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WHAT'S INSIDE

NEWS
Specialty cameras
• page 16

FEATURES
Teaching tomorrow's editors
• page 28

BUYERS GUIDE
Test equipment
• page 42

SPECIAL REPORT

Indecency Revisited

Fight over fines will determine FCC's reach

by Deborah D. McAdams

WASHINGTON

By spring, a handful of judges will decide what is proprietary on broadcast television. One federal court is mulling the split-second exposure of a breast on prime-time TV, while another contemplates the popularity of swear words among rock musicians and celebutantes.

The breast in question belongs to singer Janet Jackson, who exposed it during the half-time festivities of Super Bowl XXXVIII in 2004. CBS happened that year to be carrying the game, the most-watched and lucrative few hours on television.

In terms of production, nothing is held back for the Super Bowl. Every piece of cutting-edge gear across the country is employed in the coverage. The CBS tech team broke ground at Super Bowl XXXVIII with a wireless HD camera, but everything, including the game itself, was overshadowed by the fraction of a second it took the director to order a cutaway from Jackson's breast. For the engineers that lived and breathed the game for nearly a year, it was bewildering.

After racking up a $550,000 fine from the FCC, the breast footage made its way to the U.S. Court of Appeals for the Third Circuit in Philadelphia, where judges will determine if it meets legally defined parameters of broadcast indecency.

In the Second Circuit Court of Appeals in New York, the utterance of expletives on broadcast TV is under review. In that case,

INDECENCY, PAGE 26

CES: Convergence Closer to Reality

HDTV, content-on-the-go highlight show

by Gary Arlen
Special to TV Technology

LAS VEGAS

During the "Digital TV Transition" session at the Consumer Electronics Show, the countdown clock from the FCC's Web site (*www.dtv.gov*) was periodically projected onto the conference hall's big screen. The clock should have read 769 days, 7 hours and ticking down the minutes and seconds, which it did at the beginning of the session. But some digital gremlin sneaked in during the hour, and suddenly the clock showed 1,327 days… seemingly adding two years to the cutoff.

The surreptitious Internet gaffe generated panelist musing and audience amusement about whether to trust anything about the DTV transition and its implementation. (Even an FCC official in the conference hall could not explain the untimely Web site malfunction after calling into his headquarters from the conference room.)

CES, PAGE 8

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FOR THE CHANGING FACE OF TELEVISION

IN THIS ISSUE

P.12
Linear Acoustic

P.30
Getting closer to the film look

P.42
Test equipment

NEWS

1 **CES: Convergence Closer to Reality**
HDTV, content-on-the-go highlight show

12 **Made in America: Linear Acoustic: Staying Put in Pennsylvania**
An American audio firm finds that everything needed is in its own backyard

14 **Digital Multitasking With IPS**
Workflow requirements fuel need for all-in-one systems

16 **HD's Need for Speed**
Sports broadcasters contract new HD slo-mo and high-speed cameras

16 **Filling in the Gaps**
Rigs, remotes and flash recording all contribute to enhanced views

18 **Digital Journal—Dolby Volume and DialNorm**
Dolby debuts new loudness control technology at CES

20 **A Hi-Def Tribute to President Ford**
HDNet provides sole HD coverage of presidential funeral

66 **TV Tech Business**
Arris to Acquire Tandberg Television; Fox O&O's Adopt P2 HD; Jampro Antennas Expands Facility, Staff; Dielectric Goes Lean; Avid Names Greg Estes Chief Marketing Officer; Greg Voss Appointed Front Porch Digital CFO

FEATURES

28 **Note to the Teacher**
Inside Production, *Walter Schoenknecht*

29 **Disobeying the Laws of Physics**
Let There Be Lighting, *Andy Ciddor*

30 **Update: Getting Closer to the Film Look**
Technology Corner, *Randy Hoffner*

32 **Corporations Co-opt Citizen Journalism**
Net Soup, *Frank Beacham*

36 **Content Life Cycle III: The Hidden Agenda**
Media Server Technology, *Karl Paulsen*

38 **The Customer is Always Right**
Newsroom Technology, *Harlan Neugeboren*

40 **Reflections on the Recent CEDIA Expo**
Inside Audio, *Dave Moulton*

SPECIAL REPORT: INDECENCY

1 **Indecency Revisited**
Fight over fines will determine FCC's reach

24 **Clearing the Air**
Using delay boxes to prevent indecent slip-ups

BUYERS GUIDE

42 **User Reports—Test Equipment**
Modulation Sciences, K-WILL, Ward-Beck, JDSU, Ensemble Designs, Wohler, Hamlet, Z Technology

50 **Reference Guide**
Waveform Monitors

56 **Company Profile**
Marshall Electronics

EQUIPMENT

48, 49, 54 **Product Showcase**

58, 60 **Marketplace**

61-65 **Classified**

P.20
The Ford funeral—in HD

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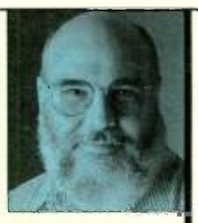
Let There Be Lighting

Andy Ciddor



Almost all of us were raised with the philosophy that we should be good people and obey the law. However, when we grew up, not all of us necessarily chose to obey all of those laws, and may have suffered the consequences. The laws that our mentors and families... p. 29

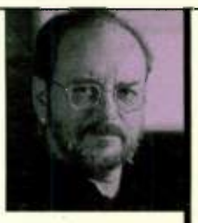
Media Server Technology

Karl Paulsen

Video servers steadily add feature sets that help improve the workflow of a broadcast facility. Software and hardware components that cover the gamut from integrated conversion between SD and HD, to cross converters from 1080i to 720p, and as far as SDTI-CP... p. 36

Inside Audio

Dave Moulton



For those of you who don't know this, there is a comparatively new trade organization called the Custom Electronics Designer and Installer Association. The organization was founded in 1989 to address the needs of companies working in the emerging "smart house"... p. 40

FROM THE TECHNOLOGY EDITOR

Documentation, Sacred Cows and Sleeping Dogs

Who was Reginald Aubrey Fessenden and why do we care about him?

I've been interested in broadcasting for almost as long as I can remember, and first read about him some 40 years ago.

The account revealed that Fessenden, a brilliant but somewhat eccentric engineering professor, had gone on the air Christmas Eve night in 1906 with a short broadcast of speech and music. This was only a few short years after Marconi had first bridged the Atlantic via radio. Prior to Fessenden's achievement, all that radio operators had heard through their headphones were the interminable dits and dahs of code or bursts of static.

In the rather lonely confines of countless shipboard radio rooms and shore stations, these early radiomen sat up and took notice. Music? Someone talking? Surely they were imagining this, or perhaps since radio was a very new thing and it was Christmas Eve, maybe they were hearing angels from on high? Perhaps it was just too much holiday cheer.

After a scripture reading, another song and the promise that he would do it again in a week, Fessenden signed off.

That's the way the story went and Dec. 24, 1906 and Fessenden's Brant Rock, Mass. laboratory have long been considered "ground zero" when it came to pinning down broadcasting's beginnings.

It's truly a great story and one that I've enjoyed relating to many others during the past four decades.

Last April, Paul McLane, editor of sister publication Radio World, asked if I would consider writing an article about Fessenden and the Christmas Eve event to commemorate the 100th anniversary of broadcasting. How could I say no?

Desiring to make the story as accurate as possible, I began researching it as soon as NAB was over.

Peeling back layers of history has always intrigued me, and this was no exception. Before it was over, I had handled and examined hundreds of letters, papers, books, magazines, photographs and other records of a bygone and much simpler world.

What I found, or more accurately, what I didn't find, truly surprised me. Actually, surprised is probably not the best word here; jolted is closer to the truth.

Other than a single letter, written just months before Fessenden died in 1932, there was very little to substantiate the story.

No newspaper articles. No magazine stories. No photographs. No eyewitness reports. Nothing really, save for the one letter.

Just so there's no misunderstanding, my research indicated that Fessenden could have conducted that seminal broadcast in the evening hours of Dec. 24, 1906. Technically, he was more prepared to do so than anyone else on the planet.

Fessenden should be remembered as the individual who broke away from the "brute force" radio school. From Hertz and Marconi on, it had been believed that the only way a radio wave could be produced was by violently discharging a spark into an antenna. Fessenden rationalized that this wouldn't work with speech and music—a nice smooth sinusoidal or continuous carrier wave was the answer. But this was prior to the arrival of the vacuum tube oscillator.

Reginald A. Fessenden

When Fessenden began his radio work, the only technology for generating sine waves was the AC generator, or alternator. He began to push General Electric to build a machine capable of operating at 100 KHz or more. After several years, Fessenden's efforts paid off and he had a machine that could produce a few watts of carrier up into the VLF spectrum. He amplitude modulated it by the simple connection of a carbon microphone in series with the antenna circuitry.

By December 1906, Fessenden had perfected his invention to the point that it was ready for a public showing of sorts. He invited engineering officials from AT&T and General Electric, some academics and a couple of reporters to witness a demonstration of radiotelephony on Dec. 21. The records show that the demonstration was successful and that he did transmit both recorded music and live speech between Brant Rock and a company-owned receive site, some 11 miles distant.

Less than a month afterwards, Fessenden published the first of several articles documenting this demonstration. It should be noted that while Fessenden's intentions were to sell telephone people on the idea of extending their system's reach without stringing wires, his Dec. 21 transmission was not encrypted or otherwise strictly point-to-point. Anyone with a suitable AM receiver could have heard it. In that respect, it was the first broadcast.

Fessenden continued with HF alternator and other radio work until he had a falling out with his business partners. The company was dissolved in 1912. As is often the case when revolutionary discoveries and inventions are involved, Fessenden spent much of the balance of his life in litigation. However, he did find time to continue with scientific research and generated some 500 patents before his death in 1932.

Broadcasting "took off" in the early 1920s, and while Fessenden was the subject and object of several magazine and newspaper articles during that decade, he never related anything about a Christmas Eve 1906 broadcast.

It was not until Jan. 21, 1932 that he first mentioned such an event. This was in a personal letter to a former associate, then a Westinghouse executive. Fessenden referenced the telco demonstration, but stated that if it were not considered a "broadcast," then what he did on Christmas Eve of that year would certainly have been the first broadcast. Parts of this letter were included in a 1940 biography that Helen Fessenden penned about her late husband. This biography seems to be the source for most of the subsequent writings about the world's first broadcast. (Others, Halper and Sterling, have reported finding a slightly earlier reference to a Christmas Eve broadcast in a 1928 speech by another Westinghouse executive.)

Regardless, it's rather strange that such a tremendous accomplishment would have to wait for more than two decades before anyone took note.

Are there any lessons to be learned here?

The first would have to be that anyone participating in an important event, especially one that would be considered a "first," should make sure that it's promptly and accurately documented so future historians won't have to resort to guesswork.

The second might be that sometimes those sacred cows and sleeping dogs should best be allowed to just lie there. This was one of the best bits of broadcasting lore ever, but I'm now a skeptic and have one less story to tell.

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The Drawn Together image is courtesy of Comedy Partners.
The Aviator image is courtesy of Miramax, Warner Bros. and theBasement.

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Phone TV Beta Launched

HOUSTON

Crown Castle recently went beta with its mobile TV service, while Verizon said it will have true cell-phone TV on the market within the next few months.

Crown Castle subsidiary Modeo beta-launched its DVB-H-based programming in New York City during the last week of 2006. The phase is expected to continue through the first quarter of this year, according to Crown Castle, a Houston communications tower firm.

The announcement came at the early January commencement of the Consumer Electronics Show in Las Vegas, where Modeo was demo-ed. Verizon also divulged its cell TV plans at CES, but neither announcement was unexpected. Both companies demo-ed handheld TV at NAB2006, and at last year's CES, Crown Castle said it planned to launch commercially over the last year.

The Modeo video service is designed to be broadcast in QVGA resolution at up to 30 frames per second. Same with Verizon's, which is being provided by MediaFLO, the mobile TV network developed by Qualcomm. Verizon, as well as Sprint and Cingular, currently offer cell-phone video over their data networks, but it has clunky load times and buffer delays. Modeo and MediaFLO more closely resemble broadcast signals. MediaFLO is transmitted on Channel 55 in the TV band, causing launch delays in some areas as adjacent-channel interference is worked out. Modeo has a nationwide license of 5 MHz at 1.67 Ghz in the radio astronomy band.

In terms of programming, Verizon (MediaFLO) has CBS, NBC, Fox, MTV, Comedy Central and Nickelodeon lined up, with local programming planned for later in the year. Modeo beta is carrying Fox News, Discovery Channel, "and others," as well as streaming audio from Music Choice, the company said.

Mobile TV

NAB Creates DTV Transition Team

WASHINGTON

NAB has hired a political campaign team to spread the word about the end of analog TV.

Jonathan Collegio, Myra Dandridge, Shermaze Ingram and Lale Mamaux have been hired to lead a national effort to publicize the DTV transition.

"NAB's DTV transition team will be charged with educating the American public on the many benefits of DTV so that no TV set goes dark on February 17, 2009," said NAB President and CEO David Rehr.

Jonathan Collegio, NAB vice president, digital television transition

Ingram, the new director of media relations for the team, once worked for "The NewHour with Jim Lehrer." She was most recently director of communications and events for Discovery Education, a division of Discovery Communications.

Dandridge will serve as director of public affairs. Most recently, she was communications director for the Congressional Black Caucus; she also served as the Florida state press secretary for the Kerry-Edwards presidential campaign.

Mamaux will be director of external relations. She was previously communications director for Rep. Robert Wexler (D-Fla.). She also worked for the Kerry-Edwards team in Florida.

Dandridge, Ingram and Mamaux will report to Collegio, who joined NAB in late 2006 as vice president of the digital television transition. Before coming to NAB, he was press secretary for the National Republican Congressional Committee. Collegio also served as deputy chief of staff for Rep. Patrick McHenry (R-N.C.) and was an associate producer at News 12 New Jersey for a year.

DTV Transition

FCC Rules on CableCARD Waiver

WASHINGTON

The FCC Media Bureau on Jan. 10 ruled on three CableCARD deployment waiver requests.

Comcast was denied a permanent waiver; Cablevision's request for a limited waiver was granted, and one by BendBroadband in Bend, Ore. was conditionally granted.

CableCARDs are the product of an order issued by the FCC eight years ago that directed cable companies to separate the scrambling from the set-top box, allowing retailers to sell cable boxes. The cards are SD-like devices that contain the scrambling technology. The order, known as the "integration ban," goes into effect July 1, 2007.

Cablevision got a partial pass because it de-integrated its boxes five years ago. However, it's doing so with "SmartCards," which don't meet FCC requirements. Cablevision has until July 1, 2009 to replace SmartCards.

BendBroadband convinced the commission that it was going all digital by 2008 and therefore shouldn't be compelled to cycle through two types of set-tops in two years.

The cable industry has delayed the implementation of CableCARDs for 10 years, contending that the scheme will cost too much.

Sununu Opposes Flags

Sen. John Sununu (R-N.H.) in mid-January was working on a bill to prohibit the FCC from imposing broadcast flags, according to his office. The legislation was said to resemble an amendment Sununu offered last year that made it through the Republican-led Commerce Committee.

The FCC mandated the flag in 2003, but implementation was enjoined by the courts in 2005 for lack of a Congressional directive. Sununu framed the flags—designed for HD content protection—as an imposition on consumer electronics makers. He will serve on the Commerce Committee again, which will be chaired by Sen. Daniel Inouye (D-Hawaii). Sen. Ted Stevens (R-Alaska), who was chairman during the last Congress, said at the time he intended to push legislation that would allow the FCC to implement the flag.

Tomlinson to Exit BBG

Kenneth Tomlinson, the controversial chief of public broadcasting, is stepping down as chairman of the Broadcasting Board of Governors, which oversees U.S.-backed international broadcasting. Tomlinson penned a letter to the president last month asking that he not be renominated for the post.

Tomlinson previously headed up the Corp. for Public Broadcasting, where he became the subject of an Inspector General's report for hiring an acquaintance to track what he considered to be liberal biases on PBS programming. He also caught flack for running his race horse business from his CPB office and double-billing CPB and BBG for simultaneous hours worked. He resigned from the CPB board in November 2005.

Tomlinson has maintained that the criticisms leveled at him were politically driven. He told the president he intends to write a book about his experience.

Rep. Ed Markey (D-Mass.), incoming chairman of the House telecom subcommittee, welcomed Tomlinson's departure.

"The resignation of Mr. Tomlinson from the Broadcasting Board of Governors is welcome news for those who want to improve the image and reputation of the United States and convey positive images and messages about our nation to the world in a manner that is bipartisan and de-politicized," Markey said.

Federal Frequency

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CES

CONTINUED FROM PAGE 1

Real problems surrounding the DTV cut-off—beyond the short-term Web site distraction—were the centerpiece of the hour discussion, during which the panelists agreed that the Feb. 17, 2009, deadline will be met.

"We certainly hope it will stick," said John Taylor, vice president of public affairs at LG Electronics and chair of the HDTV Committee of the Consumer Electronics Association, which runs CES. David Donovan, president of the Association for Maximum Service Television, also expected that Congress will hold to that date, although he acknowledged that, "You never know what's going to happen until it's just about ready."

Kyle McSlarrow, president of the National Cable and Telecommunications Association acknowledged that if Congress intends to change the 2009 analog broadcasting cutoff, it must act within the coming year to handle the array of ancillary issues accompanying the transition. His comments fueled a discussion about mandatory retransmission on cable systems of broadcast DTV multicasts, with McSlarrow reiterating that such multichannel carriage is not negotiable.

EDUCATION GAP

The panel also focused on the immense public education challenge. Despite the speakers' promises to support informational programs, the array of fundamental questions from the audience raised the prospect that the general public—which is far less informed—may be wildly confused by the informational campaigns now being planned.

Much of the panel discussion centered on the National Telecommunications and Information Administration's plan to distribute $1.5 billion of coupons to subsidize digital-to-analog set-top boxes that will enable current TV monitors to display ATSC signals. Donovan criticized the original NTIA plan, which would prohibit coupon subsidies to homes that do not subscribe to cable or satellite service.

"A converter box coupon program should be available to anyone with an over-the-air set in the home," Donovan said. Taylor took it a step further, suggesting that Congress may have to allocate "more money to support the coupon program."

MARTIN'S VIEWPOINT

FCC Chairman Kevin Martin, in an on-stage discussion the following day with CEA President Gary Shapiro, veered away from the DTV coupon program, noting only that the commission "has put in place the rules and carriage rights and obligations" for media operators.

As for the public information program, Martin said, "It is going to require some education on behalf of everyone to make sure that consumers... recognize this is an exciting opportunity."

Martin offered views on other transition factors. He cited the "innovation" that will emerge, singling out the "mobile to mobile" prospects and citing a Samsung demonstration at CES of its A-VSB technology for mobile reception of DTV signals.

Dell Inc. Founder and Chairman Michael Dell unveils Dell's new 27-inch display with an HDTV tuner during his day two keynote address at the 2007 International CES.

In a widely headlined disclosure, the Chairman announced that the FCC would not issue blanket waivers to cable companies to back away from their support of CableCARD technology. Martin insisted that by Christmas 2008, consumers should be able to "take advantage of what we're seeing on the floor," a reference to the "digital cable ready" TV receivers that were widely displayed at CES.

CONVERGENCE LARGE AND SMALL

Martin's references to CES exhibits underscored the convergence and overlapping industry objectives that permeated the 40th anniversary International CES. The increasing crossover between home computer technology and TV emerged in many ways. For example, Microsoft Chairman Bill Gates, in his CES keynote, demonstrated an upgraded Xbox 360 that has embedded Internet Protocol TV (IPTV) software, enabling the videogame console to function as a broadband set-top box.

The IPTV/Xbox will be available by year end. Although customers were not yet announced, is it expected that the emerging telephone company TV ventures will be the initial distributors, with some speculation suggesting that Microsoft itself may try to develop a standalone IPTV venture using the enhanced gaming devices.

Sony unveiled a line of Bravia LCD TV sets that are designed to receive HD video programs via broadband connections, an indicator of the integration of PC delivery and conventional TV display. Sony's emphasis, like many other TV makers, was on 1080p displays, moving the emphasis from 720p and 1080i units, which had been the centerpiece of CES in recent years.

Another approach to cross-platform video came from SanDisk Corp., which makes a variety of computer storage devices. "USBTV," a system based on the "thumb drive" portable storage gadgets, was unveiled as a process that lets consumers move digital content from PCs to TV sets. SanDisk also created the USBTV Forum to stimulate supplier participation. Akimbo Systems and Guba, Internet TV content aggregators, are the first content distributors to sign up for the service, and MovieLink (an Internet motion picture firm owned by Hollywood studios) is working with the Forum.

The initial USBTV concept allows users to load movies onto a flash memory-enabled drive, which is then placed into a special cradle attached to TV set. In Las Vegas demonstrations, SanDisk displayed the movies on large-screen TV monitors. The customized USB drive itself includes an elegant remote control for viewing the stored digital content. Among the manufacturers participating in the forum initially are LG Electronics, Mitsubishi Digital Electronics and Pioneer Electronics.

Meanwhile, other CES venues focused on mobility, such as the Verizon Wireless, which showcased its expanded V CAST mobile phone content line-up, including bundles of shows from MediaFLO, the Qualcomm offshoot that is launching a nationwide video-to-mobile phone service in March. MediaFLO announced program redistribution deals with CBS, NBC and Viacom's MTV Networks.

At the small end, portable media players proliferated, including the Sirius 'backseat" audio-video tuner, a $300 kit that will display limited TV programming in Sirius radio-equipped cars. Initial programming includes MTV Networks content.

At the other extreme of the display evolution, the "inches" competition among big-screen makers notched up as Sharp unveiled a 108-inch LCD Aquos monitor—five inches larger than Panasonic's year-old $80,000 103-inch plasma monitor. Elsewhere on the display front, Sony displayed a 27-inch Organic Light Emitting Diode monitor, far larger than the handheld-device OLED screens of previous shows. But Toshiba and Canon abandoned their much-hyped SED (Surface-conduction Electron-emitter Display) monitors, which were deemed too costly in light of the falling prices for LCD and plasma displays.

MOXI GOES RETAIL & OTHER SHOPPING OPTIONS

Moxi, the digital media recorder from Digeo Inc., which debuted five years ago at CES and then took a cable-centric set-top tack, is now back on the retail track. Digeo plans to begin marketing a "next-generation Moxi" box by April. Although details about price and distribution are not ready, Digeo CEO Mike Fidler said, "The proliferation of HD devices and programming, the growing abundance of digital content and the increasingly sophisticated expectations of consumers make this a perfect time to offer Moxi more broadly."

Meanwhile, SlingMedia expanded its line of "place-shifting" technology , and newcomers such as Monsoon Multimedia unveiled new wireless video streaming recording functions using its HAVA platform.

Elsewhere, long-time cable partners demonstrated revised tactics to handle the evolving market. Zodiac Interactive (the new name for Zodiac Gaming, a nascent set-top box cable games provider) showcased its array of video/social-networking services, including a Yahoo!-powered local search feature and a version of the FlickR photo-sharing service. The Zodiac interface, displayed on Scientific-Atlanta set-top boxes, featured "Insta," a program-browsing feature for customizing the viewing experience.

The increasing presence of digital services adds to CES's complexity. MediaZone, a "social video" broadband service that includes off-network content as well as original foreign and domestic online video, exemplified the range of new choices available to the intertwined PC and TV customers.

Moreover, the highly visible feud between high definition DVD formats (Blu-ray and HD DVD)—made more confusing by the combined "Total DVD" products that put programs in both formats onto the same sliver platter—underscored the competitive chaos that is CES.

In that context, the unexplained malfunctioning FCC Web site clock may have offered a good symbol of what lies ahead. ■

Gary Arlen has tracked the changes at CES for more than 25 years. He can be reached at GArlen@columnist.com.

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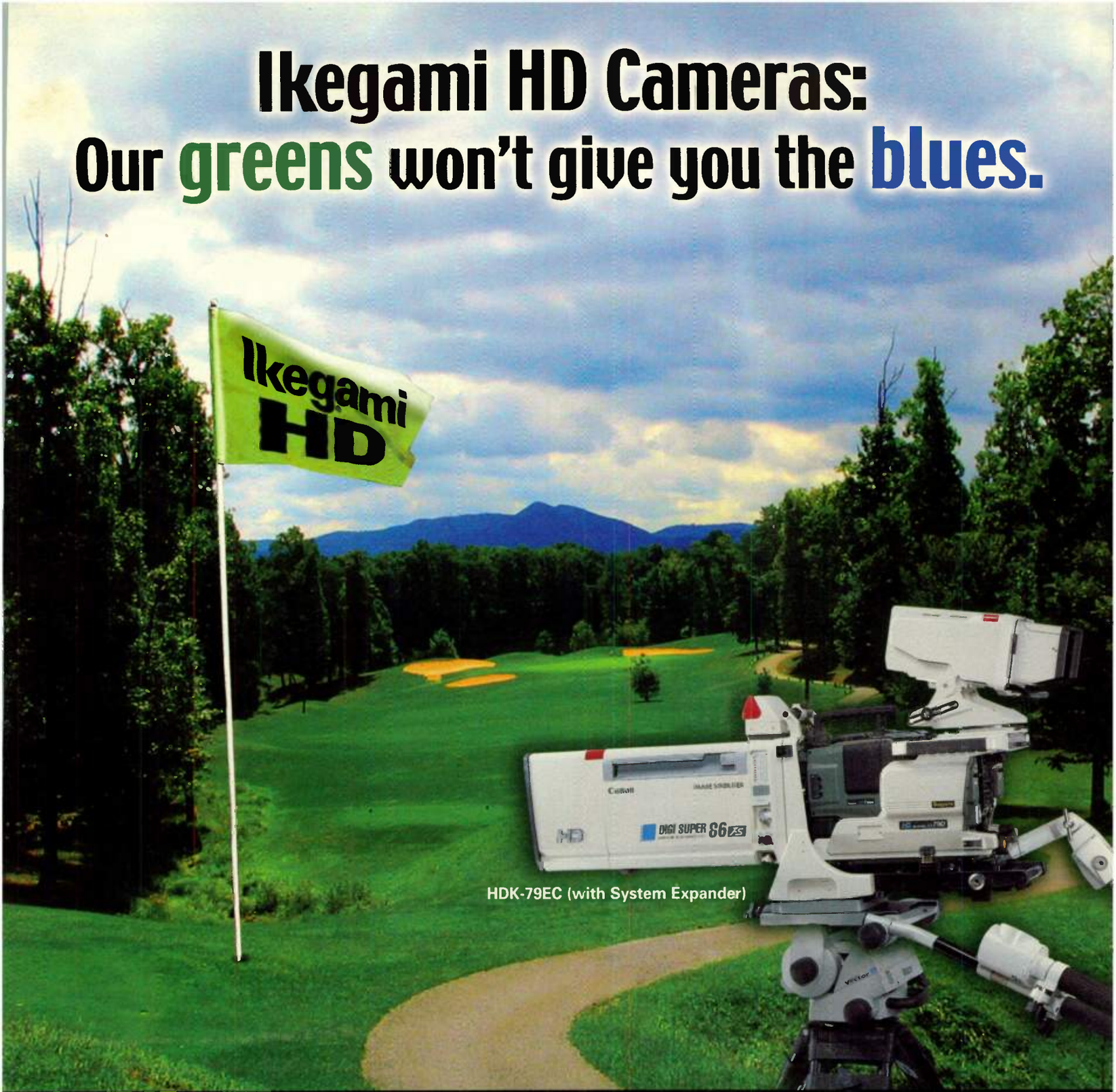

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CES Product Review

International CES 40th Anniversary 1967-2007
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Dual Hi-Def DVD Player

In an attempt to bridge the format war now waged by the Blu-ray and HD DVD camps, LG Electronics rolled out the world's first player designed for both formats. The Super Multi Blue Player took the prize as the overall best show product at CES2007 and is shipping this month. The player uses the Broadcom universal optical disc (UOD) platform featuring a combined Blu-ray disc and HD DVD system-on-a-chip (SoC) solution.

Internet Video on TV

With more consumers getting their video via the Internet, Sony is addressing this market with the new Bravia Internet Video Link, a module that streams broadband video to TV sets, via an Ethernet link from an ISP. Reportedly costing less than $500, the device will allow owners to view free Internet video content, including high definition from providers, such as AOL, Yahoo! and Grouper, as well as Sony Pictures Entertainment and Sony BMG Music, on Sony's newest Bravia TVs. The unit will ship this Spring.

Flash DVD Player

Storage giant SanDisk Corp. introduced the USBTV, a pocket-sized player that allows consumers to easily move digital content from their PC to the TV, using a specially designed TV cradle. A multimedia processor converts the stored files into various TV video/audio formats for direct playback on virtually any TV. SanDisk anticipates that its USBTV technology will lead to new product innovations, including the integration of USBTV players directly into sets.

IPTV for Gamers

In another attempt to jumpstart the market for its IPTV platform, Microsoft announced that it is adding Microsoft TV IPTV Edition to its popular Xbox 360 later this year. In addition to the EPGs, DVR and VOD capabilities offered by its IPTV software, a combined Xbox 360/IPTV unit will allow gamers to watch live streaming broadcasts while they zap aliens on the side, among other amenities. Microsoft is anticipating heightened interest for the product from telcos rolling out video services. The capability—which doesn't yet have a price tag—will be ready for the 2007 holiday season.

Digital Media Player

Anticipating that the FCC's July 1, 2007 ban on integrated cable set top boxes will actually hold, Digeo announced that new versions of its Moxi digital media players will ship this year. Although more than 400,000 Moxi players have already been deployed by cable and telco operators, the company anticipates growing consumer demand for its players once they hit the retail floor. Two HD-compatible versions were

shown at CES: the Moxi Multi-room HD DMT, which provides multi-room HD recording and playback with an integrated multi-stream CableCard, and the Moxi Home Cinema Edition HD DMR,a Linux-based system for home theater.

World's Smallest HD Camcorder

Sanyo is billing its new Xacti HD2 as the world's smallest and lightest high-definition video camera. As a successor to the HD1 and HD1a series camcorders introduced last year, the 720p Xacti HD2 weighs in at 8.3 ounces and measures 3.1 inches wide by 4.7 inches high by 1.4 inches deep, features a new HDMI digital interface and can record up to 21 minutes of high-definition video per gigabyte of available memory on any standard SD or high-capacity SDHC card, using MPEG-4 compression. The camera also features an accelerated frame rate, transmitting data at 9 Mbps. A "Web-SHQ" recording feature is designed specifically to capture video for video iPODs and other MPEG-4 capable personal media players.

1080p for Smaller Plasmas

Panasonic is bringing 1080p to smaller plasma screens. At CES, the company showed a prototype 42-inch plasma TV that can deliver more than two million pixels (1,920x1,080), more than twice the pixel count of a 42-inch HD PDP. Panasonic developed new rib and phosphor materials to develop smaller ribs, as well as improve the aperture ratio to achieve both the high density of two million pixels and the same high brightness as the current 42-inch Panasonic HD model, the TH-42PX600.

The company also introduced LIFI technology for High Definition LCD Micro Display models, featuring Luxim's long-life LIFI, a light fidelity projection display application that ensures image brightness over an extended period of time, as well as contributing to a greatly reduced start-up time.

World's Largest LCD TV

CES continues to serve as the battleground for bragging rights to the world's largest flat screen TV and this year, Sharp won the battle with its Aquos 108-inch LCD TV. The 1080p set measures 93.9 inches high by 52.9 inches wide and is being constructed at the company's 8th generation factory in Kameyama, Japan, which focuses on generating large-screen units. The previous champ was Panasonic, which debuted a 103-inch plasma TV at CES2006.

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Linear Acoustic: Staying Put in Pennsylvania

An American audio firm finds that everything needed is in its own backyard

by James E. O'Neal

(This is the third in a series of articles saluting broadcasting industry manufacturers that continue to produce their products on American soil with American labor.)

LANCASTER, PA.

In terms of age, Linear Acoustic is one of the newer kids on the block. However, a visit to the company's address here in the heart of the Pennsylvania Dutch Country doesn't really convey that impression.

There's a very strong and solid feel of Americana here. The business is located in an old stone and brick building that dates from the turn of the last century and first housed a shoe factory. Just a block a way is Lebzelter's Tire Store, which proudly proclaims itself as "the world's oldest Goodyear dealer."

Linear Acoustic is Tim Carroll's enterprise, and while it has been around for slightly less time than the former shoe factory, it is quite well established on the television and radio audio product landscape. Carroll has been turning out quality audio here products since 2004.

While the business may be new, Carroll is not exactly a newcomer in world of broadcast audio products. He spent seven years at Dolby Laboratories before deciding to go into business for himself. Linear Acoustic's first stop was in New Jersey in 2002, but Carroll preferred a different environment and moved the company to Pennsylvania two years later.

Linear Acoustic was really established to build the Octimax, a 5.1 channel audio loudness controller and surround synthesizer for television. Octimax addresses a continuously expanding market, as more and more stations make the plunge into high definition and want to add enhanced audio to go along with the widescreen visual experience.

Carroll saw the increasing requirement for 5.1 audio processing and knew there was a lack of commercial products that could do this.

With the Octimax a very viable reality, Carroll and his staff have been pushing forward on other fronts, developing products to address the digital revolution in both television and radio broadcasting. These include the Aeromax for both TV and HD FM radio. Linear Acoustic is also partnering with radio transmitter manufacturer Broadcast Electronics to integrate audio processing into BE's FM exciter.

LOCAL OUTSOURCING

Linear Acoustic is a bit different from other companies covereded in this series of stories, in that while virtually everything going into Linear Acoustic products is made in America, the company doesn't have a production line, but instead outsources manufacturing operations. However, that outsourcing doesn't stretch very far geographically.

Tim Carroll, founder of Linear Acoustics, checks one of his processors in the company's lab.

Circuit boards are assembled in nearby Reading, Pa. Cable assemblies are also done in Pennsylvania, while metal and other components are fabricated in New Jersey—or "just across the border," as Carroll described it.

All design work, final assembly and testing operations are conducted at the firm's Lancaster facility.

"Even though our completed units don't travel from start to finish under the same roof, said Carroll, "It's really all homegrown—right here and not overseas. I believe in giving back to the community and we do this by outsourcing to American manufacturers right here in this area."

WHY STAY ONSHORE?

When asked why Linear Acoustic gear took this approach instead of outsourcing to the Far East and the cheap labor available there, Carroll was quick to explain that such a scenario would not work for his company.

"We build in enough margin so that we don't end up having to shave off pennies to stay competitive," he said. "Yes, cable assemblies and other things could be done cheaper in China, However, none of our products are being produced in high volumes. It's really not worth it to have to travel to China to troubleshoot a production problem."

Carroll elaborated on this concept.

"It's really all about volume—50 units a month versus 5,000 a month, he said. "We don't need to go to China to save $10 on 100 units. That's a lot of travel. You have to figure in the cost of a trip to China."

Turnaround time is also a factor in driving the "made in America" equation for Carroll.

"I can get a quote from a local vender or fabricator here in a week. It takes months from Chinese sources."

Other concerns have movitated Carroll to keep operations close to home.

"Respect for intellectual property varies outside the bounds of this country," Carroll said. "While this is not a really big concern, it is in the back of my mind. We do have a licensing program, but don't really see a need to go overseas with it."

All in all, Carroll is well pleased with his company's business model. All manufacturing and operational resources are literally within minutes of his office, allowing him time to work on designing the next item in his company's growing catalog of quality audio products for the broadcast industry.

Carroll is a New Jersey native, and while his experiences in California were positive, he admitted that he became burned out there. "Burned to a crisp," as he put it.

"I missed the East Coast and just wanted to get back. I'm not sure that I was thinking about designing and building audio products at first," he said.

However, the Octimax took off and Carroll followed it with the Upmax, and the rest, as they say, is history.

Lancaster County is an interesting mix of old and new. On the one hand, it's not uncommon to see carriages pulled with teams of horses and, on the other, to witness the cutting edge in broadcast audio tools.

"Made in America" works for Tim Carroll's business. It would literally take one of those teams of horses to make him relocate it elsewhere. ■

TV Broadcast and Satellite

Engineers: How to Avoid Going Off Air Unexpectedly

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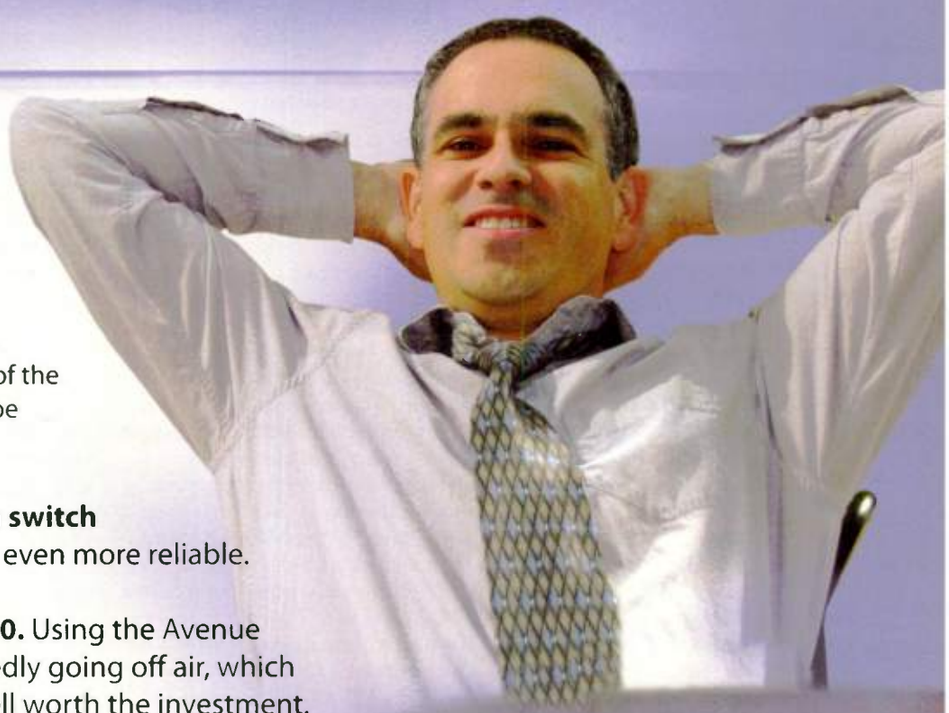

You can use the **sophisticated detection system** to your advantage by adjusting the switch's parameters for *your* facility's needs. For example, the black detection system allows you to set both the threshold and the percentage of non-black pixels. But that's not all, you can also determine the portion of the picture to be considered. This allows a corner bug to be either included or excluded in the detection process.

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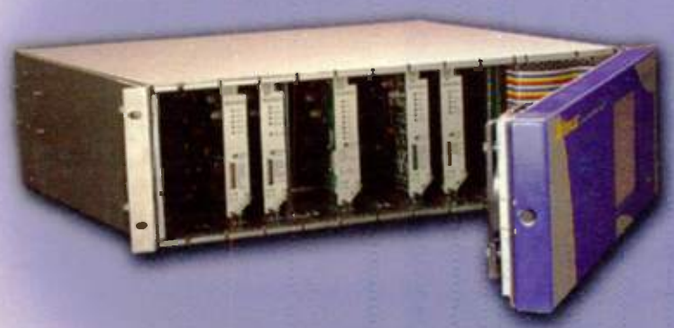

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Signal Processing and Infrastructure – That's All We Do

Digital Multitasking With IPS

Workflow requirements fuel need for all-in-one systems

by Craig Johnston

SEATTLE

"Someday a computer will do all of this," this writer was told decades ago, while gazing at a television studio and control room packed with technicians, each operating his own piece of equipment. Vendors of integrated production systems want you to know that just such a day has arrived.

Integrated production systems have, to some degree, been around for a long time. A video switcher in the 1980s that would both roll and take a VTR source, or control a routing switcher, or feature a built-in still store, was sort-of an IPS.

The modern IPS can control all of the production equipment, or as much of it as the producers want. Some IPS systems get their instructions from newsroom computers, others rely on the operator to press individual buttons on a console.

Some IPS systems have all production components, video and control, character generator, still store, camera robotic control and video playback, built into their system. At the other extreme, an IPS can simply be the controlling device for those components. There's also a middle ground, where an IPS has some components built in, and controls others peripherally.

BROADCAST PIX

In developing its IPS, Broadcast Pix in Burlington, Mass., built the switcher, CG, clip-store and multi-monitor output into its Slate switcher. But they found a significant number of their customers had occasions, like sports coverage, where they needed to have a graphics operator input stats and other information as the game-cast went along.

"All of our systems support multiple monitors," said Ken Swanton, company president and founder. "What they'll do is to put a second monitor, keyboard and mouse, graphics operator, and the switcher operator will run everything else."

Though Slate also supports input from peripheral CGs, Swanton said most customers rely on the one built into the system, an Inscriber that does rolls, crawls, animations and other effects.

"The top half of the switcher control panel is like a chameleon," he said. "It can morph into a set of controls for the CG, for a still store, for a logo store, camera control, for a clip store. As an example, when the operator opens the CG control screen, he can pick any of the CG pages to bring to air, or start rolls going, start animations playing."

Broadcast Pix Slate 100

Slate's developers intentionally left one function to an external device: audio. "We kept audio as a separate application, so our customers basically buy a Yamaha or Mackie or some kind of a mixer and attach it," Swanton said.

ECHOLAB

As Echolab's switcher technology evolved from hardware-centric to software-centric, the company kept building in capabilities that used to require separate piece of equipment.

Eventually they were able to put all that functionality on to a single Zylinks chip, said Battista Remati, Studio Ensemble project leader at Echolab.

"You buy any other competitive switcher, they're very hardware-centric pieces of equipment. There's a circuit board for graphics, a circuit board for DVE. All our features and functionality are basically what we call firmware driven," he said.

"Once you get to the level of software, all you need basically are protocols and smart buttons in order to be able to control all the elements."

Aiming at the mid-market segment of the broadcast industry and the worship market category, Echolab looked for "best-of-breed" peripheral products as companions to its switcher to complete their Studio Ensemble IPS product. They identified the Compix Media character generator, the 360 Systems Media Server, and the Avitech Multiviewer.

"All of a sudden, you don't just have a piece of equipment that switches the video signal," said Remati, "all of a sudden you're controlling workflow from a central point." The Studio Ensemble and all of its peripherals are both analog- and digital- capable.

Studio Ensemble is configured with the Compix CG, 360 server and Avitech multiviewer as peripheral pieces of equipment. But some customers asked for an all-in-one unit, which resulted in the Remote Ensemble Turnkey Portable Video System, with all components built into one single flypack case.

GRASS VALLEY

If you're ever a contestant on Jeopardy, the category is Television Equipment for $300, and Alex prompts you with: "Grass Valley Group's Ignite," the correct response is: "Whatever happened to that ParkerVision system we used to see at NAB?"

"Actually we're the same team that was at the former ParkerVision," said Grass Valley Director of Integrated Production Solutions product management Alex Holtz, who describes Ignite as a brand new, built-from-scratch product. "We spent a lot of time with our installed base, the former PVTV customers, got a lot of their feedback."

Ignite is available in both SD and HD versions. When it came to whether to build in production component equipment or control it peripherally, GVG took the middle road with Ignite. Video switching and audio control were built in, Holtz said, because they are so critical to production of a video program.

"At the same time, a challenge was that a lot of broadcasters have their own graphics systems, their own server systems, their own digital news production systems, newsroom computer systems, and we can't arbitrarily say rip out everything you have and let's start all over."

Holtz said that where ParkerVision had been limited to small and mid-market TV stations, Ignite is aimed at the most sophisticated newscasts.

PIXEL POWER

For its entry into the IPS marketplace, Pixel Power built the production control into its Clarity 500 (SD) and 5000 (HD) character generators. (The 5000 can handle SD as well.) In addition to the graphics, captions, lower thirds and over-the-shoulder pictures normally expected from a CG, the Clarity performs the functions of a production switcher, DVE and audio mixer.

The 500 and 5000 are two dual channel graphics systems. "We've interposed a chroma keyer between the two channels," said James Gilbert, Pixel Power managing director, "to allow one channel to provide a background and then the chroma keyer provides in the local live talent using a camera and the chroma keyer in front of that background, and then in front of that talent would be captions and other graphics."

Clarity also has clip stores that can play back packaged stories and other clips which have been ingested. For newscast production, Clarity integrates with iNEWS, ENPS, and Dalet.

Ross Video OverDrive

ROSS VIDEO

When Ross Video designed their OverDrive Production Control System, they knew that news and other video productions needed an integrated production control system with a lot of flexibility built in. Brad Rochon, product manager for OverDrive, said they couldn't tell their mid- to large-market customers: "we can do it, but you have to do your show this way."

"The goal at the end of the day is to be able to support their current look, the brand the facility's trying to put together."

He noted that some shows might have a technical director operating all the production equipment through

SYSTEMS, PAGE 27

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HD's Need for Speed

Sports broadcasters contract new HD slo-mo and high-speed cameras

by Robin Berger

LOS ANGELES

With more major sporting events being seen in high-definition in more living rooms, viewers are expecting the total HD experience throughout the game. And the networks are responding with new technologies that focus on the special effects that are a staple of sporting coverage.

CBS Sports seemed pleased with its pre-Super Bowl high-definition 3x slo-mo plus high-speed debut at the Jan. 7 Jets-Patriots playoff game. Sony's HDC-3300 provided the slo-mo; and NAC Image Technology's Memrecam Hi-Motion and Vision Research's Phantom V10 split credits for CBS' "SuperVision" high-speed footage. All were deemed keepers for NFL coverage.

"We definitely will be using Sony Supermo in our NCAA [basketball] tournament coverage," said Ken Aagaard, CBS Sports vice president of operations and production. The Phantom V10 will be used in its SwingVision golf coverage as well as a high-speed camera at the Final Four NCAA Tournament in Atlanta in April.

Located high above the 50-yard line, the Phantom V10 provided a reverse angle to CBS' other cameras.

"It's a tighter shot—it let us have a definitive look at a fumble we wouldn't have seen from our regular camera positions," said Aagaard of the footage captured at the Jets-Patriots playoff. As for the Memrecam (represented by two handheld Hi-Motion cameras on the field), he said, "It's the highest quality three-chip hi-speed camera out there—the only limitation is that it can only do 300 fps."

3x SLO-MO

Fox, NBC and the NFL Network also used the HDC-3300 for NFL coverage. HBO Sports has been using a handheld HDC-3300 for boxing since the World Championship Dec. 2, and ESPN used it to cover NBA games, beginning with the Lakers/Clippers Christmas match. Fox plans to use it at the Daytona 500 later this month.

Sticker shock is expected to dissipate, particularly after the competition enters the picture. Thomson declined to comment on its anticipated LDK 8300, other than to state that details should be forthcoming around NAB.

Panasonic declined all comment. The buzz there indicated something could be unveiled sometime this month. One source speculated that its new slo-mo offering could incorporate aspects of its contribution to NAC Image Technology's Memrecam. According to the source, Panasonic developed the CCU, paint controller and camera electronics for the high-speed Memrecam.

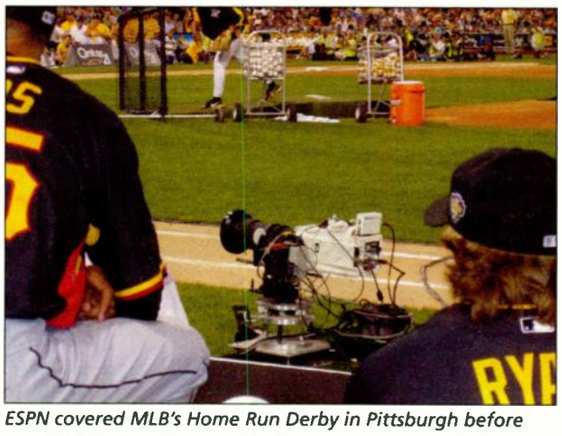
Fletcher Chicago supplied Memrecam's Hi-Motion (300 fps) and K4 (1,000 fps) models to cover boxing on ESPN, hockey on Fox and the NBA on TNT, as well as the NFL. Vice President Dan Grainge listed baseball, hockey, car racing, boxing and golf among the optimal high-speed applications.

"At 300 frames per second the camera has the ability to capture the seams of a baseball spinning, the pitcher's fingers releasing the ball, the bat making contact—all without motion blur," said Grainge. "You have a consistent image all the way through your replay that the viewer can see very clearly, which is unavailable with current slow-motion technology."

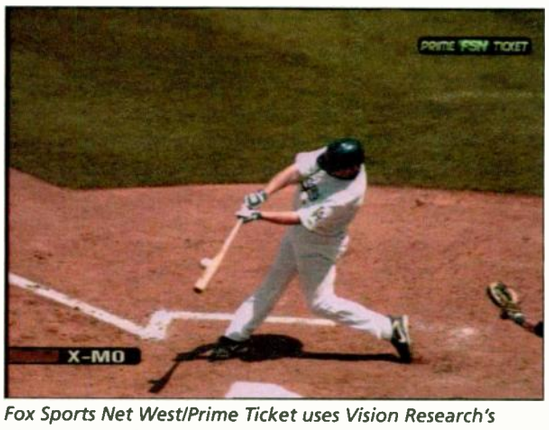
Chip Adams, director of venue engineering for NBC Olympics, contracted Vision Research's high-speed models as a replay device in the absence of a 3x slo-mo option.

"The first time we used the Vision Research camera was back in Athens [2004]," said Adams, noting that its was used for a POV angle down the balance beam using a 20x lens and some prime film lenses to capture gymnastics. At the 2006 Winter Olympics, the V9 model was reconfigured with a 55x lens—and had an actual viewfinder, according to Adams.

SPEED, PAGE 22



ESPN covered MLB's Home Run Derby in Pittsburgh before the 2006 All-Star Game, with the Memrecam K4, which records at 1,000 fps.



Fox Sports Net West/Prime Ticket uses Vision Research's Phantom V10 for its "X-MO" coverage of baseball, NHL and NBA games and PAC 10 football.

Filling In the Gaps

Rigs, remotes and flash recording contribute to enhanced views

by Robin Berger

LOS ANGELES

On Jan. 12, ESPN and SportVision tested FreezeCam, which combines video, still shots and software. The application enables picture manipulation in replay by "freezing" the action as the broadcaster zooms in, out, or around the frame to show players setting up for a given play. Multiple points of interest can be chosen, tight shots of any player in frame can be viewed, and "you can draw over it with a Telestrator," said Wendell Grigley, senior director, Remote Ops for ESPN.

"The test was very successful in giving us a new alternative angle," said Tim Corrigan, senior coordinating producer for the NBA on ABC/ESPN. He planned to use FreezeCam to broadcast the action starting with the Jan. 21 Dallas Mavericks versus Miami Heat game. "It'll be above the rim, on top of the backboard, mounted over the top of the shot clock, looking directly down at the team that's attacking that basket."

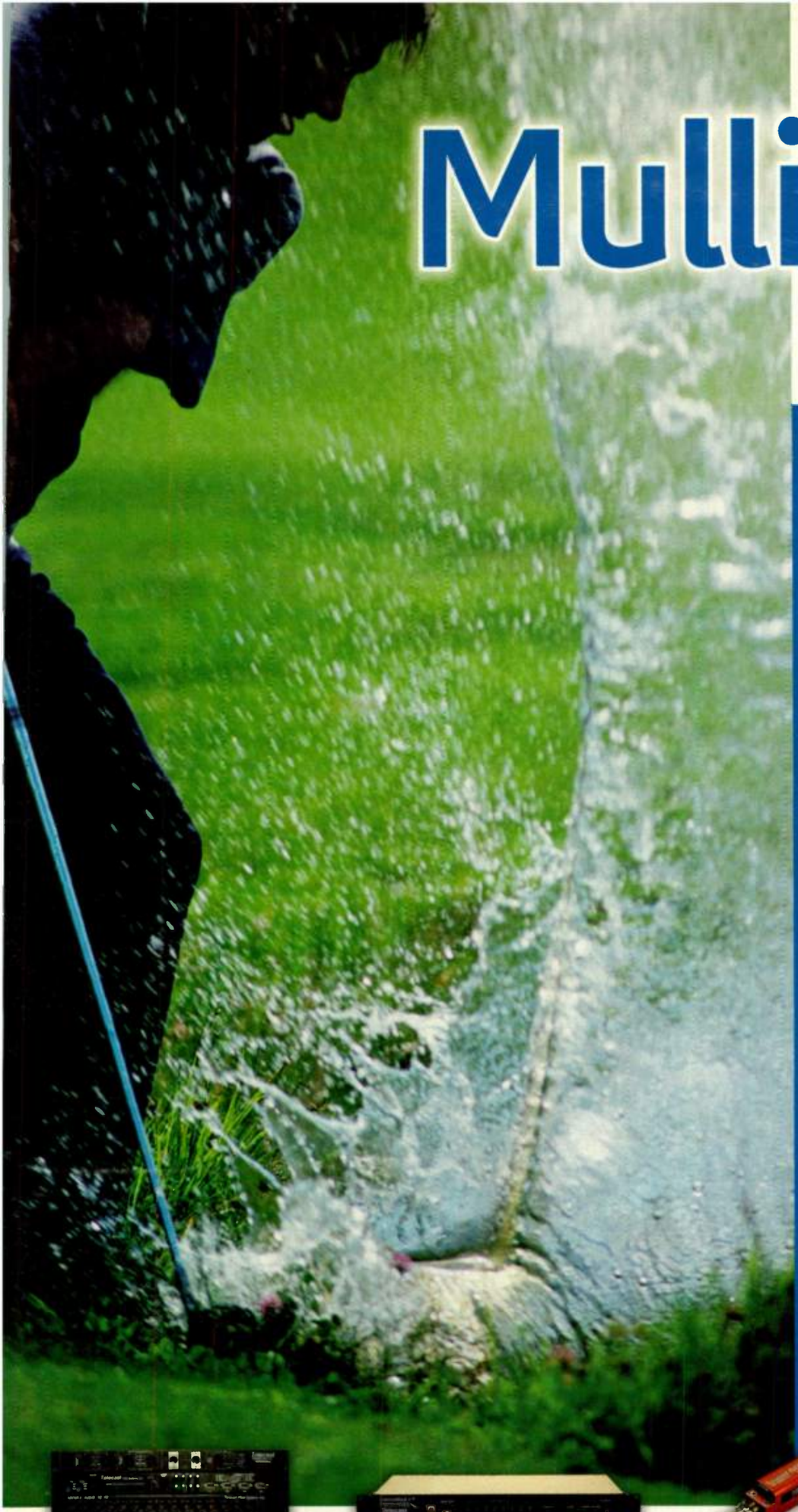
ESPN and SportVision tested the FreezeCam last month at the Pepsi Center in Denver.

REMOTES

ImageCam supplied a remote system for the Iconix HD-RH1 that CBS will use to cover the Super Bowl teams as they enter and leave the locker rooms. ImageCam President Ron Prociw cited resolution quality and ease of use in selecting the 1.32-inch by 1.50-inch by 1.92-inch camera.

Earlier, broadcaster insistence on HD prompted Aerial Video Systems, a Burbank, Calif.-based pro-vider of specialty cameras, to upgrade its PoleCam with an HD-RH1 at "more than double" the cost of its prior camera, said AVS founder and presi-

GAPS, PAGE 22



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DIGITAL JOURNAL

Bill Hayes

Dolby Volume And DialNorm

New loudness control technology for consumer devices debuts at CES

LAS VEGAS

While attending the 2007 Consumer Electronics Show in Las Vegas, I stopped by the Dolby booth to see what was new. I was really interested in the Dolby Headphone product more than anything else. It was brand new at last year's show and the demonstration that I had was quite impressive and I wanted to see how the technology rollout was going. I am pleased to say that there are now a number of manufacturers incorporating Dolby Headphone into their products including a number of laptop manufacturers. There were several multimedia laptops on display that incorporated Dolby Headphone technology in their audio circuitry which can be a great asset as more and more nonlinear editing is moved from the dedicated edit suite at the station to the remote location.

Dolby demonstrated its Dolby Volume technology at CES2007.

Another product that included Dolby Headphone technology that really caught my attention was the JVC SU-DH1 surround sound headphone adaptor. Though designed for the consumer marketspace, I can see uses for this at the station level as well. At IPTV we've had many discussions regarding desktop editing options. I am a firm believer that in the not-too-distant future, the majority of our editing will be done at the editors' true desktops and not at desktops built into an edit suite. This arrangement allows the editor to take advantage of the creative moment as opposed to having to wait for a room to become available. I have been in many sessions where much time was spent sitting around waiting for inspiration while many good ideas are lost because they happen outside of the room. The chief concern that I have heard expressed about editing at the desktop is the spillover of audio in and out of the workspace. I have always maintained that headphones are a viable solution and the addition of an adaptor like the SU-DH1 allows the editor to make creative decisions regarding surround sound audio without the need of a true sound booth. Now I am not claiming that Dolby Headphone is the perfect substitute for true surround sound but it does provide a very accurate representation and with a suggested list price of $129.95, the SU-DH1 is a good alternative.

DOLBY VOLUME

At this point, I honestly thought I was done with Dolby but the next morning there was a press release announcing a new product for the consumer market space called Dolby Volume and thus started a small maelstrom. I didn't see the original press release but I did read a newsletter story that described the Dolby Volume process and seemed to imply that since Dolby's dialog normalization has not found industry-wide acceptance, this was a different approach that Dolby was attempting. Regular readers of my column may remember about a year ago I did some tests on the terrestrial DTV service in the Des Moines area and measured the loudness of all the DTV stations in the market. The results were that only IPTV and one other station were adhering to dialnorm and the other stations were all over the board when it came to volume between each other as well as their own local and network sources. Could Dolby Volume actually fix the problem of loud commercials, level variations between channels and eliminate the need for dialog normalization? It sounded too good to be true and I believe it is too good to be true.

The beauty of dialog normalization is that the intelligence for how to handle it is included with the metadata in the audio. It maintains a consistent audio level for dialog while allowing more dynamic departures for music and effects. From what I could tell, Dolby Volume is a completely single-ended technology that acts as an intelligent limiter but I couldn't see how it would negate the advantages of dialog normalization. I set up a call with Jeff Riedmiller from Dolby to see if I could get the full story. I have been acquainted with Jeff for a few years and he has presented at the Iowa DTV Symposium and quite frankly, if there is something here that is revolutionary, I wanted to see if he'd present it at the next DTV Symposium. Jeff and I spoke briefly and a few days later he and I were on another call with Rocky Graham, also from Dolby. Here is what we discussed on those two calls.

Could Dolby Volume actually fix the problem of loud commercials, level variations between channels and eliminate the need for dialog normalization?

A FAILSAFE

The first question was, Does Dolby Volume make dialog normalization unnecessary?

The answer is no. According to Jeff, the best way to maintain accurate volume control and pristine aural quality is to use metadata and dialog normalization. The handshake that is inherent between the content creator and the content presentation system provides the best quality audio possible. Dolby Volume is a single-ended technology designed to be placed in the consumer device and compensate for non-metadata and analog services. The examples we discussed were gaming, analog services and MPEG 1-Level 2 audio systems.

How are the two systems different? Aside from the differences above, Dolby Volume acts as an intelligent limiter but it does do some dynamic range compression. In the absence of metadata, the idea is to keep the perceived aural spectral range consistent and provide for balance when the levels abruptly change; like when a loud commercial appears or the viewer changes channels.

Will the two technologies be able to coexist? I was curious to know what a device equipped with Dolby Volume and dialnorm would do in the presence of metadata. The examples I gave were if the signal has metadata and dialnorm is set, does the audio pass through the Dolby Volume system unmolested? What about a signal that includes metadata where dialnorm is incorrectly set either through oversight or design? According to Dolby, both technologies can be implemented in the same consumer device and will be able to work in harmony but ultimately it depends on how the consumer product manufacturer implements the technologies and how the home user applies them.

It would seem appropriate that the implementation would first choose the metadata and then apply Dolby Volume only as a safeguard to prevent system overloads, speaker tears and shaking the trailer off the jacks. The consumer will have the ability in a Dolby Volume-equipped device to set a reference level. It is my understanding that as overall volume is raised or lowered, the spectral balance is maintained based on human hearing characteristics.

In summary, to maintain the best aural experience for the end users, continue to accurately apply dialog normalization (or start applying it, it drives me crazy when switching between football games). Don't think about Dolby Volume as any kind of a substitute for accurate audio processing but as a failsafe. ■

Bill Hayes is the director of engineering for Iowa Public Television. He may be contacted via TV Technology.

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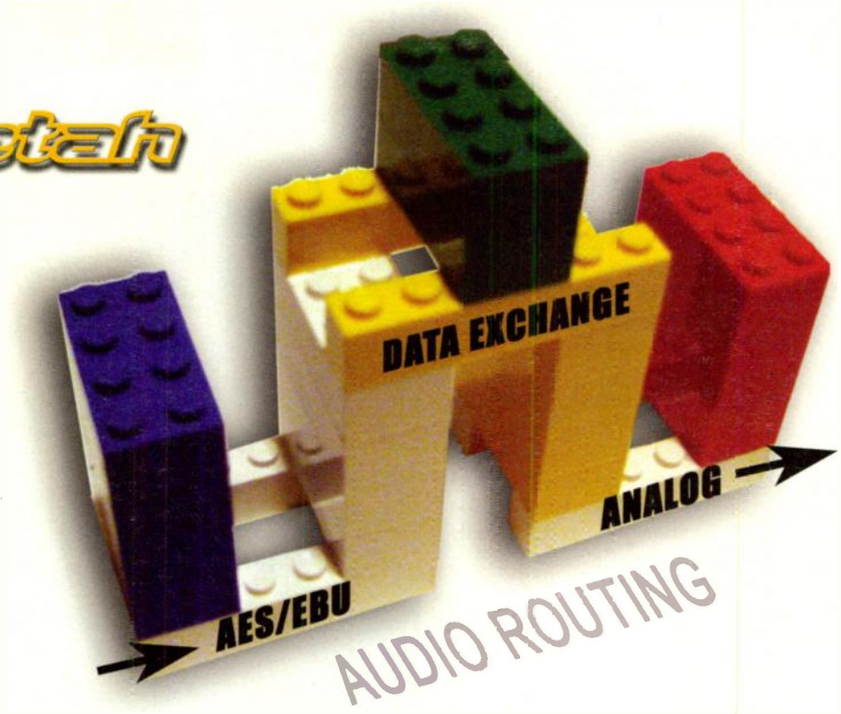

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A Hi-Def Tribute to President Ford

HDNet provides sole HD coverage of presidential funeral

by Ian MacSpadden

WASHINGTON

In the heart of the United States Capitol, centered in the Rotunda, a former U.S. President lays in state. While millions watch the proceedings on television from home, long lines of mourners wait to pay their respects to President Gerald R. Ford in the Capitol building. As the procession left the U.S. Capitol and headed slowly down Pennsylvania Avenue past the White House on its way to the National Cathedral, the pictures being shown across the country were in standard definition.

Once at the National Cathedral, broadcast and cable networks continued coverage of the President's funeral service in the decades-old format. So, was it divine intervention then that enabled a 16:9 high-definition signal to emanate from the solemn event to millions of households across the nation? Who dared to break tradition and usurp the big networks by distributing a better quality image of one of the most covered news events of the New Year? HDNet.

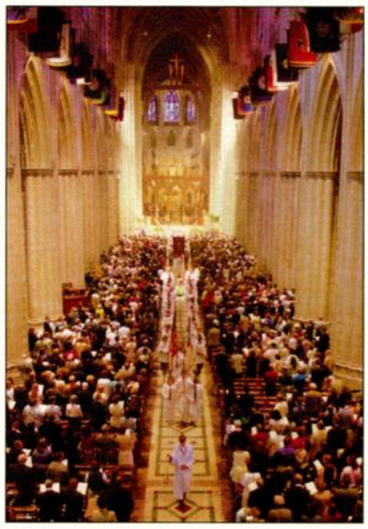
SHORT NOTICE

To be fair to the networks, there were many factors that make covering a news event like this difficult to do in HD; the first of which is getting a high-definition production truck on short notice right in the middle of football's bowl season.

"Most every HD truck is booked for sporting events this time of the year," said Jason Taubman, vice president of Design and New Technology for Game Creek Video, a Hudson, N.H.-based mobile broadcast production company that supplied its Northstar production truck for the Capitol coverage. Getting an HD signal around the Capitol is not an easy task either.

Though Washington is the nation's most fibered city for broadcast, the infrastructure is still primarily analog. The heart of this fiber optic-based video network is Verizon's Audio Visual Operations Center, commonly know as AVOC. From its hub in the center of town, AVOC houses more than 70 video routers that direct signals from all around the city, from the Pentagon to Capitol Hill, and route them to every news agency in the nation's capital. Verizon is trying to stay ahead of the technology curve, and is in the process of migrating all clients over to its huge new 1152x1152 Utah 400 SDI router. They also are installing HD capability that is targeted for completion by the middle of this year. Until then, broadcasters in Washington, DC will be moving their signals mostly on analog lines.

The method of covering such large news events in the nation's capital is also somewhat unique. Even with the fierce competitiveness of the industry, the broadcast networks frequently must pool resources when covering big events such as a President lying in state. This prevents a gaggle of cameras from crowding a room and enables the coverage to be less conspicuous—especially when covering a solemn event such as a presidential funeral. During both coverage of the Rotunda service and the Cathedral ceremony, the networks each contributed crews to produce the coverage. The equipment costs were shared and non-affiliated production trucks were used at both sites.



While the networks covered President Ford's funeral in standard definition, HDNet opted for hi-def.

STRAIGHT FEED

So with all these things working against them—timing, infrastructure, and homogeneity of coverage, how did the upstart HD network best known for its sports and entertainment programming trump the networks and offer coverage of the day's event in HD?

For the services at the National Cathedral, "ABC booked a New Century Productions truck that happened to be a well-equipped high-definition truck [NCP V]," said Philip Garvin, general manager and COO of HDNet, the Dallas based all-HD programming network. Launched in 2001 by Internet billionaire Mark Cuban, HDNet touts itself as the first national network broadcasting all of its programming in 1080i HD. Although the networks received the same signal as HDNet, they down converted the truck's HD signal to standard def, according to Garvin.

"We took the straight HD-SDI feed," he said.

To get around the networks' limitation of not having a digital distribution method, HDNet used its own HD-capable satellite truck to take the 720p hand off and upconvert it to 1080i.

"We then put it through our Dolby encoders and Harmonics 19.4 encoders and transmitted from our 2.4M dish to a Ku satellite," Garvin said. "That feed was received in our Denver Broadcast Center and led to our cable and satellite affiliates without decoding and re-encoding." Garvin said that "once it left the truck in Washington D.C., all the quality was preserved."

When asked why he thought the networks chose SD distribution over HD, Garvin said, "High definition is what HDNet does and has been doing for five years. It's routine for us. While the traditional networks use high def in sports, it's not common for news."

The gamble for the networks is that while they continue their slow transition to HD, proactive newcomers to the game may cut further into their piece of the broadcast pie.

In the early 90's CNN attracted many traditional network affiliates that felt the parent networks failed to support their satellite newsgathering and big event coverage. By offering cheap satellite time and live shots at major news events, CNN created its own affiliate network. The parent networks soon found themselves shut out of remote coverage of big stories due to the relationship CNN had fostered with their own affiliates. The networks then launched new programs and even created new divisions to rebuild and recapture the much-needed resource of their affiliates.

If HDNet begins covering more news events and creating a huge HD archive, will the HD hungry affiliates be lured away again and get the support they need somewhere else? ■

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Speed

CONTINUED FROM PAGE 16

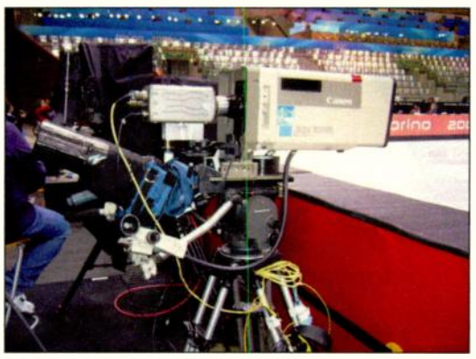
Improved in regard to its imager, processing and light sensitivity, he said the camera was key to NBC's coverage of figure skating. The rink side camera looked down the ice from a standard tripod as athletes went into their spins and jumps, capturing body positioning and how skates landed on the ice.

"This was the first major look at an event where they [the International Federation of Skating] had its new system in place for scoring the routines," he said. The new system followed Salt Lake City's controversy over scoring by a French judge.

NBC also used the camera to capture the downhill skiing and slalom events, testing its merits against icy conditions and varied light scenarios.

Though blessed with sunny skies on the downhill, NBC vied with potential light flicker later at the slalom. "If you're shooting at very high frame rates, you may be shooting faster than the pulse rates of the artificial lights. You choose a frame rate that gives you proper exposure but will minimize light flicker."

He estimated this sweet spot at about 250 frames per second for artificial light versus upwards of "around 500 fps" for shooting downhill skiing in natural light.



NBC used the Vision Research Phantom V9, supplied by Inertia Unlimited, to cover action on the ice rink at the 2006 Winter Olympics in Torino, Italy.

FRAME BY FRAME

Tom Feuer, executive producer for Fox Sports Net West/ Prime Ticket, has had a permanent V10 since July. Branded with the "X-MO" moniker, Fox has used it to cover baseball, NHL and NBA games, PAC 10 football, USC volleyball and high school football. He first discovered the Phantom in 2004 Olympics in Athens.

"We even have a [Carl's Jr.] sponsor for it on Lakers' telecasts," said Feuer. He's also quite proud of footage slowed down to capture the frame-by-frame wobble of a baseball batted by Barry Bonds, and is impressed by the V10 processing power.

The images and improved processing also impressed HBO, which, since last August, has used it to cover boxing.

"No longer are we in a situation where you trigger once and have to wait for it to render, and then wait for it to clear the queue," said Jason Collins. "You can do 10 to 15 triggers in a three-minute round, plus pick which ones we want to move over to the LSM [DDR] for replay."

This multiple trigger breakthrough came in November, said Jeff Silverman, founder of Inertia Unlimited, which supplied CBS, Fox and HBO with their V10 configurations (partner Image-Cam was instrumental in providing the CBS package and designing the robotic mount for HBO). According to Silverman, the V10 memory can be partitioned to capture up to 15 shots without replaying any of them back until a user chooses—and do so at variable speeds.

Vertical banding issues were resolved in late December, said Silverman, with a "modification so that the banding goes away completely." ■

Gaps

CONTINUED FROM PAGE 16

dent Randy Hermes.

"It's the only HD option," said Hermes. The HD-RH1 first delivered live bull riding shots from PoleCam on Jan. 6 for Versus (formerly Outdoor Life Network). Iconix also delivered remote access denied by its predecessor.

"Because the camera was designed with remote control paint capability in mind, we were able to develop custom software to control the camera through our fiber-optic system," said Hermes.

Iconix in Santa Barbara, Calif., provides customers with a remote control protocol, which can be put into a super structure designed by the user, as AVS did for its laptop PC. Iconix plans to exhibit a prototype remote control unit at NAB2007, according to Charles Rothbart, executive vice president for the company.

Meanwhile, Cablecam, a Grenada Hills, Calif.-based developer of specialized rigs for the television and film industries, built its latest rig around Nettmann Systems' PinPoint gimbal, which is one-third the size of its predecessor, considerably lighter, less costly, and "doesn't re-quire as much gyro stabilization technology," said president Jim Rodnunsky. Debuted last November at an HBO boxing event, it was also featured at New Year's Fiesta Bowl.

Cablecam also upgraded its Flexpoint 3D technology to overcome venue obstacles to north-south coverage of hockey and basketball.

"We're getting ready to start demoing the kind of shots you get for football," said Rodnunsky. And the company may soon offer a new way to dramatize boxing contenders' entry into the ring, changing camera points in mid-flight.

Cablecam's new Nettman Pinpoint Gimbal with the new Panasonic 1500 HD camera and Fujinon 4.7x13 lens, debuted last November on HBO PPV.

FLASH RECORDING

Inertia Unlim-ited designed a solid state-based, on-board recording system, using Fast Forward Video's DVR Outrider board, to record video on Flash cards. Used to capture car racing, tests indicated, "it's superior to RF if you're post producing—there's no break up in the picture," said company president Jeff Silverman.

Moreover, he said, "because you're recording on compact Flash cards, you can ultimately just hand a hard drive full of QuickTime files to the producer, who just plugs it into a[n Apple] FinalCut [Pro] system." ■

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CONTROLL YOUR WORLD

SPECIAL REPORT

Clearing the Air

Using delay boxes to prevent indecent slip-ups

by Claudia Kienzle

HAMILTON, N.J.

With penalties of up to $325,000 per station per violation, it comes as no surprise that broadcasters are extremely concerned about preventing offensive words and images from going out over the public airwaves.

But, when programs are live, such as high-profile sports and entertainment events or news, there's no telling what people will say or do in the excitement of the moment while cameras are rolling.

To prevent indecent events from airing, many broadcasters use audio/video delay boxes that delay the live signal, typically by six to 12 seconds, giving an operator time to cut away to an alternate source—like a wide shot of the stadium.

GUARDING THE PUBLIC TRUST

One such product is the Prime Image Pipeline, a dedicated A/V delay system designed to guard against airing indecent content. The top of the line HD/SD Pipeline provides up to six seconds of delay for HD video; and up to 39 seconds of delay for SD video. While it supports both SD and HD, it can only handle one or the other at a time. The Pipeline's SD-only version provides 10 to 39 seconds of delay.

"There's been a very high interest in the whole subject of indecency over the public airwaves. Recently, we were interviewed by The Washington Post and NPR, both of which were inquiring as to whether broadcasters were good stewards of the public trust," said Frank Alioto, president of Prime Image, Inc., in San Jose, Calif. "I would have to say that broadcasters have definitely been good stewards of the public trust. The indecency issue has really been at the forefront of the broadcasters' daily business, especially in the last couple of months when FCC fines have increased tenfold."

STRONG DEMAND

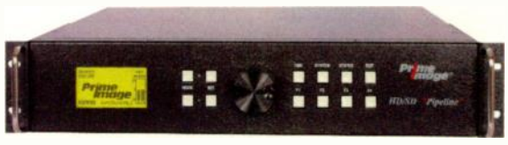
Alioto is an industry veteran who began his career as a technical director at Jefferson Pilot, a station group. When he first started there, he recalled being handed a pamphlet that quoted the words of Thomas Jefferson, "A Public License is a Public Trust." While he worked for Jefferson Pilot, and later as a creative executive at Group W, Alioto said these broadcast organizations had taken the public trust very seriously, as do most broadcasters today, judging by the strong sales for Pipeline.

"Sales for Pipeline have been very consistent and steady since we introduced it in 1994," said Alioto, "And, we're currently in negotiations with several large station groups that are purchasing multiple Pipeline units for use anywhere they are taking in live signals, including newsrooms, studios, and even mobile units."

At $12,500 for the HD/SD Pipeline and $8,500 for the SD Pipeline, Alioto said, "The cost of one Pipeline is miniscule compared to a potential FCC fine. However, in relation to Prime Image's varied product portfolio, which includes the Time Tailor compression system, TBCs, frame synchronizers, and standards converters, The Pipeline represents a small percentage of the company's overall business."

STAYING VIGILANT

While many stations want to cut back production personnel and automate wherever possible, many vendors agree that the process of monitoring the air signal for indecencies is not an application that can be easily or effectively automated. So most broadcasters must either dedicate an operator to the task of monitoring the live signal, or add that responsibility to the job description of someone already employed in the control room, such as the technical director.



Prime Image HD/SD Pipeline

The Evertz HDSD9545DLY-PRO, better known as the 'JJ Box,' is capable of either automated or manual control. But according to Orest Holyk, director of sales for Evertz, in Burlington, Ontario, Canada, most customers prefer the manual mode.

"As networks are trying to be vigilant about airing obscenities, in most cases, real operators are watching the feed to make sure there are no 'wardrobe malfunctions,'" said Holyk.

Introduced shortly after the 2004 Super Bowl, this Evertz profanity protection system gives the operator complete control over the program content going to air. The delay can be adjusted from a minimum of two frames up to 24 seconds for HD or SD, and up to 40 seconds for HD and 240 seconds for SD with the use of the HD-40 option. If an offensive event occurs, the operator only needs to hit one remote button to cause the program video and audio output to be clean switched to an alternative back-up channel. Then, the output can be returned to the main image without the audience noticing an edit has occurred.

"This system accepts several feeds, including a primary/master as well as a safe feed, and operators can select the mode of operation," said Holyk. They can cut or fade from the primary into the safe feed or blur the primary for a user-defined duration. There is also a built-in display that allows the operator to see all the input feeds to ensure the signal does not go off-air.

"Market demand for this system always grows prior to large broadcast events, like the Super Bowl, Olympics, large concerts, and other events carried live," said Holyk. ""During 'off times,' the market demand for the product is steady. Broadcast groups always want to safeguard themselves against potential lawsuits and/or other liabilities. So based on annual budgets, various station groups may make a bulk purchase to outfit their facilities with delay boxes."

TIME ZONE DELAY

Hotronic, Inc., in Campbell, Calif., recently introduced a new A/V delay box, the AV-61, which offers user-defined delays of up to three hours for under $7,000. According to Linda Chang, sales manager for Hotronic, this gives broadcasters the flexibility to use the device for different broadcast applications.

"Broadcasters can use it for profanity protection by setting the delay for just a few seconds. Then, they can press a button to cut away to an alternate source, such as a different camera view or commercial," said Chang. "Or, broadcasters can use the AV-61 to delay the broadcast of a program by up to three hours. One of our customers, MTV, uses the AV-61 to delay the broadcast of programs to West Coast viewers by three hours to compensate for the time difference."

Hotronic also offers the AY-86 which provides delays of up to 20 seconds. It was designed specifically for live profanity protection. Both systems support SDI video and AES-EBU digital audio, as well as analog video and audio, without introducing compression. Hotronic also offers the DE-41 analog composite-only delay box for up to 16 frames of delay; and the AL-86 analog composite-only delay box for up to six seconds of delay.

Doremi Labs, in Burbank, Calif., offers products that can be used for profanity protection and time zone delay, as well as slo-mo replay for sports. The Doremi V1-MP2 is a video disk recorder that uses MPEG-2 compression for SDTV; and the Doremi V1-HD is a server that uses JPEG-2000 compression and supports HDTV. Both range from 1 second up to 12 hours of delay.

MARKET EXPECTATIONS

Singapore-based Pixelmetrix's DVShift-HD provides a delay of up to 10 seconds so that broadcasters can prevent indecent content from going over the air. In doing so, it does not negatively impact picture quality or audio synchronization at all.

"Initially, right after the 2004 Super Bowl, we did see a fair amount of interest in A/V delay devices, but we found that it didn't translate into significant sales as we had expected," said Phil Dubs, vice president of sales, North America, for Pixelmetrix in Ft. Lauderdale, Fla. "Sales for the DVShift-HD have been below our expectations."

Dubs offered several reasons for slow sales of their product. "The DVShift-HD does not provide some of the ancillary features that many end-users might be looking for, such as video switching and the ability to delay analog audio," Dubs said. "Many high-end users might be looking for the 'big red button' to press that would immediately dump the video and audio, which we have not yet incorporated."

While the DVShift-HD supports most formats for HD and SD in SDI form, audio must be embedded if you want to delay it. Dubs said that embedding the audio is a fairly simple process and many companies, such as AJA, Lynx Studio Technology, and Axon have small black boxes to do the embedding and de-embedding into the SDI video stream. Switching for the video would need to be made through an outboard video switcher since the DVShift-HD does not have an internal video switcher.

As it turns out, Dubs said, "The DVShift-HD has found sales success in other applications, such as delaying digital HD network feeds when the SD analog feed comes over a different satellite. The current DVShift-HD, five and 10 second versions, will continue as a special order model, but we don't anticipate adding any of the ancillary features, such as video switcher or analog audio, unless we get a lot more interest in this product."

MARKETING CHALLENGES

ENCO Systems, in Southfield, Mich., introduced a software program named Guardien (informally called the "bleepinator") at NAB2004. Developed by company Founder and President Eugene Novacek, Guardien relies upon speech recognition technology to recognize profane words that have been programmed into it and eliminate them from the air chain.

However, according to Neil Price, ENCO's chief operating officer, "The product has not been marketed due to the lack of clarity as to whether they as the developer could be liable for fines along with their broadcast users. While the product is very reliable, no automated system can guarantee it's 100-percent reliable." ENCO's primary business is digital audio management and playout for broadcast applications and their DAD system is widely used for live HDTV audio.

In light of today's punitive, regulatory climate, Price said, "we've decided to hold off marketing Guardien until the FCC fully defines the role that technology can play in preventing profanity from airing, and to what extent product developers would be held financially responsible. ■

SPECIAL REPORT

Indecency

CONTINUED FROM PAGE 1

Fox is appealing FCC censures prompted by F-bombs dropped during separate telecasts of the Billboard Music Awards. Cher used the four-letter profanity during the 2002 telecast; Nicole Richie in 2003. Oral arguments in the Fox case were presented in December and a decision is expected at any time. As of mid-January, orals had not been scheduled for the case of the flashing breast.

Both court cases represent appeals of the FCC's March 2006 Omnibus Order, which levied an unprecedented $4.5 million in fines for broadcast indecency violations. In addition to the Super Bowl fine, CBS and more than 100 of its affiliates were slapped with proposed fines totaling $3.6 million for an episode of "Without a Trace" depicting a teen sex orgy. Six other programs drew individual fines totaling $355,000, and four more—including the Billboard broadcasts—were deemed "indecent and/or profane." Networks censured for speech indecency joined Fox in its appeal, even though some of the original determinations in the Omnibus Order were later abandoned.

PERVASIVENESS DOCTRINE

The legal framework for indecency rests on a 29-year-old precedent set by the Supreme Court in *Pacifica*. The high court then reasoned that because broadcast signals were "uniquely pervasive," the federal government had a right to regulate content. Thus, anything aired between 6 a.m. and 10 p.m. that describes or depicts "sexual or excretory organs or activities," is patently offensive by community standards and lacks artistic or educational merit is subject to FCC fines.

Those fines were increased tenfold last June when President Bush signed a bill raising the penalty to $325,000 for each individual violation, with a cap for $3 million per program. Seven months after the bill became law, no fines had been issued; most broadcasters stepped lightly after the Super Bowl cataclysm.

However, a recent incident during a National Football League play-off game refueled activists calling for a crackdown on indecency. The Jan. 13 telecast on Fox featured a crowd shot focused on a New Orleans Saints fan wearing an F-word emblazoned t-shirt. The Parents Television Council, responsible for many of the indecency complaints filed with the FCC, was outraged. PTC President Tim Winter said the shot was intentional.

Fox fired up indecency activists with its coverage of the Jan. 13 New Orleans Saints-Philadelphia Eagles game, when a crowd shot showed a fan wearing an F-word emblazoned t-shirt.

"The person wearing the profane t-shirt was chosen by the Fox Network's broadcast crew from more than 70,000 spectators in the stadium," Winter said. "The camera operator selected that particular woman and the director and/or producers of the event made an affirmative and conscious decision to air the shot from that particular camera, forcing the 'F-word' into millions of homes."

A Fox spokesman apologized for the incident, saying it was "unintentional," but the PTC wasn't having it.

"How can families take the Fox apology seriously," Winter said, "when they are suing in federal court demanding the 'right' to air the F-word?"

The PTC also picked up on a report by Frank Ahrens of The Washington Post, who noticed the fan shot wasn't live, but rather a recorded reaction to a play that just happened. The Council urged the FCC to fine Fox without waiting for the Second Circuit opinion.

It remained to be seen at press time if the t-shirt shot would influence the court's ruling on the Billboard F-bombs. When the Billboard telecasts aired, the FCC did not consider an interjectory use of the word indecent. Likewise in 2003 when U2 lead singer Bono said "f-ing brilliant" on the "Golden Globe Awards." Then in March 2004 amidst the Super Bowl fallout, the commission reversed itself and said any use of the F-word was indecent. The interpretation was applied to the Billboard broadcasts in the Omnibus Order, but no fines were levied because both telecasts aired before the final Golden Globe ruling.

Representing Fox in the Second Circuit, Carter Phillips of the Washington law firm Sidley Austin said the Golden Globe order was an unconstitutional expansion of the legal definition of indecency.

"The FCC's new, expanded indecency regime is arbitrary and capricious for two fundamental reasons," he states in the Fox court brief. "(1) the FCC has not even attempted to justify—indeed, it refuses even to acknowledge—the radical change in its policy; and (2) the FCC's decisions are inherently contradictory and provide no guidance to broadcasters as to what speech is punishable and what speech is not."

On the second point, while Golden Globe holds that all uses of the F-word are actionable, the FCC let it pass in "Saving Private Ryan" on the basis of artistic value. The FCC attorney arguing the case in the second circuit also conceded during orals that the word would not be deemed indecent in the context of news.

On par with the FCC's track record in court, the three-judge panel appeared to be skeptical of the commission's approach. Again, however, the Second Circuit grilling took place before Fox aired the Saints fan bearing the words "F**k da Eagles" across her chest. (Asterisks inserted.)

SHOCKING MOMENTS

Whatever the court decides about swearing, it's unlikely to make a difference in the Third Circuit. In fact, legal experts noted that the FCC pushed to fast-track the CBS case because it's more cut-and-dry than the F-word. The breast is considered a "sexual organ."

The Philadelphia court ultimately rejected the FCC's request to speed the process. The same federal bench stayed the commission's media ownership rules three years ago and awaits justification for those regulations.

In the Super Bowl case, FCC is maintaining CBS should have anticipated what came to be known as the "costume malfunction."

In a 75-page brief filed with the court, the FCC argued that "CBS ignored numerous warning signs that the performers might behave inappropriately, including a public statement from Jackson's choreographer promising that the show would include 'some shocking moments,'" the document states.

CBS attorneys argued in reply briefs dated Jan. 8, that "shocking moments" was a far cry from certain nudity:

"Even indulging the utterly implausible notion that a reasonable person should have interpreted the choreographer's hyperbole as signaling that a star performer might engage in the wholly unprecedented act of exposing part of her breast on live television, there is no evidence that CBS so understood the reference or that it failed to take reasonable precautions." ■

Systems

CONTINUED FROM PAGE 14

OverDrive, while others might want to use a dedicated camera and/or audio operator as well. "[OverDrive has] a couple of dozen features that are just not available anywhere else, that allow flexibility and scalability, not just the crew but with devices."

The OverDrive system integrates with the Ross Synergy standard or multidefinition switchers, which in themselves have control interfaces for video servers, VTRs, DDRs, audio mixers, CGs, robotic cameras, routers, still stores and other peripherals. Rochon said the Synergy switchers have protocols for 60 to 70 different peripherals, and Ross writes drivers for new equipment all the time.

OverDrive has a MOS newsroom interface with an ActiveX plug-in that integrates directly into newsroom systems such as Associated Press' ENPS, Avid iNEWS, and Autocue QNews.

SNELL & WILCOX

If Snell & Wilcox seemed to jump all-of-a-sudden into production control with its Kahuna multi-format production switcher, the company has some behind-the-scenes experience in that area.

"Before ParkerVision was bought by Thomson, they used our switchers to create that system," said Joe Zaller, vice president of strategic marketing at Snell & Wilcox. "So all of that learning and knowledge is integrated into the system, is part of it."

He said the same design team went to work on Kahuna's peripheral equipment integration. "One of the main premises of the Kahuna system in terms of product design was to be very interoperable and networkable with a variety or protocols."

Zaller said Snell studied the needs of large-market newscasts and other productions, what peripheral devices they used. "Over time we have integrated with most of them."

Kahuna can control a variety of VTRs, servers, routers and other peripheral production devices, in addition to the clip stores built into each of Kahuna's M/Es. And its FormatFusion feature allows the Kahuna to seamlessly integrate both SD and HD material, then output in both SD and HD.

Upstream of Kahuna, it can take instructions from newsroom computers.

SONY

Since Sony makes pretty much every piece of equipment needed for a television production, it made good sense for them to put them all together and to produce an IPS. That's exactly what the company did with its Anycast Station.

"It's basically a portable, mobile TV station that you can carry around," said Tatsuro Kurachi, marketing & business development manager for Pro A/V Marketing at Sony.

The flip-open lid of the briefcase contains an LCD screen with program and preview windows, in addition to source windows and other information. The lower half of the briefcase contains a console with switcher, camera robotics, audio control, CG and other functions. In addition to outputting straight video and audio, Anycast can stream the signal to the Internet.

"It's eliminating the hassle on the customer's side," said Kurachi, "having to collect individual source monitors, hooking up audio mixers, making sure the frame synchronizer's in. With the Anycast everything is built inside the circuitry so you don't have to worry about all those peripherals, you're ready to go."

He said upgrading to HD is easily done. "From day-one the internal processing was HD, so they [upgrade] they don't have to replace the entire unit, they just swap the board to make it HD interface, and they're ready to go."

The company has even packed robotic control of cameras communicating with Sony's VISCA protocol. Anycast accepts up to six external sources, and these can be mixed and matched with cameras and other video sources such as tape machines or servers. ■

INSIDE PRODUCTION Walter Schoenknecht

Note to the Teacher

Dear Mr. Freeman,

It was nice to meet you at the Middle School Back-To-School Night last week. And thanks for not making us sit in those dinky little desks; I'm not sure how those eighth-graders fit, but a few too many crew meals and craft service tables have ruled out that possibility for me.

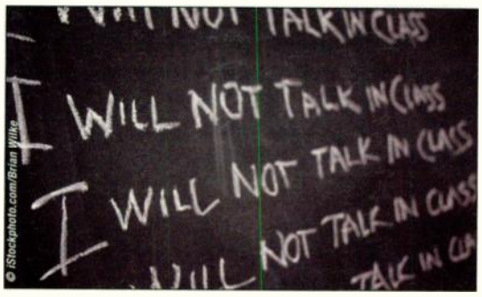
It was really interesting to see the school's TV production studio. What did you say it used to be… part of the home economics laundry area? Well, I guess that times change, and one era's idea of "the essentials for daily living" eventually gives way to that of another era.

I think I did a really good job of holding my tongue throughout your entire TV Production Class presentation, given that I actually spend my days doing the very things you're teaching in there. Of course, the parents' class period only lasted six-and-a-half minutes, so it wasn't too hard to behave. Mostly.

IF I WERE KING…

But now that Back-To-School Night is over, I thought I'd step forward and say a few of the things I wanted to say the other night. I'd heard that you put in your time at a small PBS station in the mountains, so from one TV guy to another, here goes.

If I were a real idiot, I'd start with a hilarious tirade on the second-rate trash the administrators buy for those kids to play with… that Fisher-Price-meets-Salvation-Army motif you've got going there. But the truth is that, relatively speaking, they may not find things substantially different up here in the "big time." Camera ops, TDs and engineers seldom get to choose new equipment—corporate accountants do.



I think I did a really good job of holding my tongue throughout your entire TV Production Class presentation, given that I actually spend my days doing the very things you're teaching in there.

Plenty of us have been forced to use under-powered, obsolete or just plain broken gear every day. As trite as it sounds, if you can tell a story using that junk, you've learned the essence of your craft… go to the head of the class.

I know that you're teaching them how shows get edited. What I'd really like to hear is that you're showing them how easy it is to distort reality with clever editing, twisting meanings and removing context. How about starting with that video the principal recorded for Back-To-School Night… wouldn't that be a riot?

By the way, I heard that little anecdote about Anthony and Diego taking the camera into the boys' bathroom… pretty funny. Sounds like the vice principal dealt with them pretty sternly, but now it's your turn. They'll need to hear what our industry expects of them in terms of ethics and simple good taste.

Remember, they've been raised on shows like "America's Funniest Horrible Injuries" and "reality" movies where numbskulls skateboard off roofs, so they have no better frame of reference. And don't worry if they don't seem to be listening; they are, and they need to hear this from someone they think is somewhat cool.

Well, this little note is getting longer than I intended it to be, and there are still a few more pearls of wisdom I wanted to share with you, so I'll condense them considerably. Here goes…

Solder all the zoom buttons shut. If they want a closer view, have the kids walk the camera closer to the subject, just like they did in olden days. There's nothing more nauseating than eight minutes of nonstop, simultaneous wobbling, shaking and zooming, and if they get jonesin' for zoom lens acrobatics when they're this young, there's no way we'll be able to train it out of them once they show up at our place in a few years. Do us all a favor.

Cut the camera mics off with a hacksaw, and leave their jagged stumps visible. They've got to learn how to record proper sound, and thanks to automatic level controls and hypercardioids, we're no longer teaching them to choose and place microphones, to mix attentively, and to carefully use compressor/limiters and EQ. Good sound people are like hens' teeth these days, and we've got to start growing some new ones from scratch.

And give the kids a dozen or so old CDs of outdated production music to edit with. Don't perpetuate that myth that it's OK to rip copyrighted material without a second thought; it's bad enough that their clients will some day be asking for essentially the same crass level of theft. Officer Bob, their antidrug police liaison, is trying to teach them to say "no" to illegal activities, and it wouldn't hurt for you to try it, too.

In closing, I guess I just wanted to say thanks for what you're doing with these kids. You and I would both be amazed if any of them ever really went into the production business, but that's not what you're really doing; by showing them how it's done, you're actually training them to be smarter viewers, and that's a great endpoint in my book.

Mr. Blobbykins, star of the author's son's clay animation project for school.

And thanks for playing my son's clay animation project in front of all the other parents, even if the credit roll was twice as long as the animation itself. Brilliant, isn't he?

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.

LET THERE BE LIGHTING

Andy Ciddor

Disobeying the Laws of Physics

Almost all of us were raised with the philosophy that we should be good people and obey the law. However, when we grew up, not all of us necessarily chose to obey all of those laws, and may even have suffered the consequences. The laws that our mentors and families usually wanted us to obey were the law of the land, and the law of our creed or religion. When it came to the laws of physics, we were informed that they simply weren't optional. Unlike not eating meat on Fridays or taking your shoes off at grandma's house, you can't choose to disobey the speed limit on light, or ignore the gravitational attraction that keeps us firmly planted on the earth.

For those of us who work with light, one of the most unpopular and inconvenient physical laws is the inverse square law that causes light intensity to fall away extremely rapidly as we get further from our light source. In strict theoretical physics, the inverse square law only applies to light emanating from a single, infinitely small, point in space. In practice, the lamp and optical systems of most fresnels, ellipsoidal reflector spots, PAR lamps and open-faced quartz spots such as the Redhead, are small enough to be treated as point sources.

The approximation is sufficiently close that the inverse square law calculations I have built into spreadsheets and calculating software produces results that closely match the data on luminaire spec sheets. (On the other hand, my comments on the fictional nature of some spec sheets has already been aired in these pages.)

GROWING DIM

If a compact light source produces a level of 100 foot-candles at 10 feet from the luminaire, then at 20 feet the level will be only 25 foot-candles. At 30 feet, the intensity will have diminished to 11 foot-candles, while at 40 feet it will be reduced to just six. What these numbers mean is, if your talent is correctly exposed at 10 feet from a luminaire, they will be two stops underexposed as they move just a few steps further away from that light. (See Table 1.)

Applying the calculation around the other way gives the distance that the talent can move before changing exposure by a single stop. A move from 8 feet to 11 feet from the light source produces a fall of one stop, as does a move from 32 to 44 feet.

If you have the time and space to use them, and they fit with the style of your production, large area light sources, such as fluorescent softlights, softboxes and big (6-by-6, 12-by-12, 20-by-20) diffusion frames, escape the tyranny of the inverse-square law. They are governed instead by something closer to a simple linear relationship between distance and exposure. In this case, doubling the distance between the light source and the talent simply halves the light level, rather than reducing it by the factor of four that would come from the inverse square law.

The texture and naturalistic shadow quality of large area softlight is my favorite look. Unfortunately, the difficulties of setting up large fixtures, controlling the spill light or even fitting them in to the location or studio, can make them entirely the wrong light source for the job.

So how can we use small, controllable luminaires on a production without constantly bumping our heads against that damned inverse square law? The answer is lurking in the right-hand side of the data tables. (See Table 2.) The exponential nature of the law means that while levels fall off rapidly close to

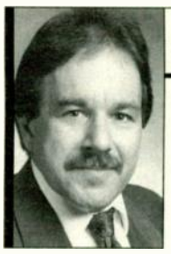
PHYSICS, PAGE 38

Distance from source	10	20	30	40	50	60
Intensity	100	25	11	6	4	3
f-stop reduction	0	-2	-3	-4	-4.8	-5

Table 1: The inverse square law at work on the output of a compact light source.

Distance	2.8	4	5.6	8	11	16	22	32	44	64

Table 2: Distances between light source and talent for single f-stop reductions in intensity.



TECHNOLOGY CORNER | Randy Hoffner

Update: Getting Closer To the Film Look

The past year has seen a significant increase in the use of video acquisition for primetime television programming. Although much primetime programming still originates on film, video acquisition for primetime is becoming increasingly common. Over the years, manufacturers of video equipment have made repeated efforts to persuade television producers to shoot on videotape rather than film.

These efforts have traditionally been met with resistance, particularly where dramatic programs are involved, as film and video have had very different "looks."

As we move into 2007, recent high-end video cameras are increasingly able to convincingly emulate the film look, and resistance is diminishing.

A lot has been written and said about "the film look," but it is an attribute that is difficult to quantify. In the days before HD acquisition, the resolution capabilities of video acquisition devices were very much inferior to those of film, but HD has narrowed that gap significantly. This left other major differences, including the temporal artifacts generated by 2:3 pulldown, contrast ratios, sharpness, and depth of field.

Historically, efforts to emulate the film look concentrated on imitating the temporal look of film or its handling of contrast, or both, while the issues of sharpness and depth of field were rarely addressed. Our level of sophistication in this area is now much higher than in the past.

In a 2002 BBC white paper on achieving the film look with video, it was posited that the major differences between film and video may be neatly divided into two areas: The amplitude transfer characteristic, which deals with contrast range, and the modulation transfer function, which deals with everything else.

FILM VERSUS VIDEO

The BBC white paper stated that despite the commonly held belief that video can handle only a contrast range of about five stops or 32:1, while film can accommodate at least 10 *f*-stops, or 1,024:1, there is really not a great deal of difference between film and a properly set up HD camera in this respect.

Negative film has a central exposure range of about two decades over which the exposure-versus-density curves are linear with a slope of about 0.9. Beyond the linear range, the curves compress at the two extremes, forming the familiar "lazy S" pattern, to cover a total range of about four decades.

Thus film delivers a *linear* contrast range of about 100:1 or 6.5 stops, and an additional 5:1 or two stops at either end of the range, both of which are significantly crushed, for a total range of about 2,000:1 or 11 stops.

The paper concludes that if the controls are properly set, current HD cameras are capable of about the same 11 stops of contrast range.

Modulation transfer function, the distribution curve of a system's gain over a range of spatial frequencies, is responsible for the detail seen in a picture.

In addition to the general sharpness of images, it provides the visual cues for object placement and image location, and thus for the portrayal of motion.

This causes the list of things affected by the MTF to include the perception of judder. One of the central conclusions to be drawn is that if video is to mimic film, it must mimic film's MTF reasonably well. Video cameras cannot precisely match film MTF, but recent work addressing parameters such as aperture correction and detail enhancement has resulted in a more film-like MTF.

It is well known that judder, the visual effect of the temporal distortion generated by 2:3 pulldown, is a central contributor to the film look. The process of 2:3 pulldown causes each film frame to be shown either two or three times, and this produces a distortion of the timeline such that in some of the showings, a moving object will be displayed in the wrong place or at the wrong time.

The perceptible effect varies from a vague restlessness in the pictures when the spatial displacement between showings is small (i.e., motion is slow), to the extreme when the spatial displacement between showings is large (motion is fast) which causes the visual system to perceive a single object as a set of multiple adjacent objects.

The degree of judder perception depends on the sharpness of the images, which is controlled by MTF. The judder component of the film look is enhanced when the video camera is shuttered at about 50 percent to emulate the 180-degree shuttering of a film camera.

The important role depth of field plays in the appearance of material shot on film is evident in the often-heard complaint that the depth of field of video is too great. This renders selective focus, a staple creative tool used to put the primary subject in focus while the background is defocused, difficult to achieve in video. The depth of field is the range of distances from the camera lens over which everything appears to be in focus.

Depth of field decreases as lens aperture increases (*f* number decreases), and if the *f* number is held constant, depth of field increases as the image size decreases.

The ultimate result is that for the same *f* number, a 2/3-inch CCD camera will have about 2.2 times the depth of field that a 35mm camera will have. It is technically possible to use 35mm movie camera lenses on a 2/3-inch video camera, but such lenses are designed to function optimally at maximum aperture, which may be as large as *f*—1.6, assuring that a 2/3-inch video camera will not match the depth of field of a film camera. A major breakthrough in achieving the film look has occurred within the past year or so with the entry into the markeplace of some high-end video cameras that employ sensors the size of the 35mm frame.

SKIN-TONE RESOLUTION

It may not be immediately apparent that MTF also affects skin-tone resolution. Film is made with its red-sensitive emulsion layer on the bottom, next to the base, and its blue-sensitive layer on top, with the green-sensitive layer between them. Because red light has to travel through the other two layers before reaching the red-sensitive layer, film is less sensitive to red than to other colors.

One result of this is that detail in skin tones, all of which contain much red, is muted, visually softening them. Video does not exhibit this reduced response to red, (in fact, digital sensors often tend to emphasize redness in skin tones), a principal reason for the frequent complaint that video makes skin tones look harsh. Recent high-end video cameras have addressed this with a feature that detects and softens skin tones.

In 2007, it has become increasingly possible to select, set up, and operate HD cameras in such a way that film performance is convincingly imitated. Some of the ways to mimic the film look in video include shooting in 24-frame progressive scan; using a video camera with a full-frame 35mm-sized sensor; shuttering the camera at about 50 percent; presetting the gamma correction, black stretch, and knee to capture an 11 *f*-stop contrast range; setting parameters such as aperture correction and detail enhancement to bring them closer to film-like MTF; and applying skin tone correction to soften harsh skin tones.

Today, one of the principal remaining impediments to the adoption of video cameras over film cameras is their sale and rental prices.

"The Film Look: It's Not Just Jerky Motion...," the December 2002 BBC white paper by Alan Roberts, is available on the BBC research and development Web site.

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

In the days before HD acquisition, the resolution capabilities of video acquisition devices were very much inferior to those of film, but HD has narrowed that gap significantly.

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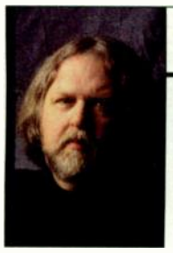

Photo: Steve Jordan

NET SOUP | Frank Beacham

Corporations Co-opt Citizen Journalism

Advertising forecasters predict double-digit growth for online media outlets in the new year. Traditional media, including television and newspapers, are slated for flat growth, at best, during 2007.

We all know what this means. The big media companies are migrating to the Internet as fast as possible, simultaneously laying off workers and cutting budgets in their traditional broadcast and print operations.

None of this comes as a surprise in the continuing transition from analog to digital technologies. However, human reaction to this sea change in media technology is continuously fascinating. It gets especially ludicrous watching these fearful media companies connive to save a buck as their old business models diminish.

A perfect example is the phenomenon tagged "citizen journalism." It certainly started out as a noble concept—the idea that ordinary people participate in the reporting, analyzing and dissemination of news and information.

It was idealized that having this "man on the street" participation in the news reporting process would serve to democratize an elitist system controlled by the few.

©iStockphoto.com/Dan Barry

Aided by the Internet and low-cost digital media acquisition tools, there is no doubt that a handful of talented, dedicated independent media creators have and continue to innovatively challenge the world's largest corporate media organizations.

However, as with most good things, the big guys eventually tried to co-opt it for their own benefit. The first attempts to use ordinary people as news reporters started with local TV stations and news organizations including CNN and the BBC. They actively sought amateur video of newsworthy events made by their own viewers.

EVERYBODY'S DOIN' IT

But the idea didn't stay small for long. Now, Yahoo and Reuters have begun an initiative that they hope will turn digital camera and mobile phone users into a national corps of voluntary photojournalists.

This changes the game, since Yahoo, rated by comScore Media Metrix as the most popular news Web site in the United States, is teaming with Reuters, one of the world's largest distributors of news.

Newsworthy photos and videos that pass muster are placed throughout Reuters.com and Yahoo News. Then, in 2007, Reuters plans to distribute some of the better submissions to the thousands of print, online, and broadcast media outlets that subscribe to its news service.

Eventually, Reuters told The New York Times that it hopes to develop a service devoted entirely to user-submitted photographs and video.

What's wrong with this picture? A lot, but let's start with two things. One is quality. (Have you looked closely at most citizen-made photos and video lately?) And the second, money. Or lack thereof.

According to a report in The New York Times, photographers (and let's assume their stills or video are good enough for use) are not paid one dime for images displayed on the Yahoo and Reuters sites.

That fact is not easy to determine by users when signing up for "You Witness," which requires Yahoo users also have a Flickr account for photo access. We found that a user had to give his consent to give Yahoo access to his Flickr images before the online fine print could even be accessed.

Flickr users are told that when they click an access button that they also agree to allow Yahoo to use their public photos. Period. No further explanation other than the comment: "You might even become famous!"

The idea, it appears, is to pay citizen journalists with 15 minutes of fame rather than actual money.

However, photos or videos selected for distribution to Reuters news organization clients will receive a "relatively small" undetermined cash payment, Chris Ahearn, president of the Reuters media group, told The New York Times. Reuters was likely to pay more to people offering exclusive rights to images of major events, he said.

Oh please! It's a good thing that Abraham Zapruder, the pioneering citizen journalist who aimed his 8mm movie camera toward the Kennedy motorcade in Dallas on Nov. 22, 1963, was not dealing with Reuters. It's doubtful he would have gotten the $150,000 payment—about half a million in today's currency—when he sold the footage to Life magazine.

Who do these media companies think they are fooling? They are making a blatant attempt to build news organizations based on free user- provided content.

To scammers, this is a wide open invitation for fraud. To professional photographers and videographers, it's an insult and a monumental act of disrespect for their craft.

Of course, there's a place for amateur footage in professional news reporting, especially in an era of ubiquitous video imaging tools. But that doesn't mean these amateur-made images will meet the standards of competent journalistic storytelling.

Earlier in my career, I was privileged to be directed as a video cameraman by the great photographer Gordon Parks. Parks was not only a film director ("Shaft," 1971), but a master of the photo essay.

Park's photo journalism at Life magazine beginning in the 1940s set the gold standard for visual storytelling. His work was no accident. He saw the world through his viewfinder in a unique way. It was a combination of skill and talent, honed over the making of thousands of images.

One wonders if the suits at these new organizations even understand the differences in quality. Perhaps they do and simply don't care, that is if they can save a few dollars.

Dan Gillmor, a proponent of citizen journalism, recently predicted in an online blog that professional photographers and videographers will soon see their ranks dwindle as the "the ability to make a living at it will crumble soon."

The pros who deal in breaking news have a problem, he said. "They can't possibly compete in the mediasphere of the future. We're entering a world of ubiquitous media creation and access. When the tools of creation and access are so profoundly democratized, and when updated business models connect the best creators with potential customers, many if not most of the pros will fight a losing battle to save their careers."

Gillmor predicts that in a world of ubiquitous media tools, which is almost here, someone will be on the spot every time to report the story.

Granted, there might be eyewitnesses with cameras nearly everywhere. But most will have limited picture-making skills. What about the trained storytellers who know how to interpret the event for millions of viewers around the globe?

I predict that in a world overflowing with dreadful citizen-made images, talented photographers and videographers will survive. Perhaps they will not be on the payroll of the traditional news organizations. Yet, they will always be in demand by a group of discriminating consumers who will pay for their services.

News dominated by citizen journalists will be just like the neighbor who makes you sit through a viewing of his 300 vacation snapshots or baby pictures from Costco. Your eyes will begin to glaze over, followed by an urge to scream.

Beware of news organizations that think they can replace professionals with citizen-made free content. It will stink. Always has, always will.

Granted, there might be eyewitnesses with cameras nearly everywhere. But most will have limited picture-making skills. What about the trained storytellers who know how to interpret the event for millions of viewers around the globe?

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

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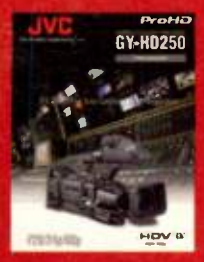

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MEDIA SERVER TECHNOLOGY **Karl Paulsen**

Content Life Cycle III: The Hidden Agenda

Video servers steadily add feature sets that help improve the workflow of a broadcast facility. Software and hardware components that cover the gamut from integrated conversion between SD and HD, to cross converters from 1080i to 720p, and as far as SDTI-CP transport and FireWire (IEEE 1394, i.Link) interfaces for DV25 are routine; but that was not always the case.

At the dawn of video servers, conversions were supported both inside and outside the box, so to speak. Early NTSC and component analog video, as well as PCM AES digital audio were internal, but as the facility went digital, analog I/O conversions moved to outside devices. Initially, embedded audio in an SDI stream wasn't available, nor were HD inputs or MPEG file systems. Video was first encoded as motion-JPEG and audio was interleaved on a separate track or in some other form of internally stored audio, e.g., MPEG-1 or another format.

Fast forward a decade; we now see the SD crossing over to HD, and with this transition we still find variations in input and output parameters. And with these changes, we see adjustments in workflow, signal system design, and complexity. HD inputs were first offered as ASI inputs that required using external MPEG-2 Long GOP encoders. HD outputs were also ASI and required external HD-decoders.

Not long after the introduction to HD, server outputs moved to native SMPTE 292M HD-SDI interfaces with some retaining ASI-outputs as an option.

Today, software codecs for HD-baseband I/O are available on some servers, yet there are vendors who emphasize a best-of-breed external HD encoder as the best way to tailor image capturing to application requirements. Depending on the application in which the server is placed, both concepts have their places.

SANS CODECS

With the baseband I/O circle just about complete, emphasis has moved to direct file transfers into storage systems without a codec. These technologies have not been without complications and frustrations for the facility operator. Managing video on a file level is not a proven science with a universal solution. Flipping content from one file wrapper, format or compression scheme to another native format, wrapped or not, is not an easy task and not without its own sets of issues.

A matrix of conversion requirements would show a surprising amount of activities necessary to transform the video, audio and metadata into something that looked and acted reasonably the same. Today's software transcoding systems do an adequate job for the routine compression protocols.

Yet repeated transcoding processes may cause visual degradation or loss of important data. Issues such as 608/708 closed-caption translation, passing of AMOL (i.e., Nielsen data), watermarking, and transcoding between MPEG to DV or back to MPEG present constraints that require adjustments.

For example, when rewrapping and transcoding at a file level between an MXF-wrapped 25 Mbps DV image with 4:1:0 sampling to a low bit-rate GXF-wrapped MPEG-2 long GOP format with 4:2:0 sampling—the type of material, such as sports versus talking heads—can affect noticeable changes in the image quality once it is transcoded.

Knowing the intended uses of your content for the final product is critical. If the content is to be file transferred and then transcoded again for craft editing on an NLE,

Knowing the intended uses of your content for the final product is critical. If the content is to be file transferred and then transcoded again for craft editing on an NLE, you should know as early on as possible how the final piece will be getting back to a server's native format for play-out.

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Care must be given to selecting the bit-rate, sampling parameters and actual encoding formats. Considerations, including image motion, contrast ratios, depth of color in the image and the like all become components of the toolset selection.

Looking back through the development of videotape formats, this is not unlike what happened when 3/4-inch U-matic, 1-inch C-format, and Betacam or MII were mixed in the operational side of television.

The differences in how these analog signals were processed when going between color-under (for U-matic) and component mapping for Betacam and MII, made a significant difference in the image quality at play-out.

Similar sets of conditions are evident in the digital domain. In compression, much of the image is eliminated and becomes unrecoverable. "Generational loss" takes on a new dimension.

MOVING TARGET

Television imaging continues to be a moving target, with the repurposing and reusing of content high on broadcasters' agendas. Today's server platforms offer many advantages to fulfill that objective, as evidenced by the transformation when servers moved from motion-JPEG to MPEG or DV compression.

Encoding and storage considerations for content are escalating. While a baseband capture at 8 Mbps was once adequate for a record-and-air model, this may not be the same for content that is recorded as SD and then internally upconverted at play-out to HD.

Users should now experiment with different encoding formats and bit levels, especially if building an HD facility that will utilize more HD play-out than SD.

The latest variable in the new content life cycle equation is metadata, those bits about the bits that seem to mysteriously crop up all over broadcast systems.

Metadata is akin to a less familiar set of information called "user bits" in a SMPTE 12M timecode track. Here, additional information that tracked the timing of the recording, e.g., running clock time, version and dates, cut numbers, etc., was made available. Recognizing the physical limitations to user bits, the designers of baseband digital systems, as well as compression systems such as MPEG and DV, enabled areas of the digital data space to carry information beyond the visual and audio content.

Metadata carries the users' own information, but also provides detailed control information, such as audio encoding parameters (i.e., dialnorm and surround mode) or in what format the image was originally intended (i.e., its proper aspect ratio for the active frame) to be linked to the material content itself.

Metadata must not only be inserted into the signal system, it must also be transported and preserved without degradation or distortion. Video server systems, just like terminal equipment, must recognize, parse, append, store and preserve for reconstruction, all forms of metadata. This challenge must further be amplified when the content is transcoded and wrapped or rewrapped within either a closed system or an open system at another facility.

Our next installment will delve into how metadata is handled in the media server environment.

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

NEWSROOM TECHNOLOGY **Harlan Neugeboren**

The Customer Is Always Right

During the past year, we have seen many changes in the way that viewers use and consume news. Viewers know that they can search Google Video, YouTube and MySpace and find news content that they want. The key words are "what they want." Many viewers will search and find any type of news content—it does not necessarily have to be from traditional sources. Viewers are also willing to trade content for quality and don't know or care that it was shot on a Sony XDCAM or Panasonic P2, for example.

To compete with these other sources, broadcasters need to be in the content business and to provide viewers with as rich an experience as possible.

Also, branding is becoming less important. While many would argue that their local news product is a brand that people trust, Google, MySpace and others have proven that viewers just want the story and don't necessarily care where it comes from.

Finally, user-generated content is now playing a very important role in the reporting the news.

OhMy News in Korea (*http://english.ohmynews.com/english/eng_section.asp?article_class=8*) has close to 20,000 citizen journalists and only 50 editors and gets millions of views per day. User-generated content when managed the right way, as in the case of OhMy, can be very effective.

PRODUCING MORE

You probably gather a lot of content that never makes it to the viewer, such as a whole press conference or interview. Also, if you look at what you are shooting, it may be possible to change the way you shoot or acquire that material to acquire it cost effectively.

At many press conferences, there is a pool feed or a pool distribution box. If you were to take a laptop with a capture device or a portable streaming encoder, you could encode the press conference in a Quicktime 1.5 Mbps format and use Quicktime Pro to trim the head and tail and publish it to a Web site.

Sony recently released the HVR-VR60 hard drive that connects via i.Link to any Sony i.Link-enabled camera. If used with the new Sony HVR-V1U 1080i/24p HDV camera, you get added features like remaining record time. If you record in DV, the drive records in AVI and when you attach the drive to any Mac or PC, it appears as another hard drive. You can edit directly from the drive to most NLEs and eliminate ingest time.

This camera and hard drive lists for about $6,000. So for $6,000 you can quickly and easily produce HD or DV content. The drive holds 4.5 hours of DV content so you can put an entire press conference or interview on one disk and when you get back to the station, you can transcode the entire interview into your preferred Web format and post it to your Web site.

While many would argue that their local news product is a brand that people trust, Google, MySpace and others have proven that viewers just want the story and don't necessarily care where it comes from.

FOR PODCAST

Also, try to provide your content in many formats, like a podcast. Apple's next version of OS X, currently named "Leopard," will have a program called "Podcast Producer." All you need is a camera with FireWire out, a Mac and Leopard server and you can easily produce Podcasts and RSS feeds.

Another system that will give you a lot of bang for the buck is iTX from OmniBus Systems. It is truly a channel in a box that accepts multiple formats—baseband or files—and has all the functionality of an automation system, a video server and a master control switcher. It runs on standard PC hardware and uses standard IT storage (Isilon, Net Apps, Xsan) and AJA Video I/O cards. With this system, you can easily create a 24-hour streaming channel.

EASE OF USE

Google Video, YouTube and MySpace make it very easy for viewers to search for video or stories on a particular topic. If you make it easy for the viewer to get to the content they are looking for, they will watch your content.

Many sites have their main content prominently displayed and easy to find. If there is any background material, it is sometimes harder to find. You need to make the background or supplementary material easy to get to. Try creating a page that has links to all of your video.

This is probably a little harder than it sounds because it involves keywords and metadata. However, in one of my earlier articles I discussed the ENPS Assignment Desk and the ability to export much of the data contained in it to XML. The assignment grid contains valuable data such as names, phone numbers and other background information that when combined with video, can be a very effective search enabler.

The ways in which consumers are finding and consuming content are changing very rapidly. We need to be pro-active and not rest on our brand names. Apple iPod and iTunes proved that if you give users an easy way to select and consume content, they will use it. When we were creating NY1 News, we lived by the following mottos:

It's possible.

It's good enough.

When the answer is "that's just the way we've always done it," do the opposite.

If you don't do it, someone else will. We all need to look beyond our traditional ways of operating and reinvent ourselves before the Google train hits us!

Harlan Neugeboren is CEO of The Workflow & Technology Group. He can be reached at Harlan@wftgroup.com.

Physics

PHYSICS FROM PAGE 29

the source, the decline slows right down as we get further away. Up close to the source we see that a movement of only 1.6 feet will drop the intensity by a stop, whereas at 16 feet from the source, we can move a distance of six feet before seeing the same change in light level.

While the math may be simple, achieving this on a production is not that much more difficult. On location and with newsgathering, it's simply a matter of pulling the lighting stands back another yard or two from the talent, and spotting the beam back down to cover the same area. To compensate for the flatter angle, use the full eight to 10 feet of elevation that most stands are capable of reaching.

Having bludgeoned the inverse square law into submission, you can fit more talent under your lights and let them, or the camera, move around some more, without any of the exposure problems.

The exponential nature of the law means that while levels fall off rapidly close to the source, the decline slows right down as we get further away.

In the studio, when trying to use the same luminaire for two people in an interview or several people on a panel or in a game show, getting the fixture as far back as possible will eradicate many of the problems of uneven brightness.

As the spots move further back, you may have to juggle a few softlights around to keep them from casting shadows. This shouldn't be too much of a problem, as large area sources can be moved back a little with very few consequences to their intensity.

Despite the headline, we're not actually breaking the inverse square law, so don't worry about the universe imploding, or having undercover agents from the National Physics Agency lift you from the parking lot late one night. It's more like we hired a slightly questionable legal consultant to find us a loophole in the law.

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.***

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INSIDE AUDIO — Dave Moulton

Reflections on the Recent CEDIA Expo

For those of you who don't know this, there is a comparatively new trade organization called the Custom Electronics Designer and Installer Association. The organization was founded in 1989 to address the needs of companies working in the emerging "smart house" and "wired house" market segments. They've had an annual convention (the CEDIA Expo) for some time now and it has rapidly grown in attendance from some 4,000 attendees a decade ago to 28,000 this year.

These are the people you would hire if you wanted a full-bore security system in your house, a multiroom audio system or a home theater. This is assuming that you are (A) too smart and/or (B) too lazy to do it yourself.

This is the first year I have attended CEDIA. I went because my company, Sausalito Audio Works, is busy developing a new line of loudspeakers designed specifically for the installed home theater market, and we wanted to get a feel for the market as well as to size up the industry and our potential competition. It was an interesting experience.

Along with the usual tradeshow exhibits (selling everything from central vacuums to secure surround sound patios and ultra subwoofer vibrating chairs), there is an educational component (called CEDIA University), wherein attendees can take courses—two- to six-hour lectures—covering a multitude of topics having to do with design and installation of various types of residential systems. Attendees can also get certified by taking exams covering said topics. I took one such class (didn't take the exam, as I am already certifiable), and also attended a freebie presentation that purported to compare an uncalibrated home theater with a calibrated one (it didn't).

CEDIA 2006 show floor

Without getting into the apparent strengths and weaknesses of the show and the organization, I do want to share a couple of observations and thoughts with you.

My first observation is that there appears to be very little, if any, awareness among the attendees or exhibitors about how movies, video and related audio are produced. They don't seem to know anything about what you do, how you do it, what your constraints and limitations are and/or what your strengths are. I was struck by the disconnect.

Think of it this way: in their view, all movies and videos are black boxes of media that are, by definition, great—they will look and sound great, if only the playback hardware and installation were great (and each exhibitor will tell you, of course, that his/her hardware is in fact the greatEST!). I should note that I don't think we are all that much better in understanding their needs and problems. The disconnect does, in fact, seem to go both ways, just so you know.

My second observation is that much of the audio technology and practices seemed pretty dated. I felt like I had stepped back into about 1995 in terms of how the audio hardware behaved and how it was thought of. I understand that I may be biased by my preoccupation with loudspeakers and my recent adventures with Bang & Olufsen and their technical prowess, but much of what I saw I have seen before, sometimes many, many times. Further, the range of quality (again, particularly of loudspeakers) seemed disappointingly

low, compared to what I am used to at, say, an AES convention.

Finally, I noticed a real disconnect and confusion regarding surround sound. There seem to be two camps: Those who believe that surround sound comes from a matrix encode/decode system such as Dolby Pro Logic II, and those who believe that surround sound is a discrete six-channel medium (that'd be me, f'rinstance).

Both camps seem to hold pretty static and unwavering views that don't take into account (very much, anyway) the existence of the other modality or any other possible future modality (7.1-M 10.2, overhead channels, etc.).

I also saw no evidence of any awareness of or sensitivity to the implications of changing aesthetic expectations, or the dedicated home theater or the distributed audio system, for changes in how we think of film, music or art. It was very top-down, pragmatic and vocational in that regard.

"You got yer five channels anna sub, see, and they're going in the living room, while in the den, see..."

CEDIA has great potential, and should be a great boon for us. CEDIA firms are leading the way in establishing high-quality home theater installations and setting standards for domestic audio and video performance. The best CEDIA turnkey installations are visually and sonically stunning, and the various problems of interoperability that I've been kvetching about over the past few months simply go away on their turf.

That's why I find it so interesting that they don't seem to know much about how movies, videos and music audio are produced. We need to help out. I imagine some educational sessions describing how scenes are shot, how editing decisions are made, how a looping stage and ADR works, how we capture sound and picture, how we mix it, and so on, would be revelations to many CEDIA attendees. Practical stuff, like budget and time constraints, event complexity, ENG limitations, etc. would also be fascinating for them.

So, I hope our production side of the industry can come to play a bigger role in CEDIA's world view. They need to know us, and what we do. CEDIA needs to mature and catch up with where we are. At the same time, we need to recognize how important they are to our futures, and give them as much help and consideration as possible.

FUGAWI IN 2007?

Next month we'll talk about the approximate resolution of the high-definition experience. I also have an equipment review coming up, of a Modulation Sciences Dolby Pro Logic monitoring device called "SpiderVision."

In the meantime, I just received a letter from Maureen Droney, executive director of the Producers and Engineers Wing of the Recording Academy. She asks, "How do we encourage interoperability between manufacturers, which would drive business—both for consumer electronics and for content producers like musical artists, producers and engineers—by reducing consumer confusion, without running into antitrust, anti-competitive issues?"

I know little about antitrust laws and the legal constraints that broadcasters, manufacturers and service providers feel in regard to talking to one another and amongst themselves, but I would love to do a piece about this important aspect of our current problem. I would welcome any information, ideas and/or thoughts that any reader might have on this subject. You will, of course, be fully credited.

Anyway, in case you hadn't noticed, it's 2007 already! Another year has passed and we're that much closer to analog oblivion. Have a Happy New Year, and don't forget to check the mono!

And thanks so very much for listening. You have no idea what a pleasure it is to write for you!

Dave Moulton is a year older, but unfortunately no wiser. You can complain to him about anything at his Web site, www.moultonlabs.com.

USER REPORT

Modulation Sciences Keeps Watch at WNET

by Frank Graybill
Chief Engineer
WNET

NEW YORK

WNET is located in the number one Nielson ranked market and has more than 19 million viewers.

We're an innovative station that embraces new technologies and constantly experiments with ways to incorporate new technology to benefit our viewers. As the first station on the air with Modulation Sciences' Television Stereo generator, Pro Channel remote IFB cueing system and the now 4400 8-VSB analyzer, I have a level of comfort working with Eric Small and his crew from MSI. They have an excellent understanding of our station operations and the industry overall.

WORTH THE INVESTMENT

When we first evaluated MSI's 8-VSB analyzer, I felt their price point was a little on the high side, but now having owned and used the unit for almost two years, I have a better understanding of the unit and I realize its value. It was well worth the investment.

When we looked at the 4400, the critical features were remote operation and control. On a daily basis, we need to monitor two stations that are more than 30 miles apart.

To do this, we purchased two MSI 4400's. The first unit is located in our master control in New York City and the other is at the transmitter site of our sister station, WLIW, on Long Island. From master control in Manhattan, we are able to monitor both WNET (off-the-air) and WLIW via the remote software with ease.

Besides remote monitoring, the feature used most frequently is the SNR moving graph. We take a quick look at the screen and are able to determine basic transmitter performance at a glance. The SNR graph is displayed on the main screen of the MSI 4400's operating software. It provides us with all of the information needed to determine if our signal is going out properly.

Two Modulation Sciences 4400 8-VSB analyzers are used by WNET to ensure top quality signals.

STANDARD DISPLAYS

The main screen incorporates what has become an industry standard—the eye pattern and constellation diagrams. Without having to drill down into the software, the critical information I require for day-to-day operations is right there at my fingertips.

We found the tap weight display invaluable in setting up and pointing our antenna. I chose to use the tap weights in favor of EVM or MER because it allows minimizing reflections during antenna set up.

Like most any product, there are some features that come with the 4400 that we don't use, as they are redundant with what we have elsewhere. For example, the 4400 offers data analysis and alarming with e-mail notification, but we are already monitoring alarms through features built into our exciters and control systems. The MSI feature is easy to set up and use, and I know it's there if I ever need it.

Overall, the Modulation Sciences 4400 is an excellent unit for daily operations and troubleshooting purposes. It provides distinguished value at a great price point. Other products that had the features we needed cost two to three times as much. This unit works accurately and reliably and gives me the information I need to do my job. I would like to see future versions include MPEG analysis capability. I think this would round out the product nicely. All in all, the one rack unit configuration is a space saver. The 4400 is user-friendly and employs Windows-based software that is easy to navigate and understand and certainly delivers what MSI promises, "comprehensive at-a-glance monitoring" at a lower cost than other products on the market.

Frank Graybill, WNET

Frank Graybill is chief engineer of WNET New York City. He has been with the station since 1983, starting out as a supervising engineer. He may be contacted at graybill@thirteen.org.

For additional information contact Modulation Sciences Inc. at 800-826-2603 or visit www.modsci.com.

BUYERS BRIEF

The StreamScope RM-40 from **Triveni Digital** is a tool for remotely monitoring, evaluating and troubleshooting transport video streams. It measures, records and analyzes DTV signals to ensure compliance with standards, integrity and reliability.

The device provides end-to-end MPEG-2 and MPEG-4 monitoring for broadcast, cable, satellite, IPTV or mobile networks. It is available in rack-mounted or portable configurations and can support ASI, SMPTE 310, QAM, 8-VSB, QPSK and other signals.

The StreamScope can be monitored from any SNMP agent in the network and provides alarms that can be distributed via e-mail, SMS or SNMP traps. The unit also provides stream profiling, comparison and template learning.

For additional information, contact Trivini Digital at 609-716-3500 or visit www.trivenidigital.com.

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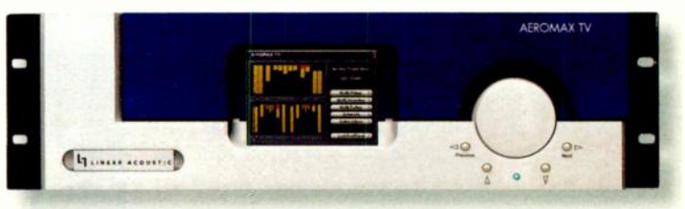
AEROMAX-TV™



AEROMAX-TV™ Television Audio Processor is a dynamics unit for two-channel main plus SAP audio, with front-panel display and controls plus Ethernet remote control. The four-channel unit can be configured as 2+2 or 2+1+1 (stereo plus two mono channels). CrowdControl™ Dialog Protection Processing is provided for the main program audio.

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LA-5448 Synchronizer

The Model LA-5448 AC-3 Frame Synchronizer and Rate Shaper can accept up to four independent AC-3 programs, re-synchronize them to a local reference, protect against bad frames by repeating or inserting known good silent frames, and selectably rate shape outputs up to a fixed rate of 384 or 448 kbps regardless of input data rate.

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USER REPORT

K-WILL Speeds Decoder Production

by Lisa Gutro and Vicky Chan
Validation Engineers
Analog Devices, Inc.

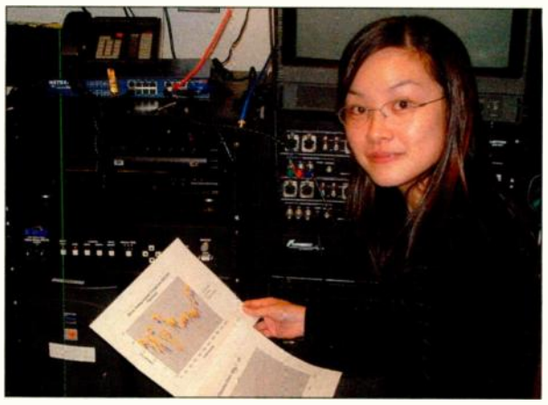
NORWOOD, MASS.

When it comes to state-of-the art audio and video decoders, efficiency, testing and quality control are critical to maintaining the industry's transition to digital infrastructures and the merging of broadcast and IT technologies.

To keep pace with this trend, Analog Devices, Inc. (ADI), one of the world's leading semiconductor companies specializing in high performance analog, mixed signal, and digital signal processing ICs, recently underwent an in-depth process to improve its testing procedures.

REPEATABLE RESULTS

ADI's goal was to shorten release time and to ensure that products shipping to set-top box providers met all requirements. However, we were having problems in evaluating the video quality of decoders in an objective, repeatable manner.



Vicky Chan

Subjective tests make repeatable results difficult. In an objective test, a machine records metrics, but in subjective tests, that in our situation typically range in length from three minutes to three hours and are done in shifts—the test engineer views the videos and notes the impairments observed. If there are problems, the source is viewed for comparison.

In our case, we found many errors in original test content provided by third parties that made identifying true decoder errors even more challenging. Subjective video quality standards are geared toward short sequences, but we needed to evaluate the effects of long-term streaming and interactions between server, network and set-top box.

Subjective tests will always be part of our system test, since there are no magic solutions to all video quality-testing problems, but ADI had to find a way to speed up the release time for new audio/video decoder products. Both of these, the Blackfin ADSP-BF533eM10 and the ADSP-BF566, provide highly integrated system-on-chip solutions for the next generation of embedded, network-connected applications.

We wanted to conduct fast checks for obvious errors such as loss of audio or video, as well as pauses and degradation in video quality. In addition, it was critical to have equipment that could be configured and automated through a server so developers could use it to verify code changes prior to committing their code.

AUTO EVALUATION

ADI evaluated technology that would provide the answer, and selected a pair of video quality evaluation and monitoring products from K-WILL. These are the VP21S for double stimulus video evaluation and QuMax for automated single/double stimulus video testing and quality control monitoring.

Double stimulus test methods allow viewers to rate quality or change in quality between two video streams,

while with single stimulus, viewers rate the quality of a single video stream.

The VP21S performs automatic, real-time evaluation of SDTV video image quality, so that system stood out when it came to encoder and decoder debugging operations.

The QuMax was selected because it has inputs for composite and audio L/R outputs. It also accepts a broad range of video formats, including SD and HD SDI and both NTSC and PAL.

ADI's configuration consists of one VP21S unit with double stimulus capability accompanied by a communication port capturing all quantitative video quality data field-by-field, pixel-by-pixel in real time.

ADI is using the QuMax to detect errors such as loss of lip sync, audio and video loss; freezes; audio/video synch problems; speedup or slowdown in audio and video and other defects. We can calculate statistics per file run and compare them against previous runs.

Video quality is very often subjective, but with quantitative measurements from this product we have been able to analyze performance in an objective, efficient manner.

Lisa Gutro and Vicky Chan are validation engineers at Analog Devices, where they tests the Blackfin ADSP-BF533eM10 and the ADSP-BF566. The opinions are those of the writers alone. Ms. Gutro may be contacted at Lisa.Gutro@analog. com *and Ms. Chan may be contacted at* Vicky.Chan@analog.com.

For additional information, contact the K-WILL Corp. at 949-553-9701 or visit www.kwillcorporation.com.

BUYERS BRIEFS

The WFM 601A from **Tektronix Inc.** is a television waveform monitor designed for use with 270 Mbps SDI signals.

It has two loopthrough video inputs and provides real-time CRT displays suitable for live monitoring purposes.

The WFM 601A provides users with a picture display of incoming video, as well as waveform displays in parade, lightning, bowtie and other presentations. The unit has a switched SDI output for feeding picture monitors and also has waveform cursors and markers for precise measurements.

The unit is intended for use in graphics workstation, telecine, camera setup and other applications within a television plant.

The WFM 601A occupies 3 RU, and two instruments can be mounted side-by-side.

For additional information, contact Tektronix Inc. at 800-833-9200 or visit www.tek.com.

The TVM-821D from the **Videotek** division of **Harris Corp.** is a serial digital waveform monitor/vectorscope designed for television broadcast and production operations.

The TVM-821D has two SDI inputs, and features LED indicators to provide users with information on video signal strength and the possibility of measurement errors due to weak signals. Other LED alarms flag EDH, EAV and SAV data problems.

The monitor has four memories for fast set-up recall and can display audio inputs in an X-Y mode for evaluation of gain and phase parameters.

The TVM-821D allows users to observe two SDI signals simultaneously for quick level comparison and features a GPI input for memory recall purposes. A 12 VDC version of the instrument is available for mobile and portable applications.

For additional information, contact the Videotek division of Harris Corp. at 800-800-5719 or visit www.broadcast.harris. com/videotek.

BUYERS BRIEFS

The Analyst from **DNF Controls** is a data communications troubleshooting tool for RS-232 and RS-422 interfaces. The unit quickly identifies and isolates interface problems by verifying signal paths between floors or building, as well as flagging problems in connector or adapter wiring.

DNF Controls Analyst data communications tool

The Analyst is useful in locating data communications problems in connection with facility upgrades, new control room or studio construction and in the field, as well as in the maintenance of existing systems.

DNF can also provide an optional data logging feature for capturing serial communication information into log files for review and analysis. Data can be captured in both directions and time stamped.

For additional information, contact DNF Controls at 818-898-3380 or visit www.dnfcontrols.com.

The PD-HD101 from **PanD Research Inc.** is a multiformat digital video signal format conversion tool that is useful for both conversion applications and systems testing.

It features a built-in colorbar generator, with signals available on all device outputs and can extract any two of eight channels of embedded audio.

The PD-HD101 has 14 LED indicators and an alphanumeric display for flagging errors, as well as for signaling spatial resolution and frame rate information.

The unit is fully automatic in most applications and needs no setup.

It can convert 1080i and 720p/59.94 to SD NTSC for confidence monitoring and operates either on batteries or from a supplied AC wall adapter.

For additional information, contact PanD Research Inc. at 603-420-4622 or visit www.pandresearch.com.

The OnAir GT from **AutumnWave** is a portable NTSC/ATSC tuner, which is designed to work with laptop computers and is powered via the computer's USB port.

The OnAir GT is bundled with TSReader software, which allows it to perform off-air (and cable QAM) signal analysis. With this software running, The OnAir GT serves as a broadcast stream analyzer. It can locate PIDs, determine if bandwidth is being wasted on ghost or null packets, and transcodes MPEG-2 streams to MPEG-4 to allow real-time analysis of the transmitted stream anywhere in the world.

The unit also allows users to record free-to-air programming SD and HD programs directly to hard drive.

For additional information, contact AutumnWave at 717-582-7134 or visit www.autumnwave.com.

The ATS-1 from **Audio Precision** is a standalone audio test set for both analog and digital applications.

The unit can provide 12 measurement functions at the touch of a button, including sweep measurements of frequency response, distortion ver-

Audio Precision ATS-1 test set

sus frequency and can store the results of up to 30 tests in nonvolatile memory.

An LCD display is provided for observing measurement results and hard copy graphs or tables generated by the ATS-1 can be sent to an external printer.

Separate analog and digital inputs are provided by the ATS-1 and the unit has an internal loudspeaker for monitoring signals under test.

For additional information, contact Audio Precision at 800-231-7350 or visit www.audioprecision.com.

The DVStation line of products from **Pixelmetrix Corp.** are designed for monitoring quality and performance of digital networks from studio to home delivery.

DVStation is able to monitor thousands of parameters within hundreds of television signals, all in real time and simultaneously.

The system provides instantaneous assessment of network health, performs error detection on multiple layers (physical, transport and video quality). It can perform full physical layer testing, with interfaces available for ASI, SPI, RF and ATM applications.

DVStation performs automatic measurement of PID bandwidth and utilization and has a freeze frame detector of flagging momentary outages and other picture problems.

For additional information, contact Pixelmetrix Corp. at 866-749-3587 or visit www.pixelmetrix.com.

The MAP 1853 from **Sencore**, a third-generation MPEG analyzer, supports MPEG-2, DVB, ATSC and ISDB standards.The MAP 1853 allows users to create transport streams for generating test files, and can simultaneously play and record multiple transport streams for testing purposes. It can perform real-time MPEG-2 analysis at data rates of up to 212 Mbps. The unit is capable of extended error and condition logging, and offers off-line transport stream analysis.

Sencore MAP 1853 MPEG analyzer

The MAP 1853 measures bit-rates of every program and PID in the transport stream and the package includes a base library of test streams.The unit's Closed Caption Analysis feature can extract and decode NTSC services, as well as DTV captioning embedded in the transport stream.

For additional information, contact Sencore Inc. at 800-736-2673 or visit www.sencore.com.

The Penpal-SDI from **PanoramaDTV** is billed as the world's smallest SDI video and audio test generator.

The unit weighs less than six ounces and is slightly less than six inches in length. The signal generator is equipped with a clip for carrying it in one's pocket.

The Penpal-SDI can generate a total of 26 video test patterns and four stereo audio test signals. It operates in either 525 or 625 line standards mode and is powered by a self-contained 3 V battery. An optional external AC adapter is also available.

The Penpal-SDI uses 10-bit video processing and a high stability crystal for all signal generation, ensuring clean and undistorted outputs.

For additional information, contact PanoramaDTV at 888-596-4537 or visit www.panoramadtv.com.

USER REPORT

CTV Relies on Ward-Beck XTM4 Test Meter

by David Craig
Audio Maintenance Supervisor
CTV

TORONTO

At the CTV network headquarters for television services across Canada, we have to deal with a multitude of signals on a daily basis. Monitoring is key to ensuring that the proper signals are delivered to the right locations at the correct levels around the clock. Maintaining quality audio signals is especially critical in keeping our listeners and viewers satisfied. Quick access to reliable monitoring, whether it is in a main equipment area, or in a control room, is also necessary for speedy troubleshooting.

ANALOG AND DIGITAL

While there are many analog and digital audio meters and monitors available for this task, the need was there for a device that would address analog, digital and embedded SDI audio signals all in a single compact package. Ward-Beck Systems Ltd. has addressed this requirement with their XTM4.

This is a 2 RU meter unit that includes two sets of PPM (peak program meters) and VU (volume unit) meters, arranged as a stereo pair. Having both PPM and VU meters is essential in interpreting true levels. The integral input sensitivity selector allows the unit to be used for signals over a wide range from microphone levels (–60 dBu) to clipping (30 dBu).

A handy LED phase correlation meter displays the stereo phase relationship between the left and right signals. The highly accurate moving needle meters are large and LED-illuminated. This makes reading them easy, even in a darkened room. (In the old days, a burned out bulb in a meter left you completely in the dark.)

The XTM4 is equipped to handle both analog and AES audio signals. Permanent connections for one analog stereo pair and one AES signal are made on the rear of the unit. Connections are provided for 75- or 110-ohm AES signals. We often use a POD10 AES switcher ahead of the XTM4 input, to give us quick monitoring of main outputs.

The Ward-Beck Systems XTM4 extended range test meter

CHECKING LEVELS

With the XTM4 installed within a jackfield area, checking any level is a breeze. Ward-Beck offers a choice of standard 1/4-inch or mini-jacks on the front panel; however, you have to specify this at the time of order. The front mounted output jack is capable of driving a pair of 200-ohm headphones. The rear analog outputs can be used to feed a separate monitor amp.

To accommodate embedded audio you simply add an XTM4 disembedder to the unit; both SD and HD disembedders are available. As a bonus the disembedder provides a re-timed output of the source, as well as two AES copies of the disembedded signal. The disembedder is capable of extracting all four AES groups.

Due to space constraints, switching between signals and source selection information is handled by a pair of pushbutton toggle switches and an eight-character dot matrix display. It takes a bit of getting used to, but once you have the hang of it, it is really quite straightforward.

Overall this unit is well suited to the job and is very affordable too.

David Craig is the audio maintenance supervisor for CTV in Toronto. He started working in the broadcast business when tubes were king, and has been at CTV for the last 18 years. The opinions expressed are those of the writer alone. He may be contacted at dcraig@ctv.ca

For more information contact Ward-Beck Systems Ltd. at 800-771-2556 or visit www.ward-beck.com.

PRODUCTS & SERVICES SHOWCASE

PRODUCTS & SERVICES SHOWCASE

USER REPORT

WBNX-TV Transitions to DTV With JDSU

by Don Richardson
Chief Engineer
WBNX-TV

CLEVELAND

WBNX-TV recently made a major step toward multichannel digital television broadcasting with the installation of an entirely new high-definition and standard-definition master control. Until recently, we had only an analog facility operating with analog tape transports and a dedicated video server.

We were awaiting our DTV license before moving forward with a total technical facility makeover. Our station delivers its signals over two sets of DS-3 links and planned to provide both an HD and two SD signals, as well as direct feeds to the cable service providers and its NTSC channel 55 transmitter. With these changes it became necessary to have an appropriate complement of MPEG-2 stream analysis tools that could look at the various service platforms on which we would be implementing.

After researching the market, and in conjunction with technology advisors and systems integrator Azcar, we selected the JDSU (Acterna) DTS-200 MPEG test system for its real-time stream content analysis and stream recording capabilities. We saw the ability to use the DTS-200's multiple plug-in modules, which support DVB, ASI /SMPTE 310, MPEG and QPSK, and its remote operation via a client computer (located in the facility, at the transmitter or home), as key features in our selection process.

Don Richardson uses the JDSU DTS-200 MPEG test system to perform real-time content stream analysis.

214 MBPS DATA RATE

The DTS-200 supports data rates of up to 214 Mbps while tracking up to 200 events and errors in real time. Single mouse clicks give access to the dozen or so standard main displays (summary view, PID information, three categories of ETR-290 monitoring, timing view and more). Additionally, it generates customized signal parameter measurements that the station technical operators may need to observe on a regular or recurring basis.

Our station's technical personnel felt that the capture and playback features of the DTS-200 would be very valuable as they configured and tested the various elements of the DTV encoding and DS-3 delivery systems. Our operations are now tapeless, primarily MPEG (and DV25) file-based over Gigabit Ethernet. The JDSU tools provide an important ability to look at network transport stream issues on the DTS-200's GigE data interface and allow us to analyze more than just the ATSC encoded streams.

Furthermore, when troubleshooting MPEG transport stream issues, vendor technical support personnel will frequently request that we provide them with samples of the troubled streams, which the DTS-200 can deliver. The DTS-200 also permits engineers to make corrections or monitor both encoding and decoding equipment using known "valid" transport streams stored in the unit.

ON-SITE INSTRUCTION

JDSU also includes an on-site familiarization and instruction course that effectively cover digital broadcast basics. They also provide an e-learning virtual classroom for ongoing training updates for new or current staff.

With only a few months of digital operations under our belt, we are still learning the ropes of MPEG and transport stream analysis. The JDSU service and sales staff continue to be very supportive along the way and stand ready to assist station engineers whenever we need it.

Don Richardson has been working in the television broadcasting industry for more than 27 years and has been with WBNX-TV since 1985. He may be contacted at drich@wbnx.com.

For more information contact JDSU at 800-428-4424 or visit www.jdsu.com.

REFERENCE GUIDE

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

WAVEFORM MONITORS

MANUFACTURER	MODEL	STANDARDS	INPUTS	DISPLAY MODES	SIZE/WEIGHT	SPECIAL FEATURES	PRICE
Broadcast Video Systems 905-305-0565 *www.bvs.ca*	VITS-2	NTSC/PAL balanced audio	4 video 4 bal. audio ref.	Freeze / 2 sec. updated video; realtime peak program audio	1 RU; 12 lbs.	Dial-up remote operation; video S/N; alarms; single line; audio PPM bar graphs	$3,100
Compuvideo 561-733-4780 *www.compuvideo.com*	SVR-1700 HDSD	SD/HD SMPTE 292M SMPTE 259M	HD-SDI; SD-SDI HD/SD; analog	Waveform; vector; combination; parade	3 RU; 19 lbs.	Digital encoder; distribution amp.; safe area; SDI lock ID	$5,999
Hamlet 866-442-6538 *www.hamlet.us.com*	MICRO-FLEX	HDI/SDI or SDI/analog; NTSC/PAL	1 video 1 external ref. embedded and AES/EBU audio	Waveform; vector; picture; all H & V ranges; analysis; audio level & phase	Handheld; 1.3 lbs.	High-res LCD display; UBS IP remote control; and download; longer battery life	Call for price
Leader Instruments Corp. 800-645-5104 *www.leaderusa.com*	LV5800	SDI/NTSC/PAL Dual link; Dolby E; SD/HD	2-4 HD/SD-SDI; AES/EBU; composite; external ref.	Waveform; vector; picture; audio; eye pattern; error status; multiframe	3 RU; 13 lbs.	Autonomous monitoring; time code continuity; flexible multiscreen setup; DVI-I output; Ethernet	Call for price
Magni Systems 800-237-5964 *www.magnisystems.com*	SDM-560M	SDI/NTSC/PAL S-Video	2 SDI 1 composite 1 S-Video; 2 AES 4 bal. analog; ref.	Waveform; vector; picture; audio level & phase	2 RU; 12 lbs.	Alarms; reporting; headphone jacks for audio monitoring	Call for price
Panasonic Broadcast 800-528-8601 *www.panasonic.com/broadcast*	BT-LH2600W	SD/HD; analog	2 SDI; component; Y/C; composite	Waveform; picture	Tabletop 26-inch monitor; 38.5 lbs.	Device is an HD LCD monitor, which also displays waveforms	$4,950
Tektronix 800-833-9200 *www.tek.com*	WVR7000	Composite analog; SDI SD/HD	2 SDI ref.	Waveform; vector; diamond; lightning; arrowhead; and others	1 RU; 8 lbs.		$7,350
Videotek/Harris 610-327-2292 *www.broadcast.harris.com/videotek*	TVM-950	SDI/NTSC/PAL SMPTE 292M SMPTE 259M SD/HD	2 HD/SD-SDI 2 optional external ref.	Waveform; vector; gamut; timing; picture	3 RU; 11 lbs.	View up to 4 inputs at once; A/B overlay frame capture; Ethernet port; closed captioning	$14,995

BUYERS BRIEFS

The CSA-1 from **Belar Electronics Laboratory Inc.** is an FFT spectrum analyzer that can be used in television, radio and audio applications.

It features a vacuum fluorescent display for presentation of real-time spectrum displays from a variety of input signals.

The CSA-1 provides display storage and user-defined spectral masks for ascertaining compliance. An on-screen cursor allows direct reading of incoming signal frequency and amplitude with 0.1 dB resolution.

The instrument features a split screen display mode for display of two channels and also display modes for either average, peak hold or infinite peak hold displays.

The CSA-1 accepts RF/IF signal inputs via BNC connectors and analog and digital audio inputs via BNCs and XLR connectors. The device is also equipped with a D9 connector for printing and remote display of spectrum information.

For additional information, contact Belar Electronics Laboratory Inc. at 610-687-5550 or visit www.belar.com.

The 5000-EX from **Bird Electronic Corp.** is a handheld digital power meter designed for measuring both analog and digital signals. The unit can report true average power or peak power levels and operates at frequencies between 40 MHz and 4 GHz.

The 5000-EX is designed to work with several of the Bird accessory power sensors, which allow tailoring of the power meter to specific applications.

The meter is provided with an internal NiMH battery, but can also be powered from a car cigarette lighter adapter or from AC mains power.

The 5000-EX has a back-lit LCD display and also allows users to interface to a computer via a built-in RS-232 connector.

External sensors connect via a 9-pin "D" connector.

For additional information, contact Bird Electronic Corp. at 866-695-4569 or visit www.bird-electronic.com.

The DSC300 from **Broadcast Video Systems Corp.** is an SDI video signal comparator tool for comparing video signals assumed to be identical for differences and potential defects.

The product can alert operators to the absence of a logo or other graphic in a particular video stream.

The unit continuously compares the two signals, subtracting one from the other and flagging users when differences occur. A card edge switch allows the error threshold to be set from a minimum of 500 errors per field to a maximum of 10 million per field.

The DSC300 also monitors the SDI signal for embedded audio streams and provides indication of presence or absence of audio via card edge LED indicators. In addition the comparator detects the presence or absence of audio with identical program content on the two SDI inputs.

The DCS300 card is designed to be used with the BVS FR601 card tray and occupies one of three slots in that tray.

For additional information, contact Broadcast Video Systems Corp. at 905-305-0565 or visit www.bvs.ca.

USER REPORT

Ensemble's a Favorite at KOTR/KPSE

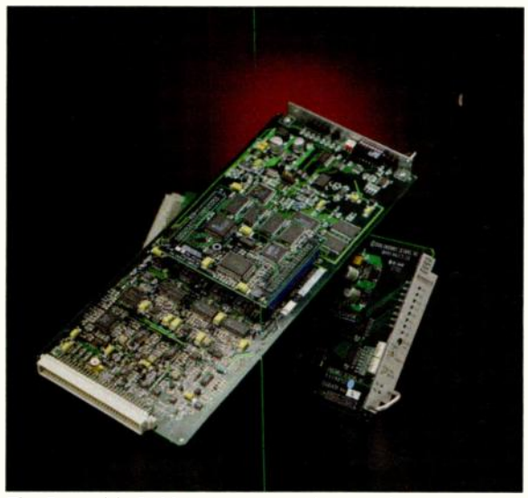
by Dave Hudson
Chief Engineer
KOTR, Monterey, Calif.
Director of Operations/Part Owner
KPSE Palm Springs, Calif.

MONTEREY, CALIF.

Both KOTR and KPSE are owned by parent companies Mirage Media and Mirage Media II. I handle engineering at both stations and take care of operations at KPSE. We run standard definition programming from a server-based master control and we also produce some local programming.

We built KOTR from the ground up in less than six months, going on-air in December 2006, and selected Media Technology Systems for assistance with facility design, equipment specification, and installation.

I told MTS that the most important thing was to have a simple, straightforward system with robust equipment. I'd seen Ensemble's equipment and heard from other engineers that it was reliable and easy to use, so I asked MTS to include it in our new station.



The Ensemble 5400 test generator/sync pulse generator

I first saw the Ensemble test signal generator/sync pulse generator at NAB2005 and was impressed with the whole product line and how the control system worked. After getting a demo at the show, I talked with some other station engineers and everyone said it was great and that the price was right too.

We use the Avenue 5400 TSG/SPG as the master reference generator for all of KOTR. We take the analog composite out and run it through distribution amplifiers to our servers and routers. We use the serial digital test patterns for QC and monitoring functions. The 5410 audio option gives us tone on bars, or whichever test pattern we're currently using. It's a pretty bulletproof system.

I like the old "set-and-forget" philosophy—just set the TSG and let it run. However, it's good to have the Avenue PC control system so that engineers can rapidly change parameters when necessary.

We also found that changing the 5400's settings from the PC interface is very convenient. It's easy to change from one test pattern to another, add another slate ID, or adjust output timing. We like the wide variety of test patterns, several types of bars and the pathological test available in the 30 or so choices.

FLEXIBILITY APPEALING

The 5400 is a card that plugs into an Avenue 3 RU chassis with its redundant power supply. The chassis can hold 10 cards, and we also use some of Ensemble's ASI processing cards in the same box. The flexibility of a chassis that accepts a variety of processing modules is appealing to us. We can always add additional TSGs or a sync changeover card later if we need it.

We are in the process of going all digital, at KPSE, along with converting from a tape-based system to an all server based system, and are using some of Ensemble's test signal equipment in the upgrade. Ensemble also makes test equipment, video processors and distribution amps in a small configuration called BrightEye that we are using at KPSE.

Dave Hudson has been with KPSE for the past seven and a half years. He may be contacted at dhudson@ my13palmsprings. com.

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

USER REPORT

Michigan Satellite Sold On Wohler

by Kevin Dimeck
Owner and Operator
Michigan Satellite Systems

ANN ARBOR, MICH.

Michigan Satellite Systems was established in 1983. I'm the owner and operator, and have been using Wohler Technologies audio equipment in connection with our Ku-band mobile satellite operations since they began in 1996.

With the move to mobile broadcasting then, I'd assembled a flyaway package and purchased my first Wohler product, the AMP-1APF audio monitor.

I decided to use Wohler Technologies equipment for primary audio monitoring due to its reliability. After building my first Ku-band mobile satellite truck in 1997, I installed the same AMP-1APF used in my flyaway package.

While building our second truck in 2000, I installed four Wohler audio monitors, including the original Wohler AMP-1APF from the first truck into the director's position of the production area. It's still there today. The only problem we've experienced in 10 years with the AMP-1APF was a volume potentiometer that finally wore out last year. I use Wohler products, as they meet my expectations for quality and reliability and are well suited for use in a mobile broadcast environment.

One of the Michigan Satellite Systems' uplink trucks on site and ready for use

UPGRADES TO HD

Recently we upgraded truck number two to HD. I purchased the AMP1-S8MDA and AMP2-S8MDA multi-format digital audio monitors and found them to be a bit more complex than the other Wohler gear. Readings are more precise on the LED meters of the AMP2-S8 series monitors, as they have 53 LED segments, as opposed to 10 on the AMP1 meters.

These bright tricolored LED meters make observation and setting of levels less time consuming when there is little time to spare when on the job. With its ability to monitor analog audio, along with AES balanced and unbalanced signals and even embedded audio, this product meets all of our audio monitoring requirements.

During the conversion to HD, we also replaced six video monitors with Wohler's PanoramaDTV RM-3270 monitors. These compact flat screen HD units take up much less space, are considerably lighter, produce less heat and are capable of both 16:9 and 4:3 aspect ratios. They also automatically recognize and switch between SD and HD video.

We recently brought a new employee on board, Chaise Trebil, who had graduated from technical school and was new to the industry. He became familiar with the Wohler products we were using in just a short time. Trebil was impressed with the user-friendliness of Wohler equipment, and how straightforward its operation was.

Kevin Dimeck is the owner/operator of Michigan Satellite Systems. He may be contacted at Kevin@misat.com.

For additional information, contact Wohler at 888-596-4537 or visit www.Wohler.com

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The brand new LV5800 provides all of the functions you need for professional SD/HD-SDI test and monitoring applications while adding functions never before available in a waveform monitor. Waveform, vector, audio, picture and protocol monitoring/analysis are all available individually or in various screen combinations. This flexible, easy to use package provides six option slots allowing system designers to optimize the configuration to specifically fit the application. The built-in XGA (1,024x768) display provides superb images and waveform representations while the rear panel DVI-I output can be used to drive an external display; an ideal feature for control room operations and network release facilities.

Autonomous monitoring, time-code continuity and full frame capture are just a few of the improvements added to the LV5800. Other features include extensive error detection with settable error limits, downloadable error logs, on-screen error identification and a low noise cooling system...just to name a few.

Please contact us for further details or for a no-obligation demonstration of this product in your facility.

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Web : www.LeaderUSA.com
Email : Sales@LeaderUSA.com

USER REPORT

Walter Media Works QCs With Hamlet

by Zen Losin
Walter Media Works

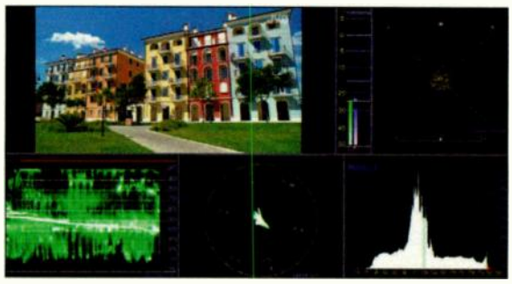
BLOOMFIELD HILLS, MICH.

Laocated just north of Detroit, Walter Media Works captures and ingests archival assets for the news industry. On a daily basis we work with formats that include 16mm black-and-white negative film, 2-inch quad tape and 30-year-old U-matic 3/4-inch tapes.

Every video problem you can imagine is seen on a regular basis here. Usually, upwards of 99 percent of it is correctable using analog technology, but obtaining proper video and audio levels is absolutely paramount to creating usable data files. We have relied on traditional analog quality control tools at the point of ingest, but once the content went into the black box of the computer there has been no inexpensive way to monitor signal quality.

HAMLET TO THE RESCUE

Recently we acquired Hamlet VidScope-vx software to add to our ingest workstations. This package includes all the test tools you would expect, including audio metering, vectorscope, waveform monitoring, color gamut checking and more. It works with the common analog to digital converters—we use BlackMagic Decklink, Convergent Design and SD Connect—and checks the content as it is digitized in real time.



Hamlet's Videoscope-vx allows users to observe multiple video signal parameters.

We're now using VidScope-vx to control the ingest process. It first allocates a block of hard disk space so the computer knows where it is going to put the file. This prevents stutters and dropped frames, and this feature alone makes the software invaluable. It also eliminates the need to reformat or defrag your capture hard drive.

You can set the VidScope-vx screen up just the way you want it—you can have several different tools running at the same time, as well as confidence monitoring of the video itself. The tools let you see what your A to D converters have done to the video signal in real time. In many instances we have to deal with a poorly lighted shot or with otherwise degraded video.

Knowing how the digital signal will look allows us to push levels that would normally exceed norms and as a result get usable pictures for our clients. Washed out or over-exposed video can be pulled back, or shots with the key subject next to a mirror can be pushed technically beyond 100 IRE units to achieve something that is acceptable for today's audiences. Having built-in audio metering allows us to set a consistent sound level, too.

FILE PLAYBACK FUNCTION

Not only does VidScope-vx allow us to measure signals on the input side of things, it also has a file playback function for previously transferred work. By using this I've discovered and fixed errors that went undetected at the time of transfer, constantly improving the quality of our archive.

Any time you know what's happening inside your computer, it's a good thing. The Hamlet VidScope-vx provides excellent quality assurance in an easy to use and understand format. The software package is top value for the dollar. There's a free demo version on the Hamlet Web site that anyone in the transfer business should try it.

Zen Losin is chief engineer of Walter Media Works, and has spent more than 25 years in the commercial broadcasting industry. He may be contacted at zen.losin@gmail.com.

For additional information, contact Hamlet Video International Ltd. at 866-442-6538 or visit www.hamlet.us.com.

BUYERS BRIEFS

The SG-6005 from **Kramer Electronics USA** is a colorbar and audio tone source, as well as a black burst and sync generator.

The unit provides 13 selectable colorbar patterns, and also a 1 KHz tone in both balanced and unbalanced formats. The SG-6005 functions are controlled from the unit's front panel, or via an RS-232 port.

The generator allows user control of SCH/phase and H/V delay parameters. It features a total of six black burst outputs. The SG-6005 has an input for locking it to a master reference and occupies 1 RU of space.

Video inputs and outputs are provided on BNC connectors. Audio is available on both RCA (unbalanced) and XLR (balanced) connectors.

For additional information, contact Kramer Electronics Ltd. at 888-866-8875 or visit www.kramer-us.com.

The model 1199 from **Link Electronics Inc.** is an SDI SMPTE colorbar generator card designed to be used with the company's DigiFlex 1000 series of rack frames.

The 1199 provides SDI SMPTE colorbars in either 525 or 625 line formats, with selection automatically made depending upon the genlock input signal present. The unit provides two different colorbar modes and also has two SDI black signal outputs. The output timing range is infinite for each output set (bars and black).

Up to 10 model 1199 modules can be accommodated in the DigiFlex rackframe, allowing multiple path timings to be established in a plant.

The 1199 can operate in genlock or free run modes and provides system information to users via a seven-segment LED readout on the card's edge.

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

The TSG-51 from **Horita Co. Inc.** is a new video test generator that produces a total of 24 digitally synthesized test signals.

The unit is fully RS-170A SC/H phased and never needs adjustment. It also generates an oscilloscope triggering signal and can provide an audio tone output at 400 Hz and 1,000 Hz.

The TSG-51 has an internal timer that can automatically switch test signal and tone outputs to black after 30 or 60 seconds for producing videotape bars and tone leaders followed by black.

Patterns are selected via a 12-position front panel rotary switch and a two-position toggle switch.

For additional information, contact Horita Co. Inc. at 949-489-0240 or visit www.horita.com.

The 7751TG2-CF-HD from **Evertz** is a combination high-definition test pattern generator card and trouble slide source.

Evertz 7751TG2-CF-HD HD test generator

The unit supports 480 as well as HD television systems, and can also provide closed-captioning test messages.

The signal generator generates both 4:4:2 and 4:4:4 signals and features card edge LEDs for indication of genlock, audio signal presence and module faults. It also provides an on-screen setup menu.

The 7751TG2-CF-HD has an onboard 128 MB compact flash memory for storage of user-generated bitmaps (trouble or test slides and/or test signals).

The module is designed to be used with Evertz 7700 series Multiframe card trays. It provides two test generator outputs and two color black outputs.

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

The AG2-AD from **Hotronic Inc.** is an SDI test signal generator that provides both SDI and analog test signals. The unit can output any of 12 patterns, including colorbars, pulse bar, line sweep, ramp, 5-step, modulated stair step, window bounce and convergence.

The generator is genlockable and also provides both embedded and discrete AES/EBU audio signal outputs simultaneously with an analog audio output. Audio signals are available via XLR connectors.

Front panel switches are used to select test signal outputs.

The AG2-AD occupies 1 RU of space and has an SDI jitter of less than 600 ps.

It provides audio signals with 24-bit resolution and digital signals with 10-bit resolution.

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

The LG3803 from **Leader Instruments** is an 8-VSB/QAM test signal generator designed for testing ATSC-compliant DTV tuners and receivers. It can provide signals between 50 MHz and 900 MHz and produces both 64QAM and 256QAM modulation formats.

The instrument incorporates a coding modulator, C/N generator and upconverter integrated into one package. It has a pseudo-random generator and bit error rate (BER) counter to facilitate BER measurements.

The LG3803 provides 100 user presets and can be remotely controlled via Ethernet. It has two built-in test patterns (colorbars and ramp) and is available with an optional DVD drive to supply a moving video signal for testing receivers in a real life situation.

For additional information, contact Leader Instruments at 800-645-5104 or visit www.leaderusa.com.

The TS-8-MTS from **Multidyne** is a combination NTSC test generator and MTS stereo generator. It features eight NTSC test signals including colorbars, multiburst, crosshatch, red field and modulated stair step.

The unit conforms to RS-170A specifications and provides RF audio and video output on either television Channel 3 or 4. An RGB colorbar output is provided, as well as a composite video output and H and V scope trigger signals.

The TS-8-MTS provides audio test frequencies at 300 Hz, 1, 3 and 8 KHz via a 600-Ohm output.

Both stereo and second audio program multiplexed outputs are available.

For additional information, contact Multidyne at 800-488-8378 or visit www.multidyne.com.

The **Rohde & Schwarz Inc.** Digital Video Quality analyzer is an objective real-time measurement device for compressed video signals.

The unit assesses picture quality from artifacts produced in the compression process, thus allowing the DVQ analyzer to be used in situations where no reference video material is available.

The analyzer can display picture quality analysis results on a scale of bad to excellent and also provide information in the form of bar graphs, numeric displays, long-term profiles and histograms.

The DVQ analyzer also detects picture freeze and loss, as well as loss of audio. It has an integrated MPEG-2 decoder and has an internal event and error reporting.

For additional information, contact Rohde and Schwarz at 410-910-7800 or visit www.rohde-schwarz.com.

COMPANY PROFILE

Marshall Electronics: Quality, Innovation and Diversification

by James E. O'Neal

EL SEGUNDO, CALIF.

Despite the surge in "wireless" connectivity, there's not a radio or television station in the world that could operate without cables, especially good mic cables. Microphone output levels are typically in the millivolt range and as such are extremely vulnerable to noise, hum and other EMI. These cables also have to take a lot of physical abuse too, as mic cables are probably the most exposed and handled bits of wiring in a broadcasting or production operation.

As an electrical engineer, Leonard Marshall was only too aware of this. In the early 1980s, Marshall was introduced to a cable product that ran circles around all others he'd worked with. It was hardly a new product, as the company making it had been in business for quite a while. However, at the time most Americans had never heard of Nagano, Japan or the company there that made such high quality cable, Mogami.

Marshall was quick to share his discovery with others in the industry and in 1985 started to manufacture audio cable assemblies with this cable and the best connectors that he could find.

Quality was the watchword and Marshall's reputation and business quickly grew.

The relationship between Marshall and Mogami has continued to this day and now Marshall's company is the sole distributor for Mogami cable products in the northern hemisphere.

BEGINNING TO DIVERSIFY

A few years after the success with cable and connector products, Marshall spread his philosophy of offering high quality items into the area of cameras and specialty lenses, establishing the company's Optical Systems Division in 1990.

Marshall's reputation in the industry continued to grow, and in 1995 the company began offering the finest in high-end condenser microphones and other products for recording studios.

Two years later, Marshall's Broadcast Multimedia Division opened with the introduction of a complete line of newly developed liquid crystal display video monitors.

Today, monitors make up a large part of the company's volume, but Dr. Nathan Mordukhay, executive vice president at Marshall, remembered that broadcasters were reluctant to accept them at first.

"When we started showing them at trade shows people didn't take the technology seriously," said Mordukhay. "There was a lot of controversy at first, but then broadcasters started looking around at all of the people using laptops with LCD screens and finally decided that maybe this technology wasn't that bad after all."

Mordukhay recalled that it wasn't very long until television broadcasters began to view LCD monitors as an ideal solution for replacing bulky, short-lived and energy inefficient cathode ray tube displays and the orders started pouring in.

Marshall Communications is headquartered in this modern 50,000 square foot building in El Segundo, Calif.

"In 1998 over a very short period of time, we saw an increase in sales of more than 800 percent," said Mordukhay. "We were the first with LCD monitors for the broadcaster and we've just kept expanding the line. We now have more than 170 models to offer."

Marshall now is a leading supplier of LCD monitors for broadcasting and professional television use. Company products are also sold under other very well known industry names, including Ikegami.

Most recently the company has diversified further and is now an OEM provider of optical systems being used in cameras by leading automotive manufacturers in their premium models.

"These are the systems used to provide rear vision and lane changing information to the driver," said Mordukhay.

Ever since Leonard Marshall sold his first audio cable assemble, quality has been a very important element.

Mordukhay explained that this is one of the driving forces at Marshall and one of the reasons for the company's growth and continued success.

QUALITY IS TOP CONCERN

"We are very concerned about quality, and we're also very concerned about pleasing our customers," said Mordukhay. "One of the things that we pride ourselves in is getting quality products out to our users in the shortest time possible. We maintain very large inventories in our two warehouses with total storage of 80,000 squaue feet, and virtually all of our deliveries are from stock."

Mordukhay is quick to point out that speed in delivery means nothing unless the product delivered is high in quality.

"Everything that we ship goes through 100 percent testing; all broadcast monitors are manufactured right here in the U.S. to assure complete quality control," Mordukhay said. "We burn in all monitors for at least 48 hours. We think that our rate of return is one of the lowest in the industry."

Marshall Electronics now ranks as a global player in providing quality products for audio, video, automotive and other industries. The company has manufacturing facilities in California, China, Japan, Korea and Russia. Marshall employs 120 persons in its California operations and an additional 300 in the overseas facilities.

MARSHALL ELECTRONICS
1910 E. Maple Street
El Segundo, CA 90245

Tel: 800-800-6608
Fax: 310-333-0688
www.marshall-usa.com

BUYERS BRIEF

The Mentor Plus from **Trilogy USA, Inc.** is a test signal and sync reference generator that supports both 525 and 625 line standards.

The unit can serve as the source of both analog and digital test signals and has a 13-character user-definable identification feature built in. A software upgrade option is available to enable the Mentor to generate 19:9 aspect radio SDI test signals with corner markers.

The generator features two SDI test signal outputs, three main black burst output and also provides separately timed black burst outputs.

The unit can supply a word clock output and also provides both analog and AES/EBU audio test tones. Embedded audio test tones are also available.

For additional information, contact Trilogy USA, Inc. at 847-461-1480 or visit *www.trilogycomms.com*.

USER REPORT

Z Technology Makes Life Easier at DBK

by J. D. Bruffy
Chief Executive Officer
DBK Comunications Ltd.

DENVER

Station owners spend millions of dollars to build commercial broadcast facilities. How do they certify their delivery systems?

The method for field measurements is defined in the FCC rules and regulations 73.686. It is a very demanding and laborious task, which makes it an expensive undertaking.

Logging pen recorders, meters that require calibration for each test location and manual entry of information are all required. In the past, testing procedures have required two people with varying degrees of knowledge, expertise and patience, in order to assemble an accurate document. The Z Technology system has simplified this process.

DBK Communications Ltd. does field measurements with a Z Technology equipped van.

ADOPTS S5000 SYSTEM

After an extensive search, DBK adopted the Z Technology S5007GPS system as the heart of our field measurement operation.

The Z Technology system was the most cost-effective and advanced technology on the market, permitting us to expand our methods of ground and aerial mapping of transmission systems. DBK has developed a special aerial mapping setup based around the Z Technology system to provide antenna performance measurements that allow you to see actual propagation of the signal over your coverage area. Part of this is the "Drive Test" that determines what is being delivered to your viewing or listening audience.

The S5007GPS Drive Test is simple to set up and to operate. All variables and specific information are entered into the computer prior to the start of the test. The test may be stopped at any point and resumed at a later time. You can track multiple signals coming from a common transmit site or that use a common antenna.

Signal sampling can be determined by time or distance traveled. In congested areas, distance would be the best method, while highway travel is best served by time plots. Drive Test is best described as a common sense approach to determining the coverage of any station.

FCC measurements require careful planning and route management, as well as specialized equipment. Measurements today are performed at two levels—15 and 30 feet above ground. This conforms to commission standards for single and two story dwellings. Congested special areas require cluster measurements.

Our company's particular system uses wideband calibrated antennas for aircraft and ground measurements conforming to FCC standards with calibration certificates. And with Z Technology at its heart, this methodology provides complete mapping in much less time and less expense than any other method we know about.

The system for aerial mapping provides continuous logging of data, and also permits capture of spectrum shots at different locations throughout the flight. The on-channel signal(s) and adjacent channels can be clearly seen and interference issues documented. With this technology, it's a win-win situation, whether in-house personnel or an independent source provides the mapping information for your station.

Z Technology systems can provide you with repeatable measurements with minimum involvement of cost and time. We provide certified independent single or annual measurements for our clients with this system and are now also using Z Technology's DVS5100 digital signal measurement package to provide additional information about their ATSC signals.

J. D. Bruffy is a veteran telecommunications and broadcast engineer with more than 40 years experience. He may be contacted at jdb@dbkcom. com.

For additional information contact Z Technology Inc. at 888-613-9832 or visit www.ztechnology.com.

BUYERS BRIEF

The PM5639/06 from **DK-Technologies America** is a handheld LCD and flat-panel display color analyzer, providing up to 15 measurements per second.

The unit's calibration is traceable to international standards and it is powered by a self-contained rechargeable battery. The PM5639/06 operates independently of flat field displays and calibrates to any white reference. The unit has 10 memories for white reference, 30 color pixel memories and 10 different set-up memories.

For additional information, contact DK-Technologies America at 800-421-0888 or visit www.dk-technologies.net.

MARKETPLACE

Highlighting the latest products available to professionals in the video industry

Doremi Labs 4K Mastering and Playback System

Doremi Labs Inc. has announced a new high-definition mastering and playback system tailored to 4K requirements.

This new recording technology breaks away from conventional approaches for accommodating 4,096x2,160 imaging using four separate synchronized HD servers. The new 4K system is built around a single server and image processor.

The Doremi system fits in only 4 RU of space and provides four DVI or four dual-link HD-SDI video streams for use with 4K digital cinema projectors.

The 4K system uses JPEG2000-compliant files which can be created by the Doremi DMS-2000 mastering station or other software-based encoders.

For more information, contact Doremi Labs Inc. at 818-562-1101 or visit *www.doremilabs.com.*

Carl Zeiss DigiDiopters

DigiDiopters from Carl Zeiss is a set of diopters in +1 and +2 magnification that attach to the front of a 2/3-inch HD lens to provide increased close-focus range and magnification capability.

DigiDiopters employ an achromatic dual-lens assembly to minimize color fringing and spherical aberration. It also has the Zeiss proprietary, anti-reflective coating that reduces light loss and flare while improving transmission for crisp images with saturated colors and accurate blacks.

Zeiss DigiDiopters weigh about 10 ounces each, and can be attached to the camera lens or to each other via a single thumbscrew. A self-centering clamping mechanism maintains a proper distance between diopter and lens and keeps them parallel to each other. It also allows stacking a +1 and +2 diopter together on the front of the lens for a +3 magnification.

The Zeiss DigiDiopters are manufactured at the Carl Zeiss Optics factory in Oberkochen, Germany and marketed worldwide by Band Pro Film & Digital of Burbank, Calif.

For more information, contact Band Pro Film & Digital at 818-841-9655 or *visit www.bandprodigital.com*

Shotoku CMC-400 Camera Motion Control

The CMC-400 camera motion control series from Shotoku Broadcast systems is built on the same platform as all of the Shotoku range and uses PC104 cards.

The CMC unit contains the drive electronics for the pan-and-tilt heads, height drive and lens functions. The unit can either be mounted directly to the side of the head using the same mountings as the existing head control unit, or may be wall mounted using the brackets supplied. It features the same network and RS422 control connections as the rest of the range and includes the new RNI (resilient network interface) option.

A variety of power options are available including standalone PDUs, rackmount and dual rackmount versions. Connections between the PDU and CMC-400 series can be up to 164 feet and use new Shotoku cables. Direct connection to other manufacturers pan and tilt heads is achieved via Ethernet or RS-422 connections.

For more information, contact Shotoku Broadcast Systems at 866-746-8658 or visit *www.shotoku.tv.*

Panasonic AV-HS300G A/V Switcher

The Panasonic Broadcast AV-HS300G switcher is a compact multiformat unit designed for smaller live event productions such as training seminars, conferences, church services and local cable origination, as well as for television stations transitioning from standard definition broadcasts to high definition.

The switcher accommodates both 720 and 1080 line HD signals and both NTSC (480 line) and PAL (576 line) standard definition video. It operates on 12 V DC and is small enough to easily fit into compact production vans and remote trucks.

The AV-HS300G is equipped with six inputs (five for either SD or HD SDI video and one for DVI/RGB). Three SD/HD SDI outputs and an HD analog component output are provided, as well as an Ethernet port for computer image importation and storage purposes. The switcher also provides tally outputs and has an internal six-channel frame synchronizer that automatically adjusts timing of incoming signals. External genlock synchronization is also available.

Panasonic Broadcast will offer a five input analog component option for the switcher.

For more information, contact Panasonic Broadcast at 800-528-8601 or visit *www.panasonic.com/broadcast.*

Kramer HDMI Distribution Amplifier

The VM-2HDMI 1:2 from Kramer Electronics is a new distribution amplifier for HDMI signals.

The unit provides two outputs from a single input and supports a bandwidth of up to 1.65 Gbps. It is compatible with all high definition television signals, including 1080p.

The distribution amplifier has a default EDID setting to enable quick and easy connection of the device. The default setting allows users to power up the VM-2HDMI 1:2 without first connecting and powering the display devices that it will be feeding. The unit can also store and recall an EDID setting from either of the connected displays.

For more information, contact Kramer Electronics at 908-735-0018 or visit *www.kramerelectronics.com.*

RF Central HD Camera Mount

The RFX-CMT-HD is a new high definition camera-mount transmitter from RF Central.

The lightweight transmitter features low delay and extremely low power consumption, making it ideal for sports broadcasts. It is constructed with NEL encoder technology and Gigawave RF amplifier technology. The unit operates with both high definition and standard definition video.

The new model is available for use in several frequency bands, including 2 GHz BAS frequency relocation spectrum. It operates with Anton Bauer, IDX, PAG and other batteries or from an 11 to 16 VDC source.

For more information, contact RF Central at 717-249-4900 or visit *www.rfcentral.com.*

Send new product press releases along with color photographs to:
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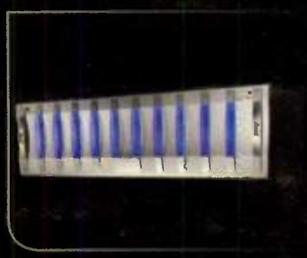

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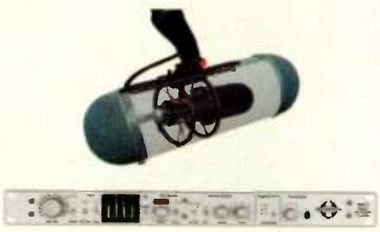

SoundField DSF-2 Digital Microphone System

The SoundField DSF-2 is a new digital microphone system that produces mono, stereo, and digital surround sound from a single microphone.

The system is designed to address high definition television broadcaster's requirements for 5.1-compatible audio with a simple microphone system. It consists of two units, the microphone and a 1 RU controller unit that provides the decoding to various output formats. Stereo audio may be output from the DSF-2 in either analog or digital via XLR or BNC connectors, respectively.

Digital outputs can be provided at 48, 96 and 192 KHz rates.

The DSF-2 package provides accurate control of apparent microphone orientation, angle and pickup pattern without the necessity of physically moving the mic.

For more information, contact SoundField's U.S. distributor, Las Vegas Pro Audio at 702-307-2700 or visit *www.lasvegasproaudio.com*.

SSL XLogic Delta-Link MADI Converter

The XLogic Delta-Link MADI HD from Solid State Logic is a new profrssional Multichannel Audio Digital Interface (MADI) converter for broadcast, live event and studio applications.

The converter allows MADI-based audio equipment such as consoles and routers to be connected directly to Pro Tools! HD without the need for format conversion workarounds.

A single XLogic Delta-Link MADI HD can replace up to four digital I/O interfaces and delivers 128 channels of digital audio interconnection from a single hardware interface. Only a single interconnection cable is required between units.

The converter includes two optical MADI ports, a USB interface, two primary port interfaces and a word/SuperClock input.

Latency in the unit is limited to one sample.

For more information, contact Solid State Logic at 631-659-2309 or visit *www.solid-state-logic.com*.

Tektronix P7313SMA Probe

The Tektronix P7313SMA is a new SMA probe specially designed to address measurement requirements associated with serial bus validation and HDMI 1.3 signals. The probe features 13 GHz bandwidth and is designed for measuring differential signals in a 50 Ohm environment.

The P7313SMA provides a common mode DC voltage input to termination network. The termination voltage can be supplied internally from the oscilloscope being used with the probe or externally by the user. The new probe also has an automatic mode that senses input signal common mode voltage and automatically sets termination voltage to match.

For more information, contact Tektronix at 503-627-4753 or visit *www.tektronix.com*.

Telestream MetaFile for FlipFactory

Version 5.1 of Telestream's FlipFactory provides users of the media and metadata conversion and transfer application with enhanced metadata capabilities. The new MetaFlip technology can transform video file metadata for submission to cable VOD providers and content aggregators such as iTunes.

The new product release also provides additional MSX and HD support as well as accommodating AMR audio in 3GP files. Further, a monitoring function has been added for use in connection with automated ingest of commercials from Centaur catch servers.

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

Bird Technologies TX RX Control Station Combiner

Specially designed for use with VHF, UHF, and 746-960 MHz communications systems, the TX RX Control Station Combiner product line from Bird Technologies simplifies cabling installation and antenna mounting for control center facilities as well as mobile command vehicles.

Additional product features include superior thermal design and low profile units for space efficient applications.

For more information, contact Bird Technologies at 440-248-1200 or visit *www.bird-technologies.com*.

Neumann KM series Microphones

New additions to Neumann's KM series of miniature microphones include the KM 183 D, KM 184 D and KM 185 D capsules, which together with the modular KM D output stage, provide users with a choice of omnidirectional, cardioid or supercardioid response patterns.

Neumann offers two versions of the new microphone—classic nickel and black.

The Neumann analog to digital converter for these mics is located immediately next to the capsule and supports a dynamic range exceeding that of the capsule. Sampling rates from 44.1 KHz to 192 KHz are supported.

Neumann also offers connection kits to allow easy connection of the digital KM mics to S/PDIF and AES/EBU interfaces.

For more information, contact Neumann at 860-434-5220 or visit *www.neumannusa.com*.

Send new product press releases along with color photographs to:
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AUDIO PRODUCTION

Want to Sell

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

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

CAMERAS

Want to Sell

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

CAMERA ACCESSORIES

Want to Sell

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

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

CONDOS FOR RENT

NAB Convention lodging, April 14-21, 2007 in Las Vegas, NV. Luxury 1 bedroom condo on the strip. Contact jamesadams969@msn.com for info.

DIGITAL EFFECTS

Want to Sell

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

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

EDITING EQUIPMENT

Want to Sell

Sony DVW-A500 digital Betacam editor, $31995; Thomson TTV-3452N OEM of Sony DVW-A500 digital Betacam editor, $29995; CMX OMNI 1000E edit cntrlr, $3900; Avid 18GM drive, $350; Accom StrataSphere Spherephous, BO; Avid MCXPRESS-NT V 4.1, BO; Avid SYMPHONY V2.1 system, $6995; Discreet Inferno HD, BO; Discreet Smoke HD, BO; Sony RM-450 cntrlr, $850. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

LENS REPAIRS

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.

LPTV STATION

Want to Sell

WEDD-LP Virginia, 5kW signal covers 80% or market-over 300,000 households, excellent facility. Terms and immediate sale NO CALLS-WRITE: WEDD-LP Box 300, 3 North Central Avenue, Baltimore, MD 21202.

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

TAX DEDUCTIBLE EQUIPMENT

Needed, 700' of 3" antenna transmission hard line, also xmtr for TV chnl 31 & if you are changing to HDTV studio equip, we could use analog bdct equip for our not-for-profit 501-c3 org. we give tax deductible receipt for your donations. Please contact us at 317-920-1000 or email srsue@catholic-television.tv.

TELEPROMPTERS

Want to Sell

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

TEST EQUIPMENT

Want to Sell

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

MONITORS

Want to Sell

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

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

SERVERS

Want to Sell

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

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Want to Sell

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SOFTWARE

Want to Sell

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

SWITCHERS

Want to Sell

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

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

TRANSMITTERS/ EXCITERS

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

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Want to Sell

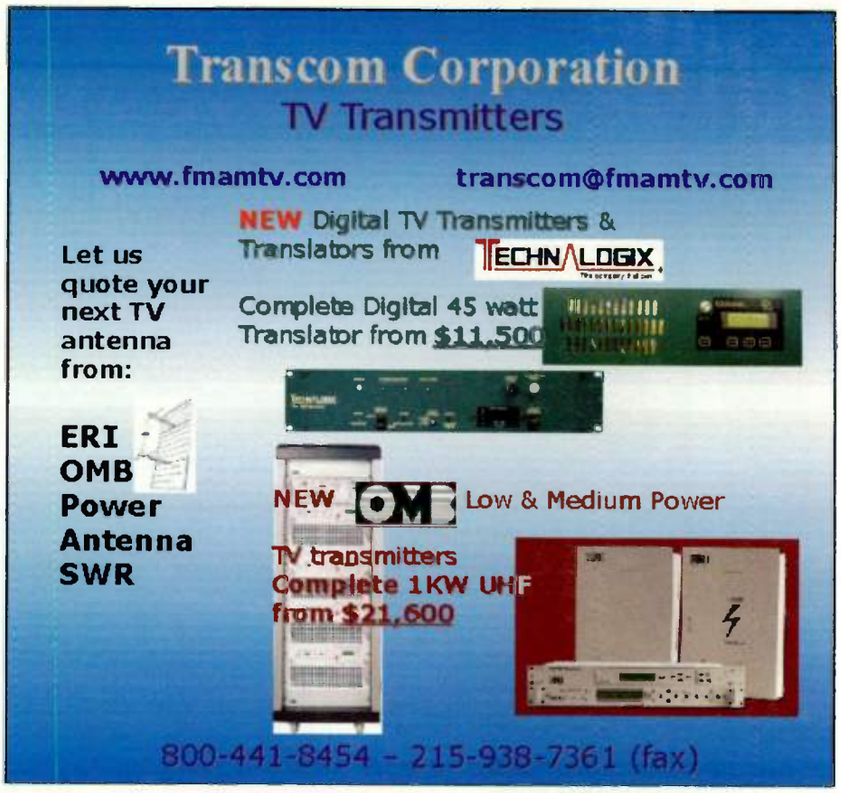
Darim Vision VS2010-STD Virtual Studio Video system, $22800; Darim Vision VS2020-STD Virtual Studio Video system, $34995. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

VTRs/VCRs/ RECORDING MEDIA

Want to Sell

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

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



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

CHIEF ENGINEER: University of Nebraska-Lincoln: Responsible for HuskerVision's technical infrastructure and system operation in the Athletic department. Duties include design, installation, maintenance, and sports production. Responsible for the technical quality of television shows, highlight tapes, network feeds, internet programming, and big screen events produced by HuskerVision. The job duties include travel, bending, lifting, carrying up to 50 pounds, and climbing ladders, stools, and other structures. There is some outdoor work. Bachelor's degree in Broadcast related field and 4 years work experience in broadcasting required; equivalency considered. Must be skilled with CAD systems. Strong broadcast equipment maintenance background essential. IT and communication/training skills necessary. FCC or SBE certification, sports production experience, internet streaming knowledge, and experience in budgeting and project management preferred. Criminal history background check will be conducted. Excellent benefits including staff/dependent scholarship program. Review of resumes will begin Jan. 19. Apply at http://employment.unl.edu UNL is committed to AA/EEO and ADA/504. If you require an accommodation, please call (402) 472-4645.

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PAGE	ADVERTISER	WEB SITE
48	AJA Video	www.aja.com
56	Autumn Wave LLC	www.autumnwave.comm
33	B&H Pro Audio	www.bhproaudio.com
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34-35	JVC Professional Products	www.jvc.com
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12	Mobile Studios, Inc.	www.mobilstudios.com
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19	PESA Switching Systems, Inc.	www.pesa.com
49	Pineapple Technology, Inc.	www.ptibroadcast.com
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49	RF Central LLC	www.rfcentral.com
54	RF Central LLC	www.rfcentral.com
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14	StreamBox	www.streambox.com
29	Tekserve	www.tekserve.com
17	Telecast Fiber Systems, Inc.	www.telecast-fiber.com
11	Thomson/Grass Valley	www.thomsongrassvalley.com
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Arris to Acquire Tandberg Television

ATLANTA

Arris, an Atlanta-based provider of telecommunications equipment for broadband networks, is purchasing Tandberg Television of Oslo Norway, in a cash and stock deal worth $1.2 billion.

The combined company will give Arris more than 25 percent of the global video processing market. Arris is a leading developer of voice-over IP data broadband network equipment and consumer premises devices; Tandberg is one the world's largest providers of video processing technology. The Tandberg acquisition will give Arris the video technology it needs to make a significant penetration into the growing market for video over broadband, according to company execs.

"The combination of Arris and Tandberg Television clearly creates the market leading supplier of voice, video and data solutions," said Jan Christian Opsahl, chairman of Tandberg Television.

"By bringing together these two market leaders we are able to expand on our vision to be the global leader in the provision of digital IP infrastructure and to enable voice, video and data to be delivered over integrated broadband networks from the content provider to the head-end to the home," says Bob Stanzione, chairman and CEO of Arris.

The combined company will have 1,600 employees and more than 2,000 customers in more than 100 countries.

The deal is expected to close by this summer, pending regulatory and other customary approvals.

Fox O&Os Adopt P2 HD

NEW YORK

Fox Entertainment Group has announced it is adopting the Panasonic P2 HD format for its 35 owned and operated stations.

Under the terms of the three-year agreement, Panasonic will be the exclusive supplier of certain ENG equipment for Fox O&Os in 26 markets, covering 45 percent of the U.S. television homes. This includes five duopolies in the top 10 markets: New York, Los Angeles, Chicago, Dallas and Washington, D.C., as duopolies in Houston, Minneapolis, Phoenix and Orlando, Fla.

The agreement includes AJ-HPX2000 2/3-inch P2 HD camcorders, AJ-HPM100 P2 HD mobile recorders, P2 cards, as well as P2 drives and other P2 products.

"We are very pleased to be chosen by Fox, one of our original development partners for P2, to supply its television stations with P2 HD and P2 equipment," said John Baisley, president of Panasonic Broadcast. "This substantial commitment reinforces Panasonic's leadership in high definition.

Currently five Fox stations—WNYW-TV and WWOR-TV in New York City, WTXF-TV in Philadelphia, KRIV-TV, Houston and KTVI-TV in St. Louis, are using Panasonic's P2 SD equipment in their news production operations.

Jampro Antennas Expands Facility, Staff

SACRAMENTO, CALIF.

RF components maker Jampro Antennas has expanded its Sky Creek Drive manufacturing facility in Sacramento, Calif.

Doug McCabe, Jampro's chief operating officer, said the company "increased manufacturing space by 25 percent, installed new, sophisticated equipment, and added a second shift to keep current with orders."

The company said increasing the floor space permitted Jampro to increase its number of CNC (Computer Numerical Control) machines to enhance parts and component production, as well as institute a more efficient manufacturing processes.

Jampro has also increased overall staffing by 40 percent, including the addition of a day shift on Fridays and Saturdays as well as a night shift. The company said the increase in staff was in order to meet customer demand and assure on-time deliveries.

Dielectric Goes Lean

RAYMOND, MAINE

Dielectric Communications announced last month that it has completed a yearlong process culminating in implementation of "Lean Manufacturing."

The company describes this as a management philosophy that helps it to reduce waste, maintain quality levels and cut delivery times.

Approximately 120 Dielectric employees were trained at the University of Tennessee, the University of Kentucky and internal events. Among the principles it is emphasizing: "working with customers to better understand 'value' as seen through their eyes; working with suppliers to prevent errors and reduce waste; and value-stream mapping, redesigning and streamlining internal processes to reduce non-value-added activities and improve lead times."

Avid Names Greg Estes Chief Marketing Officer

TEWKSBURY, MASS

Avid Technology has appointed Greg Estes as chief marketing officer.

In this newly created role, Estes will help the company further elevate its corporate brand identity in the global marketplace. He reports directly to President and CEO, David Krall.

Estes' experience includes more than 20 years working for technology and entertainment-related businesses. Prior to joining Avid, he served as vice president of global marketing for Mountain View, Calif.-based Silicon Graphics. Estes was also a founding member of RasterOps Corp., which developed the first color graphics boards and video capture devices for the Macintosh II in the late 1980's.

"With deep technology and entertainment industry experience that spans the core audio, video and consumer sectors that are central to our business, Greg Estes is an ideal fit for this new and tremendously important role at Avid Technology," said Krall.

Greg Voss Appointed Front Porch Digital CFO

BOULDER, COLO.

Front Porch Digital has named Greg A. Voss as the company's chief financial officer. His appointment is designed to further extend the company's investment and leadership in development, product advancement, and the enhancement of its patented Content Storage Management (CSM) products.

Voss joins the Boulder, Colo.-based Front Porch Digital with more than 20 years in the professional finance field, including extensive SEC, technology, finance, merger and acquisition, forecasting, and reporting experience. Prior to joining Front Porch Digital, he served as director of finance at technology startup Cornice Inc. Previously he held executive and senior management roles in finance at CRG West, DigitalGlobe, Pricewaterhouse Coopers, and Chancellor Broadcasting Co.

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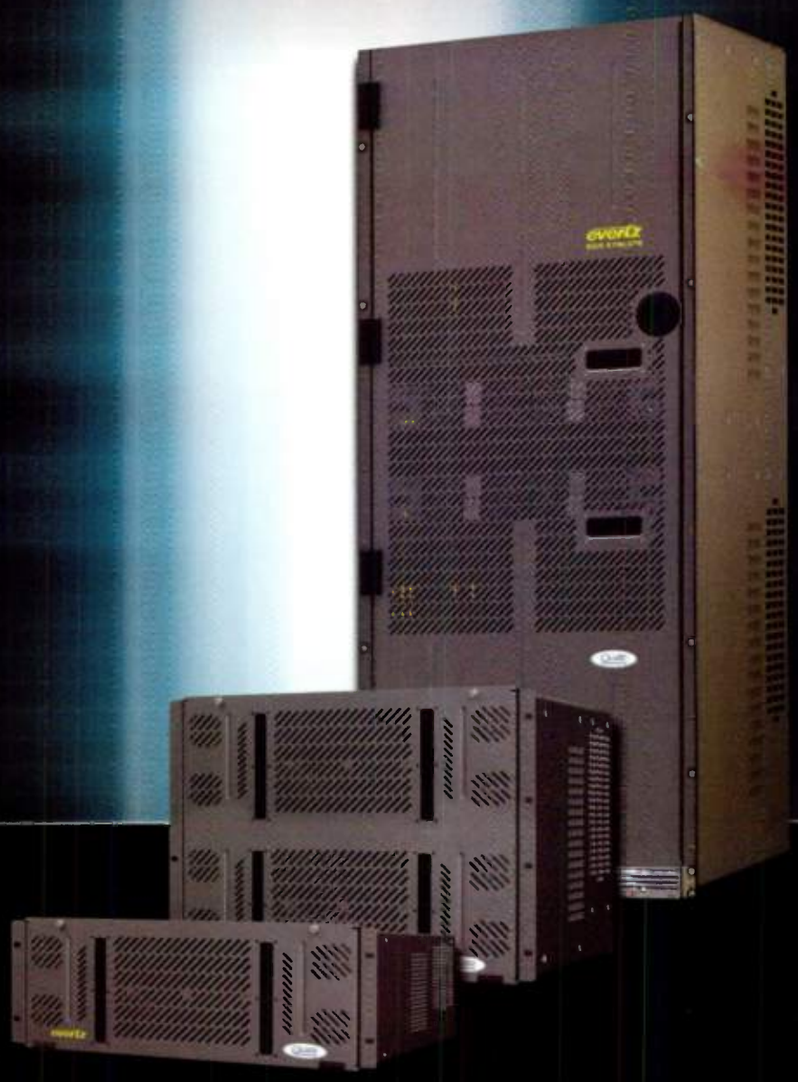

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