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WHAT'S INSIDE

AT&T Preps for IPTV

Microsoft TV resides on boxes

by Craig Johnston

SAN ANTONIO

IPTV began coursing through its fiber-optic veins in San Antonio in December, as "the new AT&T" (formerly SBC) rolled out what it terms a "controlled launch" of Lightspeed, the company's telco video-based service.

"It is precisely what we wanted it to be in terms of easy to use, simple, pretty intuitive for customers," said Jeff Weber, vice president of product and strategy at AT&T. "So that is a huge step in the right direction as we think about this product going forward."

Weber's comments were a vote of confidence for the software and user interface from Microsoft, which shipped Version 1.0 of its IPTV platform in October.

Besides IPTV's sing-song, catchy sounding name and the cutting-edge cache of having "IT" integrated into the name, Ed Graczyk, Microsoft TV director of marketing and communications said IPTV changes

AT&T, PAGE 16

EAS Struggles to Stay Alert

FCC ponders changes in digital era

by John Merli

WASHINGTON

"This is a test of the Emergency Alert System. This is only a test. Had this been an actual emergency, we'd like to say that we know exactly what to do, but it's all a bit too confusing at the moment, and so much of this is purely voluntary, so please stand by. We'll be right back."

While it's unlikely the public will ever hear that sort of message except perhaps on Comedy Central, the Emergency Alert System's future role remains in flux as the FCC considers fresh industry input on how EAS should evolve, if at all, in the digital era.

Amid a dramatic run of natural and man-made catastrophes in recent years, notably Katrina and Sept. 11, it's perhaps easy to overlook the fact that despite any major emergency's dramatic emotional effect on tens of millions of people via the media, even the most horrific disasters in the United States have been local or regional in nature. That's significant because current EAS "rules" for local emergencies (including Amber Alerts for missing children, although tornado warnings are the most prevalent) are strictly voluntary, and can vary widely from state to state.

FEMA CALLING

The only mandatory EAS provision pertains solely to a real *national* catastrophe. And for all intents and purposes, it was created to serve only one federal official's

EAS, PAGE 10

EDITORS/POSTPRODUCTION

Film Effects Producer – HD/SD experience in all formats. Reliable and flexible -- long hours expected. Code EP028

Experienced Tape Operator – for duplicating, audio relays and conversions. Knowledge of broadcast specs/formats. HD experience a+. Code EP042

Audio Engineer/Mixer – for award-winning production house. Experience with Surround 5.1 necessary. Good personality must be funny. Code EP065

Experience FCP Editor Wanted – working production company to cut boring commercial spots for clients. Long hours/poor conditions. Good rates Code EP067

VIDEO PRODUCTION

Cinematographer for Wildlife Production 60-minute HD documentary on Peru's Humboldt penguin. Shooting 720p/24 on DVCPRO HD. Code TV009

Short Film/HD shoot – HDCAM second camera. Shooting 1080p at 24. Own jib and camera needed. Code TV010

News Photogs for Cable News Channel – Experience in shooting DVCPRO50 for news magazine show, shooting DVCPRO for news. Code TV011

HD "B" Roll for Stock House - Shooting 1080p/24 or 720p/24 on DVCPRO HD, in-camera editing necessary. Code TV0102

We Buy Your Video Footage – We take your personal videos and sell as stock footage. You make money! Code TV013

SD Reality Adventure – Shoot from 60i to 24p to deliver different looks, be ready for unpredictable weather. Code TV0014

HD Music Videos – Shooting 720p/24. Must be familiar with variable frame rates to create special effects. Code TV015

News Stringer – Looking for shooters to be on scene first, fast turnaround. Own camera required. Code TV016

HD Television Special – Cameraman/Editor wanted. Shooting 1080i at 30fps on DVCPRO P2 cards. Code TV018

New Reality Show – Shooting 720p 24/30fps, experience in HD and variable frame rates required. Code TV019

HD Commercial Production Co. – Looking for cameraman with HD experience. Shooting 24/30fps. Must be capable of IT work. Code TV020

Filmmaker to Join Faculty – Must latest digital tech. Instruct in fits of multiple formats, varia frame rates, solid-state memo Code TV021

Shoot Video in Alaska – Juno TV Ne Station needs cameraperson to follo and document Iditerod in HD. Harsh conditions, but rewarding. Code TV0

hire definition

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CONTRIBUTING WRITERS

Mary Gruszka

Audio By Design

As a new year of Audio by Design begins, I'd like to thank the readers who have sent in their thoughts about the column. There seemed to be a general consensus that basic audio design concepts are often ignored in the digital age.
Regarding balanced and ... p. 24

Charles Rhodes

Digital TV

Since my article in the Oct. 19, 2005 issue of TV Technology, ("Developing a 24/7 Digital EAS System"), some real progress has been made by the FCC in the matter of the Emergency Alert System.
While broadcasters are required... p. 28

Will Workman

Inside Broadband

"In acquiring new productive forces, men change their mode of production, and in changing their mode of production, they change their way of living—they change all their social relations" —Karl Marx
In my epic struggle towards a Ph.D. in mass communications, one of... p. 32

FROM THE EDITOR

One Small Step...

In the mad rush to jump onto the IPTV bandwagon, many broadcasters have had to step back and evaluate where they fit into this brave new world. What are the implications of selling network programming on the Internet to download onto iPods and other devices? What about cell phone TV, video-on-demand, telco TV? Relationships between networks and broadcasters are becoming threatened as new technology trumps the old rules of content distribution.

Some broadcasters will be left behind; others, like WRAL, are taking the lead.

The Raleigh, N.C.-based CBS affiliate is a renowned broadcast pioneer; it was among the first to launch DTV when it turned on its digital transmitter back in the summer of 1996. Now, with the help of Decisionmark, a Cedar Rapids, Iowa-based developer of online software and information provider to the broadcast industry, WRAL is taking its local signal onto the Web.

Big deal, you say? Well, it is when you look at the details.

Because of copyright issues and restrictions on out-of-market broadcasting, local broadcasters have been limited in how they can stream their signals onto the Web, particularly in a live, real-time environment.

But earlier this month, the station, which has been using technology from Decisionmark to datacast to its viewers for years, unveiled what it calls the "Apollo Project," which uses the company's TitanCast "air to Web broadcast replication" technology to send local, network and syndicated content over the Internet but—and this is the key—targeted only to viewers in WRAL's signal reception area.

"We're not extending our coverage beyond what we already have," said Jim Goodmon, president and CEO of Capitol Broadcasting, owner of WRAL. "We're going to restrict Internet usage to just our market."

All viewers within WRAL's reception area have to do is enter a credit card number onto the station's Web site, which Decisionmark then uses to check their address to verify that they are eligible to receive the free service.

At presstime, CBS had yet to comment on the new service, so it's uncertain how this will affect future agreements between the station and the network. But whatever the outcome, we applaud such forward-thinking efforts on the part of WRAL to bring broadcasters' greatest strength—their connection to their community—to the Internet.

To paraphrase a famous saying from the "Apollo" era "That's one small step for broadcasting..."

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

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

Kudos for Mario

Dear Mario:

As one of the few CEOs with an engineering background, I keep trying to find ways to seem ahead of the curve and use my interest to better my institution. Your "Masked Engineer" article is the best I've seen in a long while.

Bill Baker
President, WNET
New York

Who'd Want an Antenna?

Dear Doug Lung:

Having read your two part article "How Hard is it to Receive DTV? (Oct. 5 and Nov. 9), I'm shocked and amazed at how casually the subject of outside antennas and rotors is treated. It is beyond my comprehension that any more than a very tiny number of terrestrial broadcast TV viewers will be willing to shell out to have a large, clunky outdoor antenna with rotor installed! Compared to free hardware and installation, the number of channels available, and the ease of operation of cable and satellite broadcasting; an outdoor antenna will be rejected by most viewers, and thus dilute further the audience share of local broadcasters.

Without a doubt, local terrestrial broadcasters are becoming more and more irrelevant to the viewers *and* to the networks as a point of distribution. The analog TV final cutoff date will begin a process that will kill local broadcasters. Eventually, only a handful of regional "super stations" will survive, sans tower and transmitter, as regional content providers for cable and direct satellite broadcasters, providing local news and human interest stories.

If auctioning the current analog TV spectrum represents a large sum of money to our government, how much more do they stand to make from the sale of allotted DTV spectrum when the terrestrial broadcasters fall one by one due to attrition? The unintended consequences of a seemingly good idea will spell the end to a great tradition of home entertainment as we know it.

Rick Crampton
Northport, Maine

Aspect Ratio Redux

Dear Mario:

Thanks for all your great writing. I just finished reading your column, "Widescreen HD Gets Toasted by Cell Phones," (Nov. 23, 2005) and was surprised to hear you take an attitude that seemed to imply that 4:3 wasn't suitable for HD.

My favorite column you've written was from years ago, when you pointed out that for the average consumer, it made more sense to own a 4:3 TV than a widescreen TV. Your piece discussed the percentages of "wasted space" when watching 16:9 on a 4:3 screen versus the opposite, and you showed that letterboxing created less black pixels than black bars on the sides when watching 4:3 on a 16:9 screen. You went on to point out that most of the programming out there will be 4:3 for quite a long time to come.

I agreed with you then, and I still agree with that theory. I've referred to this treatise several times with colleagues, so I hope you haven't changed your mind.

Bruce Thurston
Los Angeles

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Hockey Returns With a New Point of View

Goalie cams, rail cams and HD enhance NHL coverage

by Ken Freed

NEW YORK

When the Pittsburgh Penguins faced the Philadelphia Flyers on Jan. 21 at the Wachovia Center in the City of Brotherly Love, home viewers on NBC watched the action from the goalies' point-of-view as the Flyers won the game 4-2.

The National Hockey League was introducing its new "goalie cam," created to make the game more attractive to viewers. Other innovations include a robotic "rail cam" riding above the glass, more wireless microphones on players and coaches, and more HD broadcasts.

RETHINKING THE GAME

These changes in hockey coverage aim to regain and expand the fan base since the 10-month hiatus ended in July 2005 after NHL team owners locked out members of the NHL Players' Association in a salary dispute.

"The one clearly positive thing that came from the work stoppage was the opportunity to think about different ways to improve the game itself and improve television coverage," said Darryl Lepik, coordinating producer for NHL Productions. "Our idea is to get you closer to the action. Things like the goalie cam and wireless mics put you on the ice, inside the game, more than anything else I've ever seen."

"There have been earlier goalie cams," said Adam Acone, vice president for broadcasting and programming at the NHL, "but this new approach is unique. Instead of mounting a camera on the outside of the goalie's helmet, which has caused safety problems, this is first time the camera has actually been built into the goalie's mask."

The new NHL goalie cam was developed by Jeff Silverman, owner of Inertia Unlimited in Jacksonville, Vt., whose latest project is the groundbreaking 1,000 fps super slo-mo camera deployed by NBC at the Winter Games. Silverman earlier designed a helmet camera for motocross racing and a baseball umpire cam for Fox Sports.

"This is a generational advancement of those systems," he said.

The new and improved goalie cam uses the Sony XC-555 mini camera. Silverman's first step was to "deconstruct" the 7-ounce cigar-shaped SD camera, which is four inches long and 7/8-inch wide. The lens was mounted behind a pencil-sized hole drilled below the chin of the goalie mask then connected by a ribbon cable to rest of the camera inside a waterproof housing at the back of the helmet.

"The comfort and safety of the goalie was our primary concern," Silverman said, recounting visits to Montreal to meet with Itek the helmet manufacturer, to coordinate production of 12 goalie cams for the NHL,

This prototype goalie-cam was tested by Marc-Andre Fleury while playing for the AHL. Fleury now uses the goalie cam for the Pittsburgh Penguins.

painting each mask to duplicate a participating goalie's regular mask. "We've mounted the camera in a way to maximize comfort for the goalies wearing it while we ensured the camera's normal operation would not be affected by the direct impact of a hockey puck."

With an RS-232 interface on the Sony camera, he added, they can directly control the video gain, sharpness, and iris level of the fixed-image camera from a laptop with a USB connector by using a small Global Microwave Systems 2 GHz RF transmitter mounted atop the goal.

The prototype was first tested by Pittsburgh goalie Marc-Andre Fleury while playing for a Penguin farm team. Fleury has since worn the custom-fitting helmet in Penguin away games against the Flyers on Jan. 21 and against the New York Rangers on Jan. 28, both broadcast in HD by NBC Sports.

"Fleury has now worn the goalie cam more than anyone else in the league," Silverman said.

"Right now the goalie cam is being used on all NBC hockey broadcasts," said Acone, noting that sometimes one team will have a goalie cam and sometimes both teams will.

"Seeing the game from the goalie's perspective is a huge plus for coverage," said Sam Flood, coordinating producer for NBC Sports. "The goalie cam fits our philosophy of taking viewers inside the glass as much as possible. This is why we're so interested in the new rail cam being developed by NHL, although not every rink can accommodate it."

Acone explained that a robotic camera will ride atop the glass on a monorail that runs from one end of the rink to the other. This system is now being developed by Fletcher Chicago, which did two indoor tests last year at an American Hockey League game in Edmonton, Alberta, and the Frozen Four college championship in Columbus, Ohio.

"We want to put cameras where people can't go," he said. "Since we can't put a camera operator in front of the fans at ice level, a rail cam under human control could follow the play dynamically, quickly stopping and changing directions as needed."

Marty Ehrlich, executive producer for hockey at OLN, is an eager supporter of the rail cam and is working on getting it integrated into the cable network's NHL coverage.

"We're completely at the mercy of the NHL and the arena operators about when and where such a system will be deployed," he said, "and if even one fan objects to a blocked view, the system may have to come down, but this will be a lot less intrusive than a camera mounted on a golf cart running along the sidelines of a football game, so I'm confident the rail cam will happen."

Photo by Al Bello/Getty Images

Martin Brodeur, No. 30 of the New Jersey Devils has the puck kicked behind his legs by Alexei Yashin, No. 79 during their game on Jan. 24 at the Nassau Coliseum in Uniondale, NY.

In lieu of a rail cam, Flood said that NBC is stationing an on-camera reporter inside the glass between the two team benches. Whenever possible, this reporter will be a former player or coach. "We want a person right in the middle of the action to tell viewers about the game."

Other than the goalie and rail cams, NHL will not allow cameras on the ice for "Shootouts," the new means of settling overtime ties during regular season games. "We decided a camera on the ice would pose too much interference," Acone said.

Yet NHL is increasing viewer access by expanding the use of wireless microphones on selected players and coaches for games carried by NBC, OLN, FSN, and TSN in Canada.

"We've approved the Quantum 5X system," Acone, said "which is so nonintrusive that players and coaches sometimes forget they're wearing a mic."

HI-DEF HOCKEY

For HD, NBC uses three trucks from F&F Productions, a Clearwater, Fla. mobile production company. F&F Trucks 11 and 12 broadcast the Saturday games in HD, while F&F Truck 10 handles other broadcasts in SD.

"Which game is aired in the three regions depends on which home or away teams interest the different markets," Flood said, adding that the Stanley Cup playoffs will be broadcast entirely in HD.

OLN uses NEP Supershooter trucks 26 and 27, using nine cameras, including a robotic camera mounted inside the goal on the frame below the net, according to Erlich. OLN broadcasts hockey games on Mondays in HD while Tuesday and Wednesday games are broadcast in SD.

Regional cable systems also are getting into the act. The Madison Square Garden Network carries home games in HD, and on Jan. 19, MSG cablecast its first HD away game when the New York Rangers faced the Pittsburgh Penguins in the Steel City. They followed that up with another HD away game Jan. 21 when the Rangers visited Boston to battle the Bruins.

"HD is having a major impact on hockey coverage," said Acone. "The 16:9 aspect ratio is about the same shape as a hockey rink, so instead of missing action as the SD camera chases the puck on a 4:3 screen, HD allows fans to see the entire play unfold. Fans sitting in their living room get the same immersive experience as if they were sitting in the lower bowl of an ice arena."

NHL is working with HDNet and other sports carriers to determine the best placement of cameras for game coverage, Acone said. "We not sure if the existing camera positions in the arenas are the right positions for HD, and we want to know for sure." So far it looks like the best spot may be about 10 rows back from the glass with the camera about 30 to 35 feet above the ice, he said, "but we're still experimenting." ■

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Boarding the Busses for Surround Sound

Audio consoles promote more user-friendly, ergonomic controls

by Claudia Kienzle

HAMILTON, N.J.

While most live TV production remains in stereo, today's next-generation studio audio consoles are ready to support the new plateau—5.1 channel surround sound—whenever broadcasters need it.

Vendors say that most of the 5.1 channel surround sound applications they see are primarily for live sports, music specials, and awards shows in HDTV. But broadcasters want 5.1 surround sound tools on any new audio console they're buying whether or not they're ready for it right now.

"We expect that more of our clients will start using their 5.1 surround capabilities in 2006 and 2007 as more shows move to surround," said Andrew Wild, vice president of marketing for Euphonix in Studio City, Calif. "All of our clients want to have 5.1 channel capability now so that at some future date they can move to surround easily without having to upgrade their consoles."

AUTO SELECT

Euphonix monitoring on all its consoles is fully capable of intelligently handling 5.1 surround sound, including LCRS surround capability, Wild said.

"Once the mix busses are set up, all routing, panning, and monitoring automatically selects the appropriate format so the operator works the console as normal without having to learn any new operational complexities other than how to operate the pan controls."

Euphonix manufactures two consoles for on-air broadcast applications: the System 5-B and Max Air. System 5-B is more suited to larger productions and includes eight knobs per channel and TFT displays across the console. Max Air is a more compact, cost-effective control surface that can handle up to 106 channels. Both are currently 7.1 channel surround-sound capable. (However, Wild feels that 7.1 channel surround sound is unlikely to catch on due to prohibitive cost factors and that 5.1 channel surround is the preferred consumer format.)

KNBC in Los Angeles uses the Euphonix System 5 at its Burbank studio.

Euphonix consoles are used by "The Tonight Show with Jay Leno" on NBC for music, production, and front-of-house mixing, as well as by CNN, and PBS station KLRU in Austin, Texas.

SURROUND SOUND, PAGE 12

EAS

CONTINUED FROM PAGE 1

immediate needs—the president. But because no catastrophic event has ever directly threatened the entire geographic United States, the original national aspect of EAS has never been fully tested on an end-to-end basis from the White House.

Theoretically, a national EAS signal is relayed from the White House to the Federal Emergency Management Administration, to nearly three-dozen key broadcasters as Primary Entry Points, which, in turn, are supposed to be monitored by more than 500 local primary stations, which are to be monitored by the estimated 24,000 local stations and cable systems. Critics say one massive power failure, i.e., along the Eastern seaboard, could place this complicated scenario in serious jeopardy.

On the local levels, there have been some moderate successes, including EAS usage in Florida during hurricanes Katrina and Rita, and some spectacular failures, including a series of train accidents over the past several years that raise questions about the effectiveness of EAS on the local level.

NAB, SBE SEEK CHANGES

In comments submitted for the latest FCC EAS rulemaking in late January, NAB reiterated its position that for delivery of emergency information to the public, "broadcasters continue to be the most reliable and robust means of distribution." In a digital EAS environment, it said, other wireless carriers could monitor local broadcasters to obtain digital EAS data and pass it on to their subscribers.

NAB opposes simultaneous audio translation of live EAS alerts into a second language, such as Spanish, because it could "likely impede" the delivery of timely information. This puts NAB at odds with the Independent Spanish Broadcasters Association and other petitioners, who told the FCC that "multi-lingual EAS messaging is an integral component of [EAS]."

"EAS doesn't exist even conceptually for DTV right now."

—Charles W. Rhodes

NAB told the FCC it favors a "uniform protocol" for EAS, but did not offer any recommendations on how to extract such a multi-industry protocol voluntarily. SBE, meanwhile, is seeking the adoption of the Common Alerting Protocol (an open, nonproprietary standard). Also, departing from the current daisy-chain notification system, both NAB and SBE favor creating point-multipoint distribution systems to disperse messages from their sources to systems that transmit emergency messages directly to the public.

"EAS has reached a point where simple modifications or band-aid approaches are no longer applicable," EAS Committee Chairman Clay Freinwald said in an SBE statement when the group's FCC comments were submitted.

A RHODES MAP FOR EAS?

"EAS doesn't exist even conceptually for DTV right now, but it could be handled with a single sentence," says engineering consultant and TV Technology columnist Charles W. Rhodes. "That sentence approved by the FCC only has to read, 'EAS shall be carried by all stations, analog *and* DTV.' Otherwise, all this is still voluntary at the local level."

Like NAB, Rhodes believes broadcasting is the most reliable and credible means of providing EAS alerts.

An engineer for more than 55 years, Rhodes says the current EAS is flawed in another way.

"The industry got the government to allow local stations up to 15 minutes to delay test messages because of so-called program considerations. Delaying a tornado or tsunami warning by 15 minutes is the difference between life and death for some people!" said Rhodes, who fears that allowing delays during tests would become routine for station personnel and, therefore, lead to problems during actual emergencies.

He said a better solution is to ask the Advanced Television Systems Committee to seek strong input from local broadcasters and "come up with a scheme so that we have 24/7 monitoring and end-to end continuous testing, which was not possible with analog." Rhodes detailed his EAS plan in his TV Technology column last October, which, among other things, calls for the optimum use of DTV's unique system of packets.

Rhodes suggests one set of EAS headers that could be incorporated into the ATSC terrestrial standard and transmitted with DTV bit streams would be unique; it would be normally carried from the White House to the key broadcasters to indicate EAS is actually in place and capable of operating in the event of an actual national emergency, such as widespread terrorism.

Thus, he said, it will be possible to continually monitor EAS, quickly isolate failures, and restore the system. Automated monitoring and logging would be extremely simple for broadcasters and the FCC, Rhodes said.

ATSC President Mark Richer refrained from commenting directly on the Rhodes proposal, but said Rhodes was welcome to propose it within the ATSC.

"It has been our view that the government should develop, or coordinate development, of a common digital EAS protocol that can flow over all media," Richer said. "ATSC is prepared to define the carriage mechanisms for ATSC streams and to coordinate our activities with other organizations."

Rhodes' EAS proposal online at: *http://www.tvtechnology.com/features/digital_tv/f_charles_rhodes-10.19.05.shtml* ■

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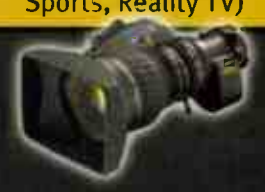

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Trading Tips on the Worldwide Exchange

CNBC employs video over IP and data fiber network for live global business news show

by Claudia Kienzle

ENGLEWOOD CLIFFS, N.J.

In today's competitive global economy, trends and economic indicators from one region can have a ripple effect on other regions of the world. To present timely business news within a global context, CNBC launched "Worldwide Exchange" in December—the first live daily business news program catering to those who are investing across international markets.

"Worldwide Exchange" is the first full integration of CNBC's roster of anchors, correspondents, and producers worldwide, all cooperating to broadcast the fast-paced, show, with live segments from three studio locations simultaneously. These include the Englewood Cliffs, N.J., studio, where Michelle Caruso-Cabrera hosts from 4 to 6 a.m. Eastern time; the CNBC Europe studio in London, where Ross Westgate hosts from 10 a.m. to 12 p.m. Central European Time; and the CNBC Asia studio in Singapore, where Christine Tan hosts from 5 to 7 p.m. in Asia.

GLOBAL VIEW

While each of the three regions is at a different point in its business day, the show gives viewers a concise, comprehensive analysis of how key trends, currencies, stock exchange indicators, and business news will likely affect the global economy.

"This [is] an exciting and informative program," said Mark Hoffman, president of CNBC, in Englewood Cliffs, N.J. "CEOs and other newsmakers [are] able to speak to an audience live on a global basis, fielding questions from CNBC reporters from around the world."

To facilitate this real-time, global production, "Worldwide Exchange" chose to employ both Global Crossing transcontinental fiber and video over IP fiber networking, rather than satellite, to move media-rich data and production communications in realtime between the three studios. CNBC, an NBC Universal company owned by GE, also uses a global data fiber networking service owned and operated by GE as well as encoding products from Tandberg Television.

"The program uses fiber rather than satellite so as to keep the delays down to a manageable level. Satellite delay, caused by the huge distances that video and sound signals have to travel, would have made this type of program almost unwatchable," said John Turner, director of operations for CNBC Europe, based in London.

"London is the central switching point for this program so all communications are kept as short as possible into London," Turner said. "We have also ensured that the video encoders used on the fibers are set for the shortest possible delay."

TALKIN' FIBER

The IFB production audio, heard through an earpiece each anchor wears, is also routed via fiber rather than a telephone network to minimize delays. Talkback communications systems are supplied by Telex Communications using voice over IP technology and video over IP for return IFB. The London studio features a large video wall supplied by Synelec, Sony cameras with Radamec robotics, and a fully loaded Philips DD35 vision switcher.

Switched live from the London studio under the direction of Jeremy Pink, CNBC vice president of international news and programming, also based in London, the program integrates live video and audio from reporters covering business news in such places as Dubai, Shanghai, Frankfurt, Brussels and Paris.

Among the show's daily segments are "It's the Global Economy," in which an economist fields questions from the three regions; "Currency Corner," a global interview with a key currency market expert; as well as a weekly segment from Mumbai, India called "CNBC India Live." The Avid iNEWS newsroom computer system is used by all three studio locations to manage the program rundown.

The format makes extensive use of a three-way split screen that features each of the three anchors on their respective sets as they converse with each other. The show also uses a quad-split screen featuring the three anchors in their own little windows, plus a fourth window showing the key newsmaker they are interviewing live.

"The inevitable delays that any global program has are the most technically challenging problem," Turner said. "The other factor is the time differences in the three regions: the U.S. is still asleep while Asia is at the end of its day. Getting CEOs and analysts to appear on the channel can therefore be difficult. Our studio production team has spent many hours rehearsing the management of delays; they have also used visual techniques to cover some of the delays."

According to Steve Fastook, vice president of technical operations for CNBC, in Englewood Cliffs, N.J., there is still some delay, especially between the United States and Asia, so the production team has to plan around the worst-case scenario.

FINANCIAL SNAPSHOT

All CNBC channels use highly automated, proprietary data charting systems that have been developed internally specifically for CNBC's needs. The system produces visually pleasing 3D animated charts, graphs, and other "boards" that the production teams prepare in advance in each studio location, and these live graphics are immediately available in London for insertion into the program.

"CNBC is live real-time data and since this data is real time, we have to store it and manipulate it in-house. We have a large data pool that uses symbols to locate specific indices/data," Fastook said. "Graphics involving data are template-driven and draw from the data pool. That way the information is accurate and real time whenever graphics are displayed."

Additional live graphics are fed from a Pixel Power live graphics system.

"A program such as this would have been impossible before the advent of video over IP and fiber technologies," Fastook said. "CNBC will be using these same technologies to provide its coverage of curling during the Winter Olympic Games in Torino, Italy. We will be producing and directing the coverage from our control room in New Jersey with talent and cameras at the venue."

HARNESSING ASSETS

Last month, CNBC assumed full control of CNBC Europe, CNBC Asia, and CNBC World from Dow Jones. (CNBC World is a 24-hour digital network available in 22 million U.S. homes via cable and satellite.) First announced in July 2005, Dow Jones proceeded to transfer its 50 percent equity interests in CNBC Europe and CNBC Asia, as well as its 25 percent equity interest in CNBC World, with the entire deal completed by the end of 2005.

"The launch of the program coincides with CNBC assuming full control in both CNBC Europe and CNBC Asia, as well as CNBC World, per the agreement with Dow Jones & Company," which became effective January 2006, Fastook said. At press time, the show had only been on the air a few weeks so there hadn't been sufficient time to assess viewer ratings or feedback.

But CNBC's spokespeople appear to be confident that the show will satisfy their viewers. When "Worldwide Exchange" premiered, Barbara Stelzner, head of news in CNBC Europe in London said, "The show's innovative perspective and production format will—for the first time—provide our viewers with an opportunity to get business news and analysis on a truly global basis. With guests from around the world, the program will give unique insight into developments that drive worldwide business and finance decisions." ■

> **"A program such as this would have been impossible before the advent of video over IP and fiber technologies."**
>
> **—Steve Fastook, CNBC**

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Boarding the Busses for Surround Sound

Audio consoles promote more user-friendly, ergonomic controls

by Claudia Kienzle

HAMILTON, N.J.

While most live TV production remains in stereo, today's next-generation studio audio consoles are ready to support the new plateau—5.1 channel surround sound—whenever broadcasters need it.

Vendors say that most of the 5.1 channel surround sound applications they see are primarily for live sports, music specials, and awards shows in HDTV. But broadcasters want 5.1 surround sound tools on any new audio console they're buying whether or not they're ready for it right now.

"We expect that more of our clients will start using their 5.1 surround capabilities in 2006 and 2007 as more shows move to surround," said Andrew Wild, vice president of marketing for Euphonix in Studio City, Calif. "All of our clients want to have 5.1 channel capability now so that at some future date they can move to surround easily without having to upgrade their consoles."

AUTO SELECT

Euphonix monitoring on all its consoles is fully capable of intelligently handling 5.1 surround sound, including LCRS surround capability, Wild said.

"Once the mix busses are set up, all routing, panning, and monitoring automatically selects the appropriate format so the operator works the console as normal without having to learn any new operational complexities other than how to operate the pan controls."

Euphonix manufactures two consoles for on-air broadcast applications: the System 5-B and Max Air. System 5-B is more suited to larger productions and includes eight knobs per channel and TFT displays across the console. Max Air is a more compact, cost-effective control surface that can handle up to 106 channels. Both are currently 7.1 channel surround-sound capable. (However, Wild feels that 7.1 channel surround sound is unlikely to catch on due to prohibitive cost factors and that 5.1 channel surround is the preferred consumer format.)

KNBC in Los Angeles uses the Euphonix System 5 at its Burbank studio.

Euphonix consoles are used by "The Tonight Show with Jay Leno" on NBC for music, production, and front-of-house mixing, as well as by CNN, and PBS station KLRU in Austin, Texas.

SURROUND SOUND, PAGE 12

EAS

CONTINUED FROM PAGE 1

immediate needs—the president. But because no catastrophic event has ever directly threatened the entire geographic United States, the original national aspect of EAS has never been fully tested on an end-to-end basis from the White House.

Theoretically, a national EAS signal is relayed from the White House to the Federal Emergency Management Administration, to nearly three-dozen key broadcasters as Primary Entry Points, which, in turn, are supposed to be monitored by more than 500 local primary stations, which are to be monitored by the estimated 24,000 local stations and cable systems. Critics say one massive power failure, i.e., along the Eastern seaboard, could place this complicated scenario in serious jeopardy.

On the local levels, there have been some moderate successes, including EAS usage in Florida during hurricanes Katrina and Rita, and some spectacular failures, including a series of train accidents over the past several years that raise questions about the effectiveness of EAS on the local level.

NAB, SBE SEEK CHANGES

In comments submitted for the latest FCC EAS rulemaking in late January, NAB reiterated its position that for delivery of emergency information to the public, "broadcasters continue to be the most reliable and robust means of distribution." In a digital EAS environment, it said, other wireless carriers could monitor local broadcasters to obtain digital EAS data and pass it on to their subscribers.

NAB opposes simultaneous audio translation of live EAS alerts into a second language, such as Spanish, because it could "likely impede" the delivery of timely information. This puts NAB at odds with the Independent Spanish Broadcasters Association and other petitioners, who told the FCC that "multi-lingual EAS messaging is an integral component of [EAS]."

"EAS doesn't exist even conceptually for DTV right now."

—Charles W. Rhodes

NAB told the FCC it favors a "uniform protocol" for EAS, but did not offer any recommendations on how to extract such a multi-industry protocol voluntarily. SBE, meanwhile, is seeking the adoption of the Common Alerting Protocol (an open, nonproprietary standard). Also, departing from the current daisy-chain notification system, both NAB and SBE favor creating point-multipoint distribution systems to disperse messages from their sources to systems that transmit emergency messages directly to the public.

"EAS has reached a point where simple modifications or band-aid approaches are no longer applicable," EAS Committee Chairman Clay Freinwald said in an SBE statement when the group's FCC comments were submitted.

A RHODES MAP FOR EAS?

"EAS doesn't exist even conceptually for DTV right now, but it could be handled with a single sentence," says engineering consultant and TV Technology columnist Charles W. Rhodes. "That sentence approved by the FCC only has to read, 'EAS shall be carried by all stations, analog *and* DTV.' Otherwise, all this is still voluntary at the local level."

Like NAB, Rhodes believes broadcasting is the most reliable and credible means of providing EAS alerts.

An engineer for more than 55 years, Rhodes says the current EAS is flawed in another way.

"The industry got the government to allow local stations up to 15 minutes to delay test messages because of so-called program considerations. Delaying a tornado or tsunami warning by 15 minutes is the difference between life and death for some people!" said Rhodes, who fears that allowing delays during tests would become routine for station personnel and, therefore, lead to problems during actual emergencies.

He said a better solution is to ask the Advanced Television Systems Committee to seek strong input from local broadcasters and "come up with a scheme so that we have 24/7 monitoring and end-to end continuous testing, which was not possible with analog." Rhodes detailed his EAS plan in his TV Technology column last October, which, among other things, calls for the optimum use of DTV's unique system of packets.

Rhodes suggests one set of EAS headers that could be incorporated into the ATSC terrestrial standard and transmitted with DTV bit streams would be unique; it would be normally carried from the White House to the key broadcasters to indicate EAS is actually in place and capable of operating in the event of an actual national emergency, such as widespread terrorism.

Thus, he said, it will be possible to continually monitor EAS, quickly isolate failures, and restore the system. Automated monitoring and logging would be extremely simple for broadcasters and the FCC, Rhodes said.

ATSC President Mark Richer refrained from commenting directly on the Rhodes proposal, but said Rhodes was welcome to propose it within the ATSC.

"It has been our view that the government should develop, or coordinate development, of a common digital EAS protocol that can flow over all media," Richer said. "ATSC is prepared to define the carriage mechanisms for ATSC streams and to coordinate our activities with other organizations."

Rhodes' EAS proposal online at: *http://www.tvtechnology.com/features/digital_tv/f_charles_rhodes-10.19.05.shtml* ■

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Surround Sound

CONTINUED FROM PAGE 10

DEMANDING APPLICATION

System Plus digital consoles, including the Alpha, Sigma and Zeta models, are the fourth generation of assignable desks from Calrec Audio Ltd. in West Yorkshire, U.K. Calrec consoles have no operational layering so the majority of controls are just one button press away.

"Audio operators in the [live broadcast] environment are under immense pressure to perform, and they cannot afford to suffer any operational problems that may take them off the air. Operators also need to be able to mix instinctively when under pressure," said John Gluck, sales and marketing director for Calrec Audio Ltd.

"An assumption is often made that digital boards will have all their facilities available at all times," Gluck said. "But this is not always true—some desks offer a pool of busses that can be used for different things, but not simultaneously. Some can also lose DSP functions [EQ, dynamics, etc.] as busses are used. Calrec desks do not 'pool' resources, and the bus structure provides everything you need all of the time. All live channels are in front of you rather than spread across the width and height of the board. Nothing is buried."

Gluck says that, even in the U.K. and Europe, broadcasting in 5.1 surround is increasingly more important for broadcasters. As a result, Calrec offers a new "Surround Spill" panel which enables dynamic handling and processing of 5.1 surround sources as single inputs, as well as comprehensive adjustment of individual discreet elements.

Calrec consoles are popular among mobile production companies including All Mobile Video, Game Creek Video, and NEP Supershooters, as well as CBS, CNBC, MSNBC, NBC Olympics, and Maryland Public Television.

POWERFUL PLATFORM

"Live broadcast brings challenges of scale versus control. In large productions, the capacity of the console needs to be large enough to accommodate the capacity of inputs and outputs required. However, space can often restrict the desire to have faders everywhere," said Steve Zaretsky, vice president of broadcast sales for Solid State Logic Inc. in New York.

By offering both discreet and assignable control surfaces, twin fader channels, plus features such as 5.1 channels, SSL's C-Series (including the C100, C200, and C300) digital broadcast consoles can be flexibly configured to meet the needs of every on-air application from news and sports to entertainment.

A key differentiator of the SSL C100 console is the way it handles a mix of mono, stereo, and surround sources. Zaretsky said that if a live surround feed has rear channels that are dominating the material that is being mixed, with the push of a button, the elements of the 5.1 feed can be spread across adjacent channels and rebalanced; and then a second button push folds that feed under one fader again.

The SSL C100 console is used on "The Daily Show with Jon Stewart" on Comedy Central, which is broadcast from NEP's Studio 52 in New York, as well as on newscasts by many stations, including KING5 and KCPQ in Seattle, WHDH Boston, WSVN Miami, WFTS Tampa, Fla., and KMAX/KOVR Sacramento, Calif.

MADE IN THE USA

Since Wheatstone digital audio consoles are designed and built at its New Bern, N.C. plant, the company is able to apply stringent quality control measures throughout its manufacturing process to ensure reliability. Wheatstone D5.1 and D9 consoles are modular, router-based systems where mix control is handled by the control surface, and routing and mixing occur within the Bridge Router.

"Live audio requires a deep feature set coupled with a clean work surface with instant recall that also provides for quick changes on-the-fly. By making operator access to functions easy, without menus to drill through, on-air mistakes are minimized," said Phil Owens, Wheatstone sales engineer.

(L to R) John T. Chow, vice president, engineering, NEP Studios, Kevin Tobin, chief engineer, NEP Studio 52, Tim Lester, audio engineer for "The Daily Show with Jon Stewart" and Lorenzo Hansford, engineer, NEP Studio 52. NEP Studios uses the SSL C100 digital broadcast console on "The Daily Show with Jon Stewart."

The Wheatstone D5.1 offers recall for every control parameter, with 32 faders generating 82 mix minus feeds, and the ability to generate 5.1 content and stereo simultaneously. The Wheatstone D9, with a 25-inch footprint and 24 faders, offers full event/memory and recall, eight stereo sub-groups, four stereo aux busses, mix-minus clean feed outputs, and 5.1 digital surround capabilities.

"Being a router-based system, the Bridge simplifies signal acquisition and subsequent routing and mixing," said Owens. "The networked nature of our router enables everything—including 64-bit bidirectional channels, logic/GPI data, control surface data, and serial data—to be carried via one CAT-5 or fiber network, which can be configured for redundancy."

Atlanta-based NBC affiliate WXIA uses a Wheatstone system with both the D5.1 and D-9 control surfaces, and The Weather Channel has just installed a D5.1. Wheatstone systems are also in use at Fox O&O stations in Cleveland, Dallas, Austin, Texas, and Grand Rapids, Mich. And Court TV has just installed a D5.1 system in its Manhattan studios.

Studer's Vista 8 digital live production console offers 100 percent redundancy, including power supplies, IO, DSP cards, and the control system.

"Some of the main challenges of mixing audio in a live environment are actually being able to react quickly to people and unexpected situations under high pressure," said Jamie Dunn, western regional sales manager for Studer USA in Northridge, Calif.

"To solve last minute or unexpected problems, it is crucial that the operator has a good overview of the console settings to reduce the potential for mistakes and to provide a level of comfort that things are as they should be," said Dunn. "To this end, one of the most important features of a digital mixing console designed for live use is the control surface user interface—and the main feature that sets our product apart from the rest of the market."

By mounting rotary encoders and switches on top of a TFT screen, Studer's Vista 8 gives operators a graphical user interface that enables a quick overview of system settings and status.

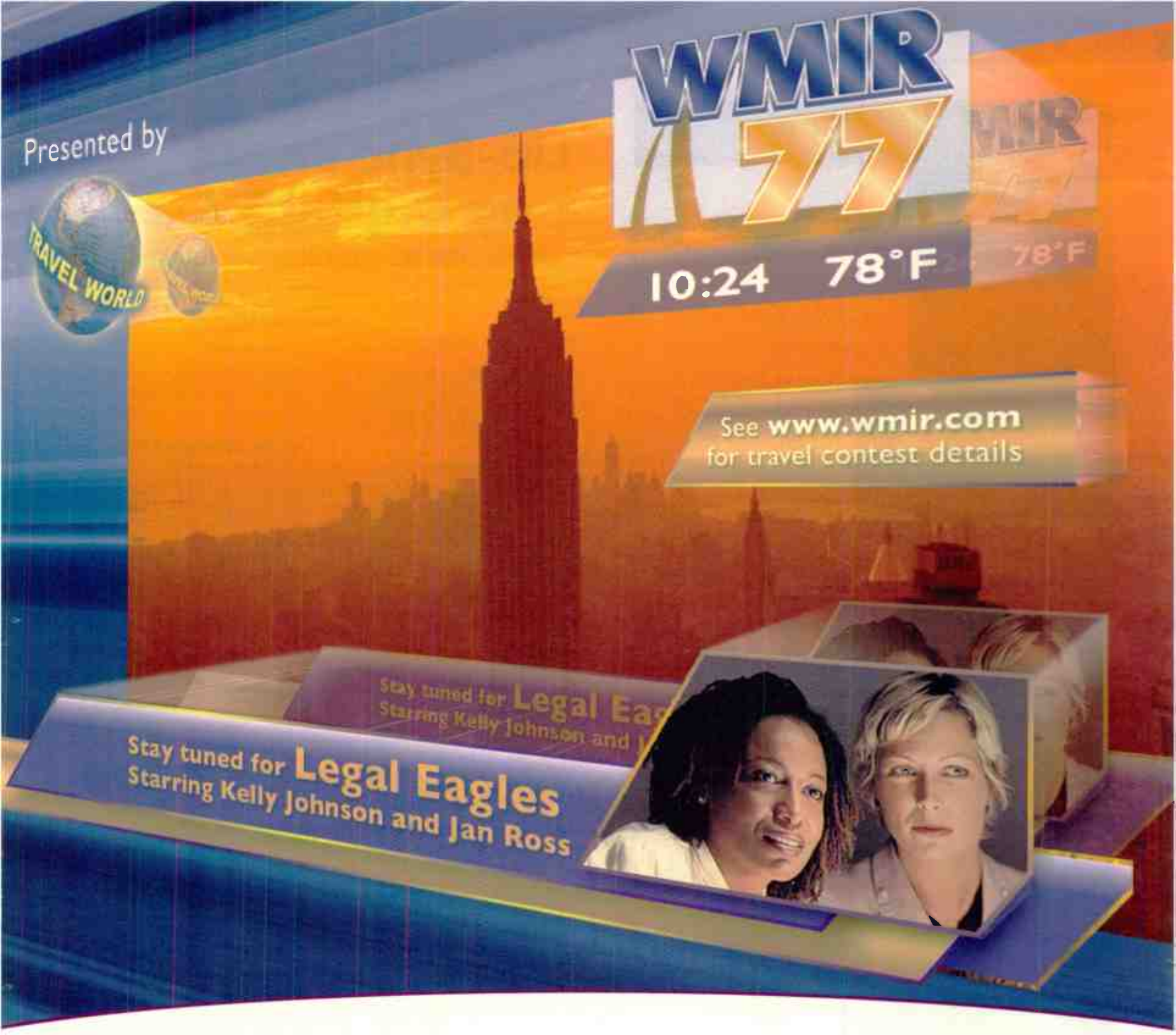
Studer's 62-fader Vista 8 has been used on live broadcasts of "The 2005 BET Awards," the "2005 Miss USA Pageant," the final episodes of "The Apprentice" and "The Contender." Also, All Mobile Video installed a 62-fader Vista 8 in its "Celebrity" HD truck with a second desk in its new HD truck. Vista 8 supports 5.1 channel mixing and monitoring, as well as 7.1 channel panning.

COMPACT DESIGN

The Harrison Trion digital audio console has an efficient, compact design due to its use of Linux, Ethernet, and USB architectures, as well as Harrison's patented IKIS platform. Trion consoles also save space by offering 6.5-inch TFT video displays that eliminate the need for a costly video monitor wall. The displays place the video sources in the same visual plane as the console controls.

"To tackle the challenges of live broadcast, Harrison consoles provide user-friendly, fast access interfaces for selecting sources, and accessing and controlling channels," said Gary Thielman, advanced product manager for Harrison Audio, LLC, in Nashville, Tenn. Trion consoles are installed at many stations, including WFAA in Dallas, WNDU in South Bend, Ind.; KMOV in St. Louis, and KTVK in Phoenix.

Trion consoles also feature an exclusive Harrison PreView waveform-envelope display which gives the operator a visual representation of channel name, stem assignments, EQ graph, dynamics graph, aux sends, surround panning, and other criteria. ■



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HDTV: MAKING IT HAPPEN

Lip-Sync Errors Dog Digital TV

SMPTE, vendors working on solutions

by Mary C. Gruszka

NEW YORK

When the average viewer notices that, all too many times, sound doesn't match up with the pictures on TV, there's a big problem.

"Lip-sync problems are a lot worse since DTV, but they are not unique to DTV," said Graham Jones, director of communications engineering in the Science and Technology department at NAB, and chair of the SMPTE ad hoc group on lip-sync issues which falls under the aegis of the S-22 Committee on Television Systems. "We have lip-sync problems even with NTSC analog transmission because there have been digital systems upstream," which introduce delay.

SMPTE and other standards organizations throughout the world have opened investigations into the causes of and solutions for lip-sync errors. Manufacturers are also stepping up to the plate with innovative ideas to measure and correct the problem.

NO SILVER BULLET

Lip-sync errors fall under different categories and need to be addressed separately, Jones said. "There are partial solutions, but there's no silver bullet."

An out-of-service test device, called "Lip Stick," is made by Calrec Audio Ltd.

"Lip Stick measures the amount of delay between video and audio signals and consists of a transmitter and a receiver," said Kevin Emmott, marketing coordinator for Calrec in

LIP-SYNC, PAGE 15

House Passes 2009

$1.5 billion set aside for converters

by Deborah D. McAdams

WASHINGTON

The budget bill containing the Feb. 17, 2009 analog shutoff deadline awaited the president's signature at press time. It was passed by the House 216-214 early this month after Senate maneuvering left it hanging at the close of the previous Congressional session in December.

The DTV provisions in the bill contain up to $1.5 billion to subsidize the set-top converter devices that would allow existing analog TVs to process digital over-the-air signals. Subsidies would be distributed in the form of up to two $40 coupons for households that ask for them. Of the money designated for converters, $5 million is earmarked for consumer education.

The bill also contains $1 billion for first-responder radio grants. When analog TV transmitters are powered down, first responders will gain 24 Mhz in the 700 band. The State of New York has already requested licenses for 700 MHz frequencies before the 2009 analog end date.

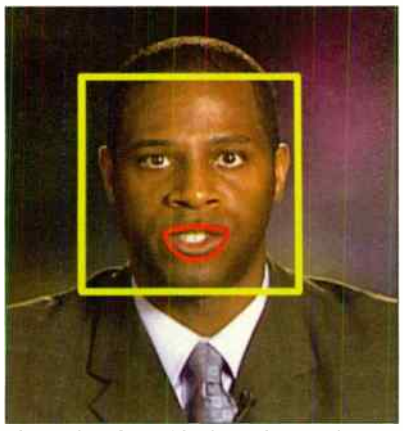
First responders were instrumental in pushing the deadline through Congress, where similar legislation floundered at the end of 2004. Last year, however, lawmakers were under a legislative gun to come up with billions through tax cuts and revenue, putting added pressure on the release of the analog spectrum. The Congressional Budget Office puts the value of that swath of spectrum at around $10 billion. Auctions for licenses in the band will commence Jan. 28 2008. The funds for the first responder grants and the converter program will come from the auction proceeds.

Other countries contemplating their own digital transitions are watching the United States. Passage of the 2009 legislation was well-covered in the United Kingdom, where the transition is expected to be completed by 2012. More than 60 percent of U.K. households already have digital TV, according to the BBC. U.K. broadcast regulator Ofcom has estimated it will take around $1 billion to subsidize the remaining households. A DTV education campaign is set to begin across the country June 9, to take advantage of viewership leading up to the World Cup. ■

Lip-Sync

CONTINUED FROM PAGE 14

West Yorkshire, England. "The transmitter inserts an ident [identification signal] onto the audio and video signal every seven seconds, and the receiver compares the incoming signal idents. The receiver measures the timing delay between the video and each of the two audio channels and indicates the difference on the appropriate display panel. The two audio channels can be used as either two mono circuits, a single stereo circuit or a simultaneous satellite audio and ISDN line to a satellite video path."



LipTracker from Pixelmetrix searches frame by frame for a face (yellow rectangle) and then locates the upper and lower lips (red outline) within the face. The mouth characteristics are extracted from the outlined region and analyzed to detect "e," "o" and "a" mouth shapes.

Lip Stick is not designed for use during transmission, as the ident system works by "inserting a test mark into the top of the active picture and an audible tone burst onto the audio paths," Emmott said. "Also, the Lip Stick system only operates with analog signals. You can convert to a digital signal after the measurement, but of course then you need to figure in the latency for the conversion prior to the conversion."

Emmott said customers have successfully used Lip Stick to "gauge the amount of delay and so correct it before transmission."

Vistek offers the V1681 VALID Generator and the V1682 VALID Reader for measuring lip-sync errors along with many other tests. According to Vistek, VALID is the name of the test signal which includes a rotating comet tail pattern that completes a full rotation every four seconds. A black cross pattern is also generated for one TV frame when the comet tail is at the 12 o'clock position. At the same time, a stereo tone is generated with identifying silences that are locked to the visual four-second pattern. This combined signal can be detected by the V1682 VALID Reader which indicates the timing difference.

The Vistek system is available for SD and HD, and can monitor embedded audio.

Once the audio-video delay is known, then appropriate delays can be inserted into the audio paths. Sigma Electronics devised a control system for its OctaStream AES Audio Management System (which includes audio delays and AES channel swapping) to make this process easier for Encore Hollywood, a full-service post production facility owned by Ascent Media.

"Encore Hollywood could figure out what the fixed delay was, but they were faced with eight channels of audio and no easy way to control-adjust them," said Bill Swilley, president of Sigma Electronics in East Petersburg, Pa.

Different types of processing for different source material means different delay settings. "An HD transfer could have a different delay than an SD transfer," Swilley said.

The Sigma Electronics OCP-100 1 RU control panel allows the setting and monitoring of card functions remotely, as well as storing of presets for each show or dub configuration.

LIP-SYNC, PAGE 18

AT&T

CONTINUED FROM PAGE 1

the very nature of video delivery to the home.

"Fundamentally, all the advantages are really enabled by the fact that all of the services are delivered over this two-way broadband network," he said. "Because it's a two-way network, you can do a lot of the so-called heavy lifting on servers."

In a broadcast environment the "heavy lifting" has to be done in the set-top box.

This speaks to the basic difference between IPTV and the QAM system that has dominated cable and satellite TV to date. With QAM, all channels are sent into the home, where the set-top box or boxes decide which channel to watch.

If 250 channels are being broadcast into your home, Graczyk said, "the set-top ignores the 249 you're not watching and displays the one you are. But those extra 249 take up a huge amount of bandwidth."

With IPTV, each set-top box in the home sends a request to a server located at the service provider, and the server sends back just the channel requested. Regardless of the number of channels available, even if many are HD, the amount of capacity into the home need only be enough to handle one channel per set-top box plus enough for data and voice.

"Twenty to 25 megabytes is in the ballpark as far as a couple TVs and the phone, Internet service, a couple of hi-def channels," said Charlie Guyer, spokesman for Alcatel, the French system integrator for Lightspeed, as well as the provider of critical hardware such as the edge servers.

IP ADVANTAGES

The 20 to 25 Mbps into the house requirement allows AT&T to use existing copper wiring from a neighborhood-serving node into the home. From that node, up through the network, everything is fiber. Servers at the service provider send individual IP video streams down the network through the serving node and into the house via the copper wire.

Guyer noted that for connecting from a serving node to new construction, "people by and large aren't putting new copper in the ground. If they're opening up the ground they're going to put fiber in."

While some day AT&T may find new services require replacing the copper wire with fiber into the house, "we're always having advances in how we can compress through compression technologies," said Guyer. He noted that IPTV already uses higher compression MPEG-4 or VC-1 rather than the older technology MPEG-2 used by broadcasters and digital cable.

Graczyk said that the ability to use existing copper wiring into homes served is only one of the advantages of IPTV. Another is that the channel switching is done in software on the server rather than in the set-top box.

"Channel tuning time for the consumer is significantly faster than in digital broadcast," he said. "So cable and satellite take one to two seconds to tune a channel; we do it in about 300 milliseconds."

In a demonstration on Microsoft's Redmond, Wash. campus, Graczyk showed a Major League Baseball application where the viewer can watch and listen to one game occupying most of the screen, with three smaller pictures of games taking place at the same time.

When the viewer switches to another game, the two pictures switch places with a DVE-ish move. And though the viewer is watching video from four games at once, they are combined upstream on the network and sent to the viewer as a single channel.

Because the network is truly two-way, a customer can request billing details or order an upgrade without phoning the service provider. "And every call costs around $7.50," Graczyk said.

He cited one cable provider who estimated they got 9 million calls per month. "You can do the math, 9 million times $7.50... if we can offload some little percentage just by giving people the ability to view it online, that's potentially a huge savings."

Because the IPTV infrastructure is computer-friendly, Graczyk said video-on-demand systems can be fully integrated in the service.

"The way VOD evolved in cable, it was kind of like a 'second class citizen,' because you were either in live TV, where you got the guide and you can navigate and change channels, but if you wanted to go to video-on-demand, it's kind of this whole different world."

This makes searching live channels and VOD libraries seamless from the user standpoint.

Because most of the functionality of IPTV is not in the set-top, the boxes themselves will require relatively little updating as incremental changes are made to an IPTV system. The servers will receive most of the upgrades.

With cable TV, "the challenge is, any time the software on the set-top box changes, it has to go through this big, long, expensive certification process with Motorola that's called 'Acadia,'" Graczyk said.

"With IPTV we don't have that restriction, in fact we can roll out these incremental updates very easily," he said.

Guyer said the newness of IPTV has required his company and other partners in AT&T's project to learn and invent as they've gone along. He said of the 30-plus IPTV projects Alcatel is leading or participating in around the world, AT&T is the largest.

"Lightspeed is the one that's under the microscope and everyone is using this as the barometer as far as the future of IPTV," he said.

One of the biggest questions he's seen the network's builder ask is if it will scale. "Will it support 18 million people? That's been a challenge but I think it's being addressed very well. AT&T is hitting all its milestones."

AT&T's Weber echoes that optimism.

"We're in the middle of massive network build, in the middle of, in our case, a complete system build, a new suite of systems that we're implementing, obviously a pretty complicated new technology around the IPTV platform, new set-tops, everything was new and new and new."

In spite of all the pioneering technical effort, he said "all came together in a way that's pretty simple for customers. So there's lot's of interesting technology behind the scenes, but from your perspective, sitting in your living room... turn it on, it's really good quality and it's easy to use." ■

Microsoft's IPTV software offers preview streams to AT&T set-top boxes.

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Alan Popkin
Director of TV Engineering
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Lip Sync

CONTINUED FROM PAGE 15

IN-SERVICE TESTING

Measuring delays out-of-service works well for post-production facilities, but for 24/7 broadcast facilities, a method of in-service testing would be invaluable.

Pixel Instruments initially demonstrated its LipTracker technology at NAB2005, and has plans to show enhancements at NAB2006.

"We take a look at the problem from the end-of-the-line point of view," said Chris Smith, director of sales and marketing for Pixel Instruments in Los Gatos, Calif.

LipTracker has inputs for both video and audio. Smith explained that in the video portion, "we locate the head or face. Once we've found the face, we find the outline of the lips, which gives us the mouth region. We do an analysis on the shape of the mouth to give some key anchor points of mutual events—mouth shapes that correspond to three different vowel sounds. These vowel sounds are fairly distinct and correspond with a fairly extreme mouth shape. We look at continuous streams of sounds and mouth shapes over a period of seconds."

The result is the delay error between the audio and video. LipTracker also looks for silences when lips aren't moving.

"We don't assign as much weight to silences as the other vowel sounds," which are more definitive, "and the mouth is not always stationary with silence, but it is meaningful enough though," Smith said.

The first version of LipTracker required a known face and voice to generate meaningful results and to prove the technology concept, but Pixel Instruments is moving ahead. The goal this year, Smith said, is "to make the technology speaker independent with the ability to work with unknown faces and voices, and to speed up the process to real-time or very close to it."

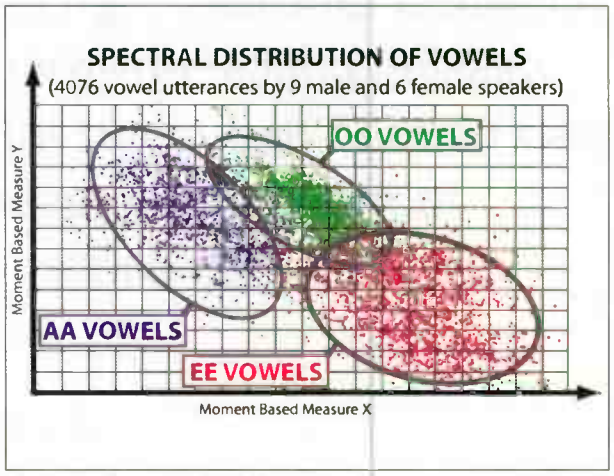
Sigma Electronics is developing the Arbalest digital audio-to-video synchronization system that it announced at NAB2005. The company hasn't released much information on how the system works for legal and patent-pending reasons, but company president Swilley said, "we're addressing transmission and contribution errors in the compressed and uncompressed domains. Once we know something is in sync, we maintain it at the other end. It's a hands-off operation for dynamic operation, with no measuring of delay and selecting presets."

Swilley said that the technology can also be used to sync up SD and HD feeds.

With current production practices, the amount of video delay can change dynamically. But if video-processing gear can somehow communicate how much delay it's producing, then a new generation of intelligent audio delays can use this information to correct for errors in a way that's inaudible.

Among its many tasks, the SMPTE ad hoc group on lip-sync issues is considering a standard for the control of audio and video synchronization compensating delay. That effort is still a work in progress.

The group also hopes to complete in the next few months, "a document that will provide engineering guidelines and good practices for the prevention and correction of errors," group chair Jones said. The plan is to include error tolerances at various points throughout the production and transmission chain, including production and post, release facility, affiliate station, emission encoder, receiver and final decoding and display. ■



LipTracker transforms the audio to frequency space and normalizes the data to minimize differences due to vocal pitch. A plot of the spectral distribution using moment-based measures shows that the "e," "o" and "a" vowel sounds can be identified and separated in a manner that is independent of the speaker.

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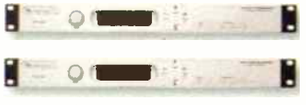

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LINEAR ACOUSTIC

Surround Sound Soived

The Perils and Promise of Lighting for HD

Better cameras make things easier, but tight budgets require creative solutions

by John Sharaf

HOLLYWOOD

To those who suggest that there isn't any difference between lighting for SD and HD I have to respectfully disagree. The question then becomes: Is it easier or harder to light for high definition photography?

Opinions vary widely on this matter, based both on experience and conjecture. From my own experience, having worked in HD production for more than three years on long form-documentaries, commercials, corporate, cable, broadcast and even low-budget theatrical features, I have to conclude that sometimes it's easier and sometimes it's harder.

Last month I worked on the live high definition production of CBS Sports' "NFL Today" show that accompanied the AFC Championship football game in Denver. I had the opportunity to discuss this very topic with the Lighting Director Lenny Mancini, Jr., who felt very strongly that lighting for HD is easier; in fact he says he can't wait until all his work is in hi-def.

Mancini explained that the improvements in the cameras themselves mean that he has less problem with the highlights overexposing and their ability to reach into the shadows without as much fill light means the ultimate effect becomes a more natural look.

On the exterior set of "NFL Today," where the four hosts and commentators sat in a roofed environment (in case of inclement weather) behind the "sports desk" with the bright football field and stadium in the background, Lenny was able to balance the shaded foreground with only four, 1,200 W HMIs. The cameras themselves did the heavy lifting in terms of compressing the highlights so as not to overwhelm the shadow areas.

Some HD cameras, like the Varicam, actually replace the knee point and slope controls when in special modes like "Film Rec" with an alternate control called "Dynamic Range" and offer four presets that can be invoked as needed, from 200 percent minimum to 500 percent maximum. For ENG or EFP crews, who finds themselves in the field without a proper engineer and monitoring equipment (normally required to tweak the knee), they'd still be able to have a range of creative control over the highlights in the sky or on lightly colored wardrobe, which might otherwise be a problem.

Producer Bill Cunningham (center) and crew prepare the 12-foot by 12-foot set for one-on-one interviews with 2005 Emmy winners, to be aired later on "Good Morning America."

One aspect of HD production that does serve to make the lighting both more difficult and easier is the additional scrutiny that is imposed because of the newness and the additional costs involved.

On the other hand, the widescreen, 16:9 aspect ratio associated with HD formats does serve to complicate matters, not only because it creates a larger "playing field" to light evenly, but because light stands or grip equipment have to be spread further back out of the shot. In some cases this might require larger units placed further back, especially if using large diffusion in front of the lights like 6-by-6-foot silk diffusion. When confronted with limited real estate, this might force the shot to be smaller than in 4:3 and create a limitation that will be blamed on the lighting department.

LOOK TO THE EDGE

Currently, when compromises are made in the framing to accommodate both 4:3 and 16:9 frames, the smaller square in the middle is favored, simply because the majority of the sets in use are in that format, but as sales of widescreen sets proliferate, more care

will be given to staging and lighting for the full widescreen. I found it revealing, as we rehearsed the post-game award ceremony in the Pittsburgh locker room at Mile High Stadium, where the Steelers ultimately received their trophy for winning the conference championship, that the background banner that CBS provided was square; as we composed the picture for 4:3, it filled the frame behind our host Greg Gumbel and his guests, but on the 16:9 picture, you could see the banner perched in the stands off the set!

Until now, there has been considerable conjecture that hi-def would reveal all the imperfections in the on-camera talents' face, and it is incumbent on the lighting department to consider this in their design approach. My experience has taught me that a combination of minimizing detail enhancement in the camera settings and careful application of soft lighting can make everyone happy. Standard definition cameras often need aggressive detail just to have a sharp enough look, but the HD cameras are so inherently sharp with many more lines of resolution that it's possible to run the detail down if not all the way off. This also minimizes the addition of unwanted noise.

EXTRA COSTS

One aspect of HD production that does serve to make the lighting both more difficult and easier is the additional scrutiny that is imposed because of the newness and the additional costs involved.

I had the privilege recently, during the first week of HD debut of ABC News "Good Morning America," to light and shoot its first multicam HD live remote at SeaWorld in San Diego. Because of the many unknowns involved, technical operations required a rehearsal day to test the HD uplink, so you can understand that the normal costs were doubled in addition to the extra HD encoder equipment, technician and spares.

Because it's only 4 a.m. in California when the show goes on the air on the East Coast, considerable efforts are made in the lighting design to make the West Coast live remotes look like daytime so that when they're replayed three hours later they still look "live." In this case, it meant lighting a large exterior tank where two whales, Shamu and Baby Shamu, would be stroked, fed and weighed on a scale by our correspondent and a whale trainer. Obviously a large light was in order!

Even before I asked for it, the operations producer reserved a Bebee lighting crane truck, which has a bank of three remotely controllable 12 K HMIs on the end of an 82-foot crane. It also has a self-contained generator that makes deployment simple and swift.

Sure enough, after blocking the shot with the placement of the Bebee truck in mind (it weighs 32,000 pounds, so it needs a strong footing), when we turned it on, even the whales thought it was daytime and came out to look for their breakfast.

We illuminated the foreground where the correspondent and trainer would play, with a 20-foot strip of daylight balanced 4-foot Fourbank Kino Flos and the remote went off without a hitch. In this case, HD was easy because the show was willing to pay for the proper tools, to protect the investment they were making in new technology.

Whether lighting for HD is easier or not, it is safe to say that it's more fun than SD, because everyone pays additional attention to the larger and sharper pictures, and with the newness of it all, the "wow" factor is still significant and can't help but reflect well on the lighting and camera technicians involved.

John Sharaf provides freelance cinematographer for news production, commercial spots, independent feature films, and music videos. The company frequently provides content for a number of major news broadcasters, including ABC News and CBS News.

THE MASKED ENGINEER | Mario Orazio

Compression Is Easy As Pi... to 100 Places

You might not have noticed that objective measurements have gone the way of NTC-7. I ain't sure if that's good or bad, but it surely does leave a big hole in equipment specs.

NTC-7 and RS-250 were pretty handy back in the days when you could measure a problem, call up the phone company, tell them what the problem was and have them fix it. Okay, so maybe they wouldn't fix it, but at least you'd be in agreement on what the problem was.

If the frequency response was off, your pictures could be dull looking. If there was periodic low-frequency noise, you'd see bars rolling vertically through the picture. You could go through differential gain and phase and all the other parameters, and by the time you were done, you could have a danged-fine analog system.

PERFECTION EXCEPTIONS

With digital, as everyone knows, everything's perfect all the time, except when it ain't. The phone company might make an effort to deliver some agreed-on error rate, but telling them what the differential gain is ain't going to help them identify why the bits aren't getting through. And then there's compression.

Whoa! Let me back off for a bit (or byte). I don't want to leave you with the impression that information compression is something new to the digital era. It ain't. The first NTSC standard used compression, and so did the second.

Methinks I'd better define information compression.

It's more like sleeping-bag stuff-sack compression than like audio-level compression. With audio-level compression, you make a determination about how best to squeeze too much dynamic range into a narrower distribution, recording, or listening channel. Then you do it, and the audio is—except for some strange consumer expanders—compressed from then on.

Information compression is different. You squeeze information into a narrower distribution or recording channel, but you always expect it's going to be decompressed before it gets seen or heard. If all goes well, there ain't any difference at all between the original and the decompressed (lossless compression), or at least there's no difference anyone can tell (perceptually lossless compression).

LOSSLESS PERCEPTION

Now then, you might think that there ain't any difference between lossless compression and perceptually lossless compression. If so, you'd be wrong, on account of people maybe not being the only thing decompressed signals hit. They could also hit an image compositor or another compressor, and those boxes might take a dimmer view of perceptually lossless compression than a person would.

Where was I? Oh, yeah, NTSC. So the first NTSC declared that what should have been 60 frames per second could be squeezed into 30 through the compression miracle of interlace. The second declared that what should have been three video channels (one for each color primary) could be squeezed into one through the compression miracle of subcarrier-frequency interleaving. There were more compression tricks—vestigial sideband, chroma filtering, etc.—but I'll stick to those two to make my point.

I don't want to leave you with the impression that information compression is something new to the digital era. It ain't. The first NTSC standard used compression, and so did the second.

Most of the time, interlace seems to work pretty well, but when there's an electronically generated horizontal edge in just one scanning line, it twitters wildly, and when stuff rolls through the picture at an odd multiple of one line per frame, it loses half its resolution. Those are just a couple of "for instances."

A COLORFUL MOIRÉ

Likewise, when a host wearing a striped shirt walks out on stage, those stripes erupt in a colorful moiré pattern that ain't in the original, and nice sharp edges between saturated colors can go dotty. But most of the time, NTSC color works pretty well.

Now then, if your pictures ain't got fine horizontal edges or problematic motion, interlace ain't going to be much of a problem, and, if you

COMPRESSION, PAGE 32

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AUDIO BY DESIGN

Mary C. Gruszka

More on Balanced and Unbalanced Audio

As a new year of Audio by Design begins, I'd like to thank the readers who have sent in their thoughts about the column.

There seemed to be a general consensus that basic audio design concepts are often ignored in the digital age.

Regarding balanced and unbalanced audio, Keith Bloomfield (a colleague from my student days) wrote: "The ignorance is magnified by the crummy jacks used on interface cards of all but the high-end equipment, and the general lack of attention paid to properly matching impedance and legitimately matching balanced and unbalanced I/Os. In a world where an MP3 is deemed hi-fi, what more can we expect?"

And speaking of balanced audio, Bill Whitlock, president of Jensen Transformers, in his excellent presentation on grounding and shielding at AES last fall, pointed out that the only requirement for a balanced circuit is that the two conductors used for such circuits must have the same (non-zero) impedance to ground. Period. Signal symmetry (voltages that are equal but opposite in polarity) does not define a balanced circuit.

It's the equal impedance to ground of balanced lines that give such circuits excellent noise rejection. Any noise that is picked up will be present in the same amount in both conductors. If presented to a device with a differential input, either a transformer or electronic circuit that responds to the difference in input voltage, then the noise will cancel out.

Signal symmetry may indeed result from a balanced circuit, as it often does for analog audio not driven into distortion. However, there can be some signals that are not symmetrical by design (i.e., test signals used by makers of polarity testers), but they still run on balanced lines.

POSITIVE DESIGNATION

Whether or not the signal itself is symmetrical, one signal conductor of a balanced line is designated as positive polarity and the other negative. For the common XLR audio connector, there was quite a debate in the late 1980s and early 1990s about which pin of the 3-pin connector should be designated positive.

Greg Hertfelder from Cerner Corp. reminds us that "professional organizations and manufacturers have universally adopted standards codifying pin-2 as positive and pin-3 as negative.

"Two examples of standards are

AUDIO, PAGE 27

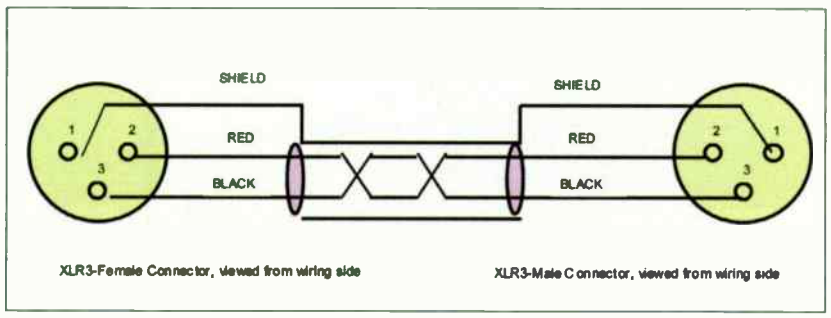


Fig. 1: Wiring diagram corresponding to Table 1 of an XLR-F cable connector to XLR-M cable connector using shielded twisted-pair cable.

	XLR-3F	XLR-3M	Cable type: shielded, twisted pair Manufacturer X, Model No. X
High (+)	2	2	Red
Low (-)	3	3	Black
Shield (SH)	1	1	Shield

Table 1: Pin-to-pin connections for wiring a cable with an XLR-3 connector at each end

	XLR-3	TRS	Cable type: shielded, twisted pair Manufacturer X, Model No. X
High (+)	2	Tip	Red
Low (-)	3	Ring	Black
Shield (SH)	1	Sleeve	Shield

Table 2: Pin-to-pin connections for wiring an XLR-3 connector to a ring-tip-sleeve phone plug

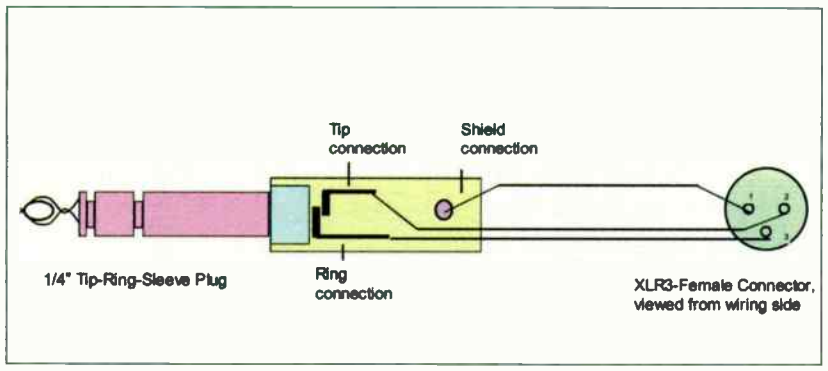


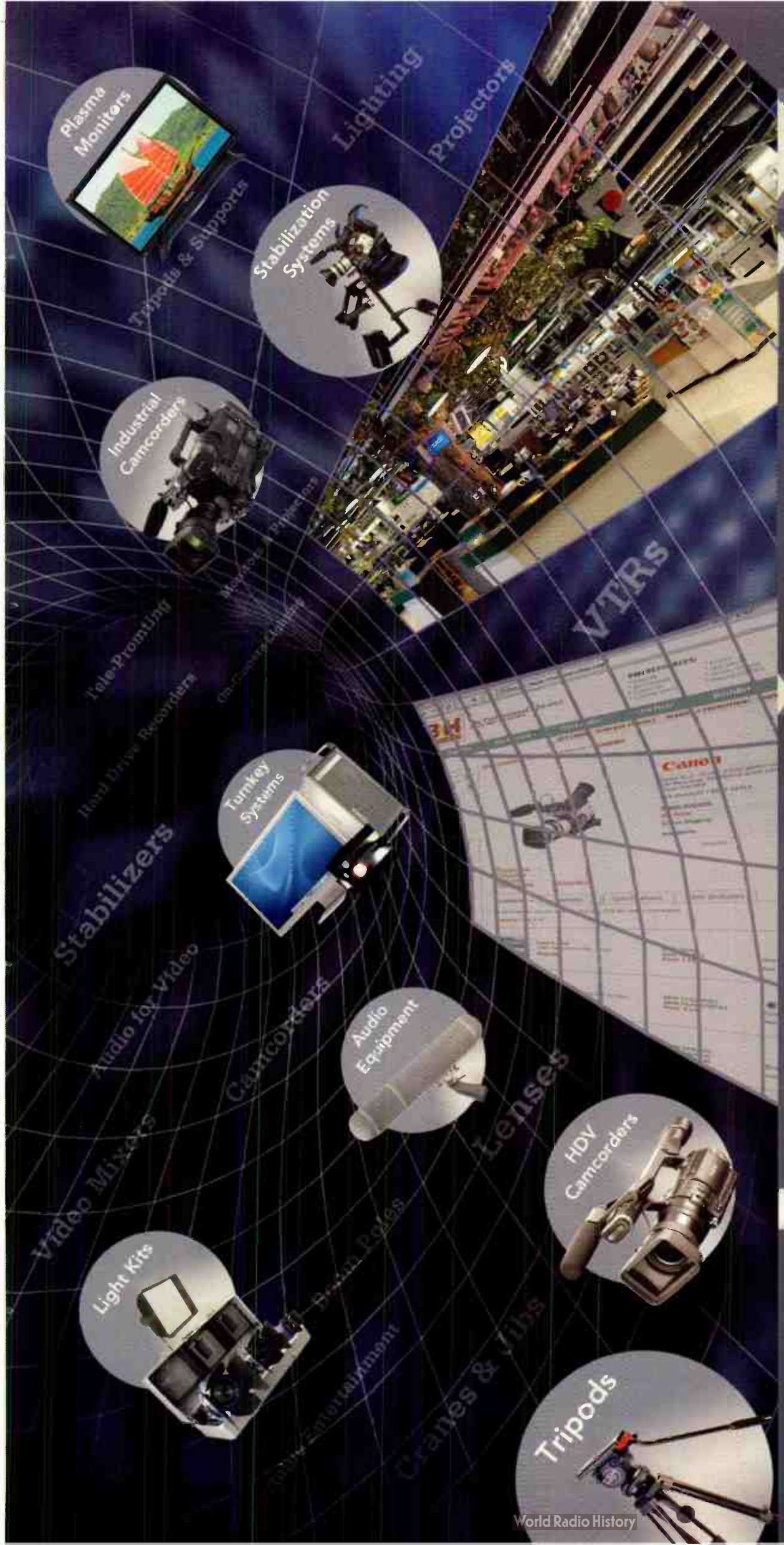
Fig. 2: Wiring diagram for an XLR-3F plug connected to a 1/4-inch tip ring sleeve phone plug.

	RCA or phone plug	RCA or phone plug	Cable type: shielded, twisted pair Manufacturer X, Model No. X
High (+)	Tip	Tip	Red
Shield (SH)	Sleeve	Sleeve	Shield

Table 3: Typical pin-to-pin wiring for unbalanced RCA or phone plug

	RCA or TS	XLR-3	Cable type: shielded, twisted pair Manufacturer X, Model No. X
High (+)	Tip	2	Red
Low (-)	Sleeve	3	Black
Shield	N/C	1	Shield

Table 4: Pin-to-pin wiring of adapter cable for unbalanced source to balanced input (N/C = no connections)



INTO THE SOURCE

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PRODUCTION MANAGER Craig Johnston

It's Time for HD Commercials

I was pleased to read the other day that in this year's Super Bowl broadcast, slightly more than half of the spots were in high definition. I might not be all that pleased except that a friend of mine is cranky. In fact, maybe I'm not all that pleased after all.

I'm generally not a bucket's-half-empty kind of guy, but at $2.4-million per 30-second spot, the advertisers in the Super Bowl are the richest of the rich, and still, nearly half of the commercials are standard definition.

Which gets us back to my cranky friend. Ask any real engineer who knows me and they'll tell you I'm not way technical. (They may say worse things about me as well, but they'll tell you I'm not way technical.)

However, I can read an instruction manual, and I've plugged a lot of things together with very few sparks and almost no smoke. I get called on a lot to help my friends put in their home entertainment centers. This is where my cranky friend comes into the story.

He asked me to help him install his new HD home entertainment center. If I do say so myself, I did a heck of a job; only made one real mistake, and there was no sparking or smoking.

Turns out the cable company hadn't actually brought HD into the house, but once my cranky friend got done nattering at them, things were fine. Fine that is, except that according to my cranky friend, the hi-def started going in and out. I sprang to my car to see what was the matter.

WHAT'S WITH THE BARS?

We were watching "Monday Night Football" in HD, and when they went to break, my friend shouted "there it is, it's not working." You've probably figured out already that what he saw was the picture go from 16:9 to 4:3, and it didn't look as crisp as ABC's football telecast. I tried my best to explain what was going on—that the commercials themselves weren't in HD. But he wasn't satisfied. Like I said, he's cranky.

I had a businessman tell me a long time ago that people like my cranky friend are actually an asset, because they give you instant feedback. Someone who complains about the service in a restaurant may be a pain in the tail, but they also may be giving you an early warning that something's wrong.

While you and I, television experts, can look at what my friend saw and know that the HD system itself isn't failing, that it's just a commercial pod that's in SD instead of HD, the regular viewer doesn't know that.

But unless they're as cranky as my friend, they probably won't tell you. They may just be real disappointed in the hi-def experience. After all that's been invested in the digital broadcasting infrastructure, it'll be too bad if people put off buying high-definition televisions because when they were watching it at their friend's house, it didn't work right.

What to do about it? Well, you can start at home. In those commercial pods, not only were most of the national commercials and all of the local commercials in SD, but the station promos were in SD as well. Come to think of it, I think the network promos were in SD too.

Your salespeople are going to have a tough time convincing the advertisers they ought to be doing their spots in HD or doing a separate HD version if the station itself seems to be content with SD for its own advertising.

Your salespeople are going to have a tough time convincing the advertisers they ought to be doing their spots in HD or doing a separate HD version if the station itself seems to be content with SD for its own advertising.

So in fact, one of the things a station might want to do is bring the infrastructure up to the point where local HD spots (and promos) can be aired. And you might also want to get the word out to the local advertising community about how they should deliver HD spots. With apologies to my friends who make high-end hi-def tape cassettes, local ad agencies are not going to want to buy those for each spot. Hint: data file on DVD.

And then there's nothing like incentivizing the sales folks to actually sell HD spots. Nothing seems to work quite as well as a bonus.

When people see their first HD, we all want them to be impressed. It's in the best interest of the stations and cable channels, and the people who work there, to make these first HD experiences the best they can be. If you won't do it for yourself, do it for me. I'm ready for my cranky friend to be cranky about something else for a change.

Craig Johnston is a Seattle-based Internet and multimedia producer with an extensive background in broadcast. He can be reached at craig@craigjohnston.com.

Audio

CONTINUED FROM PAGE 24

Audio Engineering Society AES 14-1992, and International Electrotechnical Commission IEC 268-12. Legacy wiring may exist with pin-3 positive in older television trucks, theatrical and stadium sound reinforcement systems, etc., but current devices and systems are universally wired pin-2 positive and pin-3 negative.

"Professional intercom systems are rendered moot when two ends of an XLR circuit have been wired inconsistently, and this issue is usually the culprit."

While I was aware of the AES standard, I didn't specifically mention it in my column, so I thank Mr. Hertfelder for his comments.

Signal symmetry (voltages that are equal but opposite in polarity) does not define a balanced circuit.

However, Mr. Hertfelder also seemed to interpret at least some of the wiring charts in the column on balanced and unbalanced circuits as showing pin-3 as positive. And if he did, others may have also. I re-checked those tables and they do all show pin-2 as positive. There was a problem in placement of some of the tables in the body of the text, so that could have caused confusion.

I tend to use tables as a very shorthand way of indicating pin-to-pin connections and I find them easier to follow than a wiring diagram when I wire up cables. However, the tables as originally presented did leave out cable type, and wire-to-connector pin information. So I'm presenting them here again in expanded form.

Table 1 shows normal wiring for an XLR-3 to XLR-3 type of connector, for example, XLR-3F (female) to XLR-3M (male) plugs. What the table shows is that pin-1 of one XLR is wired to pin-1 of the other XLR, pin-2 to pin-2, and pin-3 to pin-3.

The cable is a shielded twisted pair type with the shield connected to pin-1 and the wire designated as the "high" or positive wire connected to pin-2, and the wire designated as the "low" or negative wire connected to pin-3. Choose your favorite cable manufacturer and model number for the twisted pair cable.

For those who prefer wiring diagrams, Fig. 1 shows the same information as Table 1. Although for clarity the diagram doesn't show this, try to keep the twist of the signal wires as close to the connector terminals as possible.

Table 2 indicates the wiring between an XLR-3 cable and a tip-ring-sleeve phone plug (1/8 or 1/4 inch.)

Table 3 shows typical pin-to-pin wiring for unbalanced connectors like RCA phono or 1/8- or 1/4-inch phone plug.

Table 4 shows a way to make an adapter cable between an unbalanced source to a balanced input using twisted pair audio cable.

I hope that this clarifies a few points made in the earlier column.

Mary C. Gruszka is a systems design engineer, project manager, consultant and writer based in the New York metro area. She can be reached via TV Technology.

DIGITAL TV

Charles W. Rhodes

Unlicensed Devices Could Compromise EAS

Since my article in the Oct. 19, 2005 issue of **TV Technology**, ("Developing a 24/7 Digital EAS System"), some real progress has been made by the FCC in the matter of the Emergency Alert System.

While broadcasters are required to transmit EAS messages from the White House over analog channels, they are not required to transmit EAS messages over digital channels. With the analog sunset pending, the FCC seeks to extend EAS not just to DTV channels, but to all electronic media, including cell phones.

This column has suggested one technique by which a DTV channel can provide a 24/7 *emergency alarm capability*, something the present analog system cannot do. It also showed how a unique EAS header can be transmitted from the White House to all local TV stations, providing 24/7 continuous testing to confirm the EAS is actually operational. That could replace the weekly EAS testing, which is an annoyance to the public and to broadcasters.

I am not suggesting that my previous articles played any part in the actions of the FCC. The need to include DTV channels is self-evident. I believe the need for a 24/7 EAS is also obvious since 9/11 and the Katrina disasters. Last fall, I sent copies of my articles about EAS to the Advanced Television Systems Committee, which would play a crucial role in creating a 24/7 EAS over DTV channels by assigning specific ATSC headers for implementing an EAS over DTV channels. The ATSC is sponsored by broadcasters and by representatives of consumer electronics manufacturers.

MSTV and others have expressed their concern that such unlicensed transmitters might interfere with the reception of broadcast TV signals. This sounds to me like a digital citizens' band—DCB—within Channels 5-51.

One problem with implementing a 24/7 EAS over DTV channels is that so far, this has been an unfunded, voluntary effort largely by the Society of Broadcast Engineers.

However, the FCC soon may have funding from the Congress for this effort. It is rather hard to imagine how something like a national EAS can ever succeed on a voluntary basis, as it would require receiver designers to provide for 24/7 monitoring of the ATSC digital datastream for EAS headers, and sounding of both audible and visual alarms when an actual EAS header is received from over-the-air broadcasters. So it is an uphill struggle to implement this on a purely voluntary basis.

While I believe the incremental cost in receivers to provide this function is well worth it, it is not going to be free—it requires a battery backup function should AC power fail. I separate the alarm function from the delivery of emergency messages of what to do in a specific emergency that, as Katrina showed, may rely on battery-operated receivers, i.e. radios. Consumer electronic manufacturers are very sensitive to cost and to governmental regulations of how they design products.

The first step at the ATSC may occur this month. I was invited to attend a committee meeting in Washington, D.C. to explain my concept of how to provide a 24/7 EAS over DTV channels, but alas, that will not be possible since I have moved back to the great Northwest.

A lot has been said about the recent proposal by the FCC to permit further sharing of the remaining broadcast spectrum (Channels 2-36 and 38-51).

There is a proposal to allow unlicensed transmitters to operate in the so-called "white spaces" of the TV spectrum. These are channels not allocated to the community in which unlicensed transmitters will be permitted to operate. In many cases, these white-space channels are adjacent to channels in use in the given community.

MSTV and others have expressed their concern that such unlicensed transmitters might interfere with the reception of broadcast TV signals. This sounds to me like a digital citizens' band—DCB—within Channels 5-51.

WHOSE OX IS GORED

At least one paper has been published which supports the FCC view that such interference will not be significant, but then whose ox is being gored is the question.

The field strength at 1 mile from the antenna with an effective radiated power of 1,000 watts is 102.8 dB above 1 microvolt per meter. For the 1 watt ERP limit of unlicensed transmission, the field strength at 1 mile = 72.8 dBμV/m.

The power intercepted by a resonant dipole aimed towards the signal source can be determined from the field strength by means of the dipole factor, which at the center of the UHF band is -130.8. The maximum power available at a resonant dipole antenna from one unlicensed transmitter at 1 mile is 72.8 - 130.8 = -58 dBm. This would not generate third-order intermodulation or cross modulation in the front-end of DTV receivers.

Those are the mechanisms by which adjacent channel interference to DTV is caused, not poor IF selectivity, as was the case when the analog TV system was developed circa 1940.

At one-half mile, the received power will increase by 6 dB to -52 dBm; at one-quarter mile it will increase to -46 dBm; and at one-eighth mile, to -40 dBm. One DCB transmitter will not interfere with reception even on nearby DTV receivers.

Please note that I am assuming line-of-sight transmission. There is no reason why rooftop directional antennas may not be used for DCB, is there?

MULTIPLE RECEIVE SITES

But we are talking about one transmitter into one receiver. DCB is expected to be a very popular new wireless service. At four to six residences per acre in a suburban area, there may be 3,000 homes in a square mile, many of which will have these DCB transmitters. None of these would be more than a mile from a DTV receiver in this little cluster of homes. Now this is a very different matter.

The total of say, 2,000 transmitters = 2 kilowatts ERP loose in the neighborhood! Interference may extend outside of this particular 1-square-mile neighborhood as the field strength decreases rather slowly with increasing distances.

Will these all be operating at the same time? Yes (they might) and/not no, not usually.

Will these transmitters be required to observe strict sideband splatter limits into adjacent (non-white) channels?

Will some of these DCB transmitters be moved to another community and no longer be in a white channel?

Will some operators add a power amplifier, which is available on the market today boosting power 10 - 20 dB?

Now for the billion dollar question:

What if intermittent and harmful interference at the site of a CATV headend due to DCB causes the CATV operator to discontinue carriage of some over-the-air broadcast signals?

And finally, who is going to police this new DCB wireless band?

It would be extremely difficult to organize a field test of this kind of interference, as it would involve a large number of these unlicensed DCB transmitters. However it should be possible to create a model of the situation and to analyze the noise at the receiving antenna from a multitude of 1 watt transmitters evenly distributed over several square miles around the receive site. If this has been done, this author is unaware of such calculations and would like to know of it.

My initial calculations show that the noise power in a white channel will vary erratically from nil to -12.5 dBm, which I believe may overload receivers. Details to follow.

Stay Tuned

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

COUNT ON IT

André V. Mendes

Broadast IT: the Novelty Is Going, Going, Gone...

Ever since I started reading them, technology related "expert" predictions have proven to be, at best, a thoroughly mixed bag of outcomes.

Following the bell distribution patterns that you find in most statistical analysis, we often find a small number of stunningly accurate statements such as the initial Gordon Moore observation that originated the often misquoted "Moore's law," or... Bob Metcalfe's statement regarding the relation between the number of nodes in a network and its relative value.

An equally small number of enormously embarrassing, and sometimes immensely destructive "air balls" like Bill Gate's observation that no one would ever need more than 64 K in their PC, or Ken Olsen's certainty that there was no future in microcomputers.

HERE GOES...

But in the end, these statistical "outliers" are easily overwhelmed by a large majority of middle-of-the-road predictions whose partial accuracy is either derived from their initial hedging or from a painful stating of the obvious.

So it is with some trepidation that I will make the following predictions:

By the 2007 NAB and IBC shows, attending television professionals will no longer be bombarded by every broadcasting vendor claiming they have the ultimate solution for integrating information technology into their broadcast facilities and infrastructures, and;

Any broadcast vendors that are still making such claims by then will be proven to be hopelessly behind the times and will, shortly thereafter, disappear from the marketplace, and finally;

Information technology will "disappear" from your consciousness as a novelty, change or evolution that needs to be integrated into your plants.

At first, these predictions might seem strange, especially when you consider their source, but if you combine the progress that has taken place over the last four years, and the continued exponential and explosive growing influence of IT technologies in all things broadcast, it all starts to fall into place.

You might recall that in my TV Technology column from June 23, 2004, I wrote the following statement:

"A new technology appears, revolutionizes its particular area, becomes a 'de facto' standard and promptly disappears into the background while being universally disseminated."

Such is the case with IT in broadcasting. What was a novelty just three years ago is now standard. What, as recently as two years ago was innovation, is now second nature, and what was state-of-the-art last year is now part of your daily routine.

It was just recently that I realized the enormous breadth of this phenomenon. As we discussed the internal requirements and strategies to get the distribution rate version of our programs to the three locations where they are needed (our main ACE system, our ACE test system and our ACE system at a disaster recovery facility), something astonishing took place.

The same operations and broadcast engineering personnel that a few months back were struggling with understanding the vicissitudes of moving files to and from video servers and archives were now comfortably discussing the relative advantages of using hot folder functionality versus the issuance of XML commands from one workflow application (ScheduAll), via an enterprise messaging broker (Microsoft BizTalk), directly into separate archives (Masstech) in three cities.

What were once novelties, innovations and state-of-art technologies had quickly become just another set of workplace tools, arrows in one's quiver with which to tackle the challenges of optimizing one's operational workflow.

I suspect that the same process of introduction, familiarization and, eventually, complete integration, is rolling out throughout most broadcast facilities around the world.

What were once novelties, innovations and state-of-art technologies had quickly become just another set of workplace tools...

VENDOR COEXISTENCE

This transformation process is, in turn, being facilitated and absorbed by the more advanced broadcast vendors. In response to the needs of their client's new hybrid environments, and to ensure their long-term survival, they have had to adapt to new requirements for interoperability, manageability and reliability.

As time goes on, this cross-pollination of technologies continues to drive evolution, and eventually becomes an integral part of the overall environment.

It is then, when you no longer have to remind different vendors that they need to coexist within the same ecosystem and we no longer think of broadcast engineering and IT as separate disciplines, that IT "disappears" from our consciousness.

So when you head to Las Vegas this year, look for the beginning of the end of IT as a marketing theme and start looking for vendors who exhibit a thorough understanding of the need to make IT disappear. That is the key to the complete integration needed in a media world with exploding content distribution channels and methodologies.

Count on IT.

André V. Mendes is the Chief Technology Integration Officer for PBS. He can be reached via ***TV Technology****.*

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INSIDE BROADBAND

Will Workman

Who's in Control? Hint: You Aren't

"In acquiring new productive forces, men change their mode of production, and in changing their mode of production, they change their way of living—they change all their social relations"—Karl Marx

In my epic struggle towards a Ph.D. in mass communications, one of the more intriguing subjects I've had the opportunity to study has been the history of technology.

And so it's been my unspeakable pleasure to make the acquaintance of one of those highfalutin' academia concepts: technological determinism. In opposition to their social determinist foes (more on them later, but most human readers would say they're the good guys), technological determinists (the bad guys) argue from two basic premises. First, that technology is autonomous, i.e., it develops and operates outside human control; and second, that it actually shapes society, and not vice versa.

TECHNO DRIFT

So even though the ape in "2001: A Space Odyssey" shaped a tool (actually, it just picked it up) for bashing in its enemies' skulls. The tool itself that reshaped the ape's social relations.

There are more claims technological determinists make, many of which we can find evidence for in technology's accelerating pace of development and deployment.

"Technological drift," for example, is the idea that the most significant force of social change is the accumulated unintended consequences of technology. (Just think of how your cell phone has come to dominate your existence, and you might find yourself nodding.)

Charting the course of broadband, it's hard to take a social determinist stance. We certainly want the higher speeds and all the glowing goodies, but with them comes a slew of content and tools that reshape our lives. Trying to figure out how to control all this (how to regain human "agency," as the profs like to say) is difficult for any individual.

IN THE PUBLIC INTEREST

What are our allies in this struggle? Why, our institutions, of course. Our political, legal and economic systems, which benefit from all this technology, are potentially powerful enough to counter its most harmful social effects. And they're supposed to be acting in our best interests, shaping the technology so it serves us.

In casting a critical eye on regulatory and corporate forces that shape broadband, can we honestly say we're being well served? The first group has moved further and further down the deregulatory path, with its luminaries arguing that the less government interference the better. Just keep the playing field level and the market will work miracles.

Over the past six months, Congress has been cranking out bills that would update the 1996 Telecommunications Act to establish one set of rules for all broadband providers. Backing this trend, the Supreme Court in June upheld an FCC attempt to redefine cable as an "information service" rather than a "telecommunications service," meaning cable operators will not have to share their lines with competing ISPs. The FCC followed this decision by classifying DSL similarly.

Semantics aside, the message is clear—if you built it, you own it. Or if we want to phrase it in terms of this argument—if you build it, you get to control it. So what are the two premiere broadband providers doing with all this control?

CHARGING MORE

First, they're charging more. January saw cable rate increases almost across the board, up to six percent for some operators. They mostly blame license fee increases from programmers (ESPN is the primary culprit).

Second, they're seeking ways to invest in new technologies through alliances with media conglomerates. Cable giants Comcast, Time Warner and Cox have inked a joint venture with Sprint Nextel to include wireless in their service offerings, making a "quadruple play" of IP telephony, wireless, video and high-speed data to compete with phone company packages.

Read between the lines and the

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Compression

CONTINUED FROM PAGE 22

ain't got fine vertical detail or saturated colors, neither will the color subcarrier. Moral of the story—compression problems are usually related to program source material.

So now I'll talk about bit-rate reduction, also known as digital information compression. Not counting Internet streaming and downloading, DV and MPEG-2 are in widest use today; the proprietary systems in Digital Betacam, HD D-5, and HDCAM are pretty significant in TV technology, and H.264, JPEG2000, and VC-1 are coming on strong.

BETTER THAN PERFECT?

"So, Mario, which one is best?"

I figured someone would ask me that. The only honest answer is, "No one knows."

Look, an uncompressed digital signal could be considered to have a compression ratio of 1:1. Compressed signals will have higher ratios. But for most program material, there will be a compression ratio or data rate where the system is either lossless or at least perceptually lossless.

If it's operating at a lossless ratio, it's no different from uncompressed. If it's no different from uncompressed, it's perfect. If it's perfect, how can anything be better? Moral of the story—at high-enough data rates (or low enough compression ratios), all compression systems are perfect.

"But, Mario, what about higher ratios or lower rates?"

I figured someone would ask me that, too. This time the only honest answer is, "It depends."

It depends on what you want. At 1 Mbps, no compression system I've ever heard of is going to deliver flawless HD. Maybe one will deliver blocky pictures and another one soft pictures. Which one do you like better?

Maybe one seems to need a higher data rate but offers award-winning multigeneration performance, and another seems to need a lower data rate but falls apart after a few generations. Which one of those meets your needs better?

One might have a very nice failure mode. One might offer multiresolution decoding from a single bitstream. One might offer cheaper decoders, another cheaper encoders.

COMPRESSION BUFFET

Maybe one ain't best at any of those things, but draws the least power. That could be a big plus in a camcorder.

Long-GOP encoding improves compression efficiency but can make compressed-domain editing a pain. You pay your money, and you make your choice.

Think MPEG-2 is dying and we'll have a single compression standard? How touching.

Mario Orazio is the pseudonym of a well-known television engineer who wishes to remain anonymous. E-mail him at Mario_Orazio @imaspub.com.

Control

CONTINUED FROM PAGE 32

deal includes mobile video services, a potentially massive revenue stream. (After all, doesn't your cell phone or iPod now have a video screen?)

The same content providers that are forcing operators to jack up rates are also looking at broadband as a path to additional revenues.

Disney's ESPN programming franchise rolled out its broadband content service ESPN360 last year, and it now claims 7.5 million broadband subscribers, while Disney Connection counts 11 million households receiving its broadband children's fare.

IF NOT YOU FOR YOU...

All this new stuff may sound glittery and grand, but it's what these companies are not doing that's so irksome—they're definitely *not* using the new technology they control to pass greater control on to customers.

With a full IP network, a multichannel video provider has the ability to selectively push programs or channels, or bundles of channels, to customers who request them. This means there's really no excuse for them not to give customers free rein.

The FCC seems to be moving in a social determinist direction on this. It recently issued a report saying that a la carte pricing will lead to lower cable bills, not higher ones as the cable industry claims (though this industry claim is not supported by Cablevision Chairman Charles Dolan, who has argued for more than a decade in favor of a la carte).

FCC Chairman Kevin Martin has even taken the lead in arguing a la carte's case, saying the agency increasingly has been swamped with indecency complaints from parents lacking control over channels they don't want—pushing a powerful political button.

Cable and satellite providers have one valid argument—they don't have an a la carte option themselves; if they want to offer ESPN, Disney will force them to take ESPN2, ESPNews, Disney Channel, etc.

But that's all negotiable. If content providers and gatekeepers want to exploit broadband's vast potential, they need to do so with a minimal level of social responsibility.

At least let us decide what's good for us.

Will Workman is a former editor of telco industry publications Cable World and MediaView. He is now working on his Ph.D. in mass communications. He can be reached care of TV Technology.

We certainly want the higher speeds and all the glowing goodies, but with them comes a slew of content and tools that reshape our lives.

CAMERA

Canon XL H1 HDV Camcorder

by Carl Mrozek

For the past two years, the word on the street was that Canon, a founding member of the HDV consortium, had an HDV pro camcorder in the works. Two NABs came and went with no sign. The silence ended last fall, with press releases announcing the XL H1 HDV camcorder. This makes Canon the third member of the consortium to develop a unit for professionals. Not only is the XL H1 out of the bag, but it's also in inventory. It does come with a price tag considerably higher than its competition, and pros may raise questions—what does it have and what can it do that makes it worth an extra few grand?

The Canon XL H1 camcorder is the latest entry in HDV models.

FEATURES

For starters, the XL H1 has three 16:9 CCDs, with 1440 x 1080 pixel resolution, the same as the CineAlta F900. It is the only HDV camcorder in its class to use 4:2:2 sampling. Like the CineAlta, it records 1080 HD at 60i, 24p and 30p. With additional software, it can also record 50i and 25p.

Comparing the XL H1 to the F900 CineAlta may seem a stretch, given the disparity in prices. However, video from less costly HDV camcorders has been intercut with CineAlta footage for HD broadcasts. Moreover, the XL H1 has one key asset that makes this comparison even more apt—the ability to output uncompressed HD video.

In anticipation of new applications beyond HDV acquisition, Canon equipped the H1 with a feature set called the "jackpack," that allows the H1 to function as a standalone camera, a studio camera or as a production camera in multicam applications. It makes the H1 format-agnostic, allowing recording of multiple SD and HD formats. Many parameters are adjustable, including gamma, knee and color matrix. Several cine presets are included for the elusive "film look."

Adjustments can be saved in camera memory and on standard interchangeable data cards. Stored presets may be shared in a multicamera production

The XL H1 is cinema friendly in a number of ways besides the "cine-look" settings. It has switchable frame rates and aspect ratios. Aperture settings can be set manually, as can audio levels. Auto-exposure levels may be adjusted. Gain levels and shutter speed are easily set. Video filters can be changed and the white balance reset manually. Additional menu-driven functions are controllable by assigning them to two custom keys. Color bars and fader rate their own buttons. Overall, the XL H1 is designed for convenient operation and fast access to key functions, without going through setup menus.

FAST FACTS

Application
Professional grade HDV shooting

Key Features
Multiple frame rates, direct HD SDI output and cine tools

Price
$8,999

Contact
Canon USA Inc.
800-652-2666
www.canon.com

OPTICS

Electronic focusing tools would be of little use without a decent HD lens. Given its experience as a lens maker, Canon has endowed the XL H1 with a nice piece of glass having an impressive 20x zoom ratio. The small weight of the lens is also impressive; it doesn't upset camcorder balance. It accommodates 72 mm screw-on optical filters and the camera has two built-in ND filters.

In handheld mode, the Canon Optical Image Stabilization system compensates for camera shake, greatly improving performance.

Another feature of the H1 is lens interchangeability, however, currently there are no other HD lenses available. Canon does list several catalog options for the H1, including a 1.6x extender and an adapter for attaching Canon 35 mm EF still lenses, especially helpful in telephoto applications. A simple 135 mm lens effectively becomes a 1,188 mm telescopic lens on the H1. Moreover, only the optically superior center of the lens is utilized.

Finding, framing and exposure are aided with a "focus assist" button. For purists there is a black and white display mode for the color viewfinder. Zebra bars are adjustable from 70-100 IRE, with presets in the middle.

IN USE

The XL H1 has a similar layout to XL 1 or XL 2. I've used them enough to recognize the similarities and the

CANON, PAGE 35

Canon

CONTINUED FROM PAGE 34

new additions such as the HDV/DV option, the frame rate switch and the digital "jackpack." Firing up and using the H1 without reading the manual in detail was not a major hurdle.

In my initial outings, I mostly used factory presets, which are geared for a classic, crisp video look. I was pleasantly surprised when viewing the results. After shooting a fairly drab winter landscape, it was interesting to see how varied even the browns seemed, with shades ranging from auburn to sepia. There were rich overtones in the bare trees, contrasting with subtle tonalities in lichens on their trunks. The landscape came through warm and colorful. Video shot in backlit scenes at sunset was quite acceptable with and without Canon's "backlit" feature.

I was even happier with the color rendition after selecting the "Cine 1" gamma curve. I used middle settings for horizontal detail, frequency and noise reduction. Overall, these settings are geared for a "film look." I used this to my advantage at the Niagara Ice Wine Festival, shooting without camera lights or a reflector. Lighting was soft and uniform, but yielded surprisingly rich color. I was able to capture the cornucopia of colorful clothing, wine bottles and wine in the dimly lit tent.

I shot video in 24p, 30p and 60i. The only inconvenience was a few seconds of delay needed for camera reset between modes. Again, results exceeded expectations. The eye saw a dimly lit tent full of people. The camera revealed a rainbow of subtle colors, from pastels to saturated shades of red and gold and browns and blacks. Flesh tones were especially impressive, considering that I paid little attention to adjusting for them during shooting. Everything was shot in existing light, yet flesh tones were remarkably rich.

I tested Canon's 1.6x extender, but got a warning in the viewfinder that I was using a lens not compatible with HD. However, I ignored it and shot anyway. The level of detail looked HD on an external monitor. Moreover, there was no noticeable color shift. I did notice a loss of color and image softening just after sunset, as might be expected with the loss of light. The autofocus feature was strained, but I was able to focus sharply using manual focus.

I didn't always monitor audio levels, but ended up with a very usable track. I used the H1's short stereo shotgun mic and mainly relied on the auto level function. An audio level control at the front of the camera would be helpful.

SUMMARY

Uncompressed HD from the camera's SDI output is perhaps the H1's "killer app." I viewed this on an external HD monitor and it looked pretty impressive. This feature could be the tilting point when deciding to pay a bit more for this camcorder. Even without it, the Canon is jammed with more features and options accessible via hardware controls than in any other comparable camcorder.

There is no question that the XL H1 can deliver some really rich HD video. While it may not precisely match video from HD cameras in the $100,000 bracket, it can yield video that intercuts nicely. This should easily be the case when using the uncompressed HD output. Overall, the XL H1 is a serious foray into HD origination at a price that may convince many pros working in ENG and EFP that now is the time to buy into HD.

Carl Mrozek operates Eagle Eye Media, based in Buffalo, N.Y., which specializes in wildlife and outdoor subjects. His work regularly appears on the Discovery Channel, The Weather Channel, CBS, PBS and other networks. Contact him at eagleye@localnet.net.

PRODUCTS & SERVICES SHOWCASE

PRODUCTS & SERVICES SHOWCASE

CONTENT LOGGING

Imagine Products HD Log

by Michael Hanish

What place is there in your workflow for specialized video logging software, when every NLE has such a feature already? The answer is that there is a very useful and necessary place, as a separate logging application not only provides logging, sorting, and retrieval features not found in most (if any) NLE software, but also takes the burden of logging away from the editing system. One of the most flexible systems for tape and file logging is HD Log from Imagine Products for Macintosh OSX and the parallel TEPX applications for PC. This review will be focused on the Macintosh product line, though the PC line is feature-consistent.

FEATURES

HD Log comes in several flavors, Bronze, Silver and Gold, with features increasing with price. We'll be looking primarily at the feature set of the Silver edition, with a mention of what it has beyond the basic Bronze, and what the Gold version adds. Operating requirements are pretty modest: OS X 10.2.3 or higher running on a PowerMac G3 300 MHz. or better, 128 MB of RAM, 40 MB free hard drive space, built in FireWire and USB and QuickTime 5.0 or better. From the specs, you can see that HD Log will run on a very modest desktop or laptop. USB is used for the copy protection dongle and serial deck control (via Keyspan USB to serial adaptor or the like), and FireWire is used for video input, time code capture and optionally, DV deck control. The program can also make use of installed capture hardware for I/O.

Operating the application is quite simple. Using the interface's controller to move the tape, you simply mark in and out points for each clip you want to log, add identifying information (ranging from clip and reel names to extensive comments) and when done, hit Command E to add the clip to the current log and begin a new clip entry. When the tape is logged to your satisfaction, and saved, you can export the log, or just the selected clips, as a bin or batch list to your NLE application. The clips appear there as offline and ready to be captured. Supported NLEs include Final Cut Pro, Media 100, Avid, Premiere, Accom Sphere, Edit*, Edit DV, Speed Razor and EDLs in Grass Valley, Sony 910 and 9100 and CMX 3400 and 3600 formats. Export formats are well customized and operate without

IMAGINE, PAGE 39

The HD Log user interface

FAST FACTS

Application
Professional video content logging applications

Key Features
Auto capture technology, creation of customized templates

Price
$299 (bronze); $499 (silver); $699 (gold)

Contact
Imagine Products
317-843-0706
www.imagineproducts.com

Imagine

CONTINUED FROM PAGE 38

a hitch, with the manual noting limitations as to which fields will be recognized.

HD Log allows you to make one or many customized templates for logging, based on your needs, style and the requirements of your destination NLE. At this point, it should be noted that HD Log doesn't actually capture video. It just pulls just time code and a time/date stamp (if logging via FireWire from a DV source) and a JPEG image for a poster frame, at a user-designated size. The poster frame makes it easy to further identify clips in a log, but it doesn't transfer into the NLE along with the batch list.

IN USE

It sounds simple, and in practice, it is. The slim, but complete manual is hardly necessary for operation. I used HD Log most recently on a borrowed laptop while my studio was in use by a client. I was easily able to review and log all the camera tapes I needed for the next day's edit, and then export the clip selections for each reel and e-mail them to myself (the average exported log is a text file of only a few kB in size).

I then took a more thorough look at the manual and discovered that I could use HD Log to create a clip log of a media file. (This is a feature available in the Silver and Gold editions of the program.) Media file, in this case, means any QuickTime file, which can be opened and scanned as if it were a tape. I gratefully used this feature to log several reference exports from Media 100 that would eventually be heading for DVD compression. I then used the log to make a very simple annotated storyboard of the edit to e-mail the client for approval of some changes.

There are still a few more features that bear reporting. One potential time saver is Auto Capture Technology (ACT), which is available in all versions of the program. ACT detects scene changes, based on a sensitivity setting that sets a threshold for changes in the visual content of the frames. It does this while scanning the tape and grabbing poster frames. In practice, a high setting (the default is 100 percent—the greatest sensitivity) yields many clips that can be selectively merged to make more appropriate and useful clips. This is a very powerful feature that requires a bit of tweaking and fiddling to be fully useful. Once you find the appropriate setting for the tape's contents, it is a wonderful time saver.

In addition, the Gold version of HD Log features integration with Imagine Products' Image Browse, a digital clip library, available separately. Using this feature allows you to build a database of all clips in all log files. This would be ideal for a facility with multiple editing stations sharing storage and/or footage for projects, such as a newsroom. It could also be invaluable for easily building an integrated stock footage database.

SUMMARY

There are two relatively small caveats to the functioning of this stable and excellent program: you must have a free system FireWire port available for DV logging and frame capture (hubs or daisy chain set-ups will not be recognized); it is not possible to change the on-screen font size or type face, which can make it a bit hard to read if your monitor is large and/or set to a high resolution. Neither of these is a deal breaker as far as program functionality is concerned, but they would be worth addressing, in my humble opinion.

HD Log is a valuable and very useful utility for editing and post shops of any size. Operation is very streamlined, due in part to the fact that most functions can be done by keystroke combinations. Consider taking the logging chores away from your edit station and give HD Log a test drive.

Michael Hanish runs Free Lunch, a video/audio/multimedia production house near Guilford, Vt. He may be contacted at mhanish@sover.net

SERIAL INTERFACE TOOL

DNF Controls Analyst

by Ken James

DNF Controls is well known for unique and interesting machine control offerings. Several broadcast equipment vendors have included in their price books many of the DNF offerings as their very own. Knowing the ins and outs of the issues associated with serial data transfer from years of experience building machine control interfaces most likely drove DNF to invent The Analyst, a tool that quickly locates and isolates most any RS-232/422 serial data interface problem.

Ethernet is not as ubiquitous as you might think. The tried and true simplicity and reliability of serial data communications is still alive and doing well. With Ethernet, when everything goes wrong, we fall back to good old RS232/RS-422 communications—a simple point-to-point connection. It's astounding how much serial data communication remains in use by broadcasters and other professional users.

In addition to many machine control applications, RS-422 port routers, computers and automation systems all desire a single point-to-point connection best served by the simple RS-422 interface. However, nothing, including serial communications, is totally free of unknowns. Start adding a few RS-232 to RS-422 port-powered converters, 9-pin to 25-pin cable adaptors, gender changers and long cable runs with ground loops between buildings and things get messy. Cleaning up this mess just got easier thanks to DNF.

FEATURES

I received the Analyst in a professionally packaged brown cardboard box. The first thing you notice is the weight of the small package—several pounds of well-constructed metal. No cheap plastic in this box.

Included with the Analyst was a small "wall wart" transformer that is required for operation, in addition to the product manual containing 30 pages of easy to read and understand information. The booklet proved to be useful, offering a few insights not found when simply pressing buttons. (Note: the table listing the operational modes differs in order from the manual, which can lead to a bit of confusion. MON and VTR modes were swapped.) No different than any other technically oriented person, I started pushing buttons and turning the knob and

FAST FACTS

Application
Testing and evaluation of RS-232 and RS-422 interfaces and cables

Key Features
Easy to use, intuitive design

Price
$1,325; logging option $500

Contact
DNF Controls
818-898-3380
www.sales@dnfcontrols.com

The Analyst from DNF Controls is an ideal tool for troubleshooting problems associated with serial data communications.

was easily able to figure out more than 90 percent of the operations without help from the manual. The Analyst's flat menu structure greatly simplified operation of the unit and proved to be quite intuitive.

It starts to become a neat toy as well as a time saving tool.

After powering up, what first hit me was the easy to read four-line by 40 character green-on-black LCD display. (Indicators on my older RS-232 analyzer consisted of two rows of LEDS.) Four 9-pin connectors located along the top back edge of The Analyst supply the serial data interfaces. The traditional 9-pin D type connector is holding its own, even with the difficulty and expense of having to custom build many of your own interface cables. Being limited to 9-pins, I had to locate my 25-pin to 9-pin adaptors for some RS-232 interfaces that I wanted to test.

IN USE

Operating the Analyst proved to be simple and straightforward. Most of the operational modes were easily figured out without resorting to the manual. In a previous life, when customers called in for help, my first question was "Did you read the manual?" Most of the time the answer is right there in black and white. One time that I did need to consult the

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DNF

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DNF manual was during the SEND mode testing of my many cables and adapters. I had connected a male 9-pin straight-through cable to the 232 out and 422 in port and the display went dark, much to my surprise. Checking my setup I found I had not set both IN and OUT modes under the Menu function to the RS-232 standard. The OUT mode was set to 232 and the IN mode to 422. The result was very strange indeed. The display went dark, which is probably not a good thing.

Here's a quick rundown of analyzer modes:

The SEND operational mode offers a quick and simple method of testing cables, connectors and signal paths. It proved to be nice for short cables and/or long cables before being installed in the walls, provided that you have access to both ends of the cables under test.

The RECV operational mode should be ideal for checking installed cabling. (Note: two Analyst units are required for this functionality. I was limited to a single Analyst and was not able to fully appreciate this function. If you are lucky enough to have two of the devices, the ID feature which is located in the MENU, displays the user assigned device name that confirms communications between the two Analyst units.)

The MON operational mode displays the data stream between the controlled and controller. I used a laptop PC running RS-232 HyperTerminal connected to a Grass Valley Kameleon frame and was able to view the data between the two devices in hexadecimal format. The communications baud rate needs to be matched in the Analyst configuration to properly display the data. This requires only a simple press of a button. Communication between the controlled and controller was not interrupted, but the data display was inhibited when the baud rate was set incorrectly. This function could prove invaluable with an automation system interface when two separate vendors are saying two different things to the end user. Ever been there?

The ADAPT operational mode tests port-powered and externally-powered RS-232 to RS-422 converters. The analyst offered me an opportunity to check through my dozens of assorted adaptors, gender changers, null modems, pin changers and converters. I found a few defective devices and this is sure to save me troubleshooting time in the future.

The VTR operational mode is just what the name implies—a machine controller with good status reporting. I used it with my DVC Pro machine. This is a function that would be expected from the people that excel in machine control offerings.

(My demonstration unit was not equipped with the data logging functionality. This is an enhanced feature of the monitor mode, allowing off-line PC storage of the data passing between the controlled and controller devices. After downloading a manual from the DNF web site, I understood that the ADAPT and VTR modes are not available when the data logging option is enabled.)

The MENU mode is used to set up and configure the Analyst. A user-keyed-in device identification provides proof of communication when using the RECV operational mode. Format selection is also included here—for both the IN and OUT format selection. There are two separate selections for 232 vs. 422. I figure flexibility is good; however, sometimes it leads to complexity. As reported earlier, I was trapped when setting only the OUT format to RS-232 and leaving the IN format at RS-

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EYE ON EQUIPMENT

Accessories Protect, Enhance Lenses

by Bob Kovacs

Now that the price of a good video camera is less than $10,000, a quality lens is often more expensive than the camera to which it is attached.

Yet as good as today's camera lenses are, they can't do everything when it comes to shaping your images. The wise videographer packs lens accessories that expand the capabilities of the glass in front of the camera.

The first lens accessory that should be considered by all shooters is a clear glass element that screws onto the end of the lens. Made from optically pure glass, this element protects the main lens against scratches and dust abrasion. When a quality camera lens costs $15,000 or more, screw-on protection for $200 sounds like a bargain.

FILTERS OR ELEMENTS

Many videographers opt to protect their camera lenses with skylight or ultraviolet filters instead of a glass element. These are slightly pink and filter out some of the blue in the shot, darkening the sky and reducing the effect of haze.

A different version of the same effect can be achieved with a polarizing filter, and it will also provide the same protection for your camera lens. When properly adjusted, a polarizing filter can make a hazy sky bluer and clarify shots over reflective water, among other uses. A polarizing filter costs more than a clear glass filter but then it does more.

MANUAL MEMORY

With a polarizing filter, you must rotate it to the correct setting to darken the sky or reduce glare from water and window glass. With an internally focused television lens, rotate the polarizing filter to its optimum position, then mark it with Wite-Out or a spot of paint. This will help you find the best setting at a glance. If the front element of your lens rotates as you focus, you may be able to mark your lens hood with the spot that indicates maximum polarization effect.

Many other filters are available for a wide range of effects, from star filters and graduated glass to fog and diffusion filters. Diffusion filters are particularly good for aging talent, as the filters reduce wrinkles while maintaining apparent sharpness.

For serious production, you may want to combine filters for effects that are much easier to do during the shoot than in post production. This could include things like combining a graduated filter for a bluer sky with a UV filter to reduce haze and a diffusion filter to smooth out wrinkles.

For the ability to quickly combine multiple filters, you'll need a matte box that attaches to the end of the lens and a kit of filters to give you the right effects. Of course, all these filters will greatly reduce the light entering the camera, so keep that in mind when you're planning a shoot.

Filters can solve many shooting problems but sometimes you need a wider angle than your camera's lens can provide. For these you can get a wide-angle adapter that screws onto the end of the lens.

These adapters come in a variety of ranges and capabilities. If your camera lens has a focal length of 8 mm at its widest setting, a 0.8x wide-angle adapter gives you the equivalent of 6.4 mm. A wide-angle adapter of 0.5x gives you the equivalent of a 4 mm focal length and a quite noticeable fisheye effect.

Some wide-angle adapters allow you to use your lens' zoom through its entire range, while other wide-angle-adapters may cause vignetting at the extremes. If you need a wide-angle adapter that is completely compatible with your zoom, look for one that has "zoom-through" capability.

At the telephoto end of the lens, adapters are also available to increase your total telephoto range. Some adapters attach between the lens and the camera, while others screw onto the end of the lens just like a filter.

Developed for the evolving professional ENG lens market, the Manfrotto 524 zoom remote integrates with the video head pan bar to ensure a sturdy lens attachment.

A telephoto adapter also may cause vignetting in certain zoom ranges and some are more compatible than others with a camera lens' built in 2x telephoto extender. Make sure the telephoto adapter you want will work with your lens the way you intend it to work.

However, sometimes a telephoto adapter is just the thing to get the long-range shot that you need. With a 20x lens that has a focal length of 7.8 to 156 mm, switching in the lens' telephoto extender makes it a 15.6 to 312 mm lens. That's a pretty good telephoto range, but screwing on a 1.6x adapter extends that reach to 499.2 mm. I hope you have a very steady tripod!

Whether you need a filter or wide-angle/telephoto adapter, a range of products is available for any professional video lens, including the non-removable lenses on lower-end cameras.

SHAKE IT UP

Working at extreme telephoto is always tough, often due to the unsteadiness of the human hand. One way to compensate for this is to use a

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IN-DEPTH WITH HDV

What is HDV?

HDV is a new video recording format that enables **High Definition** video to be recorded onto MiniDV tapes. This revolutionary technology provides almost **6 times the picture information** of standard definition, while keeping the cameras **small & affordable**. Just like standard DV, the HDV signal can be transferred to your computer editing system via Firewire. This keeps the HDV edit workflow easy, familiar and manageable.

B&H: Your HDV Source

B&H offers every solution for your HDV video production: Cameras, Decks and Editing Systems. Our knowledgeable sales staff is on hand to help you make the best possible choice. For **Broadcast, Corporate, Event Videography** and **Digital Filmmaking**, B&H has the products needed to take you through editing, mastering and delivery.

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Lenses

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One way to compensate for this is to use a remote control device for zoom and focus, which is exactly how those massive sports lenses have been doing it for years.

If you're going out to shoot a fire from the far end of the block or capture images of wildlife from 200 yards, you will not only need a lot of telephoto on your lens, you're going to need a way to keep the image stable. Although there have been many improvements in optical stabilization in lenses, nothing beats the stability of a good tripod and a camera that's not touched.

This is where remote controls come in for zoom and focus. Once you have tweaked the pointing of the camera, you can zoom in, get your focus and pull back out to your shot. With your hands off the camera, you then can zoom in slowly to add interest to the shot—without your unsteady hands making it look like it's 7.0 on the Richter Scale.

Older cameras frequently had mechanical remote controls for zoom and focus, but most modern lenses use servomotors to get precise, smooth operation. Since these motors have electronic controls, extending the length of the cables to any convenient length is usually possible.

No professional videographer goes into the field without at least some protection—for the lens, anyway. At a minimum, you should have a filter or clear glass element to protect your valuable lens.

What you do after that depends on your creativity and wallet. Lots of things can be done today in post production but nothing beats having the shot done right in the first place. Your camera's lens is one of your most important tools—it's smart to protect and enhance it whenever possible.

Bob Kovacs is a broadcast engineer and freelance writer. He can be reached at pvreditor@yahoo.com.

EQUIPMENT EXCHANGE

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AUDIO PRODUCTION

Want to Sell

Bittree & ADC Audio and Video Patch Panels from $300; Stantron 45RU racks from $450; Mackie 1604 VLZ Pro, new, too low to quote; Mackie 1604 VLZ used, $625; Tascam M-2600 MK II 16-Channel Mixer, $1,750; Sony MXP-390 Mixer, $1,000; Digidesign 888, $650; Sony PCM7040 DAT, $3,990; Panasonic SV-3700 DAT, $200; Panasonic SV-3800 DAT, $300; Alesis M1 Active Speakers, $295/pair; Wohler Amp 1-A, $325; Wohler AMP-1A-VTR, $550; Wohler AMP-1AP, $325; Wohler Amp-1APF, $325; Wohler AMP-1APS, $325; Wohler MSH-8AL Audio Level Meter, $700; Wohler VMQ-4, $500; Audio Monitor Neumann U87 Ai Studio Microphone, $1495; AKG C 414 B ULS Microphone, $950. 818-788-4700 or 212-564-9933 or www.tvprogear.com.

CAMERAS

Want to Sell

Sony DXC-D30 w/PVV-3 docking camcorder, $9500; (4) Panasonic AW-E750 2/3" 3-CCD convertible camera w/lens, $5950/ea; Sony DXC930 color video camera, $2995. 818-788-4700 or 212-564-9933 or www.tvprogear.com.

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

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SIGNAL PROCESSING

Want to Sell

Leitch FR-684 Dual PS 2RU Frame, $295; Leitch FR-884 Dual PS 2RU Frame, $295: Leitch Mix-7001 Multi-function digital frame, $400; Leitch 6804 Mounting Frame w/Pwr sply, $250; Leitch SPG-2602N Pulse Gen, $1,250; Grass Valley Series 8900 Frames w/redundant pwr sply, $600; GVG 8501 Video DA's, $125; GVG 8551 Audio DA's, $100; Sony BVX-D10/BVR-11, $3,990; Leitch DPS-290 Component TBC, $1,200. 818-788-4700 or 212-564-9933 or www.tvprogear.com.

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Want to Sell

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Want to Sell

Videotek RS-12DVA SDI Routing Switcher, $600; Miranda Digipath 16x16 SDI Router (w/remote panel), $3,500; Leitch 4x4 MB Routers, $175; GVG Ten X, $600; Kramer 5X4 A/V Switchers, new, $475. 818-788-4700 or 212-564-9933 or www.tvprogear.com.

TEST EQUIPMENT

Want to Sell

Tektronix WFM601M SDI Waveform, $5,500; Tektronix WFM601i SDI Waveform, $5000; Tektronix WFM601 SDI Waveform, $3,990: Tektronix 1750 wfm/vec, $2250; Tektronix 1755A wfm/vec, $2550; Tektronix 1760 NTSC/PAL wfm/vec, $2950; Tektronix 1765 NTSC/Pal wfm/vec, $3450; Tektronix 1730D SDI vector, $2000; Tektronix 764 Digital Audio Monitor, $1500; Tektronix 760a Audio Monitor, $1000. 818-788-4700 or 212-564-9933or www.tvprogear.com.

TEST AND MEASUREMENT

TRANSMITTERS/EXCITERS

Want to Sell

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

1 kW Larcan, solid state, like new cond, DTV capable, redundant power supply, spare power amp board, offline soon, BO. 856-767-8884 x.204.

Comark CTT-U-200 CXIC 4P transmitter system, channel 16, ready to go on the air, xmtr installed in new facility in 1999, operated on dummy load for 60 days, on air for testing 15 minutes, this system has extremely low hours & is essentially like new, will sell part or all, one cabinet incomplete, please call or write for details, Rod Sprinkle, WPCB-TV, 412-824-3930 or rsprinkle@ctvn.org.

TRUCKS

Want to Sell

1988 Ford Cargo 8000, Shook 26' mobile production truck, 137,000 miles, (5) Ikegami HL-43s, GVG 200-2N, Leitch Terminal Gear, more, interior upgraded in 2001, great shape, fully operational, $125,000, pics available. www.videoportc.com.

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Want to Sell

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CONSULTANTS

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Director of Broadcast Engineering for Boston based eastern TV Production/ Transmission Company. Responsibilities include developing, designing, implementing and maintaining systems and equipment for broadcast facilities. Actively seek out new technical solutions to improve, expand business and improve efficiency. Provide guidance, training and management of the department staff. Based in Boston the position requires periodic travel to facilities in Philadelphia, Baltimore and remote production locations. 7+ years of experience in Engineering Management in a broadcast or production environment, with full range of skills in all broadcast technologies including AutoCAD and IT. Must have effective verbal and written communica-tions skills. Please e-mail resume to HR@videolink.tv .

ACTION-GRAM

Equipment Listings

TV Technology's Equipment Exchange provides a FREE listing service for TV stations and studios only.
All other end users will be charged. Simply send your listings to us and please indicate in which category you would like your listing to appear. Mail your listings to the address below. Thank you.

Please print and include all information:

Contact Name _____

Title _____

Company/Station _____

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Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Equipment Exchange on a **paid** basis. Line ad listings & display advertising are available on a per word or per inch basis.

Are you currently a subscriber to TV Technology?
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Please check only one entry for each category:

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- ❑ A. TV Station (VHF/UHF)
- ❑ B. Cable TV
- ❑ R. Broadcast Consultant
- ❑ L. Corporate TV facility
- ❑ N. Government TV facility
- ❑ W. Systems Integration
- ❑ D. Production/Post-prod studio
- ❑ G. Network/Group Owner
- ❑ S. Mfg. dist. or dealer
- ❑ M. Medical TV facility
- ❑ P. Educational TV facility
- ❑ K. Other _____

II. Job Function

- ❑ A. Corporate mgt/owner
- ❑ B. Engineering mgt
- ❑ C. Engineering staff
- ❑ D. Prod/Oper mgt or staff
- ❑ E. News mgt or staff
- ❑ G. Training
- ❑ H. IT mgt or staff
- ❑ F. Other

III. Purchasing Authority (check one only)

❑ A. Authorize ❑ B. Evaluate ❑ C. None

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
_____
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Price: _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
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Price: _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
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*Listings close every other Friday for the following month's issue. All listings are run for one issue only.

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DNF

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422 in the SEND mode.

After playing with the Analyst for several days, I can suggest only a few possible enhancements. The first would be a rechargeable battery power supply. This would greatly increase the portability of the Analyst, as well as its usability in field applications. Battery operation has proved to be a lifesaver many times when Murphy's Law struck and there were no easily accessed AC power outlets or extension cords handy. (Editors note: Since this review was prepared, DNF has announced the availability of a battery option for the Analyst.) Another would be a clearer fault indication for the condition I experienced when mismatching IN and OUT port settings. Maybe a direct indication that both are not set to the same standard would be a good idea. The other would be a single supplier for a cable/adaptor kit.

It has taken me several years to obtain the needed cables, adaptors, converters and gender benders to meet most of the contingencies associated with serial data interfacing. The convenience associated with purchasing from a single vendor would many times outweigh any extra cost and make life simple. Items from my toolbox that I found helpful included:

- Adaptors and couplers: A port powered RS-232 to RS-422 converter, as most computers speak only RS-232.
- An assortment of 25-pin to 9-pin adaptors: The Analyst has only 9-pin connections, which is by far the most common of doing things. However there is still a need for 25-pin interfaces.
- An assortment of 9-pin and 25-pin gender changers: This is dictated by Murphy's Law.
- RJ45 to 9 pin adaptors: The ease of installation of the RJ45 connector and the low price of the CAT-5 cable makes this a must.
- Cables: Last but not least is an assortment of 9-pin to 9-pin and 25-pin to 25-pin cables with different ends. Also needed is a CAT-5 cable with RJ45 to RJ45 four pair patch cord.

The DNF Analyst in use in the author's lab

SUMMARY

The overall robustness of the device impressed me from the beginning. The display screen was a pleasure to look at with its easy-to-read black characters on a green background. I was a bit disappointed in not having the data logging feature activated on my demonstration unit. Had it been there, I might have played with the unit for a few more days. Tools or toys, once you start playing with this device, the line blurs. It starts to become a neat toy as well as a time-saving tool. The Analyst proved itself in all operational modes and was fun to play with. Anyone involved with equipment installation, general maintenance and even design of equipment with serial interfaces would benefit from the efficiency offered by the Analyst.

Ken James is a video engineer with over 30 years experience. He spent most of his career in Grass Valley, Calif. before retiring to Montana. He remains active in video technology. He may be contacted at kenjames@blackfoot.net.

TV TECH BUSINESS

EchoStar, Liberty Invest in Sling Media

SAN MATEO, CALIF.

Sling Media Inc., creator of the Slingbox, has secured $46.6 million in financing from investors including Goldman, Sachs & Co., Liberty Media Corp., and Echostar Communications.

"We are delighted to receive financial backing from some of the true pioneers in the industry. Over the past several decades, these leaders have played an integral role in building and shaping the media world we live in today," said Blake Krikorian, co-founder and CEO of Sling Media. "It is refreshing to work with such established players who continue to push for new ways to delight and empower the consumer. In summary, we are stoked."

Launched last summer, Slingbox uses technology that streams live TV from any cable or satellite set top box or DVR to broadband-enabled devices.

Additional participants in the financing include Allen & Co., Doll Capital Management Mobius Venture Capital, The Hearst Corp. and other undisclosed investors.

Emmis Sells Four More TV Stations

INDIANAPOLIS

Emmis Communications Corp. sold four television stations to Montecito Broadcast Group of Montecito, Calif., an affiliate of the Blackstone Group, for $259 million.

The stations include CBS affiliate KOIN-TV Portland, Ore., Fox affiliate KHON-TV in Honolulu and NBC affiliates KSNW-TV in Wichita, Kan. and KSNT-TV in Topeka, Kan.

The company said in a release the net proceeds are earmarked to pay off debt.

The Jan. 27 sale follows a May 2005 announcement in which Emmis said it intended to sell its 16 TV stations. To date, the media company has sold 13 of those 16 stations.

The remaining stations are CBS affiliate KGMB-TV in Honolulu, and WB affiliates WVUE-TV in New Orleans and WKCF-TV in Orlando, Fla.

Emmis also owns 25 radio stations in the United States as well as several regional magazines.

DTV Orders Boost Harris Revenue

MELBOURNE, FLA.

Harris Corp. had a 14 percent increase in revenue in the second quarter of fiscal year 2006 to $842 million. This was, in part, due to acquisition of Leitch Technology in October 2005 and Encoda Systems in November 2004.

Broadcast Communications revenue was $135.4 million in Q2 2006, as compared to $98.9 million the previous year. Excluding charges related to cost reductions and charges related to the acquisition of Leitch, the operating margin reached 11 percent.

Major orders during Q2 included DTV transmission equipment for Gray Communications and Entravision Communications; TV equipment for Radiocomunicatii in Romania; digital radio transmitters and exciters for Clear Channel Communications and digital software systems for Swisscom Broadcasting, BridgeNetworks in Australia and KUB Telekomunikasi in Malaysia.

Howard L. Lance, chairman, president and CEO of Harris said, "Demand is improving for digital products, systems, and software at our microwave and broadcast businesses, and cost-reduction actions are delivering increased margins."

He added that financial performance in the first half of the fiscal year exceeded expectations.

Terayon Targets Pure-Play Video

SANTA CLARA, CALIF.

Terayon announced that the company is restructuring to improve its financial picture and will be directing all efforts on growing the pure-play video business segment.

"Our decision to concentrate solely of digital-video applications enables us to laser-focus the company on a growing market for real-time network digital video processing and expand out applications and services," said Jerry Chase, Terayon CEO. "The move to customizing content the instant before viewing creates substantial opportunity for Terayon, particularly in the area of digital video advertising, as it builds our existing core competencies and market leadership."

Chase said that savings realized through the restructuring would be directed to digital video software development.

Radyne Appoints New President and COO

PHOENIX

Radyne Corp. has appointed Carl Myron Wagner as president and chief operating officer.

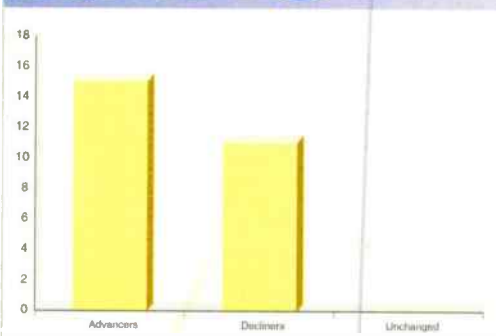
Wagner, 50, replaces Brian Duggan, who will assume new responsibilities as the president and general manager of the Tiernan HDTV business. Tiernan is a subsidiary of Radyne.

Wagner, who starts his new role Jan. 30, comes to the company from General Dynamics where he served as vice president and director of engineering for the Space and National Systems division.

"We are delighted that Myron is joining Radyne," said Bob Fitting, Radyne CEO. "His proven record of business leadership and successful technology development will reinforce our strong capabilities in creating, developing and manufacturing products that meet our customers' needs."

Fitting will retain the role of CEO until Dec. 31. Wagner is mentioned as a candidate for the position.

WIN-LOSE RATIO



TOP ADVANCERS BROADCAST STOCKS
(Jan. 20 - Feb. 3)

Acme	+6.84%
Lin TV	+4.42%

TOP DECLINERS BROADCAST STOCKS
(Jan. 20 - Feb. 3)

Nexstar	-7.68%
Sinclair	-7.18%

TOP ADVANCERS TV TECH STOCKS
(Jan. 20 - Feb. 3)

Harmonic	+21.62%
Scopus	+12.62%

TOP DECLINERS TV TECH STOCKS
(Jan. 20 - Feb. 3)

Avid	-10.26%
Tektronix	-3.05%

To have your company listed, contact Melissa Sullivan at msullivan@imaspub.com.

TV Tech STOCKS as of February 3

Company Name	52-Week Range	Jan. 20	Feb. 3	% Change
Avid	35.78 - 68.35	52.84	47.42	-10.26%
Belden	17.65 - 27.72	25.42	26.94	5.98%
Ciprico	3.70 - 5.98	5.64	5.74	1.77%
Harmonic	4.08 - 12.40	4.81	5.85	21.62%
Harris	27.25 - 47.87	45.50	46.76	2.77%
LSI Logic	5.01 - 10.75	8.62	9.08	5.34%
S-A	26.73 - 43.90	42.99	42.79	-0.47%
Scopus	5.80 - 7.51	6.18	6.96	12.62%
SeaChange	5.07 - 14.30	8.04	9.02	12.19%
Tektronix	20.97 - 31.47	29.87	28.96	-3.05%

Broadcast STOCKS as of February 3

Company Name	52-Week Range	Jan. 20	Feb. 3	% Change
Acme	3.30 - 6.24	3.51	3.75	6.84%
Belo	22.40 - 22.50	22.37	22.46	0.40%
Emmis	15.29 - 24.49	17.62	18.30	3.86%
Entravision	6.90 - 9.50	7.20	7.00	-2.78%
Fisher	41.43 - 52.60	42.39	42.64	0.59%
Gray	8.50 - 15.74	9.12	8.89	-2.52%
Hearst Argyle	23.15 - 26.34	23.75	23.83	0.34%
Nexstar	3.93 - 9.27	4.82	4.45	-7.68%
Lin TV	9.79 - 19.03	10.17	10.62	4.42%
Paxson	0.37 - 1.56	0.95	0.94	-1.05%
Sinclair	7.25 - 10.07	8.78	8.15	-7.18%
Univision	23.52 - 32.50	31.42	31.24	-0.57%
Young	1.70 - 10.02	3.51	3.65	3.99%
Tribune	28.48 - 42.17	30.05	29.28	-2.56%
Meredith	44.51 - 55.56	53.95	53.85	-0.19%
EW Scripps	44.85 - 52.91	49.40	49.94	1.09%

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Studio 2

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