased 30 percent, but in Europe increased by 15 percent.

As part of the restructuring in Q4, Leitch recorded a $9.6 million inventory charge and $4.1 million in charges related to staff reductions in its manufacturing facilities. Leitch estimated that layoffs would save roughly $5 million in annualized income. A total of 40 people were laid off in Q4, and another 30 were let go from the Toronto facility in May.

In May 2004, the video systems maker acquired Videotek, its first payment being approximately $18 million, paid in cash. Leitch's financial results for Q4 and fiscal 2004 do not include the acquisition, which was announced at NAB2004.

—Lauren Evoy

Ross Video Introduces
10 New Multi-Definition Synergy Switchers

OVERDRIVE PRODUCTION CONTROL SYSTEM

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

www.rossvideo.com/overdrive/overdrive_overview.html

TALIA NK ROUTING SYSTEM

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

www.rossvideo.com/talia/nk/nk_overview.html

GEARLITE MD

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

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

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http://www.rossvideo.com/gearlite/gearlite.html

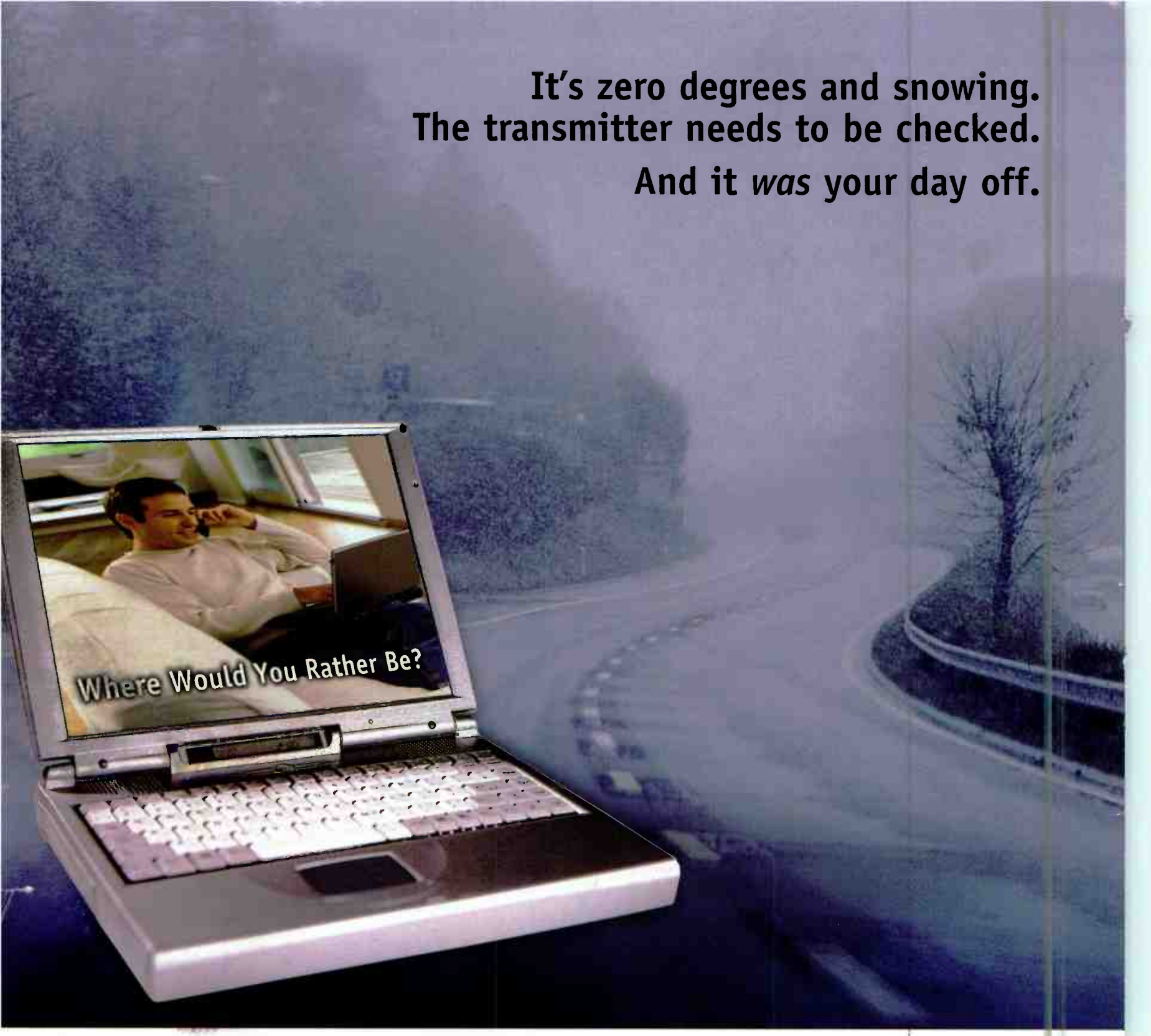
SYNERGY MD/MD-X MULTI-DEFINITION PRODUCTION SWITCHERS

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

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

www.rossvideo.com/synergy/switchers.html

ROSS PRODUCT HIGHLIGHTS



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We understand. And **we've got the solution: Harris Remote Management.** Now, take advantage of a fully integrated suite of remote tools that offer complete studio monitoring and control, transmitter monitoring, and transmitter facility monitoring. With an unmatched history as the technology leader for broadcast facility management, Harris provides the ultimate IP-driven control and intelligence products, products you can integrate as separate components (with later upgrades) or as complete solution. You'll enjoy web-based monitoring available through wireless laptop, cell phone, and PDA. You'll be able to solve problems with your counterparts dozens...or thousands of miles away. Best of all, you'll work more efficiently...and get your life back.

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ReCon – Facilities Remote Management: *Remote control power and flexibility along with ease of installation and use.*

HBM – Network Remote Management: *Consolidate expert manpower, cut response time and increase broadcast system availability.*

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