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WHAT'S INSIDE

Plug & Play OK'd

Tuner rule pending

by Deborah McAdams

WASHINGTON

The festive atmosphere surrounding federal approval of plug-and-play overshadowed remaining points of contention, particularly DTV tuners. The fate of whether or not cable-ready digital TV sets must also include over-the-air tuners rests with a panel of U.S. Appeals Court judges.

"It's all over but the final ruling, which we expect to come before the end of the year," said Jeffrey Joseph, vice president of communication and strategic relations for the Consumer Electronic Association, which initiated the appeal.

DIGITAL OTA READY

In passing plug-and-play last month, the Federal Communication Commission required that all television sets labeled "Digital Cable Ready" must include OTA tuners. The action reiterated a similar mandate adopted last year by the FCC. The CEA appealed.

At the Sept. 16 court hearing, CEA attorney Jonathan Nadler argued that OTA tuners added around $250 to the price of a TV set, an unfair expense for consumers who have cable or DBS. FCC attorney Joel Marcus said consumers expect TVs to pick up OTA signals.

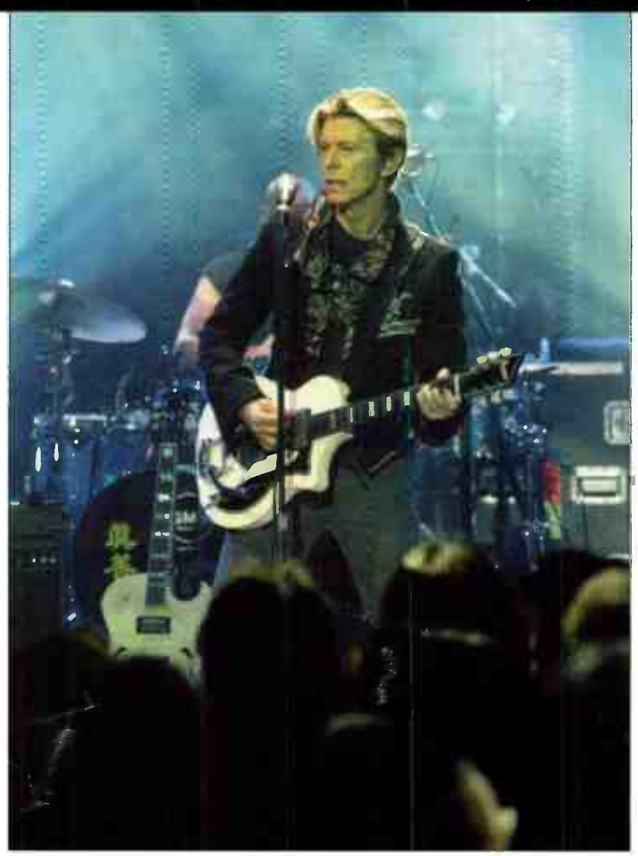
"For the past forty years, every broadcast television receiver sold in the U.S. has had the ability to receive every frequency assigned to broadcast television," the FCC told the court in its brief. "Consumers generally still expect the television they purchase to be able to receive over-the-air broadcast signals.

"In that way, should a consumer decide to discontinue cable service, his television set will not be rendered useless."

Until the court issues its ruling, set makers will technically be required to start turning out TVs with OTA tuners by next year. However, new plug-and-play developments are already in the works that could alter manufacturing parameters again. Under the current rulemaking, interactive capabilities such as video-on-demand and impulse pay-per-view are not covered and still require a set-top box—the very item that plug-and-play was designed to eliminate.

"That's really where you want to get," said Rick Chessen, chairman of the FCC's DTV task force.

The FCC's adoption of the plug-and-play rulemaking was not universally welcomed. Starz Encore Group filed an objection over copy protection measures that would classify its content in a "never copy" category, and the DBS industry objected to a rule that prohibits distributors from downconverting high-definition content, even at a producer's request.



Virtual Stardust

Bowie performs D-cinema concert

by Naina Narayana Chernoff

LONDON

In one of the largest digital cinema events to date, David Bowie played live to audiences around the world last month to promote his newest album and upcoming concert tour.

Fans throughout Europe, Australia, Asia, North America and South America got the opportunity in September to hear a 5.1 surround sound transmission of a live concert performed by the singer in London. The digital cinema concert, which previewed his new album "Reality," was simulcast live via satellite to theaters in Europe and Asia, Sept. 7-8, (accounting for time zone differences) and rebroadcast later in the Western Hemisphere.

STARDUST, PAGE 20

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Audio For Video

CONTRIBUTING WRITERS

NAME:
Doug Lung

COLUMN:
RF Technology

In my work, I'm often asked to do TV coverage studies based on Longley-Rice. With the wide availability of software for Longley-Rice coverage studies, including the free software I described last month, this would seem like a simple task. In reality, it isn't because the FCC database used for FCC Bulletin... PAGE 36

NAME:
Dave Moulton

COLUMN:
Inside Audio

As you all know, 5.1 Surround Sound calls for a center loudspeaker, placed dead ahead of us, midway between the left and right loudspeakers. Left and right are supposed to be in their traditional positions, 30 degrees off the center axis on either side of the median plane, just like in stereo... PAGE 38

NAME:
Andy Ciddor

COLUMN:
Let There Be Lighting

One sure sight that remote-controlled, motorized lighting has just about made it into the mainstream is its most recent name change.
Initially sold to us as "intelligent" and "automated" fixtures by marketing people who clearly had never done battle with them on a production... PAGE 42

FROM THE EDITOR

Choices, Choices

The space around the television set is getting more crowded with an increasing number of "boxes" that drive our video entertainment.

For years, the cable decoder reigned supreme; then about 20 years ago, VCRs began infiltrating the entertainment center. Ten years ago, cable boxes began being replaced by satellite decoders. DVD players appeared on the scene only five years ago and TiVo boxes are becoming more ubiquitous as well.

This is the American way—to give consumers more choices. Today, we can get our video via DVD, VOD, TiVo, VHS, and of course, via fiber, antenna or dish.

But is all this choice necessarily a good thing? Consumers are becoming overwhelmed by the vast selection of entertainment choices these days. Cable and satellite operators are responding by integrating decoders with PVRs—a good start at simplifying the market.

The irony of this is last month's FCC approval of the "plug and play" standard could make it easier for DTV purchasers by eliminating the need for a cable box.

However, two weeks later, new "boxes" are launched from a startup called "Roku" that addresses HDTV multimedia, and from Disney with the debut of its "Moviebeam" video downloading service. Two new options for home entertainment; two more new boxes.

Such boxes have come and gone; there have been more failures than successes in this market. Digital technology may make it simpler and faster to introduce dazzling new services but viewers are hesitant to add more complexity to their entertainment options.

Someday, perhaps, everything we want in multimedia will be available via one box that's simple to set up and operate. But until then, we'll continue to look for that one "killer box," much like the elusive "killer app" that we've been looking for all these years.

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

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

A Trip Down ENG Memory Lane

Dear Frank Beacham:

I really enjoyed your article on the history of ENG ("ENG: The Whole World is Watching," Sept. 17). When you were on the sidelines at the 1983 Orange Bowl using a camera with a one-digit serial number, I was a senior in high school. By the time I got out of college and into my first job "in the industry," it was 1990. The young company I began with (and still work for today) had about seven Sony 300A cameras with U-Matic Sony 8800s. I had a real appreciation for what our videographers on the road went through.

In 1994, we jumped (albeit slowly) to Sony Betacam SP 537 with the PVV-1 on the back. Some D30s a few years later and finally D35s have kept us going strong in the field and in the studio. Why, it wasn't but 1996 went we graduated from linear editing to non-linear Avids! Thank you for a concise, insightful look at the history of ENG.

Margaret Starnes
Richardson, Texas

Frank Responds:

You bring back memories with your mention of the Sony 300A cameras. I had an original Sony BVP-300 (without the benefit of the fixes the "A" brought) and later a Sony 330, which was a truly magnificent ENG camera in the tube era.

In order to appreciate those cameras, however, you had to have used their predecessor, the infamous Thomson Microcam, the two-piece camera that came from CBS Labs in the late 70's and was the basis for first line of Sony BVP-300 cameras. The Microcam was relatively small and had a belt-pack the size of a hefty canteen. But the cable tying the two pieces together was so thick and stiff that it tended to break at the connector with a simple body twist.

I remember those cameras not working more than they worked. As a way to survive a shoot, crews had figured out how to tape the thick cable to a stiff rod so it wouldn't twist and snap. Of course, with this contraption went all pretense of portability, but at least we brought a few pictures home.

After Sony took over CBS Labs, it refined the Microcam, turning it into the BVP-300 series. And thus Sony's first serious ENG cameras were born to fight the battle with Ikegami, whose "Handy Looky" HL-77 and 79s already ruled the day.

Frank Beacham

Not Always Progress

Dear Editor:

Congratulations on your 20 years! Though one who has spent most of his broadcast career in front of the camera, I still most enjoy reading Mario, the Masked Engineer, even if I don't always understand what the heck he's talking about!

As for the best and worst of equipment/events over the last 20 years—my vote for the worst is computer-based weather graphics or, more appropriately, I guess, the people who use them to excess.

I long for the days of showing three or four maps in a local weather segment. In the early 80's when TV Technology was in its infancy, I used to use magnetic symbols on "pull boards."

Today, in a two and a half minute segment, the viewer is bombarded with 10 or 15 (or more)! You do the math. None are on the screen long enough to be comprehended. And, of course, each one has to have a distracting transition wipe that is done for the simple reason that *it can be*.

Gary Munday
El Paso, Texas

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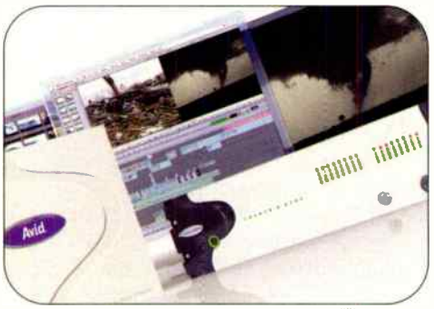

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Microsoft Seeks SMPTE Approval

REDMOND, WASH.

Microsoft submitted technical specification of the company's Windows Media 9 Series WM9 video compression system to SMPTE for the latter's consideration as an openly available international standard. In order to increase the television industry's access to WM9 compression technology, Microsoft decided to open its specification to the software codec.

WM9 promises to be easily scalable from standard-definition to high-definition video and several companies recently announced they were adopting the format for various applications. Some of these applications include BBC Technology's Colledia media management system, Tandberg Television's EN5920 encoder and Quantel's iQ, eQ and gQ post-production and graphics systems.

"I am delighted that Microsoft has chosen to bring WM9's compression technology to SMPTE," said Peter Symes, vice president of engineering for SMPTE. "The creation of an international standard based on this compression technology means there will be new choices for organizations that are strongly committed to the use of open standards and to those looking for the maximum level of interoperability in their products."

Microsoft submitted the draft specification for the SMPTE Engineering Committee meeting held on Sept. 17 - 20 in Geneva.

Open Spec

DirecTV Hacker Convicted

LOS ANGELES

A DirecTV pirate has become the first individual convicted under the Digital Millennium Copyright Act (DMCA), according to the U.S. Attorney's office in the Central District of California. Following a four-day trial, a federal jury in Los Angeles found Thomas Michael Whitehead, 38, of Boca Raton, Fla., guilty on one count of conspiracy, two counts of selling devices designed to unlawfully decrypt satellite television programming and three counts of violating the DMCA.

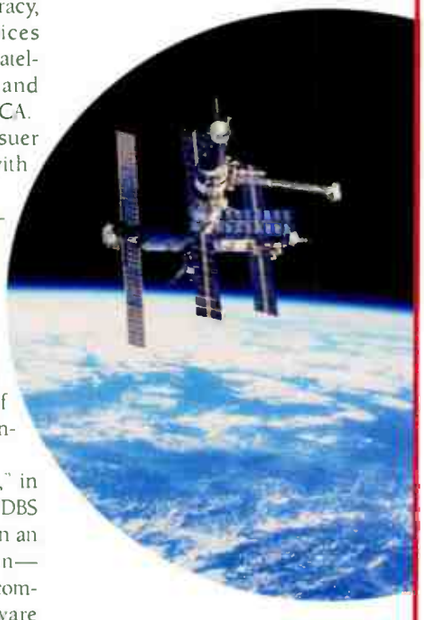
DirecTV, an aggressive pursuer of signal pirates, was pleased with the verdict.

"In terms of our own long-standing and vigorous campaign against signal thieves, we believe cases and verdicts like these will have a substantial deterrent effect and mitigate the spread of signal theft," said Rob Hall, senior vice president of business affairs and general counsel for DirecTV.

Whitehead, aka "JungleMike," in hacker chat rooms, was one of 17 DBS hackers arrested earlier this year in an undercover FBI investigation—"Operation Decrypt"—targeting computer programmers and hardware manufacturers who sold software and set-tops designed to steal service from DirecTV and EchoStar's Dish Network.

Whitehead's operation involved paying a hacker $250 a month to continually crack the conditional access software of both DBS operators. Whitehead used the information to create and sell illegally modified DirecTV access cards, often stamped with a "JungleMike" label. DirecTV officials said Whitehead once boasted that he had reprogrammed cards for 5,000 people.

Several of the defendants charged as a result of Operation Decrypt pled guilty, but



Whitehead entered a not-guilty plea and took his chances with a jury. He was found guilty on all charges, and faces up to 30 years in prison and fines of up to $2.75 million. His sentencing is scheduled for January 2004.

Signal Theft

DBS DEAL-MAKING RESUMES

In the wake of the anti-consolidation sentiment that brought relaxed media ownership regulations to a halt, News Corp. is moving forward with renewed zeal on the $6.6 billion merger with Hughes, parent company of DirecTV. News Corp. announced a plan to invest $1 billion in DirecTV to add channels, spectrum, interactivity and more high-definition programming.

In a Sept. 22 filing with the FCC, News Corp said that in five years, it would have DirecTV offering local channels in all 210 U.S. designated market areas and carrying "at least 200 to 300 channels of local and national HDTV programming,"—that is, *if* the merger were approved by the end of this year.

Pending that approval, News Corp. said it would introduce new interactive services by the end of next year and offer "very competitively price, fully integrated digital video recorders" by the end of 2005. TiVo currently supplies DVRs for DirecTV. The DBS operation accounts for about 30 percent of TiVo deployments. News Corp. has not emphatically stated it will drop TiVo, but it does make its own interactive-capable DVRs for BSkyB, and recently purchased ITV middleware-maker MediaHighway for $66.5 million. Additionally, News Corp. said it would design and launch new satellites as early as 2006 and no later than 2008 to provide the capacity necessary to beef up the HD slate.

Despite a pledge from News Corp. that it won't ratchet up its program prices for competitive distributors, opponents don't buy it. The consumer groups that won a court stay of the more lenient ownership rules restated their position that a News Corp.-controlled DirecTV would drive up cable rates. (It was a News Corp.'s Fox legal team that got the current ownership regulations overturned by a Washington, D.C. Appeals Court. Those rules are still in effect, pending a decision by another court on one front and a Senate vote on another.)

"News Corp. is likely to use DirecTV as a tactical weapon to force cable companies to pay higher prices for critical News Corp. programming content" reads the Sept. 23 FCC filing by the Consumers Union. "We find it particularly noteworthy that, despite having had many opportunities to do so in testimony on Capitol Hill, not once have News Corp officials indicated its acquisition of DirecTV will lead to lower prices for consumers."

The CU's letter was in response to a News Corp.-commissioned economic analysis that disputed the price-hike argument. News Corp. said it made no sense for the company to price its Fox programming out of the reach of cable operators, many of which own networks that DirecTV will likely want to continue carrying. Time Warner, for example, owns CNN, TNT, TBS, TCM, HBO and its various offshoots.

News Corp. also tucked an answer to the CU's letter in its own filing

"News Corp. and Hughes are convinced that offering innovative services will increase DirecTV's subscribership, make it a more effective competitor to cable operators and benefit the American public"

While the Republican-led FCC is perceived as merger-friendly, News Corp. must still get past Capitol Hill, where public outcry against further media consolidation sent lawmakers scurrying to keep the cap on ownership limits. Two lawmakers have already suggested placing conditions on the deal. Sens. Mike DeWine (R-Ore.) and Herb Kohl (D-Wisc.) called for the FCC to prevent News Corp. from taking a majority stake in Hughes for five years and making the company commit to selling Fox's programming to cable competitors at the same price paid by DirecTV.

— Deborah McAdams

Federal Frequency

SONY

it's a digital world:

Over 900 TV stations broadcasting in digital

The DTV transition reached another milestone as the NAB count of digital stations exceeded 900 this week. Some 98% of U.S. TV households are in markets served by at least one DTV broadcaster. 78% are served by fi

OVER 1,000 MPEG IMX DECKS DELIVERED TO U.S. TV STATIONS AND PRODUCTION HOUSES

Sony's MPEG IMX production system achieved another plateau this month as cumulative sales in the United States surpassed 1,000 units. Over 8,000 units have been shipped worldwide. Users praise the format's phenomenal picture quality. ... operating costs and backward compatibility with decades of assets rec... and Betacam SP®, format

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worldwide sales exceed 380,000 VTRs and corders, the DVCAM format has scored l achievements as Sony's fastest-growing ' the world's number one pro digital video format. DVCAM products have proven popular for television news, corporate and event videos, documentaries and digital cinematography.

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ROKU Debuts HD Player

PALO ALTO, CALIF.

Roku, a startup company privately owned by ReplayTV inventor Anthony Wood, recently announced the HD1000, which it bills as the world's first digital media player for HDTV. The Roku HD1000 set top box connects to any HD-capable monitor and provides a "canvas" for digital media such as art, photos and music.

The HD1000 accepts common consumer and professional memory modules, such as CompactFlash, SmartMedia, Memory Stick, SD/MMC and XD cards, and it also has a Fast Ethernet port for connection to a computer. The unit includes component, VGA, S-Video and composite video outputs, and it can be used on both high-definition and standard-definition monitors. Wood said that the focus of the product is to let consumers enjoy digital media on widescreen HDTV sets, an increasing presence in American homes.

"The growing HDTV market has triggered a new wave of thinking that goes well beyond the capabilities of previous digital media products, providing Roku with the opportunity to address this untouched market," he said.

The Roku HD1000 will be priced at under $500 and will be available starting this month.

HDTV

Mini-DVR Arrives

SAN DIEGO, CALIF.

Sony is making its new handheld PVR available in the United States this month after initially announcing a November roll-out in Japan. The PEGA-VR100K is designed to record television content, store it on a Sony Memory Stick, and play it back on Sony's Clie handheld "personal digital assistant." The recorder/player has a built-in tuner that can receive VHF channels from 1-12 and UHF broadcast from 13-62. It also has an external antenna connector, standard RCA input and output jacks and software for downloading television listings to a handheld. A little larger than a VHS tape, the PEGA-VR100K connects to a TV or cable box via coaxial cable and can record more than four hours of television programs on a 1 GB Memory Stick at the highest-quality video setting. The device's bundled video-utility software allows users to program the Memory Stick to record at a pre-set time. Recordings can be viewed on a TV, PC or the Clie.

The PEGA-VR100K can also be used to convert a video jack-equipped PC monitor into a television receiver for either cable or over-the-air signals. The device will retail for around $300.

DVR

Dolby Acquires Cinea

SAN FRANCISCO

Dolby Laboratories has acquired Cinea, a start-up content production and anti-piracy technology company based in Reston, Va.

The acquisition is Dolby's second video-related acquisition this year. In April, the San Francisco-based audio company purchased DemoGraFX, a developer of digital video signal processing and image coding technology.

Led by Robert Schumann, formerly of DivX, Cinea received a $2 million grant from NIST last year to create a system that distorts images taken by camcorders. The goal of the technology is to discourage pirating of theater-shown films.

Cinea will operate as a wholly owned subsidiary of Dolby, with Cinea personnel and offices remaining in Virginia. Cinea CEO and founder Schumann, becomes head of the subsidiary, reporting to Tim Partridge, vice president of Dolby's Professional Division.

Acquisitions

Cablevision Goes Voom

BETHPAGE, N.Y.

Cablevision will launch its new DBS service, Voom, Oct. 15, offering 39 high-definition channels, 21 of which will be exclusive to the service. It will also offer "as many as" 88 regular, standard-definition cable channels, "along with local, digital over-the-air programming," according to the company.

Voom will initially broadcast in MPEG-2, to be upgraded to MPEG-4 in Q3 next year, using upgradable Motorola set-top boxes.

According to published reports, the service will initially be available from Sears retail stores and the price for the dish/box/install combo will be $749 with $15, $30 and $40 monthly service packages.

Mickey Alpert will lead Rainbow DBS, the parent division of Voom, as senior executive vice president and chief operating officer. Alpert, who previously ran his own consulting firm, will report to Cablevision Chairman Chuck Dolan. Alpert's senior management team will include Bill Casamo, executive vice president, marketing and sales; and Jay Aldrich, executive vice president, finance. Casamo held a similar position at DirecTV, and Aldrich led his own consulting firm.

Voom is the latest pet project of Cablevision Chairman Chuck Dolan, a cable television pioneer who was not above climbing into a trench during the early days of his company. The impetus for Dolan's entry into the DBS business was the erstwhile merger of DirecTV and EchoStar. Dolan proposed that the joined companies be compelled to shed some spectrum to allow for the creation of a competitor, as a condition of the merger.

Federal authorities kiboshed the DirecTV-EchoStar merger, but Dolan proceeded with plans to build the DBS business. Cablevision launched its first satellite—Rainbow 1—in July, and has since filed applications with the FCC to launch five more satellites on Ka-band frequencies for additional interactive, video and broadband services.

DBS

MovieBeam Launches

LOS ANGELES

MovieBeam, Disney's long-awaited on-demand movie service, debuted late last month with launches in Jacksonville Fla., Salt Lake City and Spokane, Wash.

Subscribers to the service sign up for a Samsung Electronics decoder, remote and small antenna at electronics retailers and for a one-time activation fee of $30, can wirelessly download a variety of theatrical movies from studios such as Disney, Fox, Sony, Warner Brothers and Universal.

The service launched with a slate of 100 titles and will add about 10 new selections every week. Subscribers pay a monthly fee of $7 to rent the box and the programs cost $2.49-$3.00. Viewers have unlimited viewing of the selection over 24 hours. Customers can also run a quick coverage check and sign up for the service at *www.MovieBeam.com*.

Programming is downloaded via the Dotcast datacasting platform, which allows viewers to download audio and video over the analog signal of PBS's National Datacast network. Disney is an investor in Dotcast.

"The innovative MovieBeam business model relies on existing broadcast spectrum to achieve significant bandwith to the home with limited initial investment," said Peter E. Murphy, senior executive vice president and chief strategic officer of Walt Disney Co.

VOD

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by Craig Johnston

SEATTLE

To do something well, you need to concentrate on it. In the case of Seattle ABC affiliate KOMO-TV, that kind of concentration resulted in the station being awarded the Edward R. Murrow large station Newscast of the Year award for 2002.

Certainly the award is just desserts to the station that broadcast the first U.S. local newscast aired in high-definition back in 1999, but News Director Jim Tellus says it comes down to more than just technology. He credits a universal understanding throughout the station about its single focus.

"Other departments understand that the focus of this station is news, period," he said. "Certainly you need sales in the news business, it's how we make our money. But there's a unified focus here on putting out the best product."

When Tellus said, "there are not a lot of walls between departments," he was using the word "walls" in an attitudinal sense. Yet during conception and construction of the station's new building, completed in 2000, a lot of physical walls were left out of the architect's drawings, beginning with the newsroom itself.

"The only office in this newsroom is the news director's office, and confidential conversations happen here. Everywhere else, there are no other offices. The anchors don't have an office. Everyone works on a level playing field here."

One place where walls are missing is around the main studio control room. Unlike the enclosed bunker design that typifies most control rooms, KOMO's control room is spacious and open on both ends. A quest for flexibility and utility led the station to that design.

ROOM WITH A VIEW

This mini-auditorium feature of the control room was not the reason for its spaciousness. A quest for flexibility and utility led the station to that design.

This writer has been in more than a hundred studio control rooms over time, and KOMO's is the first he's seen with windows to the outdoors. That luxury is allowed by the unique monitoring: Large, bright plasma screens.

KOMO's senior technical director, Walter King, said the station was committed to designing an HDTV-ready control room, and he remembers thinking: "I don't know anything about HDTV, all I know is that it's in 16:9, and there's nobody out there that's going to make a $400 Electrohome 9-inch black-and-white, 16:9 monitor."

That problem, tackled by a local Seattle-area high-tech firm, Avitech International, led to the plasma screen solution.

Avitech was already making virtual monitor-wall controllers that allowed situation rooms to place a number of video sources onto large screens. In collaboration with KOMO and NEC, with its 50-inch PlasmaSync monitors, they developed a studio control room product.

King said the resulting plasma virtual monitor walls allowed a huge change in the control room's design. Previously, everyone shared the same wall of 50 to 100 or more individual source monitors, and control rooms had for what he calls "ducks-in-a-row" seating.

When KOMO-TV, the ABC affiliate in Seattle, upgraded its control room to handle HD, the traditional monitor wall was replaced with a plasma display.

By giving each work group its own Avitech/NEC plasma screens, they can route only the sources they need to their panels.

The utility of the plasma screens is not lost on Tellus, the news director.

"It's an amazing tool during continuous coverage, whether it's the earthquake, or whatever," he said. "We'll have multiple cameras out there, we'll have multiple live-shots and sat-shots. We can put them all right in front of us. There's no more bending necks and looking for what's up and what's not."

TAPE INTO TAPELESSNESS

KOMO searched the other side of the globe for ideas for the new facility.

"There was a group of us who went over to the U.K. and Sweden to look at TV stations, and our vendors (in Europe)," said King. "We took the best parts of what we found and put together our own version that gives us the flexibility to handle what we don't know (is coming yet)."

Another piece of technology in KOMO's plant has caused a similar change in workflow: The centralized video server and nonlinear editing. This is achieved through two Quantel Clipbox Power servers with 12 attached Edit Seats and a single Cachebox. This is integrated with the OmniBus broadcast automation and video asset management system, and AP's ENPS newsroom computer system.

"The only tape in this building is the tape that's shot in the field. Photographers come back with a Beta SX tape," Tellus said. "The first thing that happens is it's ingested into the server. Now everybody has access to it."

Instead of waiting for tape, the promotion producer can begin cutting promo bites, producers can pick tease video, the reporter can review the sound bites for scripting, and the editor can be cutting the story together; all at the same time.

Tellus said use of a centralized server took some getting used to.

"You have the ingest time," he said. "It's real-time. It's 20 minutes. Those are things that we have to consider when we're bringing new tape into the station, that there's going to be 20-minute lag time. We can't just pop the tape in and start editing."

But as individual tapes are being ingested in one of the six ingest bays, whatever amount of video from the tape that has already been ingested is available to everyone.

Tellus noted one other factor everyone had to get used to in a central server rather than a tape-based system: There's no physical tape to go grab off the shelf when looking for a piece of video.

"We try to be as descriptive on the slug as possible," he said.

It's critical that the story slug remain consistent from the time the assignment is made through the ingest and production process. Calling something an explosion in one slug and a blast in another would cause confusion in a later search for file video.

FORMAT FOR THE FUTURE

When designing the new facility, the station made the choice to be all-digital and all 16:9—from field acquisition through the production process. Thus, all of KOMO's news footage is shot in wide-screen format with Sony DNW-9 WSP camcorders.

"It didn't make a lot of sense to buy all high-definition field cameras, at the expense and the weight and everything else that went along with it, for a whole, entire newsroom team," said Mark Simonson, vice president and director of engineering.

"If I were a viewer out there, what is it I really want to do? I want to see high quality, I want to see widescreen. We wanted to give them a difference in a content point of view that nobody else was giving. And that's why we built a complete 16:9 facility, and we were the first ones in the United States to do that."

The resultant digital signal is passed through a Snell & Wilcox upconverter before it goes to the DTV transmitter. Before it goes to KOMO's analog transmitter, the side panels are trimmed to result in a 4:3 aspect ratio.

While news is KOMO's number-one focus, the station does other production as well, including "Northwest Afternoon," a daily, live, afternoon talk show. In order that the program not be treated, in King's words, "as a stepchild to news," the station installed equipment that could be easily reconfigured from talk show production to news program production.

One central tool to that quick changeover is the Grass Valley Group Kalypso switcher. King says the switcher's 48 outputs allow him to feed the router outputs to the monitor-wall screens, so that when new video is routed through a crosspoint, it's instantly visible on the monitor-walls.

The station's Pinnacle Deko character generator interfaces, via MOS protocol, with the ENPS newsroom computer. Also key to the system is ClearCom's Matrix Plus intercom system. Not only can headset and IFBs be immediately changed for the next production, but the system allows the station to split off communication to allow a simultaneous production to be done from its smaller studio control room.

Similar flexibility comes from the Euphonix System 5 High Performance Digital Broadcast Console. In addition to its 88 fully resourced channels and multichannel routing, its built-in automation allows immediate switchover from the talk show audio sources to those used for news. ■

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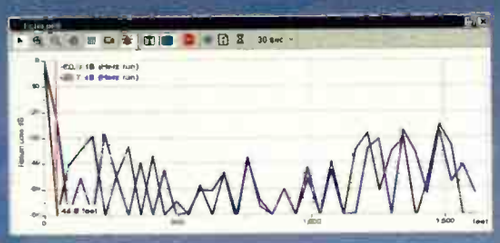

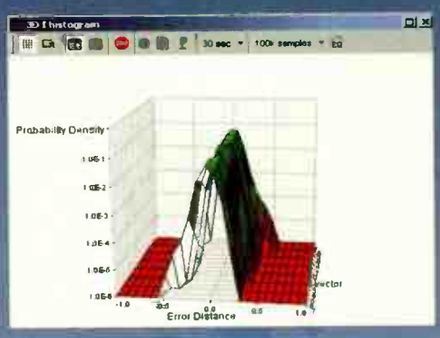

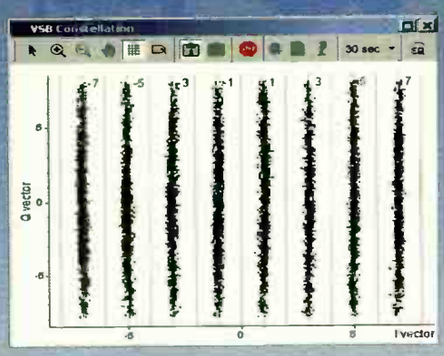

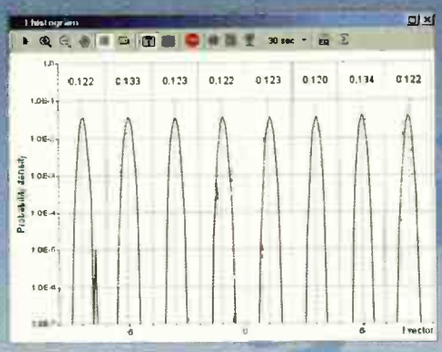

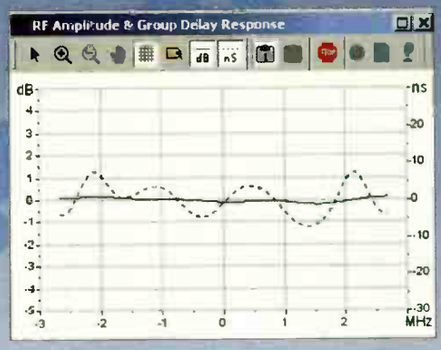

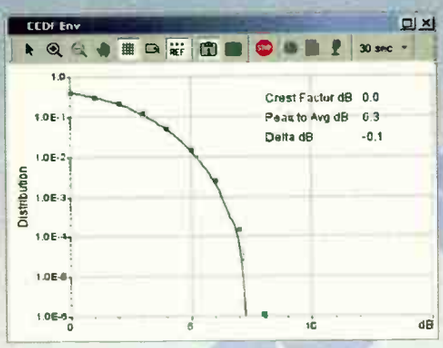

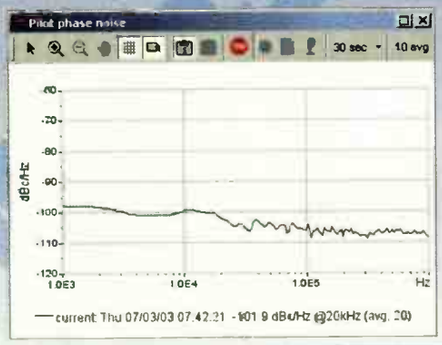

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DIGITAL JOURNAL

Bill Hayes

RF Monitoring: A Work in Progress

Digital television brings new definitions to measurement

by Bill Hayes

JOHNSTON, IOWA

Anyone who has been involved for any length of time with the DTV transition has recognized that expectations for the final product were issued long before any real evidence was given as to what would be required of the broadcasters, manufacturers and consumers. It is therefore no surprise that a lot of the fine details regarding DTV are still under some discussion and development.

In the mid- to late-1990's, I was working for Lee Enterprises at the company's CBS affiliate in New Mexico, and functioning as the "pseudo director" of engineering for the station group. I was tasked with putting together a projected budget for converting all the Lee properties to DTV.

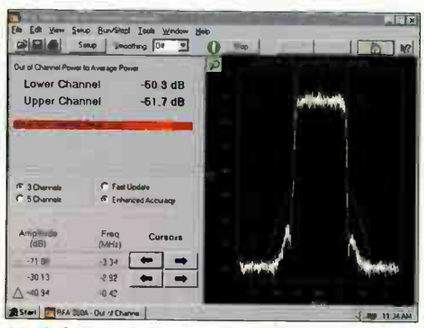
That process involved many conversations with manufacturers getting prices and specifications for equipment that even at that point were still essentially computer simulations and prototypes, with real hardware maybe months or years away.

But that May 1, 2002, deadline was looming large and there was a lot of tough talk coming out of Washington which resulted in the 2006 shutdown date for analog television broadcasting. I don't think any of us believes that we'll be pulling the plug on analog television on New Year's Eve 2006, although many of us would love to do it. It is a simple fact that the rhetoric of digital television has far outpaced the science and implementation of digital television.

ON BACK BURNER

So what has this got to do with RF monitoring and measurements? Quite a bit really. You see, in the push to get stations on the air, an awful lot of detail work was glossed over, and as a result we're trying to fix some things post-implementation. A couple of years ago, I was asked by the IEEE Broadcast Technology Society to reconstitute the RF Standards Committee to finish the work on DTV transmitter performance measurement standards.

The work had originally begun in the early '90s, but had stalled because much of the technology that the committee tried to write standards for was changing between committee meetings. The proposed contours changed because receiver carrier-to-noise ratios moved, replications of service power requirements changed, the FCC switched from 50/50 to 90/10 contours, the DTV mask was released and then revised, and we all began looking for the magic scope that had a dynamic measurement range of 110 dB, and so on. The committee went dormant waiting for the winds of change to die down. Time went on and we all got busy with the process of building DTV stations without giving too much thought to the idea of measuring the performance of the station.



Mask failure display on RFA.

I didn't give this whole process too much thought myself until 2000, when IPTV installed its first Harris DTV transmitter in Des Moines, a CD3260P2 two-tube IOT transmitter. The install of this transmitter went fairly well, but during the performance measurements, our engineers noted a problem. When measuring the mask compliance using the Tektronix RFA-300 that was part of our Monitor Plus package, the RFA showed an adjacent channel mask failure. A close look at the 500 kHz lower shoulder showed that the lower sideband infringed on the shoulder a couple of dB above the required -47 dB line. Of course we pointed this out as a transmitter performance issue, but the field engineer indicated that the scope mask was wrong. A little research indicated that whether or not the problem we were seeing was a violation determined how the mask performance specifications were interpreted. It was the tracking of this problem that probably got me involved in the RF standards activity.

During this past summer, I was able to get Tektronix and Rohde & Schwarz to come to our transmitter site in Des Moines with the latest versions of their 8-VSB measurement devices for a demonstration and discussion regarding the measurement procedures employed. I was joined by Greg Best, a consulting engineer and member of the RF Standards committee as well as Ed Miltner and Mike Gruca, transmitter engineers for IPTV.

We set up both the RFA and EFA (Tektronix and Rohde & Schwarz, respectively) and proceeded to measure the performance of the Harris transmitter. The purpose of meeting at our site was not to do a measurement box shoot-out to

MONITORING, PAGE 17

It is a simple fact that the rhetoric of digital television has far outpaced the science and implementation of digital television.

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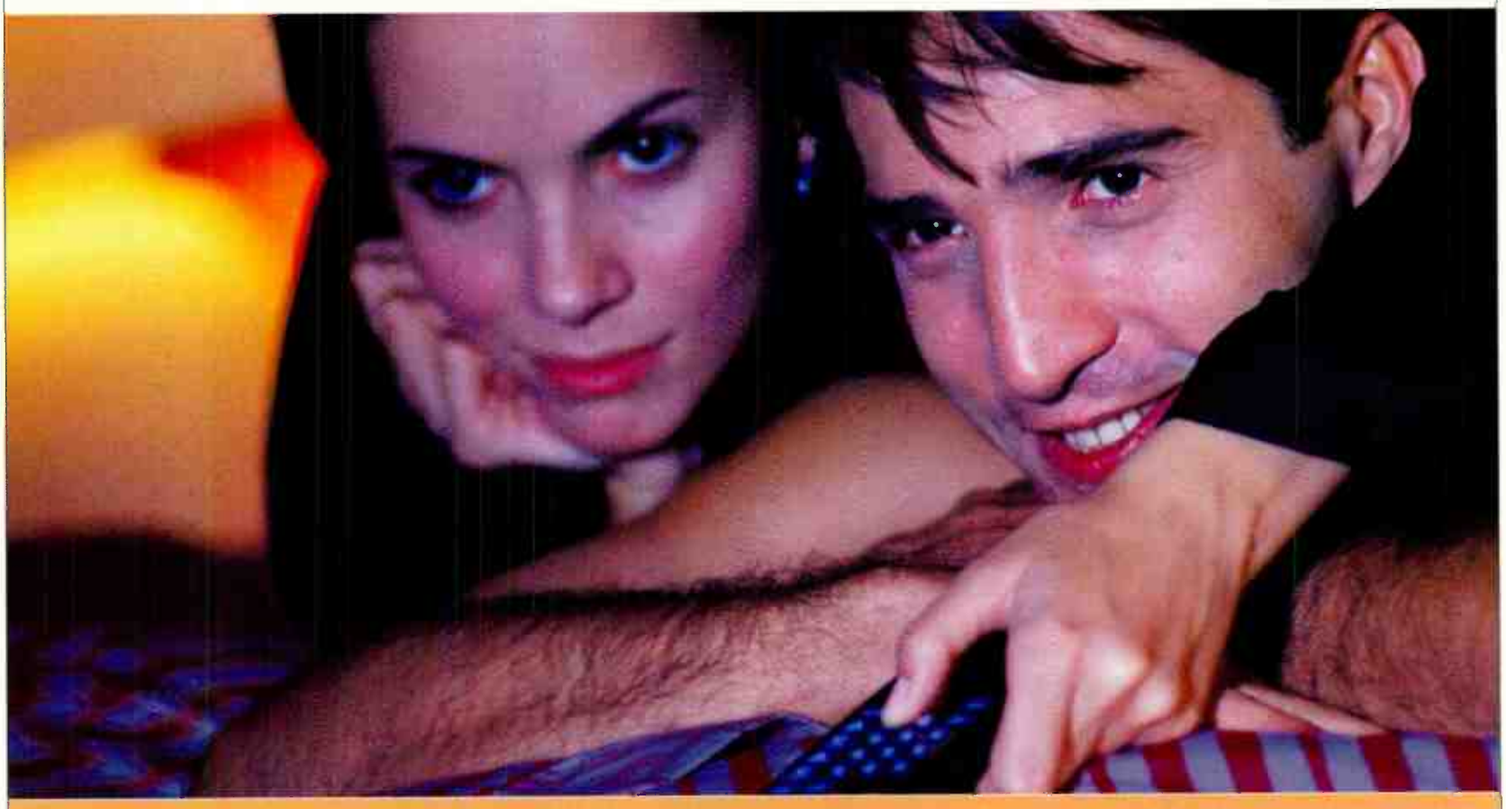

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Fox Sports Nets Cover the Country

Production of local sports shifts to niche cable networks

by Craig Johnston

SEATTLE

A dozen or so years ago, local sports production in most large markets was done by the network affiliates. Contracts for live coverage of college and professional games and their attendant pre-game, post-game and coaches shows, had gone to these stations for decades. Today, local sports have largely moved to cable sports channels such as Fox Sports Net Northwest, headquartered in Seattle.

"I think if you took all of the regional sports production," said FSNW vice president and general manager Mark Shuken, "and you took everybody (else) in the market and added it all up, it would probably be less than ours."

The regional cable channel, seen in all of Washington, Oregon, Alaska and parts of Idaho and Montana, has a local sports lineup that makes it hard to argue with Shuken.

Where the over-the-air broadcasters' sports news coverage is largely limited to five minutes or so at the tail end of the evening's newscasts, FSNW presents 90 minutes of sports news a day from its studios 10 miles east of Seattle. The cable sports outlet relies on its stable of reporters with staff and freelance camera operators. In addition to packaged material, these teams provide feeds of live sports events recorded and logged for highlight video.

Added to these local elements is a four-and-a-half hour daily video feed of sports stories and highlights from Los Angeles. The regional channels can request special packages such as season-so-far highlights of a local team's upcoming opponents.

BUSY AS GRAND CENTRAL

"Our edit bays, of which there are five, as of about 6:30 to about 10 [p.m.], it's 'Grand Central Station' out there," said Executive Producer Tom Feuer. "There are packages coming in, there are feeds coming in, and so it gets very, very busy."

Little known to FSNW viewers, or to those in the Detroit region, is that Fox Sports Net Detroit's evening news program is produced in that same Seattle studio, using the same anchors that host the northwest region's show.

Angie Mentink and Mickey York co-anchor the newscast for Fox News Detroit from a studio near Bellevue, Wash.

"It's amazing how localized that show feels, in spite of its being produced from here," said Feuer. One familiar face to Detroit viewers is that of anchor Mickey York, a well-known sportscaster from that market.

There is also a newsroom in Detroit shooting local stories and communicating constantly with the program's Seattle-based producers. Feuer gives his producers a great deal of credit for the attention they pay to making the show look and feel like Detroit.

"Pronunciation: How do Detroit people say certain things? What's the vernacular? They pay attention to detail because they know that you can't fool your audience. Maybe they're not physically in Detroit, but my God, they're emotionally and mentally in Detroit."

Despite their difference in time zones, the possibility the two live news programs will overlap always exists due to the length of live game-coverage preceding them.

"Live sports is unscripted, so if you go into overtime or double overtime, or whatever…there are some hairy moments," said Feuer.

"It takes a lot of planning and contingencies, because a lot of events aren't perfect," added Shuken. "We do have to tape some things, have some elements in the can, in case we step on ourselves."

Baseball season is FSNW's busiest time, because it produces a minimum of 146 games over the five-month-plus season. Most of those games air on the cable channel itself, but the package of 35 games sold this year to local stations was also produced by FSNW's production team. Most games are five-camera productions, and the channel hires its own mobile truck for road games rather than taking a split feed from the hometown telecaster.

In an experiment with cable company Comcast, FSNW pioneered high-definition coverage of 19 home Seattle Mariners games this summer. Shuken said FSNW was looking at what they could do to introduce HDTV sports coverage to their region.

"The Mariners showed up on the list as the top," he said, "and Comcast thought it would be great to drive their subscribers to HD."

The economics of producing the games in HD could have been a deal-breaker, except for a sort of "perfect storm."

PARTNERING WITH NHK

"(Japanese network) NHK covers every single one of the Mariners home games in high-definition television," said Feuer. "We took their feed and married our upconverted (Chyron iNFiNiT!) graphics from the standard-def show, and mixed our announcers' audio from the standard-def show with their natural sound."

FSNW uses an HD fly-pack in a separate production room to integrate the HD production. The producer/director/TD of the HD telecast can listen to the Japanese production's English-speaking director in order to anticipate what's coming. The Fox Sports' HD show director will sometimes ask that a graphic be left up a few seconds longer so he can insert it over an appropriate shot.

"However, our philosophy is that we don't want to cannibalize our standard-def show for our HD show, so if he can't do it … he says 'no.'"

The audio/tape operator rolls a videotape containing the same commercials seen in the SD telecast into the production.

Another tricky part of the integration comes when NHK shows a replay. The Japanese network uses an NHK-logoed replay effect to introduce replays, so the FSNW has to overlay their own flash-effect to the replay.

A final technical hurdle comes in "marrying" the announcers' narrative with the high-def background sound. Because the digital path the HD video follows causes it to be delayed by a number of frames, FSNW has to similarly delay the audio so that the bat meets the ball at the same time for the eyes as well as the ears of the viewers. ■

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Sony Launches 'Work Smart' Truck Tour

Digital showcase features new line of optical disc-based products

by Frank Beacham

NEW YORK

In a 51-foot-long tractor-trailer rig packed with the latest digital broadcast gear, Sony Electronics has launched a mobile education tour that will visit nearly 90 U.S. locations over the next seven months.

Sony calls it the "Work Smart, Work Sony" Truck Tour—a mini-trade show on wheels that will showcase an array of Sony digital standard- and high-definition products to video and audio professionals at TV stations, video resellers, sporting events and film festivals. But, more than just introducing new products, Sony's goal is to educate its customers about how computer networking (IT for information technology) will drive the video workplace of the future.

Being shown in the United States for the first time since their introduction at NAB2003 in April is Sony's new family of professional optical disc products, a key to the acquisition phase of the IT-based facility. Recently, Sony's new optical disc-based camcorders were given the name "XDCAM."

Also on board the tour are the latest nonlinear editors, high-definition cameras, storage devices, playback systems, monitors, switchers and professional audio gear Sony personnel will use to demonstrate workflow improvements designed for a new generation IT-based video infrastructure.

"The tour is part of our commitment to inform and educate the broadcast and production community about our innovative digital solutions that will substantially improve our customers' operations," said Pat Whittingham, president of Sony Electronics' Broadcast and Production Systems Division.

"We're bringing our digital and high-definition technology to our customers' doorstep," he said. "This collaborative, hands-on approach will help our customers see the impact that improved workflow and new technology can have on their business."

Sony's hi-def production showcase on wheels will travel to nearly 90 U.S. locations over the next seven months.

In addition to the new XDCAM optical-disc camcorders, other equipment on the truck includes the HDC-950 and HDC-930 high-definition cameras, the BVP-950 digital camera, the DNW-7 Betacam SX and DSR-390 DVCAM camcorders, the MSW-900 MPEG-IMX camcorder, the DVS-9000 and MVS-8000 production switchers, and the XPRI non-linear editing system.

The road show will also include a variety of Sony professional audio equipment (including microphones and the DMX-R100 digital console), the new LUMA LCD displays, digital signage, fiber and storage solutions, and Sony Professional Services.

The truck is 80-feet long from end to end. The trailer is 51-feet long and expands almost seven feet for a total width of nearly 16 feet. In addition, an expandable side includes a 20-by-20-foot tent for outdoor camera display.

To support the tour, Sony has set up a Web site, *www.sony.com/protour*, where video users can check upcoming tour destinations and dates, and preview the selection of products and technologies that will be demonstrated. Reservations for the tour can be booked from the web site by clicking on the "Register Now!" link.

The tour will end in April 2004, when it arrives at the Las Vegas Convention Center for NAB2004. ■

Monitoring

CONTINUED FROM PAGE 12

determine which box is the best performer, but instead to come up with some recommended practices for making and interpreting measurements based on whatever system is being used.

We saw advantages and tradeoffs in both measurement packages, depending on the types of measurements being done. Greg Best and I are still working on the report for the committee, so I won't go into too much detail, but I would like to point out some general observations.

BEHIND THE MASK

The first measurement I was most interested in was, of course, the mask compliance since the transmitter at KDIN (IPTV's Des Moines station) was not compliant according to our RFA300. Looking at both boxes making the same measurement simultaneously, I noted that the waveforms were identical and both showed the incursion into the lower shoulder at the same point.

From that, we concluded that the waveform was correct and that the incursion was real. However, the RFA showed this to be a violation and the EFA did not. The same empirical data presented to both devices resulted in different interpretations, so which one was right?

This was where we took our first break to talk about the design philosophies and interpretations. It turned out that the RFA looks at the 500 kHz shoulders and if any signal peaking in excess of -47 dB appears, the mask compliance fail flag turns on. The EFA, on the other hand, averages the power over the full 500 kHz of the shoulder and thus the slight incursion that we had was interpreted as insignificant.

The FCC position on this from FCC 98-24 (Memorandum Opinion and Order on Reconsideration of the Sixth Report and Order) states "...in the first 500 kHz from the authorized channel edge, transmitter emissions must be attenuated no less than 47 dB below the average transmitted power."

From this rather broad statement, it was easy to see where some confusion could occur. Both the Tektronix and Rohde & Schwarz representatives agreed that the more practical method would be to use the total 500 kHz shoulder average rather than a peak since an occasional peak in the shoulder isn't going to amount to anything in terms of interfering with an adjacent channel.

However, eliminating the ambiguities in how measurements are made and interpreting the results is critical since the FCC will still require that a facility operate within the confines of the rules.

One other interesting factor in measuring mask performance is the need to understand that the true performance of the system cannot be made under power. There are no available scopes that will measure a full 110 dB of dynamic range. Both the RFA and EFA use the manufacturer's data from the mask filter to create the display and correct the actual measured signal. Therefore, when verifying mask performance, we're relying on the stability of the filter and accuracy of the measured data.

We're dealing with a large, high-powered filter, the performance of which will change over time and with environmental conditions. In order to ensure accuracy of the measured data displayed on either device, it is necessary to maintain a stable environment for the filter and to measure the actual filter performance, which can only be done out of service and with more hardware than most stations have. This will probably involve hiring a consulting engineer, which may not go over well with the general manager.■

Discovery Leads HD Production Sessions

Programmer lays out criteria for sought-after hi-def content

by Bob Kovacs

SILVER SPRING, MD.

In an effort to promote more and better high-definition content, the Discovery Channel is holding seminars to explain its HD requirements to television producers.

The most recent event was held in September at Discovery's headquarters in Silver Spring, Md. About 40 producers and content creators attended, receiving an explanation of HDTV formats, technical information about the "deliverables" for Discovery programs, and examples of acceptable and unacceptable images.

"We have been on an unrelenting quest toward better picture quality," said Clint Stinchcomb, senior vice president and general manager for Discovery HD Theater, Discovery Channel's HD service.

Stinchcomb said that there are a number of factors that are driving Discovery toward HD content, including increased investment in HD production equipment, the decline of consumer HD monitor prices, pressure from the FCC, and competition between cable and satellite program providers. It was in response to these forces that Discovery Communications launched Discovery HD Theater and powered its quest for a wide variety of HD content for Discovery HD Theater, the Discovery Channel and its sister networks.

Discovery used its extensive experience producing and broadcasting HD programming to develop precise criteria for HD production, including limits to the amount of standard-definition images that are mixed into an HD program. The network also has guidelines on the recording formats that are acceptable for use in programs that are produced in HD.

PRECISE CRITERIA

All the popular professional HD videotape formats are acceptable in Discovery's HD productions, including D-5, HDCAM, HDCAM SR and DVCPRO HD, according to Josh Derby, manager of technical quality control for Discovery Production Group. Most professional standard-definition formats are acceptable—within well-defined time limits—for use in programs that are produced in HD for Discovery.

The biggest exceptions to this are DV video and 16mm film formats. Derby said that neither is acceptable for use in a program for Discovery that is produced in HD, and that the network formalized its list of acceptable and unacceptable video sources after experience and testing.

"It's all information that we've been asked a million times on the phone," he said, even as he encouraged producers to continue to call him with questions about HD video quality.

Discovery limits the use of SD images within an HD program to no more than 25 percent of the total, and no SD segment can be longer than one minute. The network's goal is to give viewers the best possible images as often as possible, even as it acknowledges that there is frequently no way to avoid the occasional use of archived SD video.

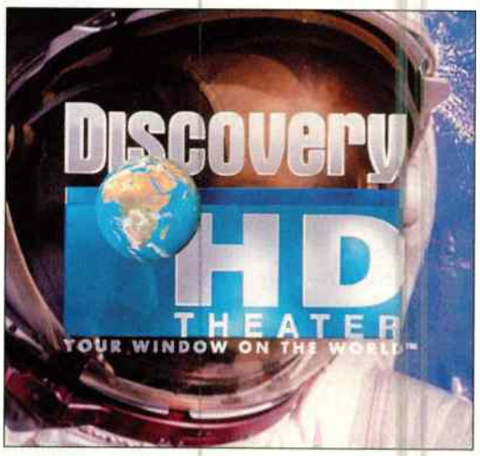
UPCONVERTED TO 1080I

Officials from Discovery were pleased with the video quality that they have seen from the Panasonic VariCam 720p camcorder, even though productions get upconverted to 1080i for eventual broadcast on Discovery HD Theater. One HD format that was unacceptable for HD production for Discovery was the new semi-pro 19 Mbps system used by the JVC JY-HD10U. Derby explained that this format created too much noise and has too many artifacts when upconverted to the final 1080i master and subsequently broadcast.

At the session, Discovery staff members detailed the deliverables that the network required from its producers. These deliverables include an HD program master, a digital stereo audio master and a digital 5.1 surround sound master, the latter two of which must be supplied on a tape compatible with a Tascam DA-88 multitrack recorder.

Discovery uses both in-house and contract producers for its SD and HD material. One of the biggest of its in-house HD productions is "Atlas HD," a visual encyclopedia of 30 countries around the world, each done as a two-hour program. With a total budget of $65 million, the first of the "Atlas HD" programs is in production now and will premier in late 2004, according to a Discovery spokeswoman.

One of the attendees at the September seminar was Joel Olicker, the president and co-owner of Powderhouse Productions in Somerville, Mass. Formed in 1995, Powderhouse Productions produced a standard-definition 10-part series for Discovery called "Extreme Engineering" in 2002.



Olicker said that he is in discussions with Discovery about producing HD programming, including a second season of "Extreme Engineering." Although he is somewhat familiar with HD production requirements, he said that making the trip from the Boston area was useful.

"It was totally worthwhile, a great experience," Olicker said. "It was great to meet the engineers. Because [HD] is so new, it doesn't hurt to hear about it again and again."

BETTER PLANNING

Discovery's acceptance of HD technology for production helps Olicker better plan his productions.

"We did a series for another network that we shot in Super 16," he said. "Within a month, the tide of opinion had shifted toward HD video."

Olicker finds that production and post-production in HD takes no longer than a standard-definition program. An official from Discovery said that an HD production typically costs 15 to 20 percent more than the equivalent program in SD.

The Discovery HD production seminar lasted about 75 minutes and had an extended informal question-and-answer session afterward. The first two seminars were given in London and Los Angeles, and Discovery is considering giving another session in New York. ■

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Stardust

CONTINUED FROM PAGE 1

Though it was not the first time performers used a digital simulcast to theaters to bring an intimate show to a large number of fans—a band called Korn broadcast a live New York concert in June 2002 to theaters in dozens of U.S. cities—the Bowie events reached more countries and included a live question-and-answer segment with the singer following the broadcasts.

It was also the first concert to be broadcast in 5.1-channel DTS digital surround sound, according to Ted Laverty, director of business development for DTS in Northern Ireland. The manufacturer's CAE-5 professional broadcast encoder was used to encode the multichannel audio feed at the concert.

"David Bowie specifically wanted Surround Sound for the event," Laverty said. "He wanted the highest quality audio possible."

As an enthusiastic supporter of new technology, it's not surprising that Bowie was the first to perform a worldwide digital cinema event. He was an early supporter of e-mail in the 1980's and was one of the first to offer an online download of a song in the mid-90's.

Produced by Sony Music, his concert was held at the Riverside Studios in Hammersmith, West London and was shown in 86 theaters in 22 countries, including the U.K., Denmark, France, Germany, Italy, and in the cities of Rio de Janeiro, Warsaw, Tokyo, Sydney and New York with a total audience of 50,000, said Julie Borchard, senior vice president of international marketing at Sony Music U.S. In the the Americas, the broadcast was held on Sept. 15, the date of Bowie's album release.

At theaters, the 90-minute concert was shown in standard definition. The video quality satisfied Philip Bird, encoder product manager at the U.K. office of Tandberg Television, adding that "it would have made no difference" if the video was high-definition.

Bird attributed the high-quality transmission of the events to Tandberg's low bit-rate MPEG-2-based E5710 standard-definition encoder. Working with its longtime DSNG partner, Kingston inmedia in the U.K., the two companies uplinked the signal onto Eutelsat W2, and transmitted it to the theaters on the day of the concert and during the rebroadcast. Using Tandberg's integrated receiver/decoder devices, they fed the signal to the DTS XD10 digital cinema media player, which output the 96 KHz 24 bit-quality surround sound audio.

DTS' Laverty said the Bowie event was one example of using an XD10, which includes an internal hard drive capable of storing up to 30 feature film soundtracks.

"It can be used to decode a full suite of digital surround sound channels," he said, adding that the player's internal hard drive can be used as the film sound-signal source, and its two DVD drives allow film-sound information to be downloaded to the hard drive.

ONWARD TO HD

Becoming the first encoding platform to integrate a DTS audio pass-through, Tandberg tested out the solution for two months prior to the Bowie events, Bird said. Tandberg and DTS had previous experience with the process, integrating DTS technology in Tandberg's professional receiver decoders used for monitoring at cable headends.

Now that the technology has been tested at such a large event, Laverty said he looks forward to taking it to the next step—a high-definition broadcast.

"HD is the perfect example of technology that delivers high-quality video and audio," he said. "We see ourselves in a position to supply the high-quality audio."

Bird sees even more potential for Tandberg and DTS to work together on other digital cinema broadcasts.

"I can see this sort of event becoming more popular," he said. "You can reach more people and spread it out geographically." ■

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What's New in Sound Debuts at AES 2003

New products abound at AV industry's quintessential audio show

by Brett Moss

NEW YORK

The last time the AES show was scheduled to be in New York, September 2001, the world was turned upside down. To the show organizers' credit, they managed to cobble together a show several months later in December. But it was a most somber show with many exhibitors, notably from the West Coast, choosing not to attend.

As of press time, things look to be much different and more optimistic for the 2003 show, Oct. 10–13, Jacob Javits Convention Center in Manhattan.

"We are excited to present this year's program of technical and special events," said Zoe Thrall, AES committee chair and GM of New York City recording studio, The Hit Factory. "Our convention committee has designed an extraordinary strong collection of events, drawing from the latest in audio technology."

BIG STUFF

Who says there is a downturn in the audio industry? Things must be looking up if the large number of new consoles is any indication.

Out of the Yamaha stable is the latest in the venerable PM family of FOH and monitor mixing consoles, the PM5000. The idea is to marry the industry-standard PM4000 with the digital performance of the PM1D.

In the studio console market, look for a new, dedicated surround sound mixing board from API. The Vision Surround Mixing Console is a 5.1 format with preamps, processing and other whatnot courtesy of API's 500 series modules. API is also bringing out the 8200, a mixer aimed at DAW users needing quality eight-channel input (courtesy of API 7800 master modules and 7600 channel strips).

Those in the broadcasting business and not at April's NAB will get their first real look at Solid State Logic's C100 and C200 boards. Also for broadcasters Calrec is demonstrating its new Hydra networking system. The system includes a mic preamp input module and is compatible with all Calrec consoles.

And in the spirit of treating the dear departed kindly, Fairlight is back and with new products. Besides upgrading its QDC operating system it will show a new, smaller workstation for the DREAM series, the Station PLUS.

IN THE BOX

If there is a "box" show it is AES. As usual, look for numerous new processors and mic preamps from established companies, boutiques and little guys just starting out.

Millennia Media has a new "Twin Topology" (tube and solid-state input paths) mic preamp/DI/parametric EQ all crammed into a very small, very busy box. It's called the TD-1 Twin Direct Recording System.

New from A Designs is an upgraded MP-2 preamp, the MP-2r (with more gain). Also from A Designs is an inline level controller aimed at controlling levels to desktop-powered speakers.

Moving from A to Z, Z-Systems has a new product, the z-Qualizer, a six-band digital parametric EQ. The z-Qualizer handles sample rates up to 192 kHz and has POW-r wordlength reduction.

"Eureka!" will be heard from the PreSonus booth. The new discovery there is the Eureka channel strip. Yamaha will bring to New York a new reverb, the SPX2000. This 24-bit, 96 kHz addition to the SPX offers a new REV-X reverb algorithm.

MIC ROUNDS

Besides offering the latest and coolest in new rackmounted toys, AES usually offers a nice selection of microphones—at all ends of the market.

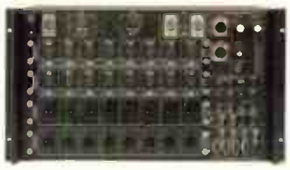
Anytime there is something new from Neumann it is worth a mention. The TLM 127 is a midpriced multipattern condenser with a high-pass filter. Another new Germanic studio mic is to be had from Dirk Brauner. The VMA Variable Pattern Tube Mic is just what it says it is along with the addition of a vocal emphasis switch. Still in Central Europe, Sennheiser offers new members of the Evolution family. The 900 series has three new mics: The E 935 and E 945 are vocal mics, and the E 903 is a snare/instrument mic.

Soundelux has chosen to continue the trend of resurrecting the golden oldies. The e49 is another variable pattern tube mic using the "kk47-style" large diaphragm. Hint, hint.

For your listening pleasure, ADAM Audio is offering a new ribbon-powered speaker. The S5V-A is a three-way model with a ribbon tweeter utilizing ADAM's Accelerated Ribbon Technology. The low end is pumped out with a 12.5-inch Hexacone woofer.

If you don't have powered speakers and are in need of a new amp, Hot House Pro Audio has the Models 400, 600 and 1000 available. Hot House's irrepressible Richard Rose promises big things from these hunks of iron.

And finally, in the miscellaneous category, Genex has a new remote (GXR948) and PC waveform audio editor (GXPC Edit) for its GX9000 and GX9048 high-end hard disk recorders. Besides picking up some Countryman mics for distribution, Shure has a new active antenna combiner for wireless microphone systems, PA821. And Neutrik has a new family of heavy-duty RCA connectors.



ADDER 162 and 882i

The heart and soul of any live set, the Adder 162 carries 32 mic/line audio, 6 intercom/IFB, and 4 duplex data and closures, all on one fiber conductor. Supports data for stats and scoring, courtesy audio feeds to the booth and commentator feeds to the truck. Further expand your capacity with the Adder 882i, which carries 10 intercom/IFB, 8 data and 4 closure signals in both directions.

SHED and HDX

Run your HD cameras on ordinary single-mode fiber, without the need for heavy, bulky hybrid cables. The SMPTE Hybrid Elimination Device (SHED) simplifies your infrastructure, while the HDX also supplies power to your HD field cameras.

VIPER II

Small throw-down modules are ideal to augment your production. POV links for NTSC and HD point-of-view cameras provide full duplex data for camera and PTZ control, plus genlock/tri-level sync return and power to the camera. Other links support NTSC/audio, SDI and HD distribution to all locations in the venue.

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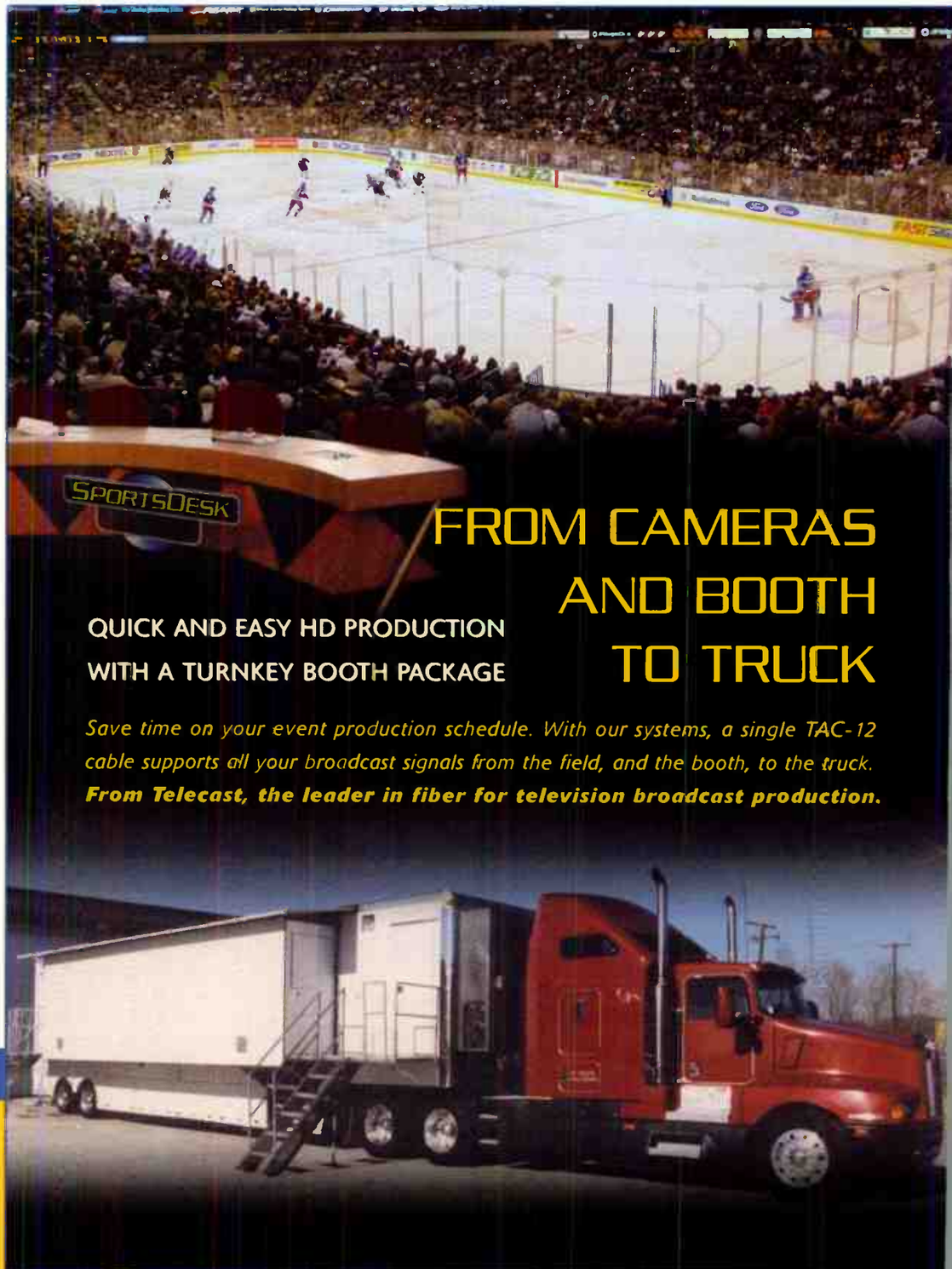
COPPERHEAD HD/SDI

Replace your triax backs and cumbersome base stations with this camera-mounted fiber transceiver, and turn your ENG camera into a remote production camera. Provides all your bidirectional signals, including HD/SDI/analog video, audio, genlock/tri-level sync, intercom, data control, return video, IFB, tally and PTZ over any distance.

DIAMONDBACK

This video mux is ideal for distributing monitor feeds to a booth, set, monitor wall or to other trucks. Uses only one fiber to transport 8 NTSC signals, with expansion to 64 videos per strand using CWDM. Or swap out any video channel for 16 audio circuits, using an Adder serial coax output.



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Mobile Units Bring Audio Onboard

Remote sound production evolves in digital video landscape

by Stephen Murphy

ARLINGTON, VA.

The historically delineated worlds of professional audio and video production have increasingly become intertwined. Nowhere is this trend more evident than in the remote broadcasting industry.

Mobile video units have been incorporating sophisticated audio facilities into formerly video-only remote trucks at an impressive rate. In addition, newly commissioned outside television broadcast units are frequently designed from the ground up with equal concern for audio and video.

A closely related trend in mobile broadcasting is the installation of smaller-footprint digital audio consoles that offer mix capabilities that far exceed their much-larger analog counterparts. Whether in integrated video/audio or audio-only mobile units, multiple-mix format digital consoles have all but replaced analog boards in remote broadcasting.

A quick scan of recently commissioned broadcast trucks provides a glimpse into the motivation behind integrated and improved audio for mobile-video production: Almost all the major trucks launched in the past year were designated as high-definition mobile production units.

As high-definition remote broadcast production increases, so too does the demand for high-quality multichannel audio to accompany the visuals.

SMALL IS BEAUTIFUL

Sony's popular small-format DMX-R100 digital console has found its way into a number of mobile audio-for-broadcast trucks. For independent A/V production companies such as UK-based Floating Earth, the 48-input DMX-R100 offers a high degree of mix and routing flexibility in a very small footprint at an affordable price point.

Floating Earth is known in England for its audiophile broadcast support of classical concerts. They have ensured high-quality audio transmission by placing the analog-to-digital audio conversion process at the stage end. Converted digital audio is sent to the Sony console via a custom fiber-optic link, eliminating long and noisy analog cable runs to the truck. The fiber link also makes it easy to send a multitrack feed to an archive recorder while the Sony board provides the live broadcast mix.

On this side of the pond, HDNet, the first all high-definition national television network, uses its two Sony DMX-R100-equipped HD mobile units to produce a variety of high-definition programming, including live sports coverage of NHL and Major League Soccer games, Division 1 college football and basketball, horse racing, boxing, CART auto racing and The Harlem Globetrotters.

NMT's new HD4 high-definition mobile unit houses an SSL MT Plus Digital Production Console.

"The Sony board provides the ideal package of inputs and outputs for the requirements of these two mobile units, combining excellent handling of 5.1 audio, built-in delay, compression and many other features. It has proven to be an excellent choice and very reliable," says Philip Garvin, co-founder and general manager of HDNet.

VERY SPORTING

High-definition broadcasts of sports and other live events are a major motivation behind the latest generation of HD-ready audio/video mobile rigs.

"High-definition broadcasting has already begun to redefine the way consumers watch programming, but where HDTV will have the biggest impact will be in sports and live entertainment," says Mark Howorth, CEO of New Jersy-based National Mobile Television (NMT).

Earlier this year, NMT, a leading provider of mobile high-definition television facilities, specified a Solid State Logic SSL MT Plus Digital Production Console for the company's fourth high-definition mobile unit, HD4.

The busy mobile production company currently provides facilities and services for more than 6,000 sporting, entertainment and other events per year. NMT's major broadcast clients include ABC Sports, CBS Sports, ESPN, Fox News, Fox Sports and The Madison Square Garden Network.

Chicago-based Trio Video recently installed a 48-fader, 88-channel Calrec Alpha 100 digital console in its new HD remote unit. The console is being fitted into a 53-foot long, 47-foot expando truck to be officially launched this December.

"We decided on the Alpha because of its architecture and ease of operation," said Carl Roszczybiuk, Trio's director of engineering.

The new HD unit will be Trio's fifth remote truck, and the first to feature a digital console.

"We have had great success with the [Calrec analog] S2 console, and look to the Alpha to broaden our appeal to our clients," says Trio co-owner Jack Walsh. Trio Video currently provides remote facilities and services for approximately 800 events per year, the majority of which are live sporting events.

Belgian mobile production company

Trio Video's X2 remote truck features a Calrec Series S2 analog console.

HDNet outfitted its HD truck with a Sony DMX-R100 digital audio console.

Outside Broadcast recently installed its second AMS Neve Libra Live digital console, this one going into its new high-definition broadcasting vehicle. The company's Unit 9 truck was commissioned to meet the growing demand for high-definition mobile broadcasting in Europe.

COMFORT ZONE

"Our reason for choosing the Libra Live is plain and simple: We are very satisfied with our Libra Live in Unit 8," said Frank Mosch, head of the sound division of Outside Broadcast. "We did look at other options, but there really aren't any other mixers with such flexibility and such a small footprint."

Euphonix consoles have enjoyed a high degree of success this year in the international mobile sports broadcast arena. The company's range of consoles—including its latest digital broadcast console, Max Air—were used for several high-profile sporting event remotes.

Seven Networks employed three Max Air digital mixing systems at the Australian Tennis Open to provide countrywide live broadcasts and feeds to 25 international broadcasters.

Television New Zealand's Moving Pictures outside broadcast division installed a 96-channel, 32-fader Max Air console in its latest mobile unit, which was promptly used to cover the New Zealand Golf Open.

"We were very comfortable with Euphonix because of our history with the CS console. It was time for us to make the change to all-digital audio and after checking out other consoles we settled on the Euphonix Max Air," said Eric Rudolphe, general manager of TVNZ Moving Pictures. "It has all the features we need, it's very powerful for its size and comes within our budget ... and the level of redundancy and backup is very reassuring when you consider the rigors of OB work."

Yamaha consoles also remain a popular choice in mobile video production. A 96-input Yamaha PM1D, is installed in Westbrook, Maine-based CSP Mobile Productions' Unit 6 truck. CSP, like most of the other video and audio production truck owners profiled, boasts a healthy list of major sports clients for its services, including ESPN, American Hockey League, National Basketball Association, Major League and World Cup Soccer and many others.

Driven by the increasingly voracious appetite for broadcast high-definition programming, "audio corners" are being expanded into full-fledged control rooms within the video-centric world of remote television broadcasting. The latest generation of digital consoles reduces the space and budget necessary to bring remote audio up to HD spec, and manufacturers of reliable, high-quality products recognize that happy end users tend to return when it is time once again to expand.

Stephen Murphy, contributing studio editor of Pro Audio Review, TV Technology's sister publication, is a multimedia producer and audio engineer/producer with Grammy-winning and platinum-selling credits.

HDTV Audio Challenges Non-Technies

Think it's easy to get 5.1 audio with your HDTV? Think again

by Frank Beacham

NEW YORK

For many consumers, the falling prices of HDTV displays are finally making it possible to build a serious home theater. Yet, for the nontechnical buyer, creating a well-integrated media room with state-of-the-art surround sound and simple control can be a daunting challenge.

A typical situation goes like this: The buyer purchases the HDTV set at a consumer electronics retailer, where he or she is assured how easy it will be to set up the TV with a sound system once it's home. Since most HD sets have no internal Dolby 5.1 sound system, the buyer usually gets a seemingly great deal from the store on a third-party surround system that includes a DVD player.

In reality, the dealer usually packages the lowest-cost DVD/surround audio system available in order to keep the overall system price down and to avoid HDTV sticker shock. (Some of these budget systems are now priced as low as $199 or even given away with the HDTV set purchase.)

The surprises start at installation time in the buyer's living room. The digital cable or satellite set-top box now must be connected to the HDTV display. This installation usually includes an outboard VCR and perhaps a standalone DVD player as well. (For this article, we'll overlook the difficulties of the video hookup and focus only on the audio side.)

The first "gotcha" is the bargain surround sound system has no digital input for 5.1 Dolby audio from the cable set-top box. Most are limited to analog audio inputs for outboard devices, even if the internal DVD player processes the full 5.1 surround.

Without a digital input for the set-top box, those HD movies and other premium surround programs will be delivered only in analog sound. Sadly, a large number of consumers—unaware they've been misled—accept the analog sound and never know they are missing one of the most compelling features of the HDTV experience.

For the nontechnical buyer, creating a well-integrated media room with state-of-the-art surround sound and simple control can be a daunting challenge.

CAVEAT EMPTOR!

We encountered this situation directly while helping a novice buyer after the initial sale of an HDTV projection system at a Circuit City retail electronics store in Las Vegas. A department manager argued that since the buyer had not directly specified *digital* Dolby 5.1 from the cable set-top box, he was not obligated to point out that omission.

After being challenged, he did, however, accept a return on the original sound system, but charged the buyer several hundred dollars more for a modest system that would accept a digital input from the cable box.

Consumers technically astute enough to demand a digital input on the sound system are often confronted with another problem. Since digital connectors are not standardized, the audio system may have a different type connection jack than the cable box. (For example, in New York City, Time Warner's digital cable boxes have a coaxial digital audio output, while Sony's line of "Dream" home theater audio systems use optical inputs.)

Steve Jordan, a New York City photographer, was forced to purchase an $80 adapter that would convert the S/PDIF coaxial digital audio connector on the back of his cable box to the TOSLINK optical connector on the back of his sound system.

Even after getting all the pieces to fit and work together, home theater buyers get another surprise. In Jordan's case, his system must be controlled with four different remote controls, creating a complexity level akin to flying a small airplane.

"After assembling a home theater system with several brands of equipment, I ended up with so many remote controls that sometimes I still can't remember how to do the simplest things," said Jordan.

To solve the problem, he purchased a sophisticated $200 programmable Sony remote control and vowed to create sequences of commands to simplify his system and to combine all functions on a single remote. After months, he still hasn't finished programming it.

"In order get to a simple, single remote control, I've had to navigate through a ridiculous level of complexity," he said.

Photo credit: CEA

DICTUM IGNORES AUDIO

Ironically, the much-publicized plug-and-play initiative for digital television devices recently endorsed by the FCC will not solve the audio problems many consumers are having with incompatible components. The new FCC-approved standards are mainly focused on interfacing video components with cable set-top boxes.

However, an emerging new technical standard could help tame the incompatibility beast. HDMI (for High-Definition Multimedia Interface) is an uncompressed, all-digital audio/video interface that provides an easy connection between any A/V source, such as a set-top box, DVD player, and A/V receiver and an audio and/or video monitor, such as a digital television set.

HDMI supports standard, enhanced, or high-definition video, plus multichannel digital audio on a single cable. It transmits all ATSC HDTV standards and supports eight-channel digital

HDTV, PAGE 31

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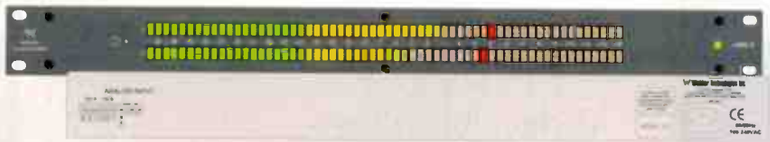

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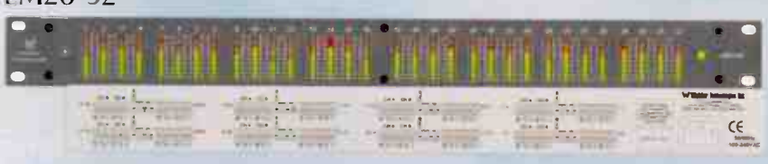

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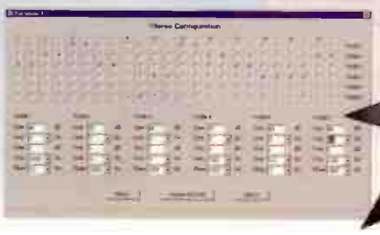

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HDTV

CONTINUED FROM PAGE 26

audio, with bandwidth to spare to accommodate future enhancements and requirements.

The new standard is backed by consumer electronics manufacturers such as Hitachi, Matsushita (Panasonic), Philips, Sony, Thomson (RCA), Toshiba and Silicon Image. The first products using the HDMI standard are expected to hit the market this fall.

However, some manufacturers are focusing on integrated home theater control in their current products. A leader in this area is Bose Corp., a company known for products with an emphasis on user-friendly controls. In its Lifestyle 28 ($2,499) and Lifestyle 35 ($2,999) home theater systems, Bose has created simple remote controls that mimic human logic through very sophisticated software.

During installation of one of the new Bose systems, the consumer tells the operating software the brand name of each component used in the home theater. From this point, the Bose remote control applies logic following the pressing of each button, automatically predicting the desire of the user. In most cases, the remote correctly guesses the proper function.

However, Bill Allen, technical marketing manager for Bose's Lifestyle home theater systems, said manufacturers can go only so far in simplifying setup and operation without more advanced interoperability standards between the various brands of equipment. Initiatives like HDMI, he said, could help.

"If everybody used it, we might have a more level playing field," Allen said. "Right now, the challenge is to find somebody to make sense of this stuff until a standard emerges that is encompassing enough. But a standard hasn't succeeded yet, and now there is an alphabet soup of connectors, there are competing formats, and there are manufacturers who want their remotes to be the only one you use."

Another problem is aggressive consumer electronics retailers selling uninformed consumers packaged home theater systems that will not perform as promised.

"You get what you pay for. Often when you try to do things on the cheap, you find there aren't really any bargains," said Allen, who noted that his company doesn't manufacture very low-end systems because their features are inadequate for a good consumer experience.

The path to digital television has been a long and rocky one. But now that the cost of HDTV television sets are falling and HD program sources are increasing, consumers are beginning to sample the product.

The question remains, however, whether a manufacturing community that never quite mastered the art of making a simple timer for the VCR can create a truly plug-and-play home theater as simple to install and operate as a conventional analog TV set.

Another problem is aggressive consumer electronics retailers selling uninformed consumers packaged home theater systems that will not perform as promised.

Audio From Analog to Digital HD

Broadcasters cite challenges in getting digital audio through transmission plant

by Dave Moulton

GROTON, MASS.

A recent informal survey of some broadcast audio professionals paints a fairly bright picture for the state of TV audio as we continue the move into our brave new digital world. The benefits of digital audio, (dynamic range, bandwidth, easy signal handling and reduced cost) are really having an effect. Setting aside the questions relating to surround sound production, a number of good things have happened to audio over the past several years.

"Our field acquisition has gotten a lot better," says Dave Gardiner, audio engineer at WCVB-TV (the ABC affiliate in Boston). "Thanks to better RF mics and a digital videotape format in the field, the audio we're getting back at the station is much cleaner now than it used to be. There's simply less distortion. Some limiting, de-essing and a little conservative console EQ seems to do well for us wherever the body of the program is assembled. Also, the processing in our transmission chain has been simplified as well. We use some soft compression and slow-leveling set at a fairly high threshold, just to keep overall station program levels pretty consistent. Then it's straight to the converters for digital transmission. There's some additional processing for the analog transmitter, to meet FCC legal requirements. HDTV has no additional processing."

Similar sentiments are expressed by Jim Starzynski, principal engineer for NBC commenting about WNBC-4 in New York.

"The analog audio signal we send over-the-air and to our cable audience has a minimal amount of audio processing applied to it," he said. "It's really pretty simple. Audio for the network is transferred, recorded or dubbed with little or no dynamic-range compression. This full-bandwidth signal travels on digital routers and enters our East Coast hub control room for switching, and from there goes to WNBC master control. The output of master control has a compressor/limiter that is set only to protect the STL for overload. Considering the STL is digital, the dynamic range stays mostly intact ... Proper gain structure, attention to relative levels and improved dynamic range of critical paths has moved us away from a 'one-size-fits-all' processor and the audible artifacts that may have accompanied that technique."

HD ADDS COMPLICATIONS

Jim goes on to note that for digital TV, things are different.

"For HDTV, we still need to consider perceived loudness and the processing necessary to achieve it," he said. "This can be done conventionally or with dialog normalization (dialnorm) and dynamic-range capabilities (DRC) if they can be established and maintained in the signal path."

Bob Dixon, manager of sound design for NBC's coverage of the Olympic Games, has similar good feelings about audio—in production and on its way out to the affiliates. He does have concerns, however, about what is happening at the set-top box on the viewer's television, mainly due to its effect on, and implementation of, metadata.

"Cable companies have the ability to over-ride metadata, but mostly they leave it alone," he said. "However, it may not always be set correctly, particularly dialnorm, and so levels may be all over the place."

Dave Gardiner concurs with this, saying that dialnorm settings, while not complex at this stage of digital TV, are important to watch when transitioning from local-to-network programming.

There are several interesting aspects to this. First, as Dolby notes in the manual for its Model 569 Multichannel Audio Encoder, this "requires the producer to correctly set the metadata parameters because they affect important aspects of the audio—and can seriously compromise the final product if set improperly."

The audio program/metadata pair goes to the Dolby Digital transmission encoder, which applies the data to the appropriate stream.

Dolby provides an example: "In a broadcast truck parked outside a football stadium, the program mixer chooses the appropriate metadata for the audio program being created. The resulting audio program, together with metadata, is encoded as Dolby E ... and sent to the TV station ... At the receiving end ... the Dolby E stream is decoded back to audio and metadata. The audio is monitored and the metadata is altered or re-created as other elements of the program are added ... This audio/metadata is re-encoded as Dolby E, leaves the post production studio and [is sent] to Master Control, where many incoming Dolby E streams are decoded back to their audio/metadata programs. The audio program/metadata pair that is selected to air is sent to the transmission Dolby Digital encoder, which encodes the program according to the metadata stream associated with it, simplifying transmission. Finally, the Dolby Digi-

tal signal is decoded in the consumer's home, with the metadata providing the information for that decoding process."

What is of interest here is that the metadata can be manipulated at (at least) three separate points in the transmission chain. As Dolby indicated, it needs to be set correctly at each of those points.

EQUALIZING THE VOLUME

To make matters more complex, the behavior of the set-top box with regard to metadata is different at each of the box's outputs. Additionally, the dialnorm level also serves as the threshold setting for Dynamic Range Control. This means that if dialnorm is incorrectly set, then DRC settings will be off as well, usually resulting in heavy limiting.

Michael Guthrie, a national account manager for Harmonic, Inc. and an encoding expert, has been studying this issue, and has found that levels are diverging as we bring metadata on line. Presently, channels may vary as widely as +/- 15 dB.

"Many engineers just leave dialnorm at the default level of -31 dBFS. If the level decoded is -20 dBFS then the audio will be 11 dB hotter, and over threshold for Dynamic Range Control," Guthrie said. "Ideally, the viewer should always hear dialog at the same level. The -31 dBFS target for dialog level allows for the other program elements to have enough dynamic range to allow for full artistic expression. The DRC circuits are there to reduce this dynamic range when it's inappropriate.

Gutrie says this makes sense if you consider that most viewers are going to set the dialog SPL to between 60 and 70 dB (SPL). Sound effects and music then have 31 dB of range above this, leading to an absolute maximum SPL of 90 dB to 100 dB in the room.

"These are the levels if DRC is not utilized, typical of a Dolby Digital Surround System," he adds. "Set-top boxes that use RF or RCA stereo outputs, or self-contained sets, typically use the DRC circuitry, reducing the peak levels, hence the dynamic range. The RF output would be heavily limited if the full range were used, while the stereo output would receive less limiting. In all cases, the dialog level is untouched *if and only if* the broadcaster's dialnorm setting matches its actual dialog level. Broadcasters have to satisfy two sets of needs, broadcasting with and without metadata. Both conditions have to work. It's kind of like stereo/mono compatibility."

Guthrie said he believed that levels from different broadcasters will converge again, *if* the industry can get a handle on metadata, and the cable companies begin to offer some feedback about the relative levels they are receiving, so broadcasters can adjust toward the norm.

From Jim Starzynski's viewpoint, if a complete metadata path is unavailable, perceived loudness is handled very similarly to BTS/NTSC.

"A limiter/compressor should be used to establish competitive and effective station sound that creates even loudness with adjacent stations and smoothens transitions from programs to commercials ... If a metadata path exists from the origin of the audio all the way to transmission, the creative staff can set those parameters and as long as the metadata path stays intact, the audience will receive those same settings at their AC-3 decoder," he said.

"Either of these systems will work. Using the complete head-to-toe metadata path ensures the creative choices made by production carries through to the audience. The DTV audio system was designed with this in mind. In its absence, a broadcaster relies on either conventional NTSC practices or uses DTV audio encoder values communicated by the creative staff. If neither of these practices are possible, a fall-back to generic values can be substituted that yields satisfactory results." ■

Miking and Mixing 5.1 for Football

The fine art of surround sound gets a workout on the gridiron

by Mary C. Gruszka

NEW YORK

The big news for NFL DTV fans this season is that all three of the networks that carry the league—ABC, CBS, and Fox—are producing key games in 5.1 surround sound audio.

The audio mixers and engineers who create the sound of NFL are writing the book on how to create an exciting 5.1 mix and, at the same time, produce compatible mono, stereo, and Dolby Pro Logic feeds in an intense and often chaotic live environment. Through experience and experimentation, week after week, they create the methods and processes that help to immerse the DTV viewer in the thrill of the game.

TV Technology caught up with two NFL audio mixers, Fred Aldous, an audio consultant and senior mixer for Fox Sports, and Wendel Stevens, senior audio mixer on ABC Monday Night Football, for insight as to how they mic and mix the NFL games for 5.1 surround.

"It's very exciting that audio is being recognized," Aldous said.

Aldous works the marquee games for Fox in NEP's Supershooter 18 truck outfitted with a Calrec Q2 analog audio console. These games are shot in widescreen 480p.

Stevens mixes the 720p production of "ABC Monday Night Football" in NMT's HD-4 truck on an SSL MT Plus digital board.

HOT DOGS AND BEER

Surround sound gives the audio mixer the ability to set the viewer in a particular setting, but where? Although both mixers are still experimenting with perspective on a weekly basis, they, for the most part, set the TV viewer in the stands like a fan attending the game.

"I'm creating a stadium crowd that is 360 degrees around, with the sound from the [playing] field in front," Aldous said. "If you are sitting in the stands, that is what happens."

Stevens describes the aural setting he creates from the perspective "of a fan watching football from the 50-yard line about half way up and enjoying his hot dog and beer."

A different perspective can situate the viewer right in the field of play, with the offensive line in front and the rest of the field behind, an approach taken in many football movies. Aldous and Stevens say they've used both perspectives at various times during a game.

Both Stevens and Aldous go for the big, full, enveloping crowd feel in their mic-ing techniques.

Stevens places two sets of Sennheiser ME64 short cardioid shotgun mics in an X-Y stereo pair near the 50-yard line, on either side of the field, to pick up the crowd roar. Each mic pair faces the playing field, capturing the crowd on the far side.

"This blurs the crowd and the PA [public address system]," Stevens noted.

Stevens complements the crowd mic pairs with an X-Y pair of Sennheiser ME64s mounted on a pole at the top of the stadium for the rear channel.

"We're six stories up and get a little bounce from the PA and pick up the big roar of the crowd," he said.

Aldous mics the crowd with two pairs of DPA 4023 cardioid microphones, each set positioned in a stereo X-Y configuration on opposite 25-yard lines, facing the field.

"You don't want to get the one guy yelling," Aldous said. "You want more of an open feel to capture the size and depth of the stadium."

Aldous also hangs an additional crowd mic pair, DPA 4006s, from the announce booth in an A-B configuration, spaced about 6-8 feet apart. Aldous refers to these as "spot mics," which he mixes to the front and rear speakers, usually more towards the rear, to better achieve the feeling of being in the stands.

SNAP OF THE BALL

The grunts and grinds of the playing field are captured by a combination of parabola and camera mics. But both Aldous and Stevens agree that it's the umpire mic that's key to creating the "you-are-there" feel to the game.

"It's the most important mic for putting the viewer on the field," Aldous said. "The NFL allows us to put a live mic on the umpire, who stands behind the defensive line, to pick up the cadence of the quarterback and to hear the realignment of the defensive line as they see how the offensive line unfolds."

The NFL controls this mic and allows it to be on from the time that the offensive huddle breaks to three seconds beyond the snap of the ball.

Aldous uses a single DPA 4061 lavalier mini mic with a Sennheiser SK250 transmitter. The mic signal is sent to an Orban 345 stereo synthesizer to give left-right perspective and front-rear depth, depending on how it's mixed in the console.

Stevens puts two mics on the umpire, Sennheiser ME104s, "to get a stereo ambience from the field of play. As soon as the ball is snapped, we go to the parabolas."

For "ABC Monday Night Football," field effects are handled by six wireless parabolas, each containing a Sennheiser ME-64 short shotgun, and 12 camera mics. Each camera has a Sennheiser 816 or 416 mounted on it.

For Fox, Aldous employs four wireless parabolas with Neumann KM183 mics each with a Sennheiser SK250 transmitter. Field level cameras are outfitted with Sennheiser MKH70 shotguns, and each of the two POV cameras utilizes a Sennheiser 416 mic.

Fox Sports senior audio mixer, Fred Aldous, at a Calrec Q2 in NEP's SS-18.

PUTTING IT TOGETHER

With everything going on in the audio control room, bringing in sound effects from DigiCarts, tracking VTRs, riding gain on announcers, plus listening for cues from the director, producer or AD, Stevens and Aldous rely on sub-mixers for a portion of the mix.

Paul Niesen sub-mixes the parabola microphones on the Fox games that Aldous works on. In charge of the RF gear, parabs, and roving reporters, Niesen "monitors the parabola operators and positions them for the best sound possible," Aldous said.

Stan Johnson works with Stevens to handle the camera and parabola mic sub-mixes. In the truck, Stevens arranges his mixes in groups—announcers, music, parabolas, delayed mics, umpire, crowd, tape machines and the like.

"I've established rules for each of the groups," Stevens explained. For example, the announcer group is 100 percent in the center, the field effects are panned left and right 100 percent with none in the center but a little, maybe 15 percent to 20 percent, in the rear. Music is panned left and right.

A big challenge Stevens faced was audio delays.

"When we are in HD and not all of the sources are in HD, there are lip sync and time delay issues [due to the upconversion process]," Stevens said.

ABC also uses the "1st and Ten" yellow line effect upstream of the video feed, which also causes a video delay.

"So we need to delay the audio for the mics for certain cameras and not others," Stevens said. "When we cut the entertainment piece, we knock the cameras into real time, take the delay out, and the "1st and Ten" guy goes into bypass."

Aldous sets up the announcers to the center channel only, music in front left and right with a little fed to the rear.

"With the sound effects, the rushes and swooshes, I try to make them 360 degrees to make them feel like a video arcade game," Aldous said.

Both Aldous and Stevens are responsible for all of the audio mixes from their respective consoles, not just the 5.1 mix. That means they closely monitor for stereo, mono, and Pro Logic compatibility.

As Aldous explained, "If you are doing only one format like 5.1, you can mix extremely aggressively to the rear as well as to the front. But you have to compromise in doing all the formats together; otherwise the stereo and mono can sound unpleasant to the listener. That's why I tend to mix conservatively in the front, since that's where the visual is." ■

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RF TECHNOLOGY

Doug Lung

FCC Bulletin OET-69 Limitations

In my work, I'm often asked to do TV coverage studies based on Longley-Rice. With the wide availability of software for Longley-Rice coverage studies, including the free software I described last month, this would seem like a simple task. In reality, it isn't because the FCC database used for FCC Bulletin OET-69 interference studies does not include TV stations' real antenna patterns. Use of the default OET-69 elevation pattern can lead to large errors, especially for LPTV stations. The FCC has recognized the limitations in Longley-Rice and is addressing it as it related to LPTV stations in a recent Notice of Proposed Rule Making. This month I'll describe the limitations of the OET-69 implementation of Longley-Rice and offer two ideas on how antenna elevation pattern data could be depicted in the FCC database, making it possible to do more accurate Longley-Rice coverage and interference studies.

One of the major limitations in the FCC OET Bulletin 69 Longley-Rice analysis is the use of a standard elevation pattern for all transmitting antennas. Table 8 from OET-69 is shown here. You will notice that at 2 degrees down tilt, the assumed relative field for an analog UHF antenna is 0.502, which is approximately 25-percent power. Many TV stations located on high mountain-top sites put the main beam of the signal at 2 degrees or more below horizontal, using electrical or mechanical beam tilt, with much less energy at 0.75 degrees down.

The impact of this on OET-69 calculated field strengths should be obvious. Using the default antenna pattern, at an antenna height of 800 meters above average terrain (HAAT), the main beam will hit the ground over 100 km from the tower site. However, with 2 degrees of down tilt, the main beam will be only 23 km from the tower site. A quick look at the FCC TV engineering database showed 99 analog TV licenses with an HAAT of 800 meters or more. Nineteen of these show electrical beam tilts of 2 degrees or more.

ANGLE, Degrees	Gain in Vertical Plane, Relative Field Strength				
	Low VHF Analog and DTV	High VHF		UHF	
		Analog	DTV	Analog	DTV
0.75	1.000	1.000	1.000	1.000	1.000
1.50	1.000	0.950	0.970	0.740	0.880
2.00	0.990	0.860	0.940	0.520	0.690
2.50	0.980	0.730	0.890	0.330	0.460
3.00	0.970	0.600	0.820	0.220	0.260
3.50	0.950	0.470	0.730	0.170	0.235
4.00	0.930	0.370	0.650	0.150	0.210
5.00	0.880	0.370	0.470	0.130	0.200
6.00	0.820	0.370	0.330	0.110	0.150
7.00	0.740	0.370	0.280	0.110	0.150
8.00	0.637	0.310	0.280	0.110	0.150
9.00	0.570	0.220	0.280	0.110	0.150
10.00	0.480	0.170	0.250	0.110	0.150

Table 8 from OET-69

How does this affect interference analysis? FCC OET Bulletin 69 uses the desired-to-undesired signal ratio to determine whether the population in a cell is considered to receive service or not. If the signal levels at greater distances from the transmitter site are calculated to be higher than they actually will be when extra beam tilt is used, other stations will be allowed to put more signal into these cells. With the wrong ratio, an OET-69 study could show no interference when interference actually would result. Looking at it from the other side, studies will show the station with additional beam tilt would cause more interference at this greater distance than it actually will.

If you have looked at UHF transmitting antenna patterns, you will see stations at high elevations use additional null fill to provide stronger signals close to the transmitter site. The differences in null fill are not accounted for in OET-69. DTV stations starting out with low power or with limits on power due to their allocation may opt for smaller, lower gain antennas. These antennas may have a down tilt of 0.75 degrees, but will have a much wider elevation pattern, resulting in stronger signal than those predicted on either side of the main elevation beam.

How bad is the problem for full power DTV stations? Based on the Aug. 29, 2003 FCC CDBS, out of 352 licensed UHF DTV stations, 114 had electrical beam tilt of more than 0.75 degrees, but only 26 used beam tilt of more than 1 degree. Using a standard elevation pattern greatly simplifies interference studies. Many interference studies, especially in congested areas, can involve calculating field strength for fifty or more stations. If a custom elevation pattern was used for each of these, both data entry time and, depending on resolution, calculation time could be excessive. Given the small percentage of stations with large amounts of electrical beam tilt, use of a standard pattern like Table 8 may be acceptable.

LPTV stations, however, are likely to use a much wider range of antenna elevation patterns. Antennas can range from Yagis and 4 dipole panels to 32 element slot antennas. Applying the elevation pattern from Table 8 to these stations is likely to lead to significant errors when calculating interference.

NEW LONGLEY-RICE INTERFERENCE MODEL FOR LPTV

The standard method for calculating interference to and from analog LPTV stations uses FCC contours, although interference waivers can be requested based on a Longley-Rice showing. In the DTV LPTV NPRM, the FCC considers adopting a contour approach for DTV LPTV, but states, "The DTV methods provide more comprehensive, accurate and realistic analyses than the contour protection method currently used for the LPTV service. Given these advantages and the DTV model's widespread use, we are inclined to prefer the DTV methodology over the contour protection method as the basis for accepting digital LPTV and TV translator applications."

This, of course, raises the question of what antenna pattern to use. The FCC NPRM summarizes it this way: Typically, LPTV and TV translator stations use transmitting antennas with less gain and more beam tilt because such antennas are less expensive, smaller and lighter, and transmit a larger proportion of the stations' limited power downward toward the close-in locations these stations want to serve. These antennas generally have broader vertical radiation attenuation characteristics than the values given in Table 8 (i.e., numerically larger relative field strengths for the corre-

OET-69, PAGE 39

SUITEVIEW

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INSIDE AUDIO **Dave Moulton**

Film vs. Music

As you all know, 5.1 surround sound calls for a center loudspeaker, placed dead ahead of us, midway between the left and right loudspeakers. Left and right are supposed to be in their traditional positions, 30 degrees off the center axis on either side of the median plane, just like in stereo.

As you also know, this setup evolved from cinema practice, where a mono center channel behind the screen provides dialog and on-screen FX, while left and right provide a stereo music score and off-screen FX, with both stereo and mono components. However, the integration of this practice into home theater and surround music systems has been troubled and uneven, for various reasons.

At the center of this is the desire (some might say need) for the home theater system to also play back music, or as viewed from the opposite end of things, be able to use a high-quality music listening system to reproduce TV sound. This is called convergence, which is the integration of various separate modalities into a single, all-encompassing modality. Convergence is at the center of digital system benefits, in that it reduces costs while increasing the capacity and versatility of a system.

In any case, music and film are quite different from a production standpoint, and a one-system-plays-all modality has to serve multiple sets of needs, often simultaneously.

Dave Moulton's standard front 3-channel monitor array, using wide-dispersion prototypes.

WHY IDENTICAL SPEAKERS?

The issue here has to do with the choice of a suitable center speaker to fit in the playback array. Because we have a television directly in front of us, a loudspeaker that is identical to the left and right ones, right in front of it, may not be suitable. Also, the TV has its own speakers. Why not use it then?

If all we're doing is watching video, that solution will be viable, if not great. As noted above, production convention drops mono dialogue into the center channel and leaves all the stereo stuff to left and right and the surround channels. However, that kind of screws up the idea of convergence... and here's where we get down to it: One of the conditions for *any* multichannel loudspeaker array that is going to generate phantom images (i.e., have stereo components) is that the speakers involved must be essentially identical in order to successfully generate those phantoms. Any pair (or more) of speakers involved in carrying stereophonic information need to be close to identical in order to be able to generate convincing phantom images and ambiences.

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OET-69

CONTINUED FROM PAGE 36

sponding vertical angles, particularly for UHF antennas). Further, TV translator stations are typically sited at high elevations (hills or mountain slopes) and commonly employ electrical antenna beam tilt or combinations of mechanical and electrical tilt to maximize their signal down into the served communities."

The NPRM said one way to account for this variability would be to incorporate antenna beam tilt into an LPTV implementation of OET Bulletin 69. This would solve the beam-tilt problem, but would not catch the differences in elevation pattern beamwidth.

A SIMPLE, ACCURATE DESCRIPTION OF ELEVATION PATTERNS

It seems to me the best approach would be to incorporate more accurate antenna elevation pattern data into the FCC database. I see two ways to accomplish this—one easy and one hard.

Antenna elevation gain and elevation pattern beamwidth are directly related. With two numbers— antenna elevation gain and beam tilt—the elevation pattern of the transmitting antenna could be characterized much more accurately than with the OET-69 Table 8 values. This approach does not describe side lobe response, but neither does Table 8. Null fill is not included directly, but since null fill reduces elevation gain it would fatten the pattern. With this data, it would be easy to include the effect of mechanical beam tilt after the untilted elevation pattern was calculated. Elevation gain is readily available for most antennas and should be easy to add to the FCC antenna database. In some cases, it can be assumed from the antenna model number.

My second alternative is a bit more complex and would be more difficult to implement, but it would also be more accurate since it would catch the side lobes and null fill. I suggest a somewhat larger database for each antenna that would include the amplitude and elevation angle for each maxima and minima between 0 and 10 degrees (or 0.75 and 10 degrees to match Table 8) and the points half way between each maxima and minima. For some low-gain antennas, there would only be three points, although the number of data points would increase substantially with higher gain antennas and may become unwieldy at some point.

CALCULATING FIELD STRENGTH FROM RECEIVED SIGNAL LEVEL

I'm often asked how field strength in microvolts per meter is related to received signal power or voltage from an antenna. I described how to calculate this in this column several years (available on my FTP site at *ftp://ftp.transmitter.com/pub/RF_Columns/rf-9309.txt*).

I've taken the formulas and put them into a spreadsheet you can download from my Web site. I didn't have room to add this to my list of tools and software last month. Fig. 1 shows the layout of the spreadsheet. Here's a description of how to use it.

	A	B
1	**FIELD STRENGTH CALCULATOR**	
2		
3	**Define Parameters:**	
4	Frequency Mhz	600.0
5	Antenna gain (dBd)	10.0
6	Line loss	0.0
7	Impedance	75.0
8		
9	**Convert Field Strength to dBmW:**	
10		
11	***Measured Field Strength (dBuV/m) =***	74.000
12		
13	Field Strength (uV/m)	5011.872
14	Dipole output (uV)=	398.832
15	Dipole output (dBuV)=	52.016
16	Ant output w/ gain& loss (dBuV)=	62.016
17	**dBmW =**	**-46.735**
18		
19		
20	**Convert dBmW to Field Strength**	
21		
22	***Measured dBmW =***	-47.000
23		
24	Ant output w/ gain& loss (dBuV)=	61.751
25	Dipole output w/o gain&loss (dBuv)	51.751
26	Dipole output (uV)=	386.839
27	Field Strength (uV/m)	4861.166
28	**Field Strength (dBuV/m) =**	**73.735**
29		
30		
31	**Convert dBmV to Field Strength**	
32		
33	***Measured dBmV =***	32.000
34		
35	Ant output w/ gain& loss (dBuV)=	62.000
36	Dipole output w/o gain&loss (dBuv)	52.000
37	Dipole output (uV)=	398.107
38	Field Strength (uV/m)	5002.762
39	**Field Strength (dBuV/m) =**	**73.984**

Fig. 1

When converting field strength in microvolts per meters to a received power or voltage level, the frequency of the signal and the gain and impedance of the antenna have to be included in the calculation. Enter this data in cells B4 through B7. Note that I've also included space to enter line loss in B6.

To convert from field strength to power and voltage, enter the field strength in dB over 1 microvolt per meter in cell B11 and read the result in cell B17. If you know the received power in dB above 1 mw, such as you would read from a spectrum analyzer, enter that number in cell B22 and read the calculated field strength in B28. The last table can be used to convert dB above one millivolt, as often found on field strength meters, to field strength in dB above one microvolt per meter. I hope you find it useful! Note that if you don't change the antenna or frequency, the dB difference between the field strength and received power will remain constant. If you have a lot of data to convert for one channel and one antenna, work out the conversion factor once and simply add it to all the readings.

Your comments are always welcome. Drop me a note at *dlung@transmitter.com*.

Photo: Steve Jordan

NET SOUP **Frank Beacham**

'Leaky Documents': A Dangerous Internet Trap

Did you know that when you exchange common Microsoft Word files over the Internet that you may be revealing hidden information from your computer?

Ask Alistair Campbell, British Prime Minister Tony Blair's former top communications aide. He released a file from the Downing Street press office to the House of Commons Foreign Affairs Select Committee investigating the genesis of a plagiarized document involving government justifications for the Iraq war.

The Microsoft Word document, without Campbell's knowledge, revealed the names of the four civil servants who worked on it. Campbell recently resigned his powerful post, and the British government now releases official documents only in Adobe's secure PDF format.

In a surprising report from the BBC, we ordinary computer users recently learned that the most common word processing documents generated on the most common word processing application—Microsoft Word—are not necessarily what we think they are. What you see on the screen or the printed page is not exactly what you get.

There is a function in all post-1997 versions of Microsoft Word, Excel and PowerPoint in which fragments of data from other files you deleted or were working on at the same time can be hidden in any document you save. With the right viewing software, this hidden data (Microsoft calls it "metadata") can easily be read by anyone who obtains the document file.

Computer researcher Simon Byers, the BBC reported, conducted a random survey of 100,000 Microsoft Word documents available from Web sites on the Internet. He found that every single one of them had hidden information.

In his research, Byers learned that about half the documents had up to 50 hidden words and a third up to 500 hidden words. Ten percent of the documents had more than 500 words concealed within them.

The hidden text often revealed the names of the document's authors, their relationship to each other, earlier versions of the text, and information about the internal network through which the document traveled. Occasionally, documents revealed very personal information such as social security numbers.

PRIVACY ISSUE

Byers said the problem of leaky Microsoft Word documents is "pervasive" and wrote that anyone worried about losing personal information should consider using a different word processing program. Alternatively, he recommends using utility programs that can scrub information from Word documents.

In informal conversations with colleagues and friends, I was surprised to hear my most computer-literate acquaintances say that they were fully aware of how Microsoft buries metadata in documents, but had never considered it a security risk. Non-technical users of Microsoft Word, however, were outraged and surprised, considering the phenomenon a huge privacy issue that needed wide public exposure.

The issue certainly caught the Washington, D.C. police department by surprise. During the widely publicized hunt for the Washington sniper the department allowed "The Washington Post" to publish a letter sent to the police that unintentionally included names and telephone numbers buried in the document file.

"The time when most information tends to leak is when you are using a document that has a number of revisions or a number of people working on it," said Nick Spenceley, founder of the computer forensics firm, Inforenz, in a BBC interview.

One way to protect against the hidden data issue is to send electronic documents only as Portable Document Format (PDF) files, advised Spenceley. "I'm not sure many people check Word documents before they go out or are published," he said.

There are a growing number of privacy horror stories with Word. Spenceley said he knows of a case in which someone found previous versions of an employment contract buried in the Word copy he was sent. Reading the hidden extras gave the person applying for the job a big advantage during negotiations.

WHO'S RESPONSIBLE?

It's perhaps no surprise that Microsoft doesn't see leaky documents as a security problem, but as a feature that its customers are responsible for using correctly. "Microsoft is aware of the functionality of metadata being stored within Word 97 documents and would advise users to follow the instructions laid out in the Microsoft Knowledge Base (see URL below)," a Microsoft PR spokesperson said. "However, Microsoft does not wish to comment on how customers use the functionality within our software."

One certain way to ensure document security and save considerable money is to avoid using Microsoft Word's default format to save documents. For most common documents, one can use Word or virtually any other word processor to save documents in the universal rich text format (RTF). Any modern word processor on any type of

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Inside Audio

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HOW IS THE CENTER SPEAKER USED IN STEREO AND SURROUND?

I've been working with a center channel since 1995, and until recently I've had no luck adapting it to the playback of stereo recordings. This is to say that I haven't been able to play back stereo recordings successfully with the center channel added. More about that in a minute.

However, when I make a surround music recording, and actually deploy a center-channel microphone in the recording space, the center becomes a compelling contributor to surround recording. I really like what it does. And I'm not alone in this. Several goodnesses accrue:

- The frontal soundstage is much more stable with a center channel present;
- The bass response is much more solid and palpable;
- The centered sounds, emitting from a real source, are much more compelling, solid and lifelike.

These things are generally true for all modalities, to the extent that stereophonic techniques are in use.

WHAT ARE THE PROBLEMS?

The basic problem is simple. If we try to add a center channel to any two-channel stereophonic mix, we have two possible techniques. First, we can take a mono sum of L & R and feed it to the center. Second, we can use a steering mechanism, wherein we use a detector and whenever L/R becomes strongly correlated, we feed it to the center, and when L & R are NOT strongly correlated, we leave the center off (this is, in a simple sense, what Dolby Pro Logic and other matrixing schemes do).

With the former, the stereo collapses. If the center speaker is audible, the stereo becomes about 30 degrees wide, in total (L and R collapse as phantoms to midway between L/Center and R/Center).

With the latter technique, the steering becomes quite audible and often annoying in complex stereo signals that have components that are highly correlated occurring simultaneously with components that aren't.

As a consequence, added to the uncertainty that end-users' playback systems will have identical center speakers (to say nothing of *good* center speakers), surround music producers tend to avoid the center speaker. It loses out by default.

ISSUES ARISING FROM BANFF

I'd been treating this state of affairs as "the way it is" and simply not worried about it until I attended the AES Multichannel Conference in Banff this past June. There, after listening to Tom Holman's excellent 10.2 surround system, and keeping the capabilities of wide-dispersion loudspeakers in mind, I got to thinking; would it be possible, I wondered, to improve on the current surround topology (5.1) in a way that didn't involve changing our current production methods, that would work really well with stereo and would work for film as well or better as the present system?

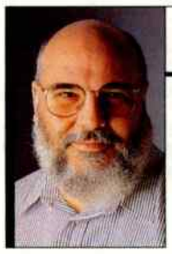
Tom Holman's 10.2 array uses eight speakers in a horizontal array, with a center front, L/R at 30 degrees, L/R at 60 degrees, Ls/Rs at 110 degrees and center rear. One of the points he made was that the 60-degree L/R speakers really filled in on the sides, so that when we hear phantoms between them and the surrounds, they come pretty clearly from 90 degrees (or thereabouts). I wondered what would happen if we made Left and Right at default angles of +/- 60 degrees? Better yet, suppose we made the five-channel array a pure pentagon, with all of the speakers placed 72 degrees apart. What would happen?

Well, when I got home from Banff, I decided to reconfigure my main system just to see what would happen. Next month I'll tell you what I found. It's actually pretty interesting.

Thanks for listening.

Dave Moulton is trying to stay centered. You can complain to him about anything at his Web site, www.moultonlabs.com.

PRODUCTS & SERVICES SHOWCASE



LET THERE BE LIGHTING

Andy Ciddor

Moving Right Along...

One sure sight that remote-controlled, motorized lighting has just about made it into the mainstream is its most recent name change.

Initially sold to us as "intelligent" and "automated" fixtures by marketing people who clearly had never done battle with them on a production, the current, less grandiose, but more realistic title of "moving light," seems to be an acceptance of their place in the world.

Simply put, these are luminaires that move, usually when we tell them to, and most particularly, when we have a sound reason for making the move.

THE GENESIS OF MOVING LIGHTS

The precursor of today's moving lights was the Vari-Lite VL1, the first 50 of which wowed the world, when they toured with the rock band Genesis on their Abacab tour in 1981. These moving lights were neither intelligent, particularly obedient nor very reliable. They required a spares level of something over 20 percent of the rig, and an entourage of specialist technicians to tender to them between shows. They also used a proprietary control method, an expensive metal short-arc lamp, and they were significantly noisy.

Much has changed since then. The moving-mirror spot was devised to give us a fixture which could move the beam around more rapidly than the full-body movement of the VL1, and with a little less noise. These generations of luminaire, now generally identified as "scanners," were reliable enough to actually own and use on a regular basis. They used cost effective Metal Halide discharge lamps and could be controlled by a standard DMX512 console, although they still had some serious drawbacks.

Aside from costing as much as a good compact automobile, the pan and tilt ranges of the mirror were limited by mechanical considerations, while the size of the mirror limited the range of possible beam angles, usually in the optical configuration of an ellipsoidal reflector spot. Until quite recently, the cooling fans, actuator motors and power supplies were still so noisy that they were

Vari-Lite's VL-1000

relegated to nightclubs and concert stages, where background sound levels have no discernable impact.

Succeeding generations of moving-mirror luminaires served as a platform for the development and refinement of such features as motorized CMY color mixing, indexable rotating gobo patterns, indexable rotating prisms, motorized faders, lighter weight switch-mode power supplies and even independent four-blade internal masking shutters. Eventually, as stepper motor technology and control systems got smoother, faster, and finally quieter, the moving yoke luminaire has reappeared.

JUST TO BE DIFFERENT

Meanwhile, as a consequence of this increasing complexity, where each luminaire can now require more than 30 control channels to drive its huge range of functions, an entire new generation of control consoles has arisen. Each of these new range of consoles attempts in various ways to reduce the complexity of the plotting process, while giving the lighting designer maximum creative flexibility.

The conceptual differences in operating these console families are substantial, and continue to diverge. Every console manufactureræand many people who have never built a console beforeæseem to be compelled to enter the moving light controller market at the very top end, with a new, high-concept console that is as different as possible from all previous consoles.

The recent proliferation in video recording formats is nothing compared to what's currently happening with moving light consoles. I suspect that there are way too many top-of-the-line consoles in the marketplace at the moment, for all of the developers to recoup their R&D investment. The fun will be to see which of these new control concepts catches the attention of programmers, LDs and the people in the big offices who write the checks for equipment purchases.

The swing back to fixtures with moving bodies in the last couple of years has not only meant that beam positioning is now more flexible, it has also allowed luminaire designers to produce instruments with wider beams than could be positioned with a steerable mirror. The wash light (what we would call a fresnel spot) has been added to the moving light catalog. Motorized functions available on these fixtures (in addition to the expected pan, tilt and zoom) include internal color wheels, full CMY mixing, beam-spreading prisms, frosts, and most recently, four-leaf rotatable barn-doors.

In addition to the panning and tilting moving lights, there are now also a variety of static positioned but motorized color-mixing floodlights suitable for covering large, fixed surfaces such as sets, buildings, and of course, cycloramas.

ATTENTION PLEASE!

Moving lights have been used in television production for many years now, although almost exclusively for doing guest spots on music shows where the audio is not live. More recently they have been seen waving their beams around in an effort to increase the excitement on game shows. Indeed a game show set that I visited recently had 170 moving lights as part of its frenzied (and utterly incomprehensible) format.

Most of the moving lights were not of the ultra low noise variety, having come straight from concert and corporate production work. Even with the fixtures at rest, the noise from 170 power supplies and more than 300 cooling fans was like standing on a sidewalk in moderate traffic. Fortunately on this production, most of the talent was reasonably close-miked and there was canned music behind the sequences where people, lights and cameras go berserk with excitement.

Given the overwhelming number of moving lights with MSD/MSR metal halide lamps, the LD on the show opted to color balance the cameras for daylight, and match the standard tungsten sources by correcting them with CT Blue. Everyone, especially the vision control guys, was very pleased with the colorimetry of their studio cameras when balanced for daylight.

Moving lights don't actually have to move in shot to be effective production tools. The next step is to add a few moving lights to a general purpose studio rig, to handle such simple requirements as an impromptu sports or special event hosting, or an interview for a news or current affairs program.

We are on the threshold of being able to achieve this right now. Last year at the LDI show, Vari-Lite released the VL-1000, a quiet, tungsten-lamped ellipsoidal spot, aimed squarely at the theatre and TV studio market. Only a few weeks ago, ETC revealed the Revolution, their quiet, tungsten moving light for this market, and Wybron will be showing their contenders, the non-moving, but otherwise motorized Nexera spot and wash fixtures, at LDI in mid-November.

Controlling these fixtures will require a moving light console with sophisticated features to make programming straight-forward, but small enough to run just a few fixtures rather than a concert extravaganza. It will need to be something that you can add to your existing control system, or perhaps even use to replace it. Fortunately there are now many such consoles available, with most of them costing much less than you think.

The next year or two will see the emergence of a new range of possibilities for the television LD, with moving lights that can simplify and extend everyday production, without major capital investment or a serious disruption to the flow of production. Stay tuned for further updates.

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

Net Soup

CONTINUED FROM PAGE 40

computer can read formatted RTF files. If sophisticated formatting, graphics or tables are an issue requiring the use of Word, PDF makes a secure display format while accurately replicating the document's style.

Mariner Software, the author of my preferred *Mariner Write* word processing application, quickly answered an e-mail query when I asked the company's assurance that no hidden data is embedded in any of my documents after saving them to the RTF format.

"I assure you there is no 'invisible' data retained or embedded," answered Mariner's Logan Ryan. "We do not subscribe to the 'questionable' marketing or technological tactics as Microsoft does. Your files are not tampered with."

Microsoft has published a document in its online Knowledge Base (Article # 223790) that describes various ways metadata is embedded in a Word document. Unfortunately, there's no single, one-button method to "clean" residual data from a Word document.

To access Microsoft's article, visit: (*http://support.microsoft.com/default.aspx?scid=http://support.microsoft.com:80/support/kb/articles/Q223/7/90.ASP&NoWebContent=1*)

Frank Beacham is a New York City-based writer and media producer. E-mail: frank@beacham.com.

IT'S TURBO CHARGED

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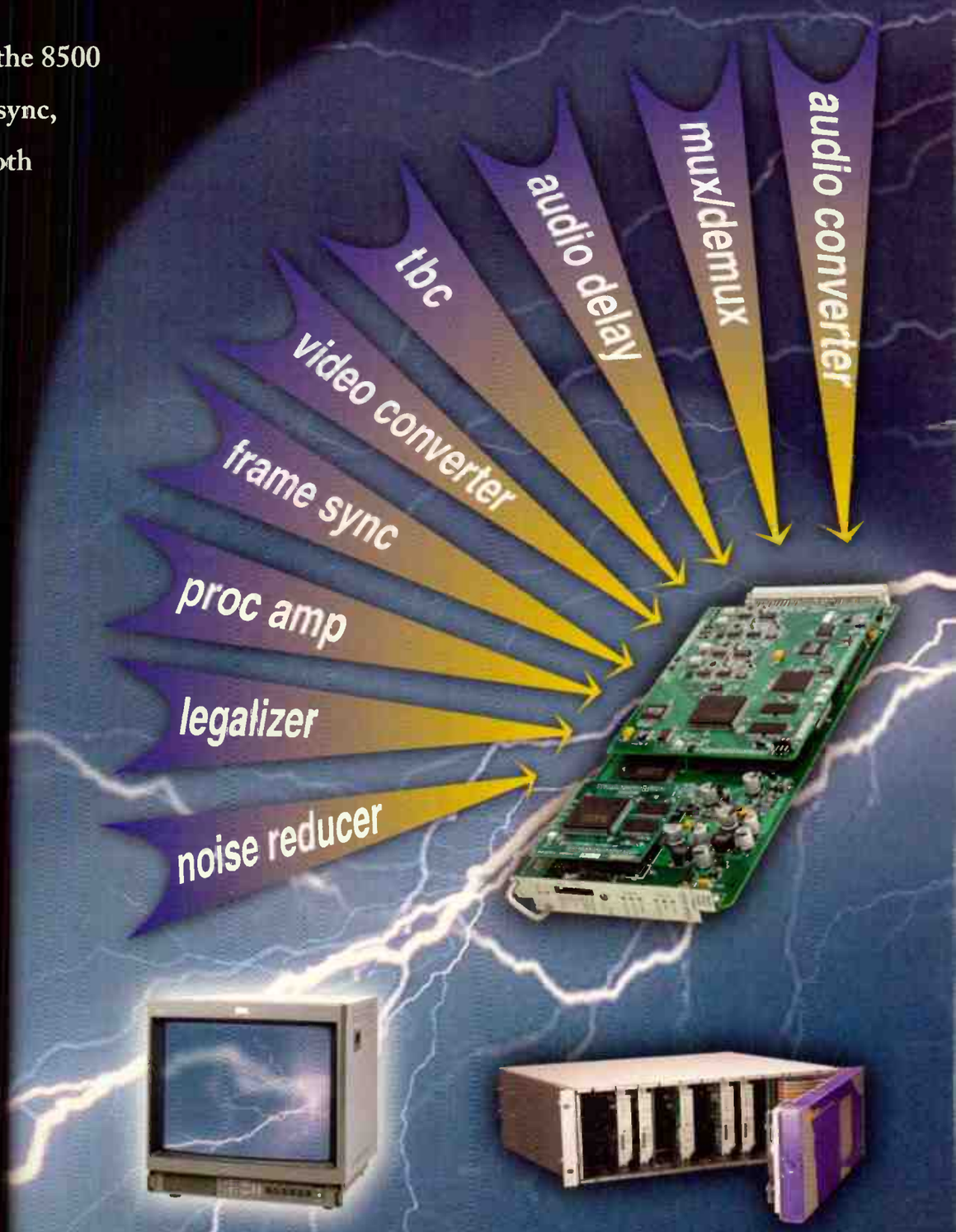

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USER REPORT

Azden Scores in Las Vegas

by Craig Caples
Owner
Caples Productions

LAS VEGAS

Caples Productions is a Las Vegas-based video production company that supports almost any type of video event but has become the local leader in sports production.

Caples started producing high school football and basketball games for what is now Cox Cable and over the last 10 years has grown to cover major off-road races, ski events and a weekly race show at the Las Vegas Motor Speedway.

As we grew we wanted and needed to add more bells and whistles, things that gave us a more professional sound and look. We wanted to implement many of the same features as those we see used on college and NFL games.

We started with the Azden Pro series wireless systems to mic the officials on the field. This was a great success and we soon started to use the same system for sideline reporters, giving us the polished, professional look and sound we wanted.

There is always an element of risk in using any wireless system and we did have some very interesting and humorous "calls" by the officials, caused by the fact that we had only two very busy VHF frequencies to use for these mics.

One of the most memorable was when the band director talked to the band over speakers that were being driven by a wireless mic on the same frequency as our referee's mic. When the official opened the mic to explain a penalty, the band director was also giving the band directions. We're still not sure, but we think one team got a penalty for playing the school fight song!

Announcer Trip Mitchell explains what race officials look for after a race, while Adam Achandi handles the camera.

UPGRADE TIME

It became evident that we would have to upgrade our wireless systems. We had great success with Azden products and they worked well and consistently. The obvious choice was to continue with the company's products.

We decided to buy Azden 1000 series wireless systems. These consist of the 1000 URX receiver, 1000 PT belt-pack transmitter and microphone, and the 1000 XT transmitter that fits on any XLR microphone. This is a diversity system that attaches to our Sony DSR-300 camcorders and was designed to mount to our Anton/Bauer batteries.

We have had the Azden 1000 series mics for about two years and have used it in almost every condition and environment without any problems. If the receiver is on the same channel as another film crew, field reporter or stadium announcer, all we do is change the frequency.

We use both the belt pack and the transmitter that attaches to a standard XLR microphone. Both are reliable, with good strong signals even on the ski slopes of Utah. The units are rugged and withstand talent that spends more time skiing on the belt-pack transmitters than on their skis.

We keep dreaming of new and different tests for the Azden UHF 1000 system; maybe a mic on the driver of a NASCAR late-model racecar will be our next test.

In conclusion, if you haven't figured out that we are sold on Azden, let me make it clear. As we continue to grow, as a company, so will our use of Azden wireless products. I'm confident that Azden will continue to introduce cutting-edge products to its already reliable, cost-effective and clear-sounding family of wireless mic systems. ■

Craig Caples is the owner of Caples Productions. He can be reached at craig@caples.net.

For more information, contact Azden at 516-328-7500 or visit www.azdencorp.com.

BUYERS BRIEF

The Solid State Logic C200 provides the latest adaptation of SSL's in-line console technology with a dedicated "knob-per-function" control surface. The C200 works well in applications where hands-on access to large numbers of controls is essential. A special mobile configuration of the C200 is also available for compact studio or mobile installations.

The SSL C200 features dual faders per channel strip, 12 main busses that support both 5.1 and stereo, and 48 multitrack busses with individual trim controls.

For more information, contact SSL at 212-315-1111 or visit *www.solid-state-logic.com*.

PRODUCTS & SERVICES SHOWCASE

USER REPORT

Telex Cuts Cord for Scharff Weisberg

by Scott Schachter
Vice President
Scharff Weisberg

NEW YORK

Scharff Weisberg specializes in rental and staging systems, focusing on corporate video production, as well as corporate meetings and presentations, stage performances and live theater.

We work on projects big and small, and often provide complex presentation systems that are set up for a day's meetings and then torn down for the next event. Although individual projects may vary in scope, some things that are important to us remain constant: Enabling production teams to communicate efficiently with one another is near the top of the list.

We've been using the Telex RadioCom BTR-800 UHF wireless intercom system since its introduction. Already familiar with previous versions of Telex intercoms, we were accustomed to how they can streamline setup and communications during an event. The BTR-800 was a natural addition to our intercom inventory, which now includes more than 60 channels of the units.

An average corporate video shoot involves an array of people who are essential to the production: projectionists, corporate spokespeople, lighting technicians and many others. Some jobs are just one-day affairs; others can occur over the course of several days.

STAYING COORDINATED

Keeping all these different elements coordinated is critical, and easy-to-use and flexible communications technology is essential, especially for stage managers in any type of video production. Typically, we position intercom stations throughout a corporate location, enabling crews to coordinate a shoot easier from various vantage points.

A key aspect of the two-channel BTR-800 system is its "source assign" feature, which allows us to have a production channel, as well as party lines for audio, video, lighting and stage managers. So, in addition to the main production channel, a second channel can then become anything you want it to become.

For example, you may want to have your cameras on a private party line, with another channel freed up for the director to use without tying up the production line. Essentially, you can just dial anything in to anywhere.

The system's duplex design also lets us switch easily between channels. That's a big benefit when a director needs to relay a message to a camera operator on Channel A, and then needs to discuss an issue with another technician on Channel B.

The ability to use each channel for different facets of a production further simplifies operations, because everyone doesn't need to hear every conversation that occurs during a production. For example, the BTR-800 includes a "wireless talk-around" (broadcast ISO) feature, allowing each beltpack on the system to momentarily route audio only to the other wireless beltpacks on its current channel. The user's audio is lifted off of the intercom bus so that only the other wireless beltpacks can hear.

The Telex BTR-800 multichannel system uses UHF frequencies and diversity reception to improve performance.

LOOK MA, NO WIRES

Obviously since it's a wireless system, crew members aren't encumbered by wires tailing behind them, which also means fewer cables that we have to run. Also, being able to multiplex numbers of different areas on the intercom system together into one is another important feature.

The Telex BTR-800 is extremely simple to setup and it interfaces easily to our hardwired systems. We are pleased with the performance and durability of our Telex wireless intercom systems. ■

Scott Schachter is a vice president with Scharff Weisberg. He can be reached at scotts@swinyc.com. *The opinions expressed above are the author's alone.*

For more information, contact Telex Communications at 800-553-5992 or visit www.telex.com.

BUYERS BRIEFS

Wheatstone's D-9TV Digital Television Console targets the needs of mid-market facilities. The modular series is available with up to 40 input faders and sample-rate converters on each digital input. The D-9TV directs any source to any fader and features integral dynamics/EQ functions.

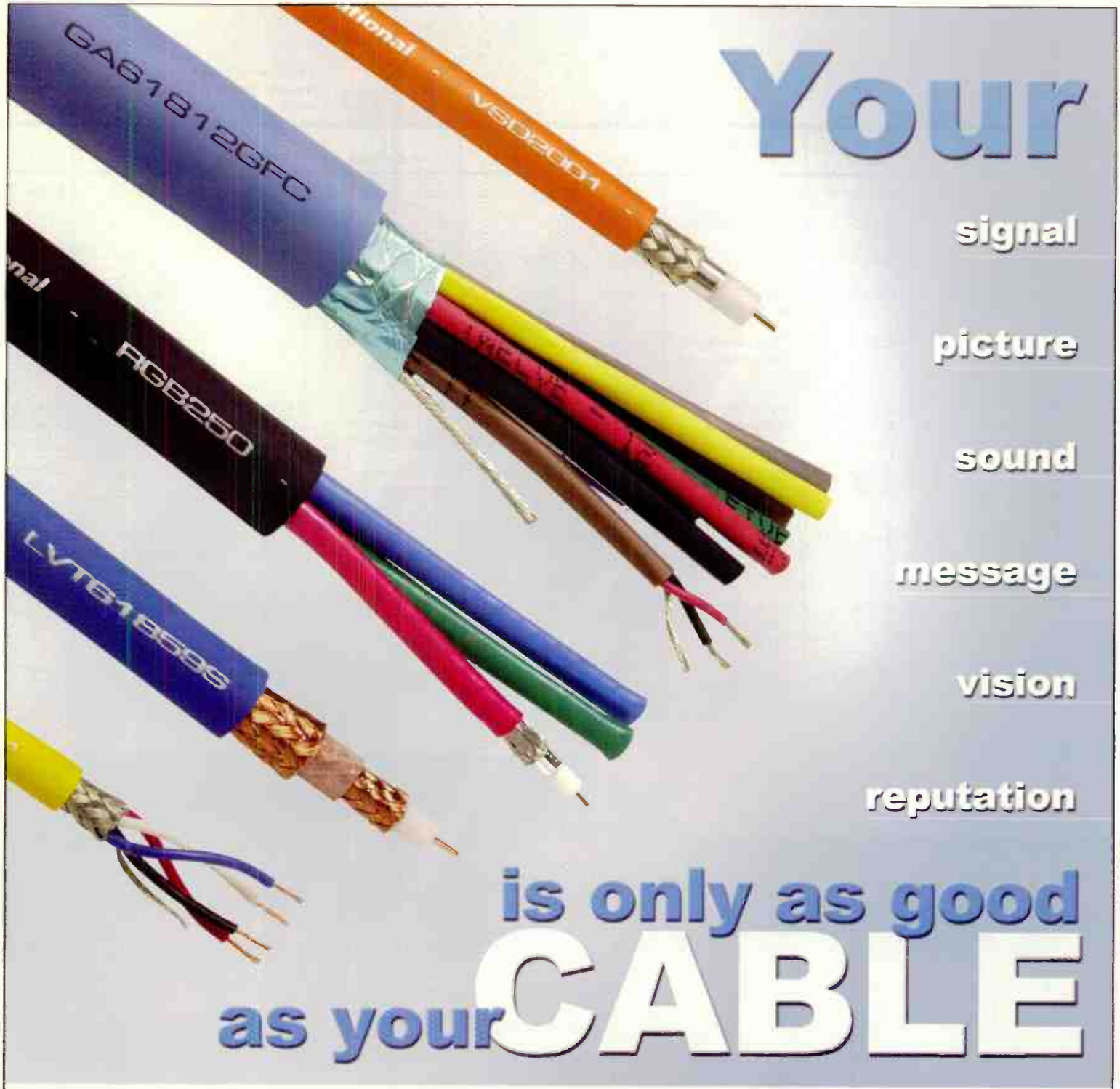
For more information, contact Wheatstone at 252-638-7000 or visit *www.wheatstone.com*.

The digital wireless microphone systems from Zaxcom have three transmitter choices, including a microphone-mounted transmitter (MMT) and a body pack. All feature digital RF modulation that provides up to 117 dB of dynamic range.

For more information, contact Zaxcom at 973-835-5000 or visit *www.zaxcom.com*.

The Modulation Sciences MSI-3300 combines A/D and D/A conversion, along with gain-riding capability and a transmission audio processor. The unit incorporates a 15.7 kHz notch filter and BTSC low-pass filter.

For more information, contact Modulation Sciences at 732-302-3090 or visit *www.modsci.com*.



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REFERENCE GUIDE

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

WIRELESS MICROPHONES

MANUFACTURER	MODEL	MIC TYPE & APPLICATION	RANGE	AUDIO RESPONSE	RF FREQUENCIES	ENG CAMERA MOUNT	BATTERY TYPE & DURATION	PRICE
AKG 615-620-3800 *www.akg.com*	WMS4000/77	Mic/transmitter (CK77WR bodypack; freq. agile UHF system)	N/A	35 Hz – 20 kHz	650.1 – 789.9 MHz (1,200 channels in four 30 MHz bands)	N/A	2 AA, 15 hours	$1,640
Audio-Technica 330-686-2600 *www.audio-technica.com*	ATW-U101 ATW-U102	Body pack for lavs. Plug-in for handheld mics	300 feet 200 feet	100 Hz – 15 kHz Same	656.125 – 668.5 MHz 728.125 – 740.5 MHz Same	Yes Yes	9 V, 5-7 hours Same	$895 $950
Azden 800-247-4501 *www.azdencorp.com*	500XT	Transmit/receiver set (plug-in xmtr)	300 feet	20 Hz – 20 kHz	794 – 806 MHz	N/A	9 V for xmtr	$760
Lectrosonics 800-821-1121 *www.lectrosonics.com*	UCR211 UCR411	Lav., plug-on, and handheld xmtrs	Up to 2,500 feet	30 Hz – 20 kHz	537 – 768 MHz, 256 selectable per block, 9 blocks available	Available from 3rd party	2 x 9 V for 6-8 hrs or 10-18 VDC	$2,420 (UCR21 $2,575 (UCR41
Sennheiser 800-434-9190 *www.sennheiser.com*	SK 5012/ EK 3041	Mini bodypack TX; portable diversity receiver	300 feet	60 Hz - 20 kHz	450 – 960 MHz; 16 channels in 24 MHz bandwidth	Dockable or GA3041-BC kit	2 AA, 7 hours	$3,200 (SK 501 $1,850 (EK 304
Shure Brothers Inc. 800-257-4873 *www.shure.com*	VPH/58	Single antenna, VHF receiver, w/T2/58 handheld xmtr, SM 58	100 feet	80 Hz – 15 kHz	169 – 216 MHz (avail. in 10 freqs.)	Velcro, camera hot shoe	9 V, 7 hours (18 hours for mic xmtr)	$613
Sony 800-686-7669 *www.sony.com/proaudio*	UWP Series	UHF synthesized handheld; portable diversity tuner	N/A	50 Hz – 18 kHz (system)	758 – 782 MHz	Shoe mount	2 AA, 6 hours	$699
Telex 800-392-3497 *www.telex.com*	ENG-100L	ENG, event, video production	500 – 1,200 feet	50 Hz – 15 kHz	668 – 680 MHz & 734 – 746 MHz	Anton/Bauer	2 AA or 9-17 VDC external	$1,047

USER REPORT

WMTV Hits the Road With Euphonix

by Philip R. Garvin
General Manager
Western Mobile TV

PHOENIX

Western Mobile TV (WMTV), part of the Mobile TV Group, installed a Euphonix System 5-B digital audio mixing system in its new HD-equipped OB vehicle in the spring of 2003.

Based in the Southwestern U.S., WMTV uses the truck to cover professional sports events, such as NBA basketball, NHL hockey and Major League Baseball. It is among the first mobile units in the U.S. that is HD/SD and 5.1 surround sound capable.

After evaluating many different consoles, we decided that the Euphonix System 5-B was the ideal system for our requirements. We knew we needed a solid, reliable audio console that could handle large numbers of inputs and outputs. The System 5-B was simple to operate, especially in terms of its 5.1 surround capabilities.

In large mobile units, weight is a major consideration and the System 5-B was the lightest of all the systems considered.

The 82-channel System 5-B has full power supply and DSP redundancy, and was specified with 12 main, 16 aux and 24 group output busses to handle multiformat surround outputs, as well as the complex mix minus and clean feed requirements.

Like many digital boards, Euphonix has an integral audio router. What makes the Euphonix router unique is that our Jupiter router controller that controls the video and audio routing throughout the truck can control it. This means we eliminated a separate audio router and simplified the audio routing, saving us time, money and weight.

Performance is what the System 5-B is all about. Every channel on the mixer has exactly the same features, and monitor channels, input channels and effects returns all include the same number of busses and aux sends, EQ, filters and dynamics. The identical features and control locations make the console easy to learn and operate.

Graham Lewis (l), a technical specialist with Euphonix, and Doug Klyn, an audio free-lancer, work with WMTV's Euphonix System 5-B console.

Full dynamic automation is included and the mixer has "SnapShot" recall of all console parameters.

Euphonix also has a great customer support team—if we ever have a question, it's never left unanswered. ■

Philip R. Garvin is the general manager for Western Mobile TV. He can be reached at philip@coloradostudios.com. *The opinions expressed above are the author's alone.*

For more information, contact Euphonix at 650-855-0400 or visit www.euphonix.com.

USER REPORT

News Audio Captured by Sound Devices

by Nick Kolias
Free-lance Sound Engineer

SEATTLE

When it comes to production gear in the field, reliability is critical and having good equipment for the job makes life easier and a lot less stressful.

In the spring of 2002, I added a Sound Devices 442 portable mixer to my equipment arsenal. It proved to be an outstanding addition—the 442 is versatile and has many features that enhance the way I work.

First and foremost, the 442 sounds great. It's also well-designed and user-friendly, and the build quality and finish are excellent.

Much of my work is ENG and shoots for network news magazines. Although most news production is challenging, news magazine shoots have their own special set of demands. A typical scenario involves sending and monitoring audio from multiple mics to at least two cameras, providing a courtesy headset to the producer, rolling a transcription recorder and sending an audio feed to a transcription house via a phone patch.

With the multitude of outputs on the 442, feeding all these devices is a simple and efficient task. For its size, the sheer number of outputs the 442 offers is amazing and they can be lifesavers on complicated setups.

The proliferation of small DV cameras means that I work with them more and more often. While DV cameras have many advantages, most have lackluster audio circuitry that can be problematic when I try to interface professional audio equipment with them.

CHANGING SETTINGS

I sometimes change the limiter threshold on my 442 mixer when working with DV cameras to achieve a higher S/N ratio without overmodulating the peaks. Because the 442 is microprocessor-controlled, I can easily tweak the mixer's software settings.

Changing limiter settings or any other internal function of the 442 is quick, and the LEDs provide immediate feedback for what you're adjusting. Since the adjustments are made in precise increments, it lets me make predictable changes when I need them. It's a superior system than having to remove a cover plate and adjust micropots or DIP switches.

The 442's rugged construction, powerful feature set and ergonomic layout have become indispensable. At the end of the day, what really matters is getting the job done and making the producer happy. The 442 has been a great tool to help me achieve just that. ■

Nick Kolias is a freelance sound engineer who works on network news, independent film and video, and corporate jobs. He can be reached at nick@fatfrogproaudio.com.

For more information, contact Sound Devices at 608-524-0625 or visit www.sounddevices.com.

BUYERS BRIEFS

The MKH 418S stereo shotgun microphone from Sennheiser provides a clear stereo signal at some distance from the sound sources. Its interference-stereo format, compact dimensions and very good consonant clarity make it well suited for film and television, both indoors and outdoors.

The MKH 418S has a frequency response of 40 to 20,000 Hz, and works from phantom power.

For more information, contact Sennheiser at 860-434-9190 or visit *www.sennheiser.com*.

The DMM100 from **ATI** accepts serial digital signals such as AES/EBU audio from 110-Ohm balanced XLR, 75-Ohm BNC, RCA input or a TOSLINK optical fiber. The unit provides reshaped outputs to simultaneously drive the same cable types, including D/A conversion. All inputs and outputs are transformer-coupled and floating to provide maximum isolation and ground loop elimination.

For more information, contact ATI at 215-443-0330 or visit *www.atiguys.com*.

The DP564 multichannel audio decoder from **Dolby Laboratories** is for quality-control monitoring of popular digital audio formats, including Surround Sound. With its ability to decode Dolby Digital (AC-3), Dolby Surround Pro Logic, Dolby Digital Surround EX, Pro Logic II and PCM soundtracks, the DP564 works in both 5.1 and stereo environments.

The DP564 has a front-panel master volume control, mute buttons for each channel, reference monitoring level and center/surround delay adjustments. The unit can deal with digital audio at sampling rates up to 96 kHz and its inputs include two BNC digital connectors and a fiber-optic TOSLINK connector.

For more information, contact Dolby Laboratories at 415-558-0200 or visit *www.dolby.com*.

The PT0600C-series of monitors from **DK-Audio** are built to fit in half-rack frames similar to popular video waveform monitors. Inside, the units are exactly the same as their freestanding counterparts that use the MSD type name.

There are two versions of the DK-Audio PT0600C monitors: the PT0600C-5.1 and PT0600C-III. The PT0600C-5.1 features surround sound monitoring using DK-Audio's "Jellyfish" pattern, a built-in audio matrix, phase meter, audio vector oscilloscope, the DK-Scale software program and an FFT spectrum analyzer. The unit has three digital AES/EBU inputs (up to 96 kHz) and a VGA-output.

The PT0600C-III monitors digital stereo audio but is otherwise similar to its surround-sound sibling.

For more information, contact DK-Audio at 800-421-0888 or visit *www.dk-audio.com*.

Engineered for dual aural monitoring of up to eight inputs, the Videotek APM-800 has two color bargraph meters, internal speakers, a headphone jack and external speaker amplifiers. Audio is monitored through two front-facing three-inch speakers and levels can be viewed on the adjacent LED bargraphs. The APM-800 has switchable peak or average meter response, stereo or monaural operation, and eight selectable inputs, which can be either balanced or unbalanced. Magnetic shielding permits use adjacent to waveform or picture monitors without interference.

The APM-800 is intended for use in remote vans, editing suites, VTR monitor bridges or for any system that requires monitoring of multiple audio signals. The unit fits in a 2 RU space.

Videotek also has a 1 RU audio monitor, the APM-200.

For more information, contact Videotek at 800-800-5719 or visit *www.videotek.com*.

The Modulation Sciences MSI-3300 is a multifunction unit that combines analog-to-AES3 and AES3-to-analog conversion (with automatic speed detection), along with gain-riding capability and a transmission audio processor. The unit incorporates a 15.7 kHz notch filter and BTSC system alias protection low-pass filter. These filters are always present in both the analog and digital input paths to protect transmission artifacts.

The MSI-3300 has both analog and digital outputs, and is intended for use by broadcasters, STLs and microwave links, satellite uplinks and cable modulators.

For more information, contact Modulation Sciences at 732-302-3090 or visit *www.modsci.com*.

PRODUCTS & SERVICES SHOWCASE

USER REPORT

Wohler Masters DTV Audio

by Christopher M. Knechtel
Systems Engineer
Linx Electronics

PALATINE, ILL.

I used to work for the Advanced Television Test Center and Model HDTV Station Project in Washington, and have been working strictly with DTV for nearly 13 years. Currently, I'm with Linx Electronics, developers of ATSC-compliant receiver technology.

After completion of the Model HDTV Station Project, the Liberty Corporation of Greenville, S.C., owner of 15 broadcast stations, contacted me to design and build its DTV conversion systems. Although the stations were a mix of ABC, NBC and CBS affiliates, I was given only two constraints; the systems had to be identical across all 15 stations and I had to purchase the equipment through a specific vendor.

Chris Knechtel poses with a Wohler EMON-1 audio monitor.

Early in the design, the need to monitor two- and 5.1-channel audio before and after the audio encoder became apparent. At that point, ABC was the only network that had selected an audio delivery format. Not knowing which format CBS and NBC would ultimately use to deliver audio to their affiliates, I knew it would be Dolby E, Dolby Digital (AC-3) or PCM.

Currently, ABC provides separate two-channel (PCM) and a 5.1-channel (AC-3 encoded at 640 Kbps) feeds to its affiliates. CBS is delivering two-channel (PCM), while implementing Dolby E for its 5.1-channel feed. NBC is delivering two-channel (PCM) and still reviewing its options for 5.1.

MONITORS ALL FORMATS

While researching audio monitoring devices, I discovered the Wohler EMON-1. It had the ability to monitor all the necessary audio formats and most importantly, it had an LCD display showing status information allowing for quick verification of audio format parameters and metadata information, all in a small (2 RU) footprint. The choice was simple; nothing else on the market came close.

The DTV system design at each station is relatively simple but very full-featured. Each station has a QC station for monitoring of audio and video signals, and the focused near-field sound performance of the Wohler EMON-1 is superior, allowing monitoring of audio quality without the need for a special listening environment. Placement of the Wohler EMON-1 is directly under the video monitor and the EMON-1's magnetic shielding is quite good.

All in all, the Wohler EMON-1 was the best choice for the system design. It has the ability to decode Dolby E, Dolby Digital and PCM audio, and its simplicity and flexibility are a great benefit. ■

Christopher Knechtel is a systems engineer for Linx Electronics and he has an extensive background in DTV. Chris can be reached at knechtelc@linxelectronics. *The opinions expressed above are the author's alone.*

For more information, contact Wohler Technologies at 650-589-5676 or visit www.wohler.com.

WTVF Goes Harrison

by Charlie Orr
Director of Operations
WTVF

NASHVILLE

The WTVF audio operational team, headed by Jay Swafford, recently completed installation of a new Harrison by GLW TVDSL audio console. WTVF (NewsChannel 5) is a CBS affiliate owned by Landmark Communications.

WTVF needed more audio flexibility for its live broadcasts, including internal routing that allows for quick audio source changes, expandability for future upgrades and the ability to reset the console in just a matter of seconds. The Harrison audio console solved multiple issues for us.

Installing an LCD video monitor right in the console also eliminated the cost of building a separate monitor wall for audio—a nice way to trim costs on a large project. We also like the increased comfort level of having Harrison close to home; the company's plant is just outside Nashville.

ON-SITE TRAINING

Engineers at Harrison coordinated the install with Beck Associates, the systems integrator for the project. We were pleased with the installation and the on-site training for the operators and maintenance staff. Both Harrison and Beck Associates were very proactive with both maintenance and operational issues, making sure our console worked correctly from day one.

We produce a range of shows from news to information-entertainment to live music performances, and the Harrison console far exceeds the requirements for all these demanding audio tasks. Its ease of operation and smooth transition from analog to digital were the final selling points for the station.

The Harrison TVDSL console has been on-line at WTVF for about seven months and our operators are pleased with its performance. ■

Charlie Orr is the director of operations for WTVF. He can be reached at corr@newschannel5.com. *The opinions expressed above are the author's alone.*

For more information, contact Harrison by GLW at 615-641-7200 or visit www.harrisonconsole.com.

COMPANY PROFILE

Calrec Moves With Mobile Production

by Bob Kovacs

Based in Hebden Bridge in West Yorkshire, England, Calrec manufactures audio mixers that are popular for live-to-air applications.

The company started in Hebden Bridge in 1956 when five engineers partnered to develop audio recording products to fill the void in the lean years after World War II. The team created their own recording studio by building a mastering recorder, cutting lathe and audio mixer.

"[The company] ended up being a service center for Beyer microphones in the U.K., and all gradually gave up their real jobs and started working for Calrec," said John Gluck, sales and marketing director for Calrec Audio.

In addition to operating a recording studio, Calrec's first products for sale were capacitor microphones, which it built for a Swiss company called Fi-Cord. Calrec (which is short for the Calderdale Recording Company) also began developing transistor microphones, which it sold under its own name.

The company's first big mixer sale was in 1969 to York University in England, which attracted the attention of the BBC, who requested a custom-designed small mixer for remote broadcasts. Gradually, the company did more and more work for the BBC and mixers eventually became Calrec's core business.

"We finally built the J-Series and the Mark II stereo O.B. mixer for the BBC, and that resulted in the first commercially available stereo broadcast console in the world, [we think]," Gluck said.

In 1985, Calrec shipped the Virtual Console System (VCS), an assignable analog audio console with digital control that allowed for full recall of all mixing parameters. AMS purchased the company in 1987 and then four of the original five partners bought back the Calrec name and restarted the company as a manufacturer of audio mixers.

"The company came back in 1989 with no product portfolio and we designed everything new from that point," Gluck said.

One of the company's first products was the Q-Series console, a medium-to-large mixer for live-to-air television. The Q-Series—in the form of the Q2—remains in Calrec's line today.

The company received some notice on these shores in the mid-1990s with

CALREC, PAGE 57

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USER REPORT

PODs Invade Matchframe

by Derek Evanson
Vice President of Engineering
Matchframe

BURBANK, CALIF.

Matchframe is a post-production company that has been in business for more than 18 years. Our facilities provide a full range of high-definition and standard-definition services including telecine, offline editing, linear and nonlinear online editing, visual effects, graphics, audio, duplication, format conversion and digital media delivery.

We needed an AES audio metering solution that provided a buffered output that could be passed on to other equipment and had an internal digital-to-analog converter for monitoring.

Matchframe's clients using our portable nonlinear edit systems wanted to be able to use the AES capabilities in the equipment, while we needed to support the large number of analog audio mixers we have in service. It was also essential that we be able to monitor the AES signal directly.

We also wanted to independently meter the feeds from our AES router in our new audio mix rooms, while passing these signals into distribution amplifiers. In addition, we required an analog signal that could be fed into the control room monitor selection portion of the consoles.

SINGLE-BOX SOLUTION

After a discussion with the people at Ward-Beck, we realized our hopes of finding a single-box solution. The new product is called a POD22 and two of them fit into a 1 RU package. The POD22 has LED meters and indicators for sample rate, errors and phase. In addition to functioning as a digital-to-analog converter, the POD22 has analog inputs and analog-to-digital conversion capability.

Both metering and conversion have been handled very conveniently by the POD22. Metering in the monitor bridge shows the operator the presence and level of the active AES audio.

Our rental customers can easily see the AES audio levels on the POD22's LED meters and the analog monitoring output makes listening to the signal convenient. The box couldn't be simpler to use; the only front-panel control selects different metering parameters. There's nothing that an untrained operator can misadjust.

In our QC station, an engineer can listen to the analog conversion from the POD22 and confirm the integrity of the signal.

The Ward-Beck POD22 simplifies audio monitoring at Matchframe. ■

Derek Evanson is the vice president of engineering for Matchframe. He can be reached at devanson@matchframevideo.com. *The opinions expressed above are the author's alone.*

For more information, contact Ward-Beck Systems at 416-335-5999 or visit www.ward-beck.com.

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AUDIO PRODUCTION

Want to Sell

DOD SR460H (3) stereo headphone amp, 1 input, 6 outputs w/individual level cntrls & 1 master cntrl, $75/BO. M Schulze, 619-698-4336.

Peavey 701R 7-chnl audio mixer, must sell, BO; Peavey UltraVerb digital stereo multi-effects processor, must sell, BO; Valley Intl PR-10a, Maxi Q, Kepex II, Gain Brain II, must sell, BO; Tascam mini studio Porta TWO audio mixer, must sell, BO; Fostex D-5 digital master rcdr, must sell, BO. 828-328-3391.

Sennheiser ME80 K3U, $125; (2) pair of Lectrosonics UHF 210's block 27 & 29, (rcvr/xmtr), $1825/unit. Stephen, 813-765-7909.

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CAMERAS

Want to Sell

Ikegami HL 55A, one owner, $4800. Stephen, 813-765-7909.

Sony DXC 537, xlnt cond in & out, all manuals & box, case, etc incl, can be docked w/BetacamSP/digital or CCU backs, just serviced by Sony tech, $1450/BO. M Schulze, 619-698-4336.

Sony UVW100 Betacam w/Fujinon 16x6 lens, Miller tripod, 3 AB bricks & chrgr, shotgun mic, PortaBrace cover, Century WA lens, all new, $5900. 518-383-6655.

CAMERA ACCESSORIES

Want to Sell

Bogen 3068 tripod, MK116 fluid head, 3067 dolly, all in xlnt cond, would like to sell as pkg but may part out, $400/BO; Sony DX-3000 ENG VF, new, never used, Ikegami ENG VF, new, never used, $100/BO. Al, 712-362-7939 or AlWud2002@yahoo.com.

IDX 400 NP/BP batt quick chrgr, 4 bays w/NMH batts, $325/BO; IDX Endura E-50 Lithium ION V-lock batts, new, never used, 4 avail, $170/ea. L Rodriguez, 714-841-1288.

Lee 85mm lens hood w/2 4x4 filter slots, fits on outside of any lens w/ 82mm filter threads, also Tiffen filters Gold Diffusion FX 5, Grad Sunset 3, ND .9 & Grad ND.9, all like new, $500; Century IF.8 wide angle adapter, 85mm mount, xlnt cond, w/optional lens shade/filter holder, $700; Vinten Vision 10 tripod, 2 stage aluminum legs, xlnt cond, incl Vinten soft case & older, used hard case, $2500; QTV FDP-12 HB LCD teleprompter w/12" high brightness LCD screen, perfect cond, complete w/custom hard case, incl Presentation Prompter software for Mac & Studio Prompter software for Windows, $2500. 330-307-1538.

Vinten Vision SD-12 tripod head & Sachtler single extension tripod legs w/floor spreader, $2500; Microforce zoom cntrl, Oppenheimer Pivot Pan handle, Canon cable, like new, $2000; Canon J8x6B3KRS wide angle lens, IKE mount, no extender, great cond, $2500. Alex, 727-595-6050.

COMPUTERS

Want to Sell

Media 100 Ultra Ice Board for AE, incl Final Effects Complete, Cinelook AE & accelerated After Effects filters, fits in any PCI slot, dramatically accelerates After Effects rendering, $2000. 330-307-1538.

EDITING EQUIPMENT

Want to Sell

Canopus ADVC-100 firewire converter, locked DVCAM audio, new in box, $235; DPS PPC-2000 TBC remote for Sony, $135. L Rodriguez, 714-841-1288.

Paltex Elan System8 editor, presently runs 6 machines, must sell, BO; Chyron Scribe Jr w/full memory & read effects, must sell. BO. 828-328-3391.

Pinnacle DV500 DVD integrated non-linear editing & DVD solution, incl full version of Adobe Premere 6.5 & Pinnacle 32-bit PCI hardware capture card. supports composite, YC component & firewire inputs & outputs, dual stream system w/real-time keyframeable effects, fast & slow motion effects & optimized workflow for DVD authoring, new cond, original box & manuals, $375. 845-278-6401 or nickm@cloud9.net.

Sony 9850, great editor, needs a new TV, makes great spots, $2000; JVC 850 (2), good units, $950/ea. G Clanke, 518-297-2727.

Videonics A/B edit cntrlr, cntrl 4 play & 1 rcd, can use time code. w/RS-32 cables, $500. G Kenny, 417-623-4646.

LENS REPAIRS

LIGHTING

Want to Sell

1K Baby Fresnels w/barndoors (2), $175/ea. Alex, 727-595-6050.

Arri 1K Fresnels, $200. Stephen, 813-765-7909.

Manufactuer selling off HMI and fluorescent production fixtures from demo stock. HMI's $1200-$2700.00, Fluorescent $500-$650.00, and tungsten kits.Please call 303-530-3222 or e-mail inquiry to info@bron-kobold-usa.com.

MICROWAVE/STL

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Mark Anexter (2) 76hz, 10', solid dishes, high efficiency w/radoms, still on tower, $500/ea plus removal; Mark Anexter P21-A-120 G (2) 8' grid 2 GHz dishes, $500/ea; (2) 10' grid 2 GHz dishes, $800/ea w/feeds, 7/8" EIA input, $2000/ all; Mark Anexter (2) 24" 13 GHz dishes w/feeds, $150/ea. G Kenny, 417-623-4646.

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MISCELLANEOUS

Want to Sell

Amiga 2500 HD w/Super-Gen, lots of software, HP printer, Commodore monitor, keyboard, $100; Panasonic MX-10, like new, $500. Wayne, 800-317-5219 in CA or waynecalifornia@yahoo.com.

MONITORS

Want to Sell

Sony PVM 1380 13" color monitor, $100. Alex, 727-595-6050.

SIGNAL PROCESSING

Want to Sell

Videotek VDA-16 & ADA16 audio & video DAs, 1x6 w/rack shelf, vgc, $150/BO. Al, 712-362-7939 or AlWud2002@yahoo.com.

SWITCHERS

Want to Sell

Panasonic WJ-220 & WJ-225, rack mount, single space video switchers, gd cond, BO. Al, 712-362-7939 or AlWud2002@yahoo.com.

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Calrec

CONTINUED FROM PAGE 52

the T-Series console, which it sold to ABC, NBC, ESPN and the CBC. Many of those went into production trucks, as Calrec designs its mixers to be lightweight yet sturdy, both of which are important for mobile production facilities. The Q2 followed with even more capability.

"The Q2 was very successful," Gluck said. "It allows for 120 stereo inputs across the width of a [production] truck, which was unheard of at the time."

Today, Calrec manufactures both analog and digital consoles for television production applications. The company's analog line ranges from the small drop-in M3 mixer, through the mid-range S2 for both truck and studio use, to the T-Series of large mixers with full automation. The Q2 and the smaller C2 complete the Calrec analog line.

The company's digital lineup runs from the Alpha 100 for large facilities to the Zeta 100 for local broadcasters. All feature fast rebooting of the internal processor without disturbing the existing audio 5.1 surround sound capability. These consoles have been sold to such diverse customers as NEP, the BBC and German broadcaster WDG.

The digital consoles all share the company's Alpha architecture, which includes the capability for redundant power supplies, DSP sections and control systems. All circuit boards are hot-swappable and a newly installed card is instantly recognized by the system.

The Calrec Zeta 100 is a smaller digital mixer that uses the company's Alpha architecture, permitting hot-swappable cards and redundant systems.

"When we introduced larger-format digital consoles, we took a lot of time to think it through," Gluck said. "It's always been our strategy to build a range of broadcast consoles so that customers have the opportunity to buy consoles that all work in the same manner, but that offer true broadcast facilities."

The company now employs about 80 people and sells its products around the world, although its primary markets are Europe and North America. ■

BUYERS BRIEFS

Artist systems from **Riedel Communications** are matrix switchers for intercom and the routing of analog and digital audio and TCP/IP data. The fiber-based dual-ring network topology provides a decentralized infrastructure for live audio and talkback.

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For more information, contact Riedel at 818-563-4100 or visit *www.riedel.net*.

Systems Wireless is a dealer for a wide range of audio products, including analog and digital audio components, and wireless microphone and intercom systems. Among the manufacturers that the company represents are Clear-Com, Drake, Lectrosonics and Sennheiser.

For more information, contact Systems Wireless at 703-471-7887 or visit *www.swl.com*.

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TV TECH STOCK INDEX

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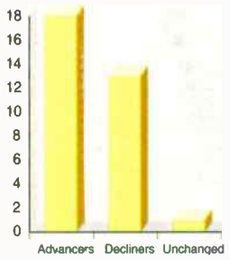

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TOP ADVANCERS BROADCAST STOCKS
(August 22—September 19)

Belo	+8.30%
Sinclair	+7.60%

TOP DECLINERS BROADCAST STOCKS
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Gray	-5.34%

TOP ADVANCERS TV TECH STOCKS
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Harmonic	+33.41%
Media 100	+22.43%

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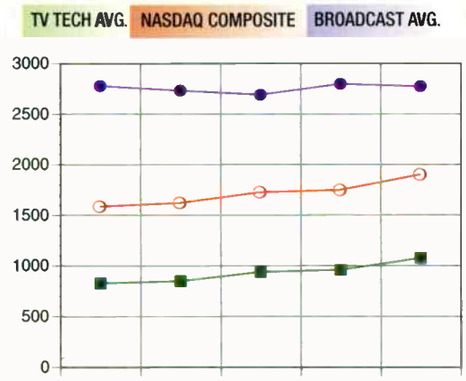
S-A	-2.27%
Storage Tech	-2.12%

TV TECH TREND



828	849	940	960	1078
1589	1625	1731	1752	1905
2782	2736	2694	2801	2777

TV Tech STOCKS as of Sept. 19

Company Name	52-Week Range	Sept. 5	Sept. 19	% Change
Avid	8.26 - 55.81	52.43	55.5	5.86%
Belden	10.50 - 20.06	18.72	19.05	1.76%
Ciprico	2.75 - 6.81	5	5.25	5.00%
Harmonic	1.01 - 6.15	4.58	6.11	33.41%
Harris	24.09 - 36.55	34.79	36.33	4.43%
Leitch	3.96 - 8.00	4.38	4.4	0.46%
SI Logic	3.78 - 12.90	11.26	11.96	6.22%
Media 100	0.35 - 1.70	1.07	1.31	22.43%
ParkerVision	4.08 - 14.61	7.71	7.58	-1.69%
Pinnacle	7.50 - 14.95	9.19	9.28	0.98%
S-A	10.10 - 37.14	34.83	34.04	-2.27%
SeaChange	4.50 - 14.40	11.9	14.34	20.50%
Storage Tech	9.66 - 27.99	27.38	26.8	-2.12%
Tektronix	14.64 - 25.75	24.3	25.67	5.64%

Broadcast STOCKS as of Sept. 19

Company Name	52-Week Range	Sept. 5	Sept. 19	% Change
Acme	5.35 - 8.65	7.4	7.5	1.35%
Belo	18.72 - 25.90	23.36	25.3	8.30%
Emmis	14.84 - 24.86	23.46	20.17	-14.02%
Entravision	5.20 - 13.60	10.24	9.9	-3.32%
Fisher	39.50 - 58.17	48	48	0.00%
Granite	1.30 - 3.70	2.89	2.79	-3.46%
Gray	7.95 - 14.90	13.1	12.4	-5.34%
Hearst Argyle	19.50 - 28.48	24.57	24.31	-1.06%
Hispanic Broadcast	16.60 - 32.44	30.92	29.5	-4.59%
Lin TV	19.45 - 26.55	23.3	22.25	-4.51%
Paxson	1.91 - 6.99	4.81	5	3.95%
Sinclair	7.68 - 14.97	10.4	11.19	7.60%
Liberty	32.10 - 45.30	44.06	44.13	0.16%
Univision	19.97 - 38.64	36.75	34.96	-4.87%
Young	6.50 - 25.54	21.03	20.94	-0.43%
Tribune	39.82 - 50.24	45.52	46.5	2.15%
Meredith	36.91 - 48.30	46.98	47.97	2.11%
EW Scripps	65.13 - 90.65	87.15	86.98	-0.20%

COMPANY FOCUS

Univision, Hispanic Broadcasting Merger Approved

LOS ANGELES

The FCC granted clearance for the $3.5 billion merger between Hispanic Broadcasting Corp. (HBC) and Univision Communications, making the transaction complete. The merger combines HBC's 68 full-service radio station licenses and 6 FM translator licenses with Univision's 32 full-service broadcast television licenses. It was determined by the FCC that the combined company would not violate the commission's current radio/TV cross ownership rule, nor would it violate the cross-media limits regarding ownership of television and radio stations in the same market.

Each share of HBC common stock has been converted into the right to receive .85 shares of Univision Class A common stock, giving HBC shareholders approximately 26.5 percent of the enlarged Univision's economic ownership. There will be no further trading of HBC common stock.

Clear Channel Communications, which owns 1,200 full-service radio stations, will have a small 3.66 percent post-merger voting stock interest in Univision. The transaction will result in Clear Channel having a lower percentage of ownership in HBC.

As part of the transaction, Univision agreed to convert its voting stock interest in Entravision into a new class of non-attributable, nonvoting stock interest, with no consent or voting rights other than the right to approve a merger, sale or liquidation, particularly the sale by Entravision of a television station affiliated with a Univision-owned network.

The Dept. of Justice recently filed a proposed Consent Decree stating that it would not oppose the merger if certain conditions were met, including the stock conversion, the reduction of Univision's total equity interest in Entravision to 10 percent over the next six years and the removal of nonvoting shareholder approval rights associated with the new class of stock. Should the FCC's new media ownership regulations eventually go into effect, Univision also will divest up to two HBC radio stations in order to comply with the new regulations.

In question are the attribution rules regarding television. The FCC said Univision has the right to reject the sale of any affiliated station, and this exceeds shareholder rights it has permitted media companies to retain in previous deals.

Consumer activists and Univision competitors have lobbied against the deal for more than a year, stating it would create a dominating empire in the Spanish-language market. The National Hispanic Policy Institute plans to ask for a federal appeals court to overturn the FCC's decision. Though the New York advocacy group has yet to make a final decision about whether to ask the United States Court of Appeals to intervene, Arthur Belendiuk, the group's attorney, expects to force the FCC to defend its order, citing "serious legal flaws" in its decision. He argues that the FCC is effectively saying that Univision cannot capitalize on its television relationship with Entravision to affect radio competition.

Jerrold Perenchio, chairman, president and CEO of Univision, says the company is "enormously gratified by the overwhelming public support" it has received from over 100 national and regional Hispanic organizations.

FCC Chairman Michael Powell said the merger "will give Hispanic media a better opportunity to compete against big media companies, (and capture) more advertising revenue. The decision widely rejects the call to separate Hispanics into a separate class for government review purposes."

— *Kelly Brooks*

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